FINAL SOURCE CONTROL REMEDIAL ACTION WORK PLAN
DOVER MUNICIPAL LANDFILL SUPERFUND SITE
TOLEND ROAD
DOVER, NEW HAMPSHIRE

Prepared For:

Executive Committee of the Group of Work Settling Defendants
Dover Municipal Landfill Superfund Site

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ACRONYMS

AAL	Ambient Air Limit
ARAR	Applicable or Relevant and Appropriate Requirements
AROD	Amended Record of Decision
AS	air sparging
BGS	below ground surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	constituents of concern
EMP	Environmental Monitoring Program
ESD	Explanation of Significant Differences
FES	Field Elements Study
FFS	Focused Feasibility Study
FS	Feasibility Study
GMS	groundwater model system
gpd	gallons per day
gpm	gallons per minute
GPS	global positioning system
GWE	ground water extraction
HASP	Health and Safety Plan
ICLs	Interim Cleanup Levels
IDR	Industrial Discharge Request
LUI	Lower Upper Interbedded
mg/Kg	milligrams per kilogram
MOM	Management of Migration
MSL	Mean Sea Level
NHDES	New Hampshire Department of Environmental Services
NPL	National Priority List
O&M	Operation and Monitoring
OMM	Operation, Maintenance, and Monitoring
PDI	Pre-design investigation
PDS	Pre-Design Study
PID	photo-ionization detector
POTW	publicly owned treatment works
QAPP	Quality Assurance Project Plan
RA	Remedial Action
RCRA	Resource Conservation and Recovery Act
REMP	Revised Environmental Monitoring Plan
RFFS	Revised Focused Feasibility Study
RI	Remedial Investigation
ROD	Record of Decision
SC	Source Control
SCADA	Supervisory Control and Data Acquisition
SCFFS	Source Control Focused Feasibility Study
SCRA	Source Control Remedial Action

SCRD	Source Control Remedial Design
SCRD-WP	Source Control Remedial Design Work Plan
SMP	Site Management Plan
SOW	Scope of Work
SVE	soil vapor extraction
THF	tetrahydrofuran
TZD	Treatment Zone Demonstration
µg/L	micrograms per liter
US	Upper Sand
USEPA	United States Environmental Protection Agency
UUI	Upper Upper Interbedded
VC	vinyl chloride
VOC	volatile organic compound
WMA	waste management area

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1.0 INTRODUCTION

1.1 OVERVIEW

Pursuant to the 2004 Amended Record of Decision (2004 AROD), the United States Environmental Protection Agency (USEPA) Region 1, in agreement with the New Hampshire Department of Environmental Services (NHDES), is requiring the completion of a Source Control Remedial Action Work Plan (SCRA-WP) at the Dover Municipal Landfill Superfund Site (the Site). USEPA and NHDES are referenced herein as the "Agencies".

The Executive Committee of Work Settling Defendants for the Dover Municipal Landfill Superfund Site (referred to herein as the Dover Group) is to complete the SCRA-WP in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and its amendments. The specific activities, procedures, and criteria by which the Source Control Remedial Action (SCRA) is to be performed are described in this Work Plan. A draft SCRA-WP was submitted to the Agencies on December 29, 2010. The Agencies provided approval of and comments on the draft SCRA-WP in a letter dated January 24, 2011. This Final SCRA-WP addresses the Agency comments and includes a summary of the responses in Appendix F.

The Dover Group retained GeoInsight, Inc. (GeoInsight) as the General Contractor to prepare the SCRA-WP. The Dover Group designated Michael J. Webster of GeoInsight as the Project Manager with responsibility for the administration of the actions called for in the Work Plan. GeoInsight teamed with XDD, LLC (XDD) to assist in scoping remedial design activities and preparing the associated Work Plan.

Three integrated project plans will guide the completion of this SCRA-WP. They are presented in three (3) volumes including the Site Management Plan (SMP), Quality Assurance Project Plan (QAPP), and Health and Safety Plan (HASP). These three project plans were completed by GeoInsight in 2005 upon initiation of 2004 pre-design investigation (PDI) activities. The QAPP and HASP were reviewed, and revised (as necessary) concurrent with the development of this SCRA-WP and were submitted to USEPA under separate cover in January 2011. An SMP Addendum was prepared in January 2009 to provide information regarding activities associated with the Southern Plume Management of Migration (MOM) and Northwest Landfill Hotspot remedial activities. The SMP Addendum also provided information regarding use of a limited portion of the top of the former Dover Municipal Landfill (Landfill) by the City of Dover for the storage of compost to ultimately be used in final closure and grading. Because, unlike the Southern Plume MOM and Northwest Landfill hotspot remedial actions, SCRA described in this Work Plan will result in material changes to the Site (such as reconfigured access roads and permanent structures), the SMP will be revised once the SCRA is completed and the associated ground water extraction (GWE) system is operational.

The Operation, Maintenance, and Monitoring (OMM) Manual will include protocols to operate, maintain, and monitor the GWE system and system component specifications. The OMM Manual is described in Section 6.6 and will be developed concurrently with the construction of the GWE system.

In addition to the OMM Manual, the current Environmental Monitoring Plan (EMP) will be revised once the SCRA is operational. The revised EMP (REMP) will include consideration of ongoing performance monitoring associated with the Southern Plume, Northwest Landfill, and SC remedial systems, and will be designed to comply with requirements associated with the NHDES Groundwater Management Permit that has been issued for the Site. Consistent with Agency comments received during SC remedial design, the REMP will include consideration of conditions associated with the northern portion of the perimeter ditch, the swale, and the Cocheco River.

1.2 OBJECTIVES

The objectives of the SCRA are to:

- augment, if necessary, and maintain the permeable cover on the Landfill surface to prevent exposure to waste in the Landfill and allow flushing of constituents of concern (COCs) from the Landfill waste management area (WMA); and
- construct and operate a GWE system at the toe of the Landfill to intercept ground water with concentrations of COCs above Interim Cleanup Levels (ICLs) emanating from the WMA.

The objective of the SCRA-WP is to identify how the SCRA will be implemented. This SCRA-WP includes the following information:

- the approach to construction activities;
- the schedule and sequence of construction activities;
- a description of how staging areas will be managed;
- a description of the proposed performance monitoring system; and
- a Construction Quality Assurance Project Plan (CQAPP).

Components of the SCRA-WP, such as project schedule, contractor contacts, and performance monitoring system, will be updated as necessary to reflect new information or significant changes in the project team, scope, or objectives. This SCRA-WP is a companion document to the December 29, 2010 100% SCRD, including Technical Bid Specifications (Appendix D) and the Drawings Package (Appendix E).

1.3 PROJECT IMPLEMENTATION

SCRA activities will be completed at the Landfill in three phases, as further discussed in Section 4.1. Because of considerations associated with seasonal conditions in the vicinity of the Landfill, and in particular, the potential presence of appreciable standing water during late winter and early spring, certain SCRA activities were implemented in the fall and winter

2010. Phase I activities, which have been substantially completed, focused upon impacted sediment removal and grading activities along the perimeter ditch during a period of seasonal low water. Phase I activities were completed by Clean Harbors, Inc., the contractor selected by the Dover Group in October 2010 after completing of a formal bidding process. This SCRA-WP will reference Phase I activities that have been completed at the Landfill. A summary of Phase I activities will be included in the As-Built Construction Report.

Phase II and III activities will be conducted during the 2011 construction season. The Dover Group has completed the Phase II/III bidding process and has selected H.G. Sargent Corporation (Sargent) as the remedial construction contractor. The Dover Group anticipates that a contract will be executed with Sargent during March/April 2011 and that 2011 SCRA activities are likely to be initiated at the Landfill in April 2011.

1.4 WORK PLAN ORGANIZATION

This SCRA-WP is organized as follows:

- Section 1.0 describes the project overview, objectives, and Work Plan organization;
- Section 2.0 presents a description of the Site and Work Plan area;
- Section 3.0 provides general background of the Site and presents a summary of the 2004 AROD, 2009 Source Control Focused Feasibility Study (SCFFS), and subsequent Explanation of Significant Differences (ESD);
- Section 4.0 describes how components of the Source Control remedy will be implemented;
- Section 5.0 describes the schedule and sequence of construction activities;
- Section 6.0 provides the approach to performance monitoring;
- Section 7.0 describes the SMP components;
- Section 8.0 describes the QAPP components;
- Section 9.0 describes the HASP components;

- Section 10.0 includes information related to Project Coordination;
- Section 11.0 includes a list of Work Plan references.

2.0 SITE AND WORK ZONE AREA DESCRIPTION

2.1 SITE DESCRIPTION

The Landfill is located to the west of Tolend Road in the west corner of the City of Dover as shown on the Site Locus (Figure 1). The Landfill operated from approximately 1960 to 1979. The Landfill is bordered by the Hoppers wetland to the north, residential properties along Tolend and Glen Hill Roads to the east, and forested wetlands to the south and west. At its closest meander point, the Cocheco River is located approximately 600 feet east/northeast of the east corner of the Landfill (i.e., the entrance of the Landfill along Tolend Road). At its closest location, the north bank of the Bellamy Reservoir is approximately 1,500 feet south of the southwest corner of the Landfill (i.e., the toe of the Landfill near well clusters SC-10 and SC-18). Land located to the west and south between the Landfill and the Bellamy Reservoir consists of undeveloped woodland and forested wetlands. Features of the Landfill and the surrounding areas are illustrated on Figure 2 and Figure 3.

The Landfill surface is generally topographically flat with a slight increase in elevation (approximately 10 feet) from the east side of the Landfill to the northwest corner. Small trees and shrubs occupy the eastern, northeastern, and localized areas of the north portion of the Landfill. The central and southern portion of the Landfill is covered by vegetation including grass and low brush. Access to the Landfill is via a gate and dirt access road located at the southeast corner of the Landfill, just north of the intersection of Tolend and Glen Hill Roads. A metal Butler building, used in previous work at the Site, is located at the west end of the Landfill access road near the southwest corner of the Landfill.

A shallow drainage ditch was located along the toe of the Landfill (known as the "perimeter ditch"). The perimeter ditch collected surface water runoff and intercepted, at least seasonally, shallow ground water flow. Portions of the perimeter ditch were backfilled during Phase I activities performed in late 2010. The perimeter ditch discharged (via a series of culverts) to an erosional gully that is located to the east of the intersection of Tolend and

Glen Hill Roads. This gully is referred to as the "drainage swale" or "swale." The swale drains to the northeast, discharging to the Cocheco River approximately 600 feet northeast of the east corner of the Landfill (i.e., the entrance to the Landfill along Tolend Road). The elevation of surface water in the Cocheco River (approximately 110 feet Mean Sea Level or MSL) is approximately 30 feet lower than the elevation of the ground surface along the top of the west bank of the river (which generally ranges from 142 to 144 feet MSL).

A more detailed description of the Site is presented in Section 1 of the Revised Focused Feasibility Study (RFFS; GeoInsight, January 2004) and Section 1 of the RFFS Addendum (the USEPA Addendum; June 18, 2004) prepared by the USEPA.

2.2 DESCRIPTION OF HYDROGEOLOGIC UNITS

This section summarizes general information regarding the hydrogeology and stratigraphy at the Landfill and identifies the units within which the GWE system will be installed. In particular, the identification and thickness of hydrogeologic units near the southern and western toe of the Landfill were reviewed to select the vertical placement of extraction wells.

The overburden materials in the vicinity of the Landfill consist of upper and lower hydrostratigraphic units that are separated by a layer of Marine Clay that has an average thickness of approximately 30 feet. The depth to the Marine Clay unit varies across the Site. The clay layer is present at the ground surface to the northwest of the Landfill and slopes downward to the south and east. The clay layer forms a barrier to the vertical flow of ground water between the upper and lower hydrostratigraphic units. A topographic map of the top surface of the Marine Clay unit that was developed during Golder Associates, Inc. (Golder; 1995) PDI activities and updated by GeoInsight was included as Figure 3 (SCFFS; GeoInsight 2009) of the 100% Source Control Remedial Design (SCRD). The depth to the top of the Marine Clay unit in the area of the toe of the Landfill ranges from 45 to 65 feet below ground surface (BGS).

The characteristics of the upper hydrostratigraphic unit were developed based upon a compilation of historical stratigraphic information and detailed soil borings completed during SEA Consultants Inc. (SEA) 1994 Pre-Design Study (PDS) and Golder's 1995 PDI (and as described in Section 4.2 of SEA's 1994 PDS report and Section 5.2.2 and 5.2.3 of Golder's 1995 PDI report). The upper hydrostratigraphic unit is divided into three sub-units (from the ground surface downward); an Upper Sand (US) unit, an Upper Upper Interbedded (UUI) unit, and a Lower Upper Interbedded (LUI) unit (NOTE: the "Upper" Interbedded stratigraphic unit was designated as such because of the presence of a similar "interbedded" unit that was identified within the lower hydrostratigraphic unit below the Marine Clay; the interbedded unit located beneath the clay layer was designated the Lower Interbedded unit). The GWE system wells will be installed in the US, UUI, and LUI units above the Marine Clay.

The US unit consists of fine to medium sand with little silt or clay. The observed thickness of the US unit varies, ranging from being thin or absent in the northwestern portion of the Landfill to a maximum observed thickness of 37 feet in the vicinity of well series SC-8 (located along the south central toe of the Landfill). The thickness of the US unit along the southern and western toe of the Landfill is typically 15 to 35 feet.

The UUI and LUI units consist of fine to very fine sand with interbedded layers of silt and clay. Analyses conducted during the Golder and SEA PDS/PDI programs indicated that grain size decreases with depth, and the silt and clay content increases with depth within both Upper Interbedded units. The contact between the Upper and Lower portions of the Upper Interbedded stratigraphic unit is gradational and is not always clearly identifiable. The Upper Interbedded units are thin or absent in the northwest portion of the Landfill where the Marine Clay layer is present at the ground surface. The typical thickness of the combined UUI and LUI units along the toe of the Landfill is approximately 10 to 45 feet. During subsequent discussions within this SCRA-WP document, the units within the upper hydrostratigraphic unit will be referred to as the US, UUI, and LUI.

2.3 REMEDIAL ACTION WORK AREA DESCRIPTION

Remedial implementation activities will be focused upon the footprint of the Landfill, the western and southern toe of the Landfill, and the perimeter ditch. The approximate boundary of the implementation work area is illustrated on Figure 2. The SCRA Work Area is surrounded by over 180 acres of densely vegetated woodlands and forested wetlands. Currently, the SCRA Work Area is accessed by a dirt path that originates on Tolend Road to the south of the Landfill, and the westward extension of the access road that is located on the top of the Landfill. The Landfill and contiguous properties that comprise the SCRA Work Area are owned by the City of Dover (a member of the Dover Group) and are undeveloped. Consequently, the contractor has full access to the areas where SCRA will be conducted.

The GWE system components will be located in very close proximity to the western and southern toe of the Landfill and will be installed in the area of the former perimeter ditch, a portion of which was filled in late 2010 in conjunction with implementation of the SC remedy. Remedial system extraction wells, support buildings, and flow equalization components will be constructed on the eastern flank of the eastern Landfill lobe and the southern and western flanks of the western Landfill lobe. An access road will be constructed along this portion of the toe of the Landfill, extending from Tolend Road to the existing access bridge located west of the existing Butler building at the southwest corner of the Landfill. The on-site ground water conveyance system will be connected to a lift station that is being constructed by the City of Dover near the east corner of the Landfill.

Consequently, much of the SCRA construction activities will be completed along the western and southern toe of the Landfill, within the general footprint of the former perimeter ditch. Open portions of the perimeter ditch northwest of the Landfill consist of a relatively flat, narrow strip of land located between the toe of the Landfill and the adjacent woodlands and forested wetlands. During wet periods of the year, the perimeter ditch and adjacent areas can contain standing water. Areas adjacent to the perimeter ditch have become overgrown with brush and small trees since active landfill operations ceased.

2.4 REMEDIAL ACTION DESCRIPTION

There are three primary components to the SC remedy. These components are briefly described in the paragraphs that follow.

Closure of Perimeter Ditch

Arsenic-impacted sediment with concentrations above 50 mg/Kg (milligrams per kilogram) was removed from the perimeter ditch in late 2010. After this material was removed, the southern, eastern, and western portions of the perimeter ditch were backfilled. The northern portion of the perimeter ditch will remain open to facilitate seasonal operation of the Northwest Landfill Hotspot remedial system.

Extraction of Leachate and Ground Water

A network of extraction wells will be installed along the downgradient toe of the Landfill. The extraction well network is expected to extend from the vicinity of the Landfill entrance (in the east) to the southwest corner of the Landfill (in the vicinity of existing well SB-4D). The extraction wells will be designed to extract leachate and impacted ground water migrating from beneath the Landfill in the US, UUI, and LUI strata, intercepting COCs migrating in ground water emanating from the WMA at concentrations above ICLs.

The extracted leachate and ground water will be conveyed to the City of Dover municipal sewer collection system for treatment at the City of Dover publicly owned treatment works (POTW). It is expected that several thousand feet of sewer piping and one lift station will be installed to convey the leachate and ground water to the existing municipal sewer conveyance system for eventual treatment at the City of Dover POTW. The design and construction of the extension to the municipal sewer collection system is being completed by the City of Dover separately from, but in coordination with, the Superfund remedial action.

Maintaining Permeable Landfill Cover

A key component to the long-term effectiveness of the SC remedy is the overall reduction of COC mass resulting from biodegradation occurring within the solid waste mass and general limits of the Landfill. Continued infiltration of water into the Landfill mass is required to sustain the microbial populations responsible for continued degradation within the Landfill and to maintain a hydraulic gradient that will flush residually impacted ground water to the SC extraction system. The Landfill is currently covered with a permeable, vegetated soil cover. The design of the SC remedy requires that the cover prevent potential direct contact with Landfill waste, but remain permeable to be effective for these purposes. Accordingly, this element of the remedy focuses on maintaining the cover to prevent direct contact with waste while preserving its permeability to precipitation, infiltration, and percolation. Consequently, after other SCRA construction activities are completed, localized areas on top of the Landfill where existing gravel cover is sparse and cover material is of poor quality for vegetative growth will be augmented with topsoil and seeded.

3.0 BACKGROUND

3.1 GENERAL

The Landfill, located to the west of Tolend Road in the west corner of the City of Dover, operated from approximately 1960 to 1979. The unlined Landfill accepted both domestic and industrial waste material from the surrounding community. Early operation practices reportedly included emptying drums of liquid waste into pits excavated to the water table and burning the waste prior to disposal (summary of Landfill operator depositions in Appendix O of the 2004 RFFS). Waste disposal initially occurred in the eastern portion of the Landfill and progressed westward until the current areal extent of the Landfill was reached (approximately 47 acres). The thickness of the waste material is variable and generally increases from the east to the west, with a maximum thickness of approximately 24 feet in the west-central portion of the Landfill (Figure 3-1 of the 1995 PDI report illustrates the limits and relative thicknesses of waste material within the Landfill). Initial Landfill closure activities were completed in 1980 and consisted of placing clean fill over the existing Landfill surface. In the early 1980s, additional closure activities were undertaken and included the excavation of a ditch (the "perimeter ditch") along the perimeter of the north, west, and south borders of the Landfill to collect surface water runoff and intercept shallow ground water flow. Features of the Site and surrounding area are shown on Figures 1, 2 and 3.

The Site was placed on the USEPA's National Priority List (NPL) on September 8, 1983. COCs at the Site include volatile organic compounds (VOCs) and arsenic. A Remedial Investigation (RI) was completed by Goldberg-Zoino & Associates, Inc. (GZA) and Wehran Engineers and Scientists (Wehran) in 1988 based upon the results of sampling activities completed during 1985 and 1986. A Field Elements Study (FES) was completed by HMM Associates, Inc. (HMM) in 1990 based upon the results of sampling activities completed during 1989. The FES was performed to address certain technical issues that were not fully evaluated in the RI. The original Feasibility Study (FS) was completed by HMM in February 1991.

Based upon the data presented in the RI, 1991 FS, and FES, the original Record of Decision (ROD) was issued by the USEPA on September 10, 1991, and a Consent Decree for Remedial Design/Remedial Action between the USEPA and the Dover Group was finalized on August 7, 1992. The 1991 FS included a detailed evaluation of the following four SC alternatives:

Alternative	Description
SC-1	No-Action with Long-Term Monitoring.
SC-2	Limited Action with Long-Term Monitoring/Access Restriction/Institutional Controls/Alternative Water Supply.
SC-5	Re-Contouring of Landfill/Multi-Layer Cap/Slurry Wall/Ground Water Recovery System/Ground Water Treatment/Discharge to Cocheco River/Geotextile Cover in Drainage Swale (SC-5A - Alternative SC-5 with Discharge to the Dover POTW).
SC-7	Re-Contouring of Landfill/Multi-Layer Cap/Interceptor Trench/Landfill Extraction Wells/Ground Water Treatment/Discharge to Cocheco River/Pre-Design Grid Sampling/Selected Sediment Excavation/Sediment Consolidation in Landfill (SC-7A - Alternative SC-7 with discharge to the Dover POTW).

The SC remedy selected in the 1991 ROD (Alternative SC-7/7A) included removal and consolidation of arsenic-impacted sediments from the drainage swale between the Landfill and the Cocheco River, installation of a cap on the Landfill meeting Resource Conservation and Recovery Act (RCRA) Subtitle C standards, and collection and on- or off-site treatment of COC-impacted ground water (leachate).

Since the 1991 ROD was issued, detailed investigation activities were completed during the Southern Plume PDS (SEA, 1994), 1995 PDI (Golder, 1995), and associated Environmental Monitoring Program (EMP; Golder, 1993 to present). Initial focused investigation activities completed after the 1991 ROD was issued included the Trench and Swale Characterization

(GeoInsight, 1998) and the Draft Final Bioremediation Pilot Assessment (Envirogen, Inc. [Envirogen] and XDD, 2001).

In 1994, while the design of the 1991 ROD remedy was in progress, the Dover Group reviewed innovative remedial methods to identify potential approaches that could offer a more cost-effective, permanent treatment of the target COCs at the Site than the long-term containment remedy identified in the 1991 ROD.

In May 1996, GeoInsight completed a focused feasibility study (FFS) for the Site. The objective of the FFS was to compare the selected 1991 ROD remedy to two *in situ* alternatives that appeared to be applicable based upon Site-specific technical data and recent advances in remedial technologies since the 1991 ROD was issued. The *in situ* alternatives evaluated in the FFS included a biowall (aerobic treatment trench) and an *in situ* treatment zone.

Based upon the results of a treatability study (Envirogen, 1995), field sparging study (Envirogen, 1996), the FFS (GeoInsight, 1996), and discussions with the Agencies, the USEPA and the NHDES approved implementation of a bioremediation treatment zone pilot study, a field demonstration of an *in situ* biodegradation remedy. The bioremediation pilot was performed by the Dover Group between 1996 and 2001 under an Administrative Order by Consent signed in 1997. The bioremediation pilot included a Treatment Zone Demonstration (TZD), which employed *in situ* sequential anaerobic and aerobic enhanced biodegradation. The results of the bioremediation pilot project were described in the Draft Final Bioremediation Pilot Assessment (Envirogen and XDD, 2001), which was reviewed, but not approved, by the NHDES and USEPA. The evaluation of that report by the NHDES is described in a letter dated April 23, 2002 (included in Appendix A of the USEPA's January 30, 2004 RFFS Addendum).

Based upon discussions with the USEPA and NHDES, it was agreed that Site-specific information derived from previous studies would form the basis for an evaluation of the Landfill bioreactor/aerobic treatment trench remedy compared to the 1991 ROD source

control remedy. To complete the required evaluation of the alternative remedy, the 1996 FFS was revised, and the results were presented in the 2004 RFFS (GeoInsight, 2004).

Prior to evaluating remedial alternatives, the previous risk characterization was updated to account for current Site conditions and changes in toxicological information and assumptions used in risk assessment. The results of then-current EMP monitoring events (August 2000, December 2000, and Summer 2001) were used to evaluate whether conditions at the Site and the associated risk to human health and the environment had changed significantly since the 1991 FS was completed. The results of the risk characterization update were used to assist in evaluating the remedial action objectives that were originally developed during the 1991 FS and for revising these objectives, as warranted. Based upon the revised remedial action objectives, the 2004 RFFS included a detailed evaluation of four remedial alternatives:

- the No Action Alternative (designated SC-1 and MOM-1);
- the 1991 ROD Remedy (designated SC-7/7A and MOM-2/4);
- the Alternative Remedy (designated SC-A and MOM-2); and
- the Mixed Alternative Remedy (designated SC-A and MOM-2/4).

Based upon the 2004 RFFS as qualified by USEPA's RFFS Addendum and discussion with the Agencies, the 2004 AROD was executed in 2007 and identified the Mixed Alternative Remedy (SC-A and MOM-2/4) as the selected remedial approach for the Site. The Mixed Alternative Remedy was described on page 42 of the 2004 AROD as:

<u>Proposed Mixed Alternative</u>

1. SC-A: Source Control, as in the Proposed Alternative, the Landfill remains uncapped with a soil cover in place and an air sparging trench captures or degrades all contaminants with a contingency for capping and dewatering.

2. MOM-2/4: Management of Migration, same as 1991 ROD MOM.

The Mixed Alternative Remedy (SC-A) is described in more detail in Section 4.5 of the 2009 SCFFS.

The 2004 AROD selected a Source Control (SC) Remedy for Site that employed an air sparging trench located at the downgradient perimeter of the Landfill to intercept and treat impacted leachate and ground water. The 2004 AROD established the components of the SC Remedy.

The 2004 AROD also required that several PDIs be performed to further evaluate conditions in certain areas of the Site to support design of the selected remedy. A summary of the PDIs and objectives completed since the 2004 AROD was included in Section 1.4.6 of the 2009 SCFFS. Pertinent results of the PDIs related to the SC portion of the selected remedy were presented in Section 5.7.2 of the 2009 SCFFS report.

3.2 SOURCE CONTROL FOCUSED FEASIBLITY STUDY SUMMARY

The SCFFS, dated February 20, 2009, compared the air sparging trench (SC-A) with an alternative remedy (SC-Ex) that involved the use of an extraction well system located at the downgradient toe of the Landfill to intercept and transfer impacted ground water for off-site treatment at the Dover POTW. This evaluation was prompted by and premised, in part, upon evaluation of new information that included:

- Southern Plume PDI results indicating that the plume center of mass was located relatively close to the southwest corner of the Landfill footprint (i.e., within approximately 200 yards);
- data from the Northwest Landfill PDI indicating an area of relatively high concentrations of target COCs in northwestern corner of the Landfill; and
- data from the Air Sparging Trench PDI indicating the absence of other localized areas of significant COC impacts within the Landfill footprint and at its downgradient perimeter.

Fundamentally, Alternative SC-Ex involved replacing one element of the approved remedy, the air sparging trench, with a network of extraction wells. The 2004 AROD remedy (SC-A) included a separate ground water recirculation system installed at the southwest corner of the

Landfill to address concentrations of tetrahydrofuran (THF) that were expected to exceed the treatment capacity of the trench. In Alternative SC-Ex, this system was eliminated because the THF concentrations were treatable by the Dover POTW. In addition, the use of hydraulic flow barriers to ensure interception by the trench would not be necessary in Alternative SC-Ex because of the flexibility of extraction well location and operation to ensure capture. Aside from these changes, the technical elements of Alternative SC-Ex were functionally equivalent to those of SC-A.

The SCFFS comparison of the two alternatives identified that Alternative SC-Ex would:

- provide permanent, effective treatment of the target COCs without the need for complex, potentially costly contingency measures;
- employ technology elements that are simpler to design, construct, and operate;
- coordinate efficiently and cost-effectively with MOM and hotspot remedies;
- be constructed and reach full operational status more than 3 to 5 years sooner than the full scale 2004 AROD SC remedy; and
- cost significantly less to implement and operate than the SC components of the 2004 AROD remedy with far less uncertainty regarding effectiveness.

3.3 EXPLANATION OF SIGNIFICANT DIFFERENCES SUMMARY

Based upon its review of the 2009 SCFFS and discussions with the Dover Group, USEPA prepared an ESD to change one component of the approved 2004 AROD source control remedy. A public meeting was held on April 27, 2009 to provide a summary of the ESD and request public comment. A 30-day comment period was opened on April 27, 2009. The ESD was issued by USEPA on June 30, 2009.

The modified remedy revised the source control component at the toe of the Landfill, employing:

- installation and operation of a GWE system to intercept COCs in leachate and ground water at the toe of the Landfill for off-site treatment at the Dover POTW,

in place of:

- construction and operation of an air-sparging trench to intercept and treat *in situ* leachate and impacted ground water at the downgradient toe of the Landfill.

3.4 AMENDED STATEMENT OF WORK – 2009

USEPA, NHDES, and the Work Settling Defendants (WSDs) signed a Consent Decree, which was entered by the Court on July 23, 1993 (the "1993 Consent Decree"), agreeing to perform the work set forth in the Statement of Work (the "1993 SOW") that was attached as Appendix B to the 1993 Consent Decree (the 1993 SOW is currently attached to the Amended Consent Decree as Appendix B-1). The Source Control landfill cap portion of the 1991 ROD remedy was designed for the Site; however, investigations during and following that design demonstrated that an alternate Source Control remedy could be as effective or even superior to the cap. Following a Revised Focused Feasibility Study (the "RFFS") proposed by the Dover Group and EPA's Addendum to the RFFS, USEPA issued the 2004 AROD revising the Source Control component of the 1991 ROD on September 30, 2004. Based on data from the PDIs set forth in the 2004 AROD which resulted in a SCFFS, USEPA issued the 2009 ESD (described in Section 3.3) to change one component of the Source Control remedy.

The 2009 Amended Remedial Design/Remedial Action Statement of Work (the "2009 ASOW") modifies and supersedes the 2007 SOW. The 2009 ASOW further defines the activities and deliverables to be performed by the Dover Group for RD/RA activities and Operation and Maintenance under the Amended Consent Decree, Civil Action No. 1:92-CV-406-N (the "Amended Consent Decree"), which was entered by the U.S. District Court for the District of New Hampshire on November 14, 2008, and pursuant to the 2009 ESD and the appropriate portions of the 2004 AROD and 1991 ROD for the Dover Municipal Landfill Superfund Site, issued by USEPA.

4.0 CONSTRUCTION ACTIVITIES

4.1 OVERVIEW OF PROJECT IMPLEMENTATION

The SCRA project will be implemented in three general phases. These SCRA activities are being performed under the 2009 ASOW. The construction activities include the following:

- Phase I: Earthwork – in general, includes site preparation, installing erosion and sedimentation controls, clearing, grubbing, excavating impacted sediment, stockpiling excavated sediment, disposing of impacted sediment, backfilling the perimeter ditch and the excavation area, and initial construction of an on-site unpaved access road along a significant distance of the Landfill toe;

- Phase II: Construction – in general, includes installing ground water extraction wells, force and gravity conveyance piping, two on-site lift stations, one large underground sedimentation tank, a potable water line, overhead electrical service lines, underground communications lines; installing extraction well pumping station enclosures and equipment; and coordinating system start-up and shake down activities; and

- Phase III: Project Completion and Demobilization – in general, includes adding enhancements to the existing permeable cover, installing the final layers of an access road, restoration activities, and installing permanent security fencing and gates.

Phase I SCRA activities were initiated at the Site in November 2010 to take advantage of seasonal conditions that are typically characterized by relatively low water conditions within the perimeter ditch and adjacent forested wetlands. The anticipated schedule, construction activities, and critical path items were evaluated while completing remedial design activities. Based upon observations made while conducting PDI activities at the Site, it was identified that much of the area adjacent to the toe of the Landfill, including the perimeter ditch, contained appreciable standing water during late winter, spring, and early summer, and, therefore, it would be difficult to complete the contemplated construction activities at these times of the year. Consequently, the Dover Group proposed, and the Agencies authorized, Phase I activities that would substantially complete the necessary sediment removal and earthwork activities within the perimeter ditch during the late fall and winter 2010. Under Phase I, the area of the perimeter ditch was backfilled and brought to a grade that will allow for Phase II activities to be completed regardless of water conditions near the Landfill.

USEPA approved acceleration of Phase I by email on September 21, 2010. A Technical Memorandum was prepared and submitted to USEPA on October 15, 2010 that included a description of how Phase I activities would be implemented.

General contractors will be contracted directly by the Dover Group to perform the Work. The Work is defined by the December 29, 2010 100% SCRD document that includes the Technical Bid Specifications (Appendix D) and the Drawings Package (Appendix E). The Contractor will be responsible for performing the work to complete construction and installation of the SC components. GeoInsight will observe construction and installation activities and monitor quality control procedures. Table 1 provides a general schedule and timeline. Section 5 identifies the sequence of implementation and critical path tasks.

Based upon the results of a formal bidding process that was completed by the Dover Group in October and November 2010, Clean Harbors Environmental Services, Inc. (CHES) was selected to implement Phase I SCRA. Phase I activities were initiated in November 2010. Under Phase I, Clean Harbors was responsible for site preparation, excavation and off-site disposal of arsenic-impacted sediment from the perimeter ditch, and backfilling and grading of the perimeter ditch. A Work Plan for Phase I activities that was prepared by CHES is included in Appendix A. The Work Plan includes information regarding the sequence of work activities, stockpile management, excavation, backfilling, and dewatering methods.

4.2 MEETINGS

4.2.1 Pre-Construction Conference

A pre-construction conference will be scheduled after the general contractor is selected. The conference will include representatives of the Dover Group, the oversight contractor, the general contractor and key subcontractors, and representatives of the Agencies.

The purpose of the pre-construction conference will be to establish relationships, define roles and responsibilities, and answer questions regarding logistics, communication, and

implementation of the remedial design. The agenda for the pre-construction conference will include:

- introducing team members;
- discussing USEPA expectations;
- reviewing general scope of work;
- reviewing the Construction Quality Assurance Project Plan (see Section 4.5);
- reviewing the project schedule;
- establishing the schedule for meetings and briefings;
- reviewing roles and responsibilities;
- reviewing document control procedures;
- discussing key issues, concerns, project goals;
- discussing procedures to resolve disputes and misunderstandings;
- reviewing the Health and Safety Plan and emergency procedures; and
- reviewing procedures for project completion.

For Phase I of the SCRA, a pre-construction conference was held on November 2, 2010 at the offices of the Dover Department of Public Works (DPW). During the meeting, representatives of CHES and GeoInsight discussed the agenda items listed above.

In November and December 2010, the Dover Group initiated the bidding process for Phase II/III of SCRA. Review of Phase II/III bids and selection of a contractor was completed during February and March 2011. Sargent Corporation was selected by the Dover Group as the contractor for Phase II activities. The preconstruction conference is anticipated for April 2011. Representatives of USEPA and NHDES will be invited to the pre-construction conference.

4.2.2 Meetings During Construction

During the construction period, the Dover Group and their construction contractor, and oversight consultant will meet with representatives of USEPA and NHDES to review and discuss progress of construction. Meetings are anticipated to be scheduled bi-weekly (or as otherwise agreed to by the parties) during SCRA construction activities.

4.2.3 Public Meetings

A public meeting was held on November 1, 2010 to review the plan to initiate Phase I activities in the fall of 2010. Prior to the meeting, notices were sent to local residents in the vicinity of the Landfill to invite them to participate in the meeting.

A public meeting was held on January 25, 2011 to provide a summary of completed Phase I activities and to review the construction schedule for 2011.

4.3 IMPLEMENTATION OF SOURCE CONTROL COMPONENTS

4.3.1 Purpose/Objectives

Prior to closure of the perimeter ditch, consistent with the 1993 ROD (and subsequent 2004 AROD and 2009 ESD), sediment that contains arsenic at concentrations above 50 mg/Kg must be excavated and disposed off Site. After the arsenic-impacted sediment is removed, the western, southern, and eastern portions of the perimeter ditch will be closed by backfilling. Closure of these portions of the perimeter ditch will largely eliminate the seasonal discharge of shallow ground water from the western and southern portions of the Landfill as surface water to the drainage swale. A portion of the backfilled ditch will be built up for construction of an access road associated with GWE remedial system components along the southern and eastern toe of the Landfill. Closure of the perimeter ditch was completed in late 2010.

The purpose of the construction of the GWE system is to extract leachate and impacted ground water migrating from beneath the Landfill in the US, UUI, and LUI strata, to reduce COC concentrations to below ICLs in ground water emanating from the WMA.

4.3.2 Task Descriptions

The approach to closing the perimeter ditch was described in Section 5 of the 100% SCRD and the October 15, 2010 Technical Memorandum and October 21, 2010 Supplement (copies of which are included in Appendix A). After the sediment excavation activities were completed, the perimeter ditch was backfilled with structural fill to facilitate construction of the access roadway and GWE system.

In general, construction of the GWE system and enhancing the permeable landfill cover include the following:

- drilling and development of fifteen (15) extraction well clusters, each consisting of three (3) wells, drilled to depths of approximately 25 feet, 45 feet and 65 feet, respectively; actual depths will be dependent upon field conditions;
- trenching, installing 3-inch diameter force main conveyance piping, and backfilling to access road subgrade;
- trenching, installing 6-inch diameter gravity conveyance piping, and backfilling to access road subgrade;
- trenching, installing 2-inch diameter water line and services to selected extraction well buildings;
- trenching, installing subsurface communication and permissive wiring, conduits and boxes, and backfilling to specified grade;
- excavating, installing two on-site 8-foot diameter lift stations and associated valve pits, and backfilling to access road subgrade;
- excavating, installing three (3) valve pits and appurtenances associated with the water service line, the force main relief valves/cleanouts, and the sedimentation tank drain;
- excavating, installing one 35,000-gallon sedimentation tank, and backfilling to specified grade;
- connecting the 35,000-gallon sedimentation tank to the City of Dover lift station (to be constructed at the Site by others);

- installing utility poles and an overhead electric power line supply extending from Tolend Road to the west side of the project site, as well as provisions for drop-downs to service to the extraction well buildings;
- installing fifteen (15) extraction well buildings and all internal appurtenances, expanding one of the extraction well buildings near Tolend Road to include an office and a bathroom;
- installing exterior electrical panels and associated appurtenances;
- connecting the electrical service drop-downs to the panels;
- installing surface-mounted well pumps, interior piping, and controls inside of the extraction well buildings;
- coordinating system start-up and testing with the Engineer;
- installing the final layers of an access road (sand and gravel subbase and processed, recycled asphalt) to specified standards and grades;
- installing fencing, gates, and security features;
- placement of vegetative support material on side-slopes and other areas requiring restoration;
- adding soil enhancements to the existing permeable cover; and
- spreading of seed and fertilizers to stabilize disturbed surfaces and support growth of vegetation.

4.3.3 Additional Sediment Characterization

Concurrent with initiating Phase I activities, and consistent with Section 5.2.5 of the 100% SCRD, GeoInsight completed additional sediment characterization activities in the western and southern portions of the perimeter ditch. The results of the additional characterization activities were summarized in the October 15, 2010 Technical Memorandum (Appendix A) and were used to refine the scope of sediment removal activities associated with Phase I SCRA.

4.3.4 Site Preparation

The approach and methods for erosion control, clearing and grubbing, and surface water control were described in the October 15, 2010 Technical Memorandum and Clean Harbors Work Plan dated November 17, 2010 included in Appendix A. Section 4.4 of this SCRA-WP summarizes the approach for stormwater pollution prevention during construction activities.

4.3.5 Work and Support Zones

The Work Zone is shown on the Site Plan (Figure 2) and includes the Landfill surface and the areas west, south, and east of the Landfill.

The existing Butler Building will be used as a support building. During Phase I activities, the contractor mobilized a trailer and portable sanitary services to the Landfill. Phase II/III activities will also include mobilization and use of on-Site trailers and portable sanitary services.

4.3.6 Staging Areas

Staging areas are primarily located on the Landfill surface, or within the Work Zone at the toe of the Landfill. Staging areas are generally surrounded by hay bales and lined with filter fabric to contain stockpiles of impacted sediment or fill awaiting use as backfill. Staging area locations are near existing roadways to facilitate access and minimize disturbance to the Landfill and Work Zone area surfaces. Prior to construction, the staging area locations will be mowed to lower the vegetation, covered with filter fabric, and surrounded by hay bales.

Excavated sediment was transported to the Landfill, deposited in a temporary sediment staging area, and free liquids, if present, were allowed to drain prior to waste characterization and off-site disposal.

Containment was established to prevent potential erosion or other migration of potentially impacted sediment, and to minimize risk of contact with the materials. The stockpile was maintained during the work period. The staging area and stockpile layouts and construction details were presented on Drawing 3-2 of the 100% SCRD.

Earthmoving equipment was brushed of loose materials and washed with a pressure washer on the truck pad or on the Landfill surface prior to exiting the Site.

4.3.7 Transportation

During Phase I, fill materials were transported to the Site from the pre-approved sand and gravel pit located in the neighboring town of Madbury, New Hampshire along approved truck routes.

Transport of materials from the Landfill was performed by qualified personnel with appropriate training and with appropriate permits and licenses. Transport was performed using dump trucks or roll-offs. Vehicle transport paths were identified during the work and vehicle decontamination was conducted as necessary whenever a vehicle left the Work Area. For off-site disposal of excavated materials, transport was performed using covered trucks in accordance with applicable regulations.

4.3.8 Materials

Materials were specified in the Technical Specifications and Bid Documents (Appendix D of the December 29, 2010 100% Source Control Remedial Design) that generally include common sand, bank run gravel, crushed rock, and recycled asphalt. A local source of common sand and bank run gravel was identified in the adjacent town of Madbury, New Hampshire.

4.3.9 Equipment

Equipment used by the Phase I contractor is identified in the Work Plan included in Appendix A. In general, Phase I equipment included excavators, bull dozers, dump trucks, vacuum trucks, bobcats, and service vehicles. Phase II equipment is anticipated to include sonic drilling rigs and support equipment, shoring installation equipment, cranes, and utility trucks. Most equipment will be staged and stored on top of the Landfill. Equipment will be supplied and maintained by the General Contractor.

4.3.10 Impacted Sediment Disposal

Five composite samples of the excavated perimeter ditch sediment were collected for waste characterization to evaluate disposal options. It was anticipated that arsenic-impacted sediment removed from the perimeter ditch and other SCRA derived wastes would not be classified as hazardous under RCRA Part 261 based upon historical results of Toxicity Characteristic Leaching Procedure (TCLP) testing. Based upon testing of the stockpiled sediment, the arsenic-impacted sediment was characterized as non-hazardous.

The material was accepted for disposal at Waste Management's TLR-III Refuse Disposal Facility located in Rochester, New Hampshire, approximately 3 miles from the Landfill. Samples for waste characterization were collected from sediment stockpiles located on the Landfill in accordance with the disposal facility requirements.

The sediment was tested for the following:

- total RCRA 8 metals by USEPA Method 6000/7000 methods;
- volatile organic compounds by USEPA Method 8260;
- semi-volatile organic compounds by USEPA Method 8270;
- pesticides by USEPA Method 8081;
- polychlorinated biphenyls (PCBs) by USEPA Method 8082;

- ignitability/flashpoint by USEPA Method 1030;
- corrosivity/pH by USEPA Method 9045;
- reactive sulfide by USEPA Method 7.3.4.1; and
- reactive cyanide by USEPA Method 7.3.4.2.

4.3.11 Inspection and Monitoring

4.3.11.1 Erosion Control Monitoring During Construction

The contractor or its subcontractor(s) will conduct monitoring of erosion and sedimentation control devices at a frequency sufficient to ensure intended performance of the devices and to minimize the chances of improper function failure that might lead to surface water body impacts. Monitoring activities are described in Section 8 of the Construction Storm Water Pollution Prevention Plan (CSWPPP) included in Appendix B. In general, monitoring will include evaluation of sheet flow areas, defined channels or other waterways, and potential discharge locations to confirm that controls are performing acceptably. Monitoring will be conducted not less frequently than once per seven calendar days during the course of normal construction activities and within 24 hours of the end of a significant storm event. Significant storm events are defined in the CSWPPP (see Section 1, page 2). Site specific CSWPPP monitoring forms are included in the CSWPPP.

Evaluation of dust generation will be made visually based upon wind conditions and traffic/equipment activity.

The sediment stockpile was continually monitored during storage to maintain coverage and limit access to the sediment. Stockpiled sediment was removed from the Landfill in February 2011.

4.3.11.2 Wetlands Monitoring

Section 10.3 of the 100% SCRD proposed a post-construction wetlands monitoring program that will be performed after the GWE system becomes operational. The objective of the program will be to monitor conditions within wetland areas adjacent to the GWE system.

A wetlands monitoring program was developed and reviewed by the Agencies as part of the remedial design effort associated with the 1991 ROD. For this SCRA-WP, we propose to modify the monitoring approach that was previously developed for the 1991 ROD, as outlined in Golder's 1995 PDI report, to be consistent with the change to the SC remedy and certain changes at the Landfill since the 1995 report was completed.

Eight vegetation monitoring plots and six wetland delineation data plot pairs were established in Golder's 1995 PDI report (Section 8.5), which were designated WVP-1 through WVP-8 and 1U/W through 6U/W, respectively. Detailed information regarding tree species, diameter at breast height, percent cover, and location in the canopy was recorded at each monitoring plot (Appendices CC, DD, and EE of the 1995 PDI report). The 1995 PDI vegetation monitoring plots and wetland delineation pairs are included on Figure 4 of this SCRA-WP. Figure 4 also includes the steady-state ground water drawdown for the SCRA that was estimated by the ground water model system (GMS) model (see Figure 7 of the September 17, 2010 Technical Memorandum in Appendix A of the December 29, 2010 100% Source Control Remedial Design).

The locations of the 1995 PDI monitoring plots were evaluated relative to the areas of anticipated drawdown resulting from GWE system operation. One vegetative monitoring plot (WVP-1) is located near the area that drawdown is anticipated to be greatest and four vegetative plots (WVP-2 to WVP-4, and WVP-8) are located where drawdown is anticipated to be moderate. Three vegetative monitoring plots (WVP-5 to WVP-7) are located in upgradient areas were drawdown is anticipated to be considerably less than areas near the GWE system.

Based upon the results of our review of current conditions at the Landfill and considerations associated with the new remedy, the following table provides a summary of the historical plots that will be used for monitoring the SCRA.

PLOT ID	RATIONALE FOR USE
WVP-1	retain for use; re-establish baseline data in 2011
WVP-2	retain for use; re-establish baseline data in 2011
WVP-3	not selected for use; area affected by TZD clearing, duplicative location of WVP-4
WVP-4	retain for use; re-establish baseline data in 2011
WVP-5	retain for use; re-establish baseline data in 2011
WVP-6	not selected for use; location stratigraphy (marine clay near ground surface); not representative of general site conditions
WVP-7	not selected for use; located upgradient of Landfill within Hoppers wetland complex; difficult to distinguish natural change versus change attributed to GWE
WVP-8	retain for use; re-establish baseline data in 2011

The delineation pair locations will be re-evaluated in the field during re-establishment of the vegetation plots to ensure that they are located on comparative upland (designated with a "U") and wetland (designated with a "W") sides of the delineated boundaries. The wetland boundary south and east of the Landfill was evaluated and updated in September/October 2010 by Normandeau Associates, Inc. (Normandeau) and summarized in a memorandum included in Appendix A. In the area evaluated by Normandeau in 2010, it appears that the wetland boundary near Tolend Road shifted to the east. Therefore, wetland delineation pair 2U/2W will be re-established during 2011 field activities, and other pair locations will be evaluated.

In addition to wetlands monitoring, shallow ground water fluctuations will be monitored using shallow piezometers. Piezometers will be manually installed adjacent to vegetation monitoring plots. In addition, gauging data for select monitoring wells collected during EMP

and Southern Plume activities will be provided to Normandeau and used in their wetland assessment.

The monitoring plots, delineation pairs, and shallow piezometers will be established in the spring of 2011 and baseline monitoring activities will be performed during the growing season of 2011 (approximately in July 2011) and before the GWE system is started.

Once SCRA construction activities are completed, early GWE operations begin, and hydraulic monitoring data become available, long term monitoring of the plots will be incorporated into the REMP. Additional vegetation monitoring plots and delineation pairs may be established as part of the REMP after data from performance monitoring are evaluated in the first few years of operation.

4.3.12 Demobilization Approach

Upon completion of construction activities and enhancement of the permeable cover, disturbed areas along the GWE system location will be stabilized. Rip-rap, erosion control matting, wood chips, and hay mulch may be used to perform these activities as shown on the 5-Series Drawings (Appendix E; 100% SCRD).

4.3.13 Compliance with ARARs

The Applicable or Relevant and Appropriate Requirements (ARAR) for the SCRA are summarized in Tables 2A, 2B, and 2C.

4.4 CONSTRUCTION STORM WATER POLLUTION PREVENTION PLAN

A CSWPPP was prepared to comply with the substantive requirements of the USEPA National Pollution Discharge Elimination System (NPDES) Construction General Permit (CGP) and the City of Dover's Phase II NPDES MS4 permit. The CSWPPP provides guidelines to minimize the potential impacts of erosion and sediment migration associated

with earthwork and construction activities during SC implementation. The CSWPPP describes the implementation of procedures and installation of systems and controls designed to reduce the transport of materials due to wind, surface runoff, and dewatering activities.

The purpose of the CSWPPP is to identify potential sources of storm water pollution (both during wet and dry weather) and develop Best Management Practices (BMPs) to minimize the potential for runoff from identified sources at the Site to impact adjacent forested wetlands and reduce potential impacts present from storm water run-on pathways.

A copy of the CSWPPP was provided to USEPA in November 2010. The CSWPPP is included in Appendix B.

4.5 CONSTRUCTION QUALITY ASSURANCE

A Construction Quality Assurance Project Plan (CQAPP) was prepared to establish quality assurance measures to be implemented during SCRA construction activities.

Inspection and verification activities are required to demonstrate that materials used and construction techniques employed provide final products and systems that meet the intent of project design drawings and technical specifications. The CQAPP describes the activities that will be performed as part of this documentation process. The responsibility, authority, and lines of communication for construction inspection and verification activities are discussed in Section 2.0 of the CQAPP. Minimum qualifications of the personnel performing construction and materials testing are identified in Section 3.0 of the CQAPP. Anticipated meetings to communicate project performance and important elements of the design, quality assurance program, and schedule are described in Section 4.0 of the CQAPP. Section 5.0 of the CQAPP describes anticipated oversight, inspection, sampling, and testing activities associated with construction of the SCRA. Documentation of construction quality assurance (QA) and quality control (QC) activities are discussed in Section 6.0 of the CQAPP.

Project CQA/QC are specifically based upon information presented in the project Contract Documents, which include the 100% SCRD, SCRA-WP, Bid Specification Package, Drawing Package, contract requirements and conditions, supplemental conditions, and other appended or referenced plans. The CQAPP addresses material and construction standards, test procedures, and general guidance for CQA personnel in charge of monitoring the construction of the Site remedy. The construction contractor or contractor-designated subcontractor shall conduct CQA/QC testing to monitor the contractor's work. The Dover Group has engaged GeoInsight, as the Engineer to monitor the CQA/QC testing, CQA/QC records, the performance and overall quality of the work, and certify that the completed project complies with the requirements of the contract specifications. The Engineer or an Engineer-appointed subcontractor may duplicate CQA/QC testing if deemed necessary to ensure data quality.

The CQAPP includes a summary table of the anticipated CQA/QC tasks associated with the SCRA Construction Project. The CQAPP is included in Appendix C.

4.6 CONSTRUCTION DOCUMENTATION AND DELIVERABLES

The Engineer will be responsible for documenting construction activities through accumulated submittals, testing results, required descriptive remarks, data sheets, and checklists provided by the contractor or obtained independently. Documentation and data collected by the contractor and Engineer during the construction activities will be available at the Site upon request.

Submittals received from the contractor will be logged by the Engineer with regard to the title of the submittal, the date received, form of transmittal, and its status. The Engineer will then evaluate each submittal for compliance with the requirements of the Contract Documents and will either approve, approve with corrections, request a revision, or reject the submittal. Records of the submittal receipt, its rejection (if applicable), and its acceptance will be kept on-Site and an electronic copy will be saved to the project file.

Work that does not, in the Engineer's opinion, conform to the SCRA construction plans and specifications will be documented and reported to the contractor. Non-conformance will be reported to the contractor as soon as practicable by the Engineer either verbally or in writing. The non-conformance will be resolved and corrective action taken by the contractor as soon as practicable. If the corrective action results in the work conforming to the plans and specifications, the action shall be documented and accepted. If a change is required, a formal Change Order may be instituted using approved procedures described in the Contract Documents.

4.7 OPERATIONAL AND FUNCTIONAL

Within 45 days after the Dover Group concludes that the SCRA construction activities are fully (100%) completed, a Pre-Final Source Control Construction Inspection (Pre-Final Inspection) will be scheduled with representatives of USEPA and NHDES. The objective of the Pre-Final Inspection will be to evaluate the SCRA system and identify punch-list items. Within 75 days of the Pre-Final Inspection, the Dover Group will coordinate a Final Source Control Construction Inspection (Final Inspection) to determine construction/system completeness. The Final Inspection will include representatives of USEPA and NHDES.

Within 60 days of completion of the Final Inspection, the Dover Group will submit to USEPA and NHDES for review and approval the Final Source Control Remedial Action Construction Report (Final Report). The Final Report will document that punch-list items have been addressed and that the remedy construction is complete. The SC remedial system will be considered Operational and Functional once USEPA approves or modifies the Final Report.

5.0 SCHEDULE SUMMARY

5.1 PROJECT DELIVERY STRATEGY

Table 1 presents the estimated construction schedule for completion of the SCRA. This schedule is dependent upon approval of the final design report and SCRA-WP by USEPA after reasonable opportunity for review and comment by the NHDES. Construction activities will begin after USEPA/NHDES approval of the SCRA-WP and selection of the Phase II remedial contractor by the Dover Group. The general sequence of activities will be:

Earthwork – Phase I – Completed Fall 2010

- confirm and flag wetland boundaries;
- treat invasive species within western portion of perimeter ditch;
- collect additional sediment samples to delineate excavation areas;
- installation of erosion and sedimentation controls including siltation fence, construction entrance/truck wash, and check dam(s);
- installation of crushed rock fill to reinforce access roads on top of the Landfill and surrounding areas;
- clearing and grubbing of the perimeter ditch, access areas adjacent to the perimeter ditch, staging areas, and proposed access road areas;
- construction of staging area controls for vehicle refueling (if necessary) and for equipment/material staging;
- installation of temporary dewatering infiltration basins to manage sediment and dewatering fluid from perimeter ditch excavation activities and utility trenching activities;
- installation of an impacted soil dewatering/staging pad on top of the Landfill;
- construction of temporary material and equipment staging areas as needed;
- excavation of arsenic-impacted (greater than 50 mg/Kg) sediment in the perimeter ditch, and dewater for temporary onsite storage prior to disposal offsite;

- backfilling the perimeter ditch using imported common sand borrow and road gravel to construct an access road that supports heavy equipment and trucks including drilling rigs, vacuum trucks, and service vehicles along the toe of the Landfill; and

- installation of temporary stabilization measures including woodchips or haymulch on disturbed surfaces during winter months.

Construction – Phase II – Spring – Summer - Fall 2011

- conduct Pre-Construction Conference;

- re-establish vegetation monitoring plot and delineation pair locations and conduct baseline data collection in July 2011;

- perform inspection of existing erosion control features and update and amend, as needed, for the 2011 construction season;

- excavation to approximately 12 feet bgs and associated dewatering activities for installation of a buried sedimentation tank structure;

- install sedimentation structure;

- excavation to approximately 15 feet bgs and associated dewatering activities for installation of lift stations;

- install on-site lift stations on the east and west sides of the Landfill (two total);

- prepare foundation/footing areas for buildings and sedimentation structures;

- drilling and development of fifteen (15) extraction well clusters, each consisting of three (3) wells;

- install electrical service infrastructure after extraction wells are installed to minimize issues with overhead hazards in drilling areas;

- install on-site gravity and force conveyance piping (main and laterals) and connections to lift stations;

- install foundations/footings for extraction well pump stations;

- install extraction well nest mechanical and support building enclosures (15 total);

- install equipment, pumps, and controls;

- install off-site sewer conveyance line (concurrent with other activities);

- connection of on-site conveyance piping system to the City of Dover municipal sewer lift station, including connection from sedimentation tank and bathroom;
- submit SCRA OMM (within 30 days of 75% construction complete date); and
- GWE system start up and testing.

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- augment existing cover in areas that are identified to have insufficient organic cover material and visible exposed debris;
- perform grading of selected supplementary cover materials;
- vegetate/reseed with specified seed mixes and fertilizer to establish a sufficient stand of vegetation;
- install final access road bedding, access gates, and as necessary, fences;
- conduct Pre-Final and Final Inspections;
- conduct As-Built survey; and
- prepare Final Construction Report.

5.2 POTENTIAL SCHEDULE MODIFICATIONS

5.2.1 Overview

The project schedule and sequencing were reviewed to evaluate critical path items and anticipate conditions that could result in significant changes to the project delivery strategy and project schedule.

In addition to Agency review and approval of the SCRA-WP, the primary critical path item associated with SCRA construction activities is the extension of the existing municipal sewer conveyance system to the Landfill. Operation of the on-Site GWE system cannot be initiated until the conveyance extension has been constructed (thus allowing the transfer of extracted ground water to the POTW for treatment). These activities, including the construction of a

City-owned and operated lift station, are being coordinated by the City in consultation with representatives of the Dover POTW. Although the conveyance extension project is proceeding on a parallel track to the SCRA, its design and construction require coordination with multiple private property owners, design of a river crossing, and the need to meet local requirements for conducting work in roadways and easements.

Currently, the City has initiated lift station and conveyance extension design activities, and has obtained preliminary approvals for the easements required to construct the conveyance line extension. The City's engineering team has met with the SCRD engineering team and has coordinated design of the lift station with the on-Site remedial system and operating control logic. The results of these meetings were incorporated into the 100% SCRD and associated bid documents.

The Dover Department of Public Works imposes a moratorium on excavation activities within and along roadways from December 1st through April 1st each winter season. Consequently, the City expects that design activities and formal easement arrangements will be completed this fall and winter, and that a contractor will be selected to initiate construction of the conveyance system starting in April 2011. Activities are being planned so that the majority of on-Site construction activities are finished by the time the conveyance extension is completed.

5.2.2 Potential Delays

Conditions that could adversely impact the construction schedule include:

- delay of SCRA-WP approval by the Agencies - the Dover Group plans to meet necessary deadlines so that the Agencies can plan internal resources accordingly for review efforts;
- excessive standing water proximal to the Landfill could delay or slow construction activities - this potential delay condition was addressed by accelerating the on-Site activities that involve potential surface water management to perform these activities in a dry time of year (i.e., fall of 2010);

- potential delays associated with construction of the City-owned lift station and sewer line extension, which are outside the Dover Group's control - because the City is a member of the Dover Group, these activities are being closely coordinated with ongoing SCRA, and the City is focused upon completing lift-station and sewer line extension activities consistent with the overall SCRA schedule objective of having the SCRA system operational in 2011;

- delays associated with necessary infrastructure upgrades; modification to electrical services by the regional electrical company has previously caused delays at the Site - discussions with appropriate electric company representatives have been initiated and formal quotes for on-Site upgrades have already been obtained;

- the lack of availability of qualified contractors to complete SCRA construction (although it is unlikely that this condition will occur) - this condition has not been identified during bid activities conducted to date; and

- the lack of availability of or delays in procuring specialized equipment required for the SCRA construction, principally the surface-mounted pumps and the sedimentation tank - this issue will be addressed by initiating procurement during the winter, well before the construction stage in which these structures and equipment will be needed.

6.0 PERFORMANCE MONITORING

6.1 OVERVIEW

Consistent with recommendations made by USEPA, performance monitoring will focus upon documenting actual extraction well pump rates versus 100% SCRD design pump rates, and measuring and documenting hydraulic conditions along the toe of the Landfill using the existing network of ground water monitoring wells. Hydraulic measurements obtained during performance monitoring activities will be used to evaluate system capture. They will also be used as inputs to the model to evaluate optimal locations for additional monitoring wells or piezometers, if considered necessary based upon review and analyses of performance monitoring data for the first several years of system operation.

It was agreed that initial performance monitoring associated with the ground water extraction system would focus upon documenting hydraulic conditions imposed by the system of extraction wells (as opposed to the more traditional approach of comparing water quality downgradient of the remedial system to the concentrations on the upgradient side). This approach was agreed to because there are not significant differences between the suite of COCs and relative concentrations in areas within and downgradient of the toe of the Landfill, and operation of the GWE system is expected to "pull back" impacted ground water that is currently located downgradient of the Landfill toe within the Eastern and Southern Plumes, which would confound analysis of COC trends. Therefore, the existing network of monitoring wells that is located in the vicinity of the GWE system will be used to monitor changes in hydraulic conditions associated with operation of the remedial system. Hydraulic conditions under system operation will be compared to historical hydraulic conditions. If performance data do not indicate adequate capture of impacted ground water migrating from the WMA, changes may be made in the operation and configuration of the remedial system (such as changes to individual well extraction rates, or the installation of additional extraction wells) to improve performance.

As specified in the September 30, 2010 USEPA approval letter for the 100% SCRD, USEPA indicated that the performance monitoring well network will be evaluated after the GWE system is operational. Section 6.2 below identifies the existing monitoring wells that are proposed for the initial performance monitoring program and the approach for monitoring hydraulic conditions at these locations.

The approach used to evaluate the performance of the SCRA GWE system will also consider USEPA guidance described in:

- "General Methods for Remedial Operations Performance Evaluations," USEPA Report EPA600/R-92/002 (dated January 1992);
- "Elements of Effective Management of Operating Pump and Treat Systems," USEPA (Office of Solid Waste and Emergency Response) Report OSWER 9355.4-27FS-A (dated November 2002); and
- "A Systematic Approach for Evaluation of Capture Zones at Pump and Treat Systems, Final Project Report," USEPA Report EPA600/R-08/003 (dated January 2008).

The typical approach used to evaluate GWE systems consists of evaluation and convergence of multiple "lines of evidence" that include estimating the Target Capture Zone (TCZ), evaluating hydraulic information and data, reviewing trends in VOC concentrations, and estimating the actual areas of influence of the remedial system.

Evaluation of remedial system performance will include:

- review of actual ground water extraction rates compared to design rates;
- comparison of hydraulic data in performance monitoring wells to historical data;
- evaluation of hydraulic data in plan view (by stratigraphic layer) and in cross section;
- using trend and other appropriate statistical analyses to evaluate changes in hydraulic conditions;

- using trend and other appropriate statistical analyses to evaluate changes in COC concentrations over time and position with regard to the extraction well network; and

- mapping and comparing VOC distribution and concentrations over time (in plan and cross-section view).

6.2 PERFORMANCE MONITORING PROGRAM

6.2.1 Overview

The performance monitoring program will include continuous pump rate monitoring, periodic gauging, continuous hydraulic monitoring, comparison of hydraulic data to historical data, ground water sampling, and, possibly, model simulations. The frequency of monitoring will be modified as appropriate based upon evaluation of monitoring results. In this context, it is important to note that hydraulic conditions associated with operation of the GWE system will first approach steady state conditions at locations nearest the extraction wells. Based upon analyses conducted while completing the 100% SCRD, steady state hydraulic conditions with the GWE system operational are anticipated to be established relatively quickly in the US stratigraphic unit (several weeks to months). Because of their hydraulic properties, steady state conditions within the UUI and LUI stratigraphic units are expected to develop over a more extended period of several years. It is also important to note hydraulic head at the Site fluctuates seasonally within the three stratigraphic units, generally by approximately 1 to 3 feet.

- **Continuous Pump Rate Monitoring**: OMM activities will include continuous monitoring, and, as needed, extraction rate adjustments to achieve effective capture of impacted ground water migrating from the WMA with COC concentrations above ICLs. On-going adjustments of individual extraction pumps will be conducted to maintain design pump rates as hydraulic conditions change and fluctuate near extraction wells and as pump parts (primarily hoses) wear over time. Individual extraction well pump rates and performance of extraction well groups will be evaluated at least weekly. Overall performance of the GWE system will be evaluated by considering the following components:

a) extraction rates at individual wells;

b) total extraction rate for the GWE system;

c) total extraction rate for groups of wells; and

d) combined extraction rate for the series of wells in each stratigraphic unit.

The OMM Manual will include a formal schedule of system monitoring requirements, and information regarding measures that will be taken to maintain the design extraction rates. The OMM Manual will also include an outline and schedule for extraction rate measuring and system evaluation. Consistent with the approach outlined above, we anticipate that in addition to evaluating performance for the total system and individual extraction wells, combined extraction rates will be reviewed and evaluated for separate sections of the GWE system (i.e., the western leg and the eastern leg) and for the different stratigraphic units within each leg (i.e., US wells, UUI wells, and LUI wells). Certain details regarding extraction rate monitoring requirements will depend upon the specific pumps and controllers that are ultimately installed during Phase II activities.

- **Periodic Hydraulic Gauging**: Periodic gauging will include hydraulic monitoring conducted during semi-annual sampling events (described below) and in selected wells on a more frequent basis. Table 3 indicates the frequency of hydraulic gauging activities.

- **Continuous Hydraulic Monitoring**: Continuous hydraulic monitoring will be performed for each extraction well and in selected performance monitoring wells indicated on Table 3. Hydraulic conditions in selected performance monitoring wells will be recorded every three hours using pressure transducers. The transducers will be installed in performance monitoring wells with different vertical screen intervals to monitor hydraulic conditions and response in separate hydrogeologic units. Note that transducers will not be deployed in shallow wells that are expected to go dry. Hydraulic data for the extraction wells will be downloaded to the programmable logic

controller (PLC) program and retrieved electronically. Transducers in performance monitoring wells will be downloaded to a field lap-top. Use of transducers is described in a new Standard Operating Procedure (SOP #19) that is included in the January 2011 QAPP. Hydraulic data will be used to evaluate hydraulic conditions at individual monitoring wells, and to evaluate general seasonal trends in the hydrogeologic units.

- **Ground Water Sampling**: A subset of approximately 55 monitoring wells in the study area are sampled twice yearly as part of the EMP/GMP monitoring program. In addition, a selected set of wells indicated on Table 3 will be sampled quarterly. These data will be evaluated for trends in ground water quality over time. In addition, ground water will be collected from the extraction wells prior to start-up to evaluate baseline concentrations. Additional samples will be collected periodically to assess changes in ground water quality at the extraction locations. Extraction well ground water concentration data may be used to focus extraction at specific locations.

- **Hydraulic Model Comparison**: As previously discussed, hydraulic conditions at the Site and associated with the extraction system are complex and may be complicated to interpret using field data alone. Accordingly, field hydraulic data may be used as inputs to the hydraulic model to simulate effects of actual operating conditions, providing an additional method of assessing system performance. Potential transient effects associated with rainstorms, atypical periods of wet/dry weather, etc., will be considered while performing these model-based assessments.

6.2.2 Data Quality Objectives

Table 4 lists the Data Quality Objectives for information obtained as part of the SCRA Performance Monitoring Program. The table lists the types of samples collected and how these data will be used in performance monitoring.

6.3 PERFORMANCE MONITORING WELLS

6.3.1 Overview

The 100% SCRD proposed that the network of ground water monitoring wells located near and along the toe of the Landfill be used for performance monitoring. As described in this SCRA-WP, hydraulic and COC monitoring data obtained from existing wells will be used to evaluate the need to augment the performance monitoring program and network of monitoring wells.

Based upon USEPA's review of the September 24, 2010 100% SCRD, USEPA approved modifications of the 2009 Scope of Work (SOW) requirements, and, consistent with paragraphs 15 and 116 of the Second Consent Decree, granted relief with regard to the component of the SCRD that describes the approach to performance monitoring. The September 30, 2010 approval letter indicated:

- Section 6.4.1.2 of the 2009 ASOW implies that the Performance Monitoring Well network will be in-place prior to system start-up. However, further discussion has determined that it will be better to assess operation of the recovery system and design of a proper monitoring network once the recovery system is operational.

Consequently, this SCRA-WP includes a discussion of the initial activities that will be conducted as part of initial performance monitoring associated with the SCRA. System operation information and data collected as part of the initial performance monitoring program will be evaluated and summarized in annual SCRA reports. These data will be reviewed and discussed with the Agencies with regard to evaluating GWE system performance, and the need to augment and/or revise the initial performance monitoring program (including the possible need to install additional performance monitoring wells).

6.3.2 Performance Monitoring Well Selection

Currently, there are approximately 200 monitoring wells located in the general vicinity of the Landfill. Information regarding these monitoring wells was reviewed to evaluate possible inclusion in the initial performance monitoring program. Preference was given to wells that

are screened within discrete stratigraphic units (i.e., the screened interval of the well does not extend across a stratigraphic interface), and wells whose screened interval was neither too short (i.e., 2 feet long) or too long (i.e., longer than 15 feet).

Figures 6 and 7 of the September 17, 2010 Technical Memorandum (Appendix A of the December 29, 2010 100% SCRD) and Figure 6 included in the Response to Comments (Appendix G of the December 29, 2010 100% SCRD) were reviewed to evaluate the area of and relative magnitude of hydraulic influences associated with approximate steady state GWE system conditions. Based upon a review of this information, monitoring wells were selected to represent:

- areas along the line of extraction wells near the downgradient toe of the Landfill;
- areas upgradient and downgradient of the line of extraction wells that are estimated to experience hydraulic influences from the extraction system of at least 1 foot;
- areas near the east and west end of the line of extraction wells; and
- "background" areas that are not expected to experience direct hydraulic influences from operation of the GWE system.

Depending upon the intended use, pressure transducers will be deployed in a subset of the initial performance monitoring wells. The transducers will be programmed to obtain measurements of hydraulic head at intervals of approximately three hours. Hydraulic measurements will be obtained from the remaining performance monitoring wells using an electronic water level meter at weekly (during system start up) and quarterly intervals.

Tables 3A and 3B summarize information regarding the proposed initial performance monitoring wells. Table 3A includes information regarding the general category of the performance monitoring well, and the anticipated monitoring activities and frequency. Table 3B includes well construction information.

Although not directly related to the performance of the GWE system, a subset of existing monitoring wells that are located within the Southern Plume MOM Study Area will be

included in the ongoing hydraulic gauging program. These wells will be gauged concurrently with monitoring performed under the EMP/REMP and the SCRA. Hydraulic information obtained during these monitoring events will be reviewed to evaluate the extent of SCRA GWE hydraulic influences to the south and west of the Landfill into the Southern Plume MOM Study Area. In particular, these data will be used to establish pre-SCRA GWE system operation hydraulic conditions and evaluate possible "back capture" of the Southern Plume within the downgradient area of influence associated with the SCRA GWE system. After the SCRA GWE system is operational and relatively steady state hydraulic conditions are established (over the first few years of system operation), the overprint of the system will be evaluated with regard to the continued need to operate, or modify, the Southern Plume MOM remedy.

6.4 SYSTEM OPTIMIZATION ASSESSMENT

Monitoring data obtained while operating the SC GWE system will be used to evaluate possible remedial system enhancements. The evaluation will also include information obtained from the REMP and remedial actions conducted elsewhere at the Site, including the Northwest Landfill air sparging/soil vapor extraction system and the Southern Plume MOM GWE system.

Possible GWE system enhancements may include:

- adjusting ground water extraction rates at individual wells;
- installing additional ground water extraction wells;
- evaluating use of alternative pumps to attain target extraction rates;
- evaluating use of alternative pumping schedules (such as pulsed systems); and
- assessing the utility of possible system tie-ins with other remedies operating at the Site.

6.5 REPORTING

Information obtained while conducting the remedy performance and optimization assessments will be summarized in the Annual SCRA Performance Reports. The Annual SCRA Performance Reports will include the 12-month standard calendar year and will be completed in April of each year (summarizing the previous year of operation). A summary of general operational data will be included in quarterly Progress Reports (to be submitted in January, April, July, and October).

6.6 OPERATION, MAINTENANCE, AND MONITORING MANUAL

A preliminary table of contents for the anticipated Operation, Maintenance, and Monitoring (OMM) Manual is included in Appendix D. The OMM Manual will include protocols to operate, maintain, and monitor the GWE system and system component specifications. The OMM Manual will be developed concurrently with the construction of the GWE system. The contractor selected to construct the GWE system will provide equipment specifications and information to include in the OMM Manual.

Consistent with Section 6.3.5 of the 2009 ASOW, the OMM Manual is due within 30 days of the 75% construction completion. Consequently, it is anticipated that the OMM Manual will be completed during the summer/fall of 2011.

In the October 27, 2010 comment memorandum regarding the 100% SCRD, USEPA requested information regarding how "Management of Solids" associated with the on-site conveyance system will be addressed, and how samples of sediment will be obtained from the sedimentation tank. GeoInsight anticipates that sampling and solids management procedures will be described and included in the OMM Manual. Samples of accumulated solids will be collected and analyzed using procedures established in the revised QAPP (that was submitted to USEPA in January 2011).

7.0 SITE MANAGEMENT PLAN

The SMP was revised by GeoInsight in 2005 when additional PDI activities were initiated at the Site. The SMP covered the period when the additional PDI activities, as described in Sections 1.4.6 of the SCFFS, were completed. An SMP Addendum was prepared in January 2009 to provide information regarding activities associated with the Southern Plume MOM and Northwest Landfill Hotspot remedial activities. The SMP Addendum also provided information regarding use of a limited portion of the top of the former Landfill by the City of Dover for the staging of compost to ultimately be used in final closure and grading. The SMP Addendum was uploaded to the USEPA web page associated with the Dover Municipal Landfill Superfund Site. Because the SCRA described in this Work Plan will result in material changes to the Site (such as reconfigured access roads and permanent structures), the SMP will be revised when SCRA construction is completed and the associated GWE system is operational.

The updated SMP will include specific information regarding the location and configuration of permanent site features and utilities, site security, management and disposal of residuals, maintenance of the Landfill surface, and data management related to the final SCRA and other remedial actions at the Site. The updated SMP is anticipated to be completed late 2011.

8.0 QUALITY ASSURANCE PROJECT PLAN

The Quality Assurance Project Plan was updated to include requirements of the SCRA activities. The updated QAPP was submitted to USEPA under separate cover in January 2011.

9.0 HEALTH AND SAFETY PLAN

The Health and Safety Plan was updated to include requirements of the SCRA activities. The updated HASP was submitted to USEPA under separate cover in January 2011.

10.0 PROJECT COORDINATION

10.1 OVERVIEW

This section of the SCRA-WP includes information regarding project team members involved with the construction and implementation of the SCRA, and identifies the types of anticipated subcontractors.

The Dover Group retained Michael J. Webster of GeoInsight as the Project Manager to manage and direct the work performed at the Site. Mr. Webster served as Project Manager during PDI and SCRD activities. In general, project plans, document reviews, and field investigation activities will be scheduled and implemented by the Project Manager.

The Dover Group retained Clean Harbors Environmental Service, Inc. (CHES) as the General Contractor to implement the work required for Phase I SCRA activities. The Dover Group initiated bidding associated with Phase II/III SCRA in November and December 2010. Sargent Corporation was selected as the contractor for Phase II/III SCRA activities.

Figure 5 provides an organizational chart. Resumes of key personnel are included in Appendix E.

10.2 DOVER GROUP COORDINATOR

The Project Coordinator for the Dover Group is:

Dean Peschel
Dover Landfill Executive Committee
c/o City of Dover
288 Central Avenue
Dover, New Hampshire 03820
(603) 516-6094
(603) 516-6463 (Fax)
dean.peschel@ci.dover.nh.us

As Project Coordinator for the Dover Group, Mr. Peschel will be the primary point of contact with USEPA and NHDES. Mr. Peschel will also be the Dover Group's point of contact with the Project Manager and will facilitate Work Plan activities associated with the Site.
Mr. Peschel will also be responsible for communications with representatives of the City and local citizens. For this SCRA-WP, Mr. Peschel will be responsible for keeping the City of Dover Conservation Commission informed of the scope and schedule for field activities, and coordinating access to and use of City-owned land to establish the Work Zones. He will also ensure coordination of the activities of sewer design engineers under contract to the City with those of the SCRA team.

10.3 PROJECT MANAGER

The SCRD-WP Project Manager is:

Michael J. Webster, P.G., L.S.P.
GeoInsight, Inc.
One Monarch Drive
Littleton, Massachusetts 01460
(978) 679-1600
(978) 835-6547 (cell)
(978) 679-1601 (Fax)
mjwebster@geoinc.com

As Project Manager, Mr. Webster will be responsible for:

- contract coordination and internal performance monitoring for subcontractors and vendors;
- overall technical responsibility for the work performed in each phase;
- coordination and liaison with USEPA and NHDES regarding field activities;
- assisting Mr. Peschel, as necessary, with communication and liaison with local officials and the public; and
- assisting Mr. Peschel, as necessary, with communication and liaison with agency personnel and representatives, as well as the City of Dover sewer design engineers.

Figure 5 presents a Project Organization Chart for the project management team.

10.4 SUBCONTRACTORS

Two analytical laboratories will be used for SCRA tasks. Analyses for compliance monitoring related to the discharge of ground water to the Dover POTW system and post-excavation sediment analyses will be performed by Absolute Resource Associates (ARA; formerly known as RL Laboratories, LLC), located in Portsmouth, New Hampshire. ARA has provided laboratory services associated with Southern Plume MOM, NW Landfill Hotspot, and PDI activities at the Site.

Katahdin Analytical Services Inc. (Katahdin), located in Scarborough, Maine, was contracted to perform general chemistry analyses of ground water samples for COC concentration monitoring in ground water. Katahdin is the laboratory used for the EMP/REMP, and will be retained for performance monitoring analyses associated with SCRA performance monitoring program.

Characterization and monitoring activities related to wetlands are performed by Normandeau Associates, Inc. (Normandeau) of Bedford, New Hampshire. Normandeau performed historical assessment activities during the 1994 to 1996 PDI and RD work. Normandeau recently completed assessments of the Landfill cover and perimeter ditch that were included in Appendix B of the 100% SCRD.

Surveying activities have been performed by Vermont Survey and Engineering, Inc. of Montpelier, Vermont from 2007 to present.

Prior to initiating earth work activities this fall, Swamp Inc. of Kittery, Maine was contracted to treat invasive species along the perimeter ditch and in focused areas of the Landfill.

Electrical services for Landfill activities have been provided by American Electrical Services, Inc. (AES) of Sterling, Massachusetts. AES is coordinating the electrical service connections with Public Service of New Hampshire (PSNH).

CHES was the selected contractor to perform the first phase of implementation activities, including site preparation, impacted sediment removal and disposal, and backfilling of the perimeter ditch.

Sargent Corporation was selected for Phase II/III activities to perform the following services:

- amending the permeable Landfill cover;
- installation of GWE system extraction wells;
- installation of GWE system piping and manifold;
- construction of GWE system support buildings, including sedimentation system;
- procurement of pumps, equipment, and controls; and
- installation of pumps and equipment.

Other than the noted services above, the Dover Group does not currently anticipate that other subcontractors will be used to complete activities associated with the SCRA.

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TABLES

TABLE 1
IMPLEMENTATION TIME TABLE
SOURCE CONTROL REMEDIAL ACTION
DOVER MUNICIPAL LANDFILL SUPERFUND SITE
DOVER, NEW HAMPSHIRE

SC REMEDY COMPONENT	DESCRIPTION/IMPLEMENTATION APPROACH	TIMING
30% SCRD (6.2.3)	• due 120 days from approval of the SCRD Work Plan (approval date was November 9, 2009).	4 months (submitted on March 10, 2010)
75% SCRD (6.2.4)	• due 90 days after approval of the 30% SCRD (approval date was April 15, 2010).	3 months (submitted July 15, 2010)
100% SCRD (6.2.5)	• due 60 days after approval of 75% SCRD; approval date was July 26, 2010.	2 months (draft submitted September 24, 2010 and approved September 30, 2010); (final version submitted December 29, 2010)
SCRA WORK PLAN (6.3.1)	• due 90 days after approval of 100% SCRD; final draft approved January 24, 2011; and • development of monitoring system and CQAPP was initiated during the design phase.	3 months (submitted December 29, 2010) (final version submitted March 24, 2011)
PRE-CONSTRUCTION CONFERENCE AND INTIATION OF CONSTRUCTION (6.3.2 and 6.3.3)	• within 60 days of USEPA approval of the SCRA-WP	2 months (required by March 24, 2011, although start of earthwork in November 2010 formally initiated construction)

TABLE 1
IMPLEMENTATION TIME TABLE
SOURCE CONTROL REMEDIAL ACTION
DOVER MUNICIPAL LANDFILL SUPERFUND SITE
DOVER, NEW HAMPSHIRE

SC REMEDY COMPONENT	DESCRIPTION/IMPLEMENTATION APPROACH	TIMING
EARTH WORK PHASE - FALL 2010		
SITE PREPARATION	• confirm and flag wetland boundaries; • treat invasive species within western portion of perimeter ditch; • collect additional sediment samples to delineate excavation areas; • installation of erosion and sedimentation controls including siltation fence, construction entrance/truck wash, and check dam(s); • installation of crushed rock fill to reinforce access roads on top of the Landfill and surrounding areas; • clearing and grubbing of the perimeter ditch, access areas adjacent to the perimeter ditch, staging areas, and proposed access road areas; • construction of staging area controls for vehicle refueling (if necessary) and for equipment/material staging; • installation of temporary dewatering infiltration basins to manage sediment and dewatering fluid from perimeter ditch excavation activities and utility trenching activities; and • construction of temporary material and equipment staging areas as needed;	1 to 2 weeks Completed in November 2010

TABLE 1
IMPLEMENTATION TIME TABLE
SOURCE CONTROL REMEDIAL ACTION
DOVER MUNICIPAL LANDFILL SUPERFUND SITE
DOVER, NEW HAMPSHIRE

SC REMEDY COMPONENT	DESCRIPTION/IMPLEMENTATION APPROACH	TIMING
PERIMETER DITCH CLOSURE	• installation of an impacted soil dewatering/staging pad on top of the Landfill; • excavation of arsenic-impacted (greater than 50 mg/Kg) sediment in the perimeter ditch, and dewater for temporary onsite storage prior to disposal offsite; • backfilling the perimeter ditch using imported common sand borrow and road gravel to construct an access road that supports heavy equipment and trucks including drilling rigs, vacuum trucks, and service vehicles along the toe of the Landfill; and • installation of temporary stabilization measures including woodchips or haymulch on disturbed surfaces during winter months.	4 to 6 weeks Perimeter Ditch Excavation Completed by December 14, 2010 Backfilling Completed by January 31, 2011
CONSTRUCTION PHASE - SPRING – SUMMER 2011		
GWE SYSTEM CONSTRUCTION	• conduct Pre-Construction Conference; • re-establish vegetation monitoring plot and delineation pair locations and conduct baseline data collection in July 2011; • perform inspection of existing erosion control features and update and amend, as needed, for the 2011 construction season; • excavation to approximately 12 feet bgs and associated dewatering activities for installation of a buried sedimentation tank structure; • install sedimentation structure; • excavation to approximately 15 feet bgs and associated dewatering activities for installation of lift stations; • install on-site lift stations on the east and west sides of the Landfill (two total);	4 to 6 months (anticipated start in April 2011)

TABLE 1
IMPLEMENTATION TIME TABLE
SOURCE CONTROL REMEDIAL ACTION
DOVER MUNICIPAL LANDFILL SUPERFUND SITE
DOVER, NEW HAMPSHIRE

SC REMEDY COMPONENT	DESCRIPTION/IMPLEMENTATION APPROACH	TIMING
GWE SYSTEM CONSTRUCTION (continued)	• prepare foundation/footing areas for support buildings and sedimentation structures; • drilling and development of fifteen (15) extraction well clusters, each consisting of three (3) wells; • install electrical service infrastructure after extraction wells are installed to minimize issues with overhead hazards in drilling areas; • install on-site gravity and force conveyance piping (main and laterals) and connections to lift stations; • install foundations/footings for extraction well pump stations; • install extraction well nest mechanical and support building enclosures (15 total); • install equipment, pumps, and controls; • install off-site sewer conveyance line (concurrent with other activities); • connection of on-site conveyance piping system to the City of Dover municipal sewer lift station, including connection from sedimentation tank and bathroom; • GWE system start up and testing.	
MEETINGS DURING CONSTRUCTION	• progress meetings with USEPA/NHDES during construction.	Bi-weekly during construction (or as otherwise agreed to by parties)
OMM PLAN (6.3.5)	• within 30 days of 75% construction complete date; • development of OMM was initiated during the design phase.	anticipated summer 2011

TABLE 1
IMPLEMENTATION TIME TABLE
SOURCE CONTROL REMEDIAL ACTION
DOVER MUNICIPAL LANDFILL SUPERFUND SITE
DOVER, NEW HAMPSHIRE

SC REMEDY COMPONENT	DESCRIPTION/IMPLEMENTATION APPROACH	TIMING
OFF SITE TREATMENT AT POTW	• lift station adjacent to Tolend Road; and • sewer line from Landfill to existing City of Dover sewer – can be independent of on-site construction schedule – however, likely to be installed during same time period as on-site lift stations and sedimentation tank.	To be installed by others in summer of 2011
PROJECT COMPLETION AND DEMOBILIZATION PHASE – FALL 2011		
PERMEABLE COVER	• visual survey of existing Landfill cover completed in May 2010; • augment existing cover in areas that are identified to have insufficient organic cover material and visible exposed debris; • perform grading of selected supplementary cover materials; • vegetate/reseed with specified seed mixes and fertilizer to establish a sufficient stand of vegetation; • install final access road bedding, access gates, and as necessary, fences; and • conduct As-Built survey.	1 to 2 weeks for initial application (fall 2011)
PRE-FINAL AND FINAL CONSTRUCTION INSPECTION (6.3.6)	• Pre-Final Source Control Construction Inspection within 45 days of SCRA construction complete; and • Final Source Control Construction Inspection within 75 days of Pre-Final Inspection.	1.5 months (fall 2011)

TABLE 1
IMPLEMENTATION TIME TABLE
SOURCE CONTROL REMEDIAL ACTION
DOVER MUNICIPAL LANDFILL SUPERFUND SITE
DOVER, NEW HAMPSHIRE

SC REMEDY COMPONENT	DESCRIPTION/IMPLEMENTATION APPROACH	TIMING
FINAL CONSTRUCTION REPORT (6.3.7)	• within 60 days of Final Source Control Construction Inspection.	2 months (fall 2011)
SC REMEDY OPERATIONAL & FUNCTIONAL (6.3.7)	• status achieved after USEPA approves Final Source Control Construction Report.	0 days

NOTES:
1. Timing estimates are based upon preliminary proposals from contractors and reviewof RS Means Catalog information.
2. Construction activities associated with implementation of each SC component will be performed simultaneously, whenever practical.

TABLE 2A
SOURCE CONTROL REMEDIAL ACTION
ACTION SPECIFIC ARARS

Authority	Requirement	Status	Requirement Synopsis	Actions To Be Taken
Federal	Resource Conservation and Recovery Act (RCRA), 42 U.S.C. §§ 6901 *et seq.*, Standards for identification and listing of hazardous waste, 40 C.F.R. Part 261	Applicable to excavated material and material generated by treatment processes; Relevant and appropriate to material in the landfill	New Hampshire has been delegated the authority to administer these RCRA standards through its state hazardous waste management regulations (Env-Wm 400). These provisions have been adopted by the State.	Material excavated or otherwise generated during remedy implementation, including hydraulic control system installation and material generated by treatment processes, will be analyzed by appropriate test methods and, if applicable, managed in accordance with the substantive requirements of the state hazardous waste regulations. Non-hazardous materials will be disposed appropriately.
Federal	RCRA, Standards applicable to generators of hazardous wastes, 40 C.F.R. Part 262	Applicable for hazardous wastes generated from the remedial action; Relevant and Appropriate for hazardous wastes undisturbed in the landfill	New Hampshire has been delegated the authority to administer these RCRA standards through its state hazardous waste management regulations (Env-Wm 500). These provisions have been adopted by the State.	If remedial activity generates hazardous wastes, then they will be managed in accordance with the substantive requirements of the State hazardous waste regulations.
Federal	RCRA, Standards for owners and operators of hazardous waste treatment, storage, and disposal facilities, 40 C.F.R. Part 264	Applicable for hazardous wastes generated from the remedial action; Relevant and Appropriate for hazardous wastes undisturbed in the landfill	New Hampshire has been delegated the authority to administer these RCRA standards through its state hazardous waste management regulations (Env-Wm 700).	If any hazardous waste is generated from remedial activities it will be treated, stored, and disposed of under these standards. As a contingent remedy, if the hydraulic control is not effective the landfill will be capped and meet closure/post-closure requirements under these standards.
Federal	RCRA - Air Emission Standards for Process Vents, 40 CFR Part 264 Subpart AA	Relevant and Appropriate	Process vents associated with managing hazardous waste that have total organic concentrations of 10 ppm or greater. This section of RCRA has not been delegated to the State.	This ARAR does not apply to the remedy as currently designed; however, if processes to which this regulation applies are used in connection with the source control processes, air emission controls will be implemented if the applicability threshold is met.
Federal	RCRA - Air Emission Standards for Equipment Leaks, 40 CFR Part 264 Subpart BB	Relevant and Appropriate	Air emissions standards for equipment that contains or contacts RCRA waste with organic concentrations of at least 10% by weight. This section of RCRA has not been delegated to the State.	If equipment covered by this standard is used in the remedial action, and handles hazardous substances at concentrations that meet this rule's threshold, then air emission controls will be implemented.
Federal	RCRA - Air Emission Standards for Tanks, Surface Impoundments and Containers, 40 CFR Part 265 Subpart CC	Relevant and Appropriate	Air emissions standards for treatment, storage, and disposal facilities with VOC concentrations of 100 ppmv or greater.	If tanks, surface impoundments or containers are used in the remedial action and meet the applicability threshold, then air emission controls will be implemented.
Federal	Clean Water Act (CWA), Section 402 - National Pollution Discharge Elimination System standards, 33 U.S.C. § 1342; 40 C.F.R. 122-124, 131, 136	Applicable	These standards address water discharges which may be directed to surface water.	If a discharge from the remedial action is directed to surface water the discharge will be treated, if necessary, so that these standards will be achieved. Monitoring will be performed to determine whether operation and maintenance of the remedy could potentially affect nearby surface water bodies, in accordance with Env-Or-607 (see below).

TABLE 2A
SOURCE CONTROL REMEDIAL ACTION
ACTION SPECIFIC ARARS

Authority	Requirement	Status	Requirement Synopsis	Actions To Be Taken
Federal	CWA. National Recommended Water Quality Criteria ("NRWQC"), 40 C.F.R. § 122.44	Relevant and Appropriate	These regulations establish water quality standards for protection of human health and aquatic life.	Used to develop regulatory standards for surface waters and sediments. Surface water and sediment will be monitored to evaluate whether the remedy is effective in protecting areas from the migration of contaminants from the landfill.
Federal	CWA, Phase II Stormwater Standards, 40 C.F.R. 9, 122, 123 and 124	Applicable if over one acre is disturbed; Relevant and Appropriate if less than one acre is disturbed	Storm-water control standards for construction projects between one and five acres.	These standards will be met to control stormwater runoff and prevent erosion as required.
Federal	CWA, General Pretreatment Regulations for Existing and New Sources of Pollution, 40 C.F.R. 403	Applicable	Pretreatment standards for discharges to a POTW. POTW must be in compliance with its NPDES permit in order for a remedy to discharge to the POTW under the CERCLA Off-Site Rule.	Groundwater removed from the hydraulic control system will be treated, if necessary, to meet these standards before discharge to the City's POTW.
Federal	CWA, Underground Injection Control, 40 C.F.R. 144,146,147	Applicable	Standards for discharge of treated groundwater back into the ground.	Treated groundwater or liquids generated during remedial activities conducted at the Landfill will meet these standards before being reinjected into the ground.
Federal	Clean Air Act (CAA), Air Emissions from Municipal Solid Waste Landfills, 40 C.F.R. Part 60, Subpart WWW	Relevant and Appropriate	Standards for air emissions of non-methane organic compounds (NMOCs) from municipal solid waste landfills greater than 2.5 Mg in design capacity and emitting 50 Mg/yr or more of NMOC.	If the landfill is capped under the contingent remedy, emissions of NMOCs will be managed to meet these standards if the threshold is exceeded.
Federal	CAA, National Emission Standards for Hazardous Air Pollutants (NESHAPS), 40 C.F.R. Part 61	Applicable	Emissions of 189 designated hazardous air pollutants (HAP) are addressed under these standards. Includes requirements for dust control.	Air emissions (including dust) of any HAP during the remedial action, including the contingent landfill capping remedy, will meet these standards.
Federal	OSWER Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils, 67 Federal Register 71169 (Nov. 29, 2002), http://www.epa.gov/osw/hazard/correctiveaction/eis/vapor/complete.pdf	To Be Considered	Used to evaluate potential risks associated with indoor air at residences near the Site.	Potential risks associated with indoor air at residences near the Site will be evaluated, monitored and corrected, if and as necessary, consistent with this guidance.
Federal	Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action, and Underground Storage Tank Sites. OSWER Directive 9200.4-17P, April 21, 1999. http://www.epa.gov/swerust1/directiv/d9200417.pdf	To Be Considered	Used to evaluate the monitored natural attenuation component of the remedy.	Contaminant levels in Eastern Plume shall be monitored until they naturally attenuate below risk levels, consistent with this guidance.

TABLE 2A
SOURCE CONTROL REMEDIAL ACTION
ACTION SPECIFIC ARARS

Authority	Requirement	Status	Requirement Synopsis	Actions To Be Taken
Federal	EPA Guidance: Risk-Based Clean Closure, March 16, 1998 http://www.epa.gov/osw/hazard/correctiveaction/resources/guidance/risk/cclosfnl.pdf	To Be Considered	Used to evaluate the clean closure of the landfill at the completion of the remedy.	Landfill will be closed consistent with this guidance at the completion of the remedy. If clean closure cannot be achieved, the landfill will be capped based on RCRA C standards under the contingent remedy.
Federal	Technical Guidance for Final Covers on Haz. Waste Landfills and Surface Impoundments: EPA/530-SW-047; July, 1989.	To Be Considered	Used to develop landfill covers on hazardous waste landfills.	An appropriate cover will be placed on the landfill after clean closure is achieved. If clean closure cannot be a achieved, as a contingent remedy a RCRA C cap will be constructed consistent with the guidance.
Federal	Technical Memorandum – Revised Alternative Cap Design Guidance Proposed for Unlined, Hazardous Waste Landfills in the EPA Region I, Office of Site Remediation and Restoration (February 5, 2001) http://www.epa.gov/region1/cleanup/resource/guidance/C524.pdf	To Be Considered	Guidance on developing alternative landfill cap designs.	Guidance on developing alternative landfill cap designs. If clean closure cannot be achieved, this guidance may be considered when constructing the RCRA C cap under the contingent remedy.
State	Identification and Listing of Hazardous Wastes, N.H. Admin. Code Env-Wm 400, Toxicity Characteristic	Applicable to excavated material and material generated by treatment processes Relevant and Appropriate to material in landfill	These standards list particular hazardous wastes and identify the maximum concentration of contaminants for which the waste would be a RCRA characteristic waste. The analytical test set out in Appendix II of 40 C.F.R.. Part 261 is referred to as the Toxicity Characteristic Leaching Procedure (TCLP). The federal requirements 40 C.F.R. Part 261 are incorporated by reference.	Material excavated or otherwise generated during remedy implementation, including hydraulic control system installation and material generated by treatment processes, will be analyzed by appropriate test methods and, if applicable, managed in accordance with the substantive requirements of the state hazardous waste regulations. Non-hazardous materials will be disposed appropriately.
State	Requirements for Hazardous Waste Generators, N.H. Admin. Code Env-Wm 500 [formerly He-P Ch. 1905.06]: including Part 507 Storage Requirements; Part 513 Emergency/Remedial Actions	Relevant and Appropriate	Requires determination as to whether waste materials are hazardous and, if so, requirements for managing such materials on site prior to shipment off site. The federal requirements 40 C.F.R. Part 262 are incorporated by reference.	If remedial activity generates hazardous wastes, then they will be managed in accordance with the substantive requirements of these regulations.
State	Requirements for Owners and Operators of Hazardous Waste Facilities/Hazardous Waste Transfer Facilities, N.H. Admin. Code Env-Wm 700 [formerly He-P Ch. 1905.08]	Relevant and Appropriate	This regulation establishes requirements for owners or operators of hazardous waste sites. Part 708 incorporates by reference the federal requirements under 40 C.F.R. Part 264, including but not limited to Subpart G (closure/post closure), Subpart I (containers), Subpart J (tanks), Subpart N (landfills). Specific subsections are listed below.	This regulation establishes requirements for owners and operators of hazardous waste sites or treatment facilities. Specific sections are ARARs as described below.

TABLE 2A
SOURCE CONTROL REMEDIAL ACTION
ACTION SPECIFIC ARARS

Authority	Requirement	Status	Requirement Synopsis	Actions To Be Taken
State	Hazardous Waste Facility, Groundwater Monitoring [formerly He-P Ch. 1905.08(d)(6) a,b], Env-Wm 702.10 – 702.13	Relevant and Appropriate	Standard requires groundwater monitoring of hazardous waste facilities.	A groundwater monitoring system will be installed and operated that is capable of detecting potential migration of hazardous waste and constituents from the landfill and in offsite plumes and will be operated as long as any contamination exceeding CERCLA risk levels is in place.
State	Hazardous Waste Facility Closure and Post-Closure Disposal Units, Env-Wm 708.02(a)(12)	Relevant and Appropriate	Closure and post-closure standards for hazardous waste facilities.	Landfill must meet clean closure standards at the completion of the remedy.
State	Hazardous Waste Facility - Use and Management of Containers, Env-Wm 708.03 (d)(1)	Relevant and Appropriate	Standards for the management of containers containing hazardous waste. Incorporates by reference the standards of 40 CFR Part 264, Subpart I.	If excavated materials or any other materials generated from implementing the remedy are hazardous waste and are managed in containers, then the containers will be managed to meet the substantive portion of this requirement.
State	Hazardous Waste Facility - Tanks, Env-Wm 708.03(d)(2)	Relevant and Appropriate	Standards for the management of tanks containing hazardous waste. Incorporates by reference the standards of 40 CFR Part 264, Subpart J.	If a tank or tank system is used for storing or treating hazardous wastes as part of Site remediation, it will be constructed with secondary containment and a leak detection system and comply with all other substantive requirements including monitoring and inspection requirements.
State	Hazardous Waste Facility - Waste Piles [formerly He-P Ch. 1905.08 (f)(1)(d)], Env-Wm 708.03(d)(4)	Relevant and Appropriate	Standards for the use of waste piles for hazardous waste. Incorporates by reference the standards of 40 CFR Part 264, Subpart L.	If temporary on-site storage of hazardous soils or materials is required, a structure will be designed, built, and operated in accordance with the specific requirements of this section.
State	Hazardous Waste Facility - Landfills, Env-Wm 708.03(d)(6)	Relevant and Appropriate	Standards for the use of hazardous waste landfills. Incorporates by reference the standards of 40 CFR Part 264, Subpart N.	The remedy will achieve clean closure of the landfill. If clean closure cannot be achieved a RCRA C cap will be constructed and maintained under these standards under the contingent remedy.
State	Contaminated Site Management, NH Admin. Code Env-Or 600: Part 607, Groundwater Management Permits; Part 608, Activity and Use Restrictions; Part 610, Monitoring; Part 611, Contaminated Soils	Applicable	Env-Or Part 607 provides for establishment of institutional controls to control use of groundwater that exceeds AGQS, requires monitoring of the groundwater quality, requires implementation of measures to restore the groundwater quality, and requires an evaluation of the effectiveness of the measures. Part 608 establishes standards for setting institutional controls to protect human health and components of the remedy. Part 610 establishes standards for monitoring groundwater, including requirements and criteria for constructing, developing, and decommissioning monitoring wells. Part 611 establishes standards for managing contaminated soils.	Institutional controls will be established to protect against use of contaminated groundwater. Activity and use restrictions will be established to prevent human exposure to contaminated groundwater and protect components of the remedy. Groundwater monitoring will be required until State groundwater standards are achieved (monitoring will be continued if additional Federal groundwater standards still need to be achieved). Groundwater monitoring and extraction wells will be installed, operated, and decommissioned under these standards. Contaminated soils generated from installation of the hydraulic control system and any other remedial activity will be managed in compliance with these standards.

TABLE 2A
SOURCE CONTROL REMEDIAL ACTION
ACTION SPECIFIC ARARS

Authority	Requirement	Status	Requirement Synopsis	Actions To Be Taken
State	Groundwater Management and Groundwater Release Detection Permits, Env-Or 700 [generally cited as Env–Wm1403 in the ROD and AROD; section renumbered by the State]	Applicable	Establishes groundwater management standards.	Groundwater re-injected into landfill and groundwater discharged to wetlands or that ultimately discharges to surface water shall be treated to meet AGQS and shall not degrade surface water. A GMZ and a monitoring program will be established at the site and will remain in place until cleanup goals have been attained throughout the GMZ.
State	Underground Injection Control Requirements, Env-Ws 384	Applicable	The purpose of these rules is to establish standards, criteria, and procedures for underground injection to wells to prevent pollution and protect groundwater as specified in 40 CFR 9, 144, 145, and 146.	Treated groundwater or liquids generated during remedial activities conducted at the Landfill will meet these standards before being reinjected into the ground.
State	Standards for Pretreatment of Industrial Wastewater, Env-Ws 904	Applicable	Pretreatment standards for discharges to a POTW. POTW must be in compliance with its NPDES permit in order for a remedy to discharge to the POTW.	Groundwater removed from the hydraulic control system will be treated, if necessary, to meet these standards before discharge to the City's POTW.
State	Groundwater Discharge Permit and Registration Rules, Env-Wq 402 [Cited in the ROD and AROD as Env-Ws 1500]	Applicable	These regulations establish substantive requirements for discharges to groundwater, including prohibited discharges (Env-Wq 402.07), water quality sampling (Env-Wq 402.08), and compliance criteria (Env-Wq 402.22).	If the operation and maintenance of the remedy requires discharge to groundwater, these standards will be complied with.
State	Surface Water Quality Regulations, Env-Ws 1700 [only Env-Ws 1708 cited in the ROD and AROD]	Applicable	These rules establish water quality standards for the state's surface waters. Water quality criteria for toxic substances are established. See Part Env-Ws 1703 Water Quality Standards, Env-Ws 1704 Alternative Site Specific Criteria, and Env-Ws 1708 Anti-Degradation. These rules are applicable to point or non-point discharge(s) of pollutants to surface waters.	If a discharge from the remedial action is directed to surface water the discharge will be treated, if necessary, so that these standards will be achieved. Monitoring will be performed to determine whether operation and maintenance of the remedy could potentially affect nearby surface water bodies, in accordance with Env-Or-607.
State	Standards for Construction, Maintenance and Abandonment of Wells, NH Admin. Code Env-We 600	Applicable	This provision requires that wells be constructed, maintained, relocated, and/or abandoned according to these regulations.	All wells will be constructed, maintained, relocated and/or abandoned according to these regulations.
State	Ambient Air Quality Standards, Env-A300	Applicable	The purpose of this chapter is to establish ambient air quality standards for various types of pollutants emitted in or transported into the State of New Hampshire pursuant to section 109 of the Clean Air Act (Act), 40 CFR 53, and 40 CFR 50, as amended. These standards are intended to be protective of the public health and public welfare in accordance with RSA 125-C:1.	Air contaminants, especially particulate matter emissions generated during on-site activities will be controlled, to ensure that the appropriate regulatory standards are met.
State	Standards Applicable to Certain New or Modified Facilities and Sources of Hazardous Air Pollutants, Env-A 500	Applicable	The purpose of this chapter is to establish state standards to regulate: (a) Certain new or modified facilities in accordance with authority delegated by the EPA under §111(c) of the Clean Air Act; and (b) Certain sources of hazardous air pollutants in accordance with authority delegated by the EPA under §112 of the Clean Air Act.	Air emissions (including dust) of any of HAP during the remedial action, including the contingent landfill capping remedy, will meet these standards.

TABLE 2A
SOURCE CONTROL REMEDIAL ACTION
ACTION SPECIFIC ARARS

Authority	Requirement	Status	Requirement Synopsis	Actions To Be Taken
State	Fugitive Dust, N.H. Admin. Code Env-A Part 1002	Applicable	Requires precautions to prevent, abate and control fugitive dust during specified activities, including excavation, maintenance, and construction.	Precautions to control fugitive dust emissions will be required during site remediation activities that could generate dust.
State	Regulated Toxic Air Pollutants, NH Admin. Code Env-A Part 1400 [cited as Env-A Part 1300 in the ROD and AROD]	Applicable	This regulation identifies toxic air pollutants to be regulated. These pollutants are also listed by EPA in 40 CFR 261. High, moderate and low Toxicity Classifications are established. Air toxics in these classifications are regulated when they occur in concentrations that cause adverse health effects including increased cancer risk.	If there are remedial processes that result in releases of contaminants into the air, air quality standards will be complied with during remedial activities.

TABLE 2B
SOURCE CONTROL REMEDIAL ACTION
CHEMICAL SPECIFIC ARARS

Authority	Requirement	Status	Requirement Synopsis	Actions To Be Taken
Federal	Safe Drinking Water Act (42 U.S.C. §300f *et seq.*); National primary drinking water regulations - Maximum Contaminant Levels (MCLs) (40 C.F.R. 141, Subpart B and G)	Relevant and Appropriate	Establishes maximum contaminant levels (MCLs) for common organic and inorganic contaminants applicable to public drinking water supplies. Used as relevant and appropriate cleanup standards for aquifers and surface water bodies that are potential drinking water sources.	On and off-site ground water will attain MCLs through successful operation of the hydraulic controls and off-site disposal of contaminated groundwater to the POTW, addressing localized sources in the landfill and potentially through extraction and treatment of groundwater in the southern plume and natural attenuation in the eastern plume. Otherwise, the contingencies of capping the landfill and active treatment of groundwater in the eastern plume will meet cleanup levels in groundwater outside of the compliance boundary for the capped area and institutional controls will prevent exposure to contaminated groundwater within the capped area. Institutional controls will be maintained until risks identified under these standards are eliminated. The MCL for arsenic has been retained as a relevant and appropriate cleanup standard.
Federal	Safe Drinking Water Act (42 U.S.C. §300f *et seq* .); National primary drinking water regulations - Maximum Contaminant Level Goals (MCLGs)(40 C.F.R. 141, Subpart F)	Relevant and Appropriate for non-zero MCLGs only; MCLGs set as zero are To Be Considered	Establishes maximum contaminant level goals (MCLGs) for public water supplies. MCLGs are health goals for drinking water sources. These unenforceable health goals are available for a number of organic and inorganic compounds.	On and off-site ground water will attain nonzero MCLGs when there is no MCL or State drinking water standards, whichever is more stringent at the completion of the remedy through successful operation of the hydraulic controls and off-site disposal of contaminated groundwater to the POTW, addressing localized sources in the landfill and potentially through extraction and treatment of groundwater in the southern plume and natural attenuation in the eastern plume. Otherwise, the contingencies of capping the landfill and active treatment of groundwater in the eastern plume will meet cleanup levels in groundwater.
Federal Criteria, Advisories, and Guidance	EPA Risk Reference Dose (RfDs)	To Be Considered	RfDs are considered to be the levels unlikely to cause significant noncarcinogenic adverse health effects associated with a threshold mechanism of action in human exposure for a lifetime.	RfDs will be used to calculate residual acute human health risks as appropriate in evaluating the effectiveness of the remedy in accordance with USEPA human health risk assessment guidance for Superfund sites.
Federal Criteria, Advisories, and Guidance	EPA Carcinogenicity Slope Factor	To Be Considered	Slope factors are developed by EPA from Health Effects Assessments and present the most up-to-date information on cancer risk potency. Slope factors are developed by EPA from Health Effects Assessments by the Carcinogenic Assessment Group.	Slope factors will be used to calculate residual carcinogenic human health risks as appropriate in evaluating the effectiveness of the remedy in accordance with USEPA human health risk assessment guidance for Superfund sites.
Federal Criteria, Advisories, and Guidance	Guidelines for Carcinogen Risk Assessment EPA/630/P-03/001F (March 2005)	To Be Considered	Guidance for assessing cancer risk.	Residual risks due to carcinogens will be assessed using these guidelines.

TABLE 2B
SOURCE CONTROL REMEDIAL ACTION
CHEMICAL SPECIFIC ARARS

Authority	Requirement	Status	Requirement Synopsis	Actions To Be Taken
Federal Criteria, Advisories, and Guidance	Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens EPA/630/R-03/003F (March 2005)	To Be Considered	Guidance of assessing cancer risks to children.	Residual risks to children due to carcinogens will be assessed using these guidelines.
Federal Criteria, Advisories, and Guidance	Health Advisories (EPA Office of Drinking Water)	To Be Considered	Health Advisories are estimates of risk due to consumption of contaminated drinking water; they consider non-carcinogenic effects only. To be considered for contaminants in groundwater that may be used for drinking water where the standard is more conservative than either federal or state statutory or regulatory standards.	Health advisories will be used to evaluate the non-carcinogenic risk resulting from exposure to certain compounds. The remedy prevents exposure to contaminants though institutional controls to restrict exposure until cleanup goals are achieved through hydraulic controls and off-site disposal of contaminated groundwater to the POTW, addressing localized sources in the landfill, potential extraction and treatment of groundwater in the southern plume, and natural attenuation in the eastern plume. Institutional controls will be maintained until risks identified under these standards are eliminated.
Federal Criteria, Advisories, and Guidance	NOAA Technical Memorandum NOS OMA 52	To Be Considered	Potential ecological risks evaluated using these thresholds.	Potential ecological risks will be evaluated using these thresholds for sediment in the swale and ditch that contain arsenic. Sediment that contains more than 50 mg/kg arsenic will be removed and disposed of offsite. Measures will be taken to prevent contaminated sediment from washing into the Cocheco River during excavation.
Federal Criteria, Advisories, and Guidance	Ontario Lowest Effect Levels 1993,1994	To Be Considered	Used to provide a spectrum of ecological risk resulting from exposure to site contaminants for use in ecological risk assessment.	Potential ecological risks will be evaluated using these thresholds. The remedial action will address identified risks to ecological receptors.
State	Drinking Water Quality Standards: NH Admin. Code Env-Ws 314 MCLs and MCLGs for Inorganics; NH Admin. Code Env-Ws 315 MCLs and MCLGs for Regulated Organics	Applicable for MCLs and non-zero MCLGs only; MCLGs set as zero are To Be Considered	State MCLs and MCLGs establish maximum contaminant levels permitted in public water supplies and are the basis of State Ambient Groundwater Quality Standards (AGQS) that are applicable to site groundwater. The regulations are generally equivalent to the Federal Safe Drinking Water Act (SDWA).	Used to establish cleanup standards for groundwater. Long-term monitoring of contaminants, based on these standards, will be performed to evaluate whether the groundwater remedies are effective in preventing the migration of contaminants and achieving drinking water standards. If not the contingent remedy, capping the landfill, will attain these standards outside of the compliance boundary for the waste management area and institutional controls will prevent exposure to contaminated groundwater within the capped area. Institutional controls will be maintained until risks identified under these standards are eliminated.
State	New Hampshire Ambient Groundwater Quality Standards (NH AGQS) (Env-Or 603.03, Table 600-1) [generally cited as Env–Wm1400 in the ROD and AROD; section renumbered by the State]	Applicable	Establishes maximum concentration levels for regulated contaminants in groundwater which result from human operations or activities. NH AGQS are equivalent to MCLs for contaminants that have MCLs. NH AGQS have been established for site groundwater contaminants for which no MCLs are established, and are derived to be protective for drinking water uses. The NH AGQS will be used for site contaminants where MCLs are not currently established (e.g., tetrahydrofuran (THF)).	Used to establish cleanup standards for groundwater. Long-term monitoring of contaminants, based on these standards, will be performed to evaluate whether the groundwater remedies are effective in preventing the migration of contaminants and achieving drinking water standards. Institutional controls will be maintained until risks identified under these standards are eliminated.

TABLE 2B
SOURCE CONTROL REMEDIAL ACTION
CHEMICAL SPECIFIC ARARS

Authority	Requirement	Status	Requirement Synopsis	Actions To Be Taken
State	Groundwater Protection Standards: NH Admin. Code Env-Or 603.01(a) and (b) [generally cited as Env–Wm1400 in the ROD and AROD; section renumbered by the State]	Applicable	Wm-Or 603.01(a) and (b) provide that groundwater shall be suitable for use as drinking water without treatment and shall not contain any regulated contaminant in concentrations greater than ambient groundwater quality standards established in Env-Or 603.03.	Used to establish cleanup standards for groundwater. Long-term monitoring of contaminants, based on these standards, will be performed to evaluate whether the groundwater remedies are effective in preventing the migration of contaminants and achieving drinking water standards. Institutional controls will be maintained until risks identified under these standards are eliminated.
State	Nondegradation of Groundwater to Protect Surface Water: NH Admin. Code Env-Or 603.01(c) [generally cited as Env–Wm1400 in the ROD and AROD; section renumbered by the State]	Applicable	Wm-Or 603.01(c) provides that, unless naturally occurring, groundwater shall not contain any contaminants at concentrations such that groundwater to surface water results in a violation of surface water standards in any surface water body within or adjacent to the site. Env-Or 603.01 (c) therefore incorporates surface water standards set forth at Env-Ws 1700.	Used to establish cleanup standards for groundwater. Long-term monitoring of contaminants, based on these standards, will be performed to evaluate whether the groundwater remedies are effective in preventing the migration of contaminants and achieving drinking water standards. Institutional controls will be maintained until risks identified under these standards are eliminated.
Municipal	City of Dover Sewer Code Chapter 147	Applicable	The City of Dover Sewer Code describes sewer use and regulation, industrial pretreatment standards, and construction requirements for sewer and water mains.	Groundwater discharged to the POTW from the site will meet applicable standards of the City of Dover Sewer Code.
State	Title L Water Management and Protection, Chapter 485-A Water Pollution and Waste Disposal, Sections 485-A:4 (XV), 485-A:5, and 485-A:6	Applicable	Chapter 485-A establishes State and municipal pretreatment standards for the discharge of waste into the collection system or the sewage treatment facility of any municipality or other governmental entity, any waste that does not comply with such pretreatment standards.	Groundwater discharged to the POTW from the site will meet the applicable requirements of Title L Water Management and Protection.
State	Part Env-Ws 904 Standards for Pretreatment of Industrial Wastewater	Applicable	Part Env-Ws 904 establishes standards for pretreatment of industrial wastewater to prevent the indirect discharge of pollutants to a POTW which would (a) pass through, interfere with, or otherwise be incompatible with the safe and successful performance, operation, and maintenance of the POTW; (b) cause the POTW to violate any water quality standards specified in Env-Ws 1700; or (c) adversely impact sludge quality and prevent its use or disposal as other than a hazardous waste.	Groundwater discharged to the POTW from the site will meet the applicable standards for pretreatment of industrial wastewater as prescribed in Part Env-Ws 904.

TABLE 2C
SOURCE CONTROL REMEDIAL ACTION
LOCATION SPECIFIC ARARS

Authority	Requirements	Status	Requirement Synopsis	Actions To Be Taken
Federal	Fish and Wildlife Coordination Act (16 U.S.C. §661 *et seq*.)	Applicable	Any modification of a body of water or wetland requires consultation with the U.S. Fish and Wildlife Service and the appropriate state wildlife agency to develop measures to prevent, mitigate, or compensate for losses of fish and wildlife.	Specified federal agencies will be contacted to help analyze impacts of installing and operating the hydraulic control system and discharge pipe connecting to the sewer, localized source control actions, the groundwater collection and treatment systems and any other remedial activities on wildlife in wetlands and the river.
Federal	Protection of Wetlands (40 C.F.R. § 6.302(a); Appendix A)	Applicable	This regulation codifies standards established under Executive Order 11990. Under this requirement, no activity that adversely affects a federal jurisdictional wetland shall be permitted if a practicable alternative with lesser effects is available. Action to avoid, whenever possible, the long- and short-term impacts on wetlands and to preserve and enhance wetlands.	This regulation has been eliminated from 40 C.F.R. Part 6. Compliance with the Wetlands Executive Order is currently a matter to be addressed under the Protectiveness Criterion rather than the ARAR Criterion.
Federal	Clean Water Act, Section 404 (33 U.S.C.. § 1344); Section 404(b)(1) Guidelines for Specification of Disposal Sites for Dredged or Fill Material (40 C.F.R. Part 230, 231 and 33 C.F.R. Parts 320-323)	Applicable	Under this requirement, no activity that adversely affects a federal jurisdictional wetland shall be permitted if a practicable alternative with lesser effects is available. Controls discharges of dredged or fill material to protect aquatic ecosystems.	Material excavated from wetlands and water bodies during construction of the hydraulic control system, discharge pipe to the City sewer, the groundwater collection and treatment system, from addressing the swale and from the activity of filling the perimeter ditch will be performed using the least environmentally damaging methods practicable. Measures to mitigate damages will be used during construction and operation of the remedy. Wetlands will be restored to the extent practicable.
Federal	RCRA General Facility Standards - Seismic Standards (40 CFR 264.18(a))	Relevant and Appropriate	New Hampshire has been delegated the authority to administer these RCRA standards through its state hazardous waste management regulations (Env-Wm 708.02(7)). Facility siting standards for hazardous waste facilities pertaining to seismic risks.	Construction of any on-site treatment facility will not be located within 200 feet of a fault that has had a displacement in Holocene time.
State	Criteria and Conditions for Fill and Dredge In Wetlands: RSA Ch. 482-A and NH Admin. Code Env-Wt Parts 300-400, 600, and 700 [Only En-Wt 300 identified in the ROD and AROD]	Applicable	These standards regulate filling and other activities in or adjacent to wetlands, and establish criteria for the protection of wetlands from adverse impacts on fish, wildlife, commerce, and public recreation.	Material excavated from wetlands and water bodies during construction of the hydraulic control system, discharge pipe to the City sewer, the groundwater collection and treatment system, from addressing the swale and from the activity of filling the perimeter ditch will be performed using the least environmentally damaging methods practicable. Measures to mitigate damages will be used during construction and operation of the remedy. Wetlands will be restored to the extent practicable.
State	NH Hazardous Waste Rules - Location Requirements, Seismic Standards; Env-Hw 708.02(7)	Applicable	The RCRA program is delegated to the State of New Hampshire. The NH Rules have incorporated by reference the requirements of 40 C.F.R. 264.18(a) regarding facility siting standards for hazardous waste facilities pertaining to seismic risks.	Construction of any on-site treatment facility will not be located within 200 feet of a fault that has had a displacement in Holocene time.
State	Wellhead Protection: Small Production Wells for Small Community Water Systems; Env-Dw 301 and Large Production Wells for Community Water Systems; Env-Dw 302	Relevant and Appropriate	Regulations establish wellhead protection areas around new large and small community wellheads. A small community water system means a public water system serving a population of 25-1,000 persons without street hydrant fire protection. A large community water system means a community water system which serves 1,000 persons or more or any community water system that provides fire protection.	Groundwater remediation will be conducted to prevent contamination of any small or large community wells in the vicinity of the Site.
State	Protection of the Purity of The Bellamy Reservoir and Its Watershed; Env-Ws 386.58	Applicable	The purpose of this section is to protect the purity of the water of the Bellamy Reservoir which is the principal drinking water supply for the City of Portsmouth.	Groundwater remediation will be conducted to prevent contamination of the Bellamy Reservoir or any of its tributaries.
State	Native Plant Protection Act; RSA 217A and Res 1100-1108	Applicable	Prohibits damaging plant species listed as endangered within the State.	Listed plant species will be identified and remedial activities will comply with these standards.

TABLE 2C
SOURCE CONTROL REMEDIAL ACTION
LOCATION SPECIFIC ARARS

Authority	Requirements	Status	Requirement Synopsis	Actions To Be Taken
State	Terrain alteration adjacent to surface waters; RSA 485:17, Env-Ws 415 and Env-Wq 1500	Applicable	The purpose of these rules is to protect surface water quality from degradation resulting from any activity which significantly alters terrain or occurs in or on the border of the surface waters of the state. The permanent methods for protecting water quality described include: vegetated filter strips, grassed swales, detention ponds, wet ponds, constructed wetlands, infiltration trenches, infiltration basins and water quality inlets.	Activities performed in association with the implementation of the remedy, including installation and operation of the hydraulic control system and discharge pipeline to the sewer, will be compliant with these standards and will result in the least adverse impact to surface waters/wetlands. If the contingent remedy of capping the landfill is implemented these standards will be applied. Engineering controls (e.g. siltation controls, erosion controls) will be implemented during remedial activities to minimize harm to surface waters/wetlands. Excavated material, including well drillings, will be stockpiled and dewatered outside of wetland areas prior to off-site disposal. Wetlands would be restored (using suitable soil and vegetation) where altered temporarily by the remedy.

TABLE 3A
MATRIX OF MONITORING ACTIVITIES
SOURCE CONTROL REMEDIAL ACTION
DOVER MUNICIPAL LANDFILL SUPERFUND SITE
DOVER, NEW HAMPSHIRE

		HYDRAULIC MONITORING			GROUND WATER QUALITY MONITORING		
WELL ID	STRATIGRAPHIC UNIT	COMPREHENSIVE GAUGING*	CONTINUOUS HYDRAULIC INFLUENCE MONITORING	QUARTERLY GAUGING	SEMI-ANNUAL SAMPLING (Current EMP/GMP)	QUARTERLY REMEDY PERFORMANCE MONITORING	
						JANUARY	JULY
East Side of Landfill							
SC-5US	US	X		X	X		
SC-6US	US	X		X			
MW-103S	US	X	X	X	X	X	X
MW-103U	UUI	X	X	X	X	X	X
SC-7US	US	X	X	X	X	X	X
SC-7UUI	UUI	X	X	X	X	X	X
SC-7LUI	LUI	X		X	X		
SC-17US	US	X		X			
SC-17UUI	UUI	X		X			
SC-8US	US	X		X	X		
SC-8UUI	UUI	X	X	X	X		
SC-8LUI	LUI	X	X	X	X		
SC-15US	US	X		X	X		
SC15UUI	UUI	X		X	X		
SC-16US	US	X		X	X		
SC16UUI	UUI	X		X	X		
EP-1S	US	X	X	X	X		
EP-1I	UUI	X	X	X	X		
EP-1D	LUI	X	X	X	X		
B5-WT	US	X		X			
SB-5D	LUI	X		X	X		
MW-104S	US	X		X	X		
MW-104U	UUI	X		X	X		
SC-24S	US	X		X	X		
SC-24I	UUI	X		X	X		
SC-24D	LUI	X		X	X		
West Side of Landfill							
SC-12US	US	X		X	X		
SC-12UUI	UUI	X		X	X		
B-4WT	US	X		X			
SB-4D	UUI	X		X	X		
SC-11US	US	X		X	X		
SC-11UUI	UUI	X		X	X		
SC-9US	US	X	X	X	X	X	X
MW-101U	UUI	X	X	X	X	X	X
OW-1A	US	X		X			
SC-10US	US	X	X	X	X	X	X
SC-10UUI	UUI	X	X	X	X	X	X
SC-10LUI	LUI	X		X	X		
SC-18US	US	X		X	X		
SC-18UUI	UUI	X		X	X		
PZ-2-S	US	X		X			
PZ-2-M	UUI	X		X			
PZ-2-D	LUI	X		X			
PZ-5-S	US	X		X			
PZ-5-M	UUI	X		X			
PZ-5-D	LUI	X	X	X			
PZ-8-S	US	X		X			
PZ-8-M	UUI	X		x			
PZ-8-D	LUI	X		X			
B-8WT	US	X		X	X		
SB-8D	LUI	X		X	X		
SB-10I	UUI	X		X	X		
SB-10D	UUI/LUI	X		X	X		

NOTES:
1. * = Semi-annual comprehensive gauging is conducted as part of ongoing Environmental Monitoring Program (EMP)/Ground Water Monitoring Program (GMP) activities.
2. US = Upper Sand.
3. UUI = Upper Upper Interbedded.
4. LUI = Lower Upper Interbedded.

TABLE 3B
MONITORING WELL CONSTRUCTION INFORMATION
SOURCE CONTROL REMEDIAL ACTION
DOVER MUNICIPAL LANDFILL SUPERFUND SITE
DOVER, NEW HAMPSHIRE

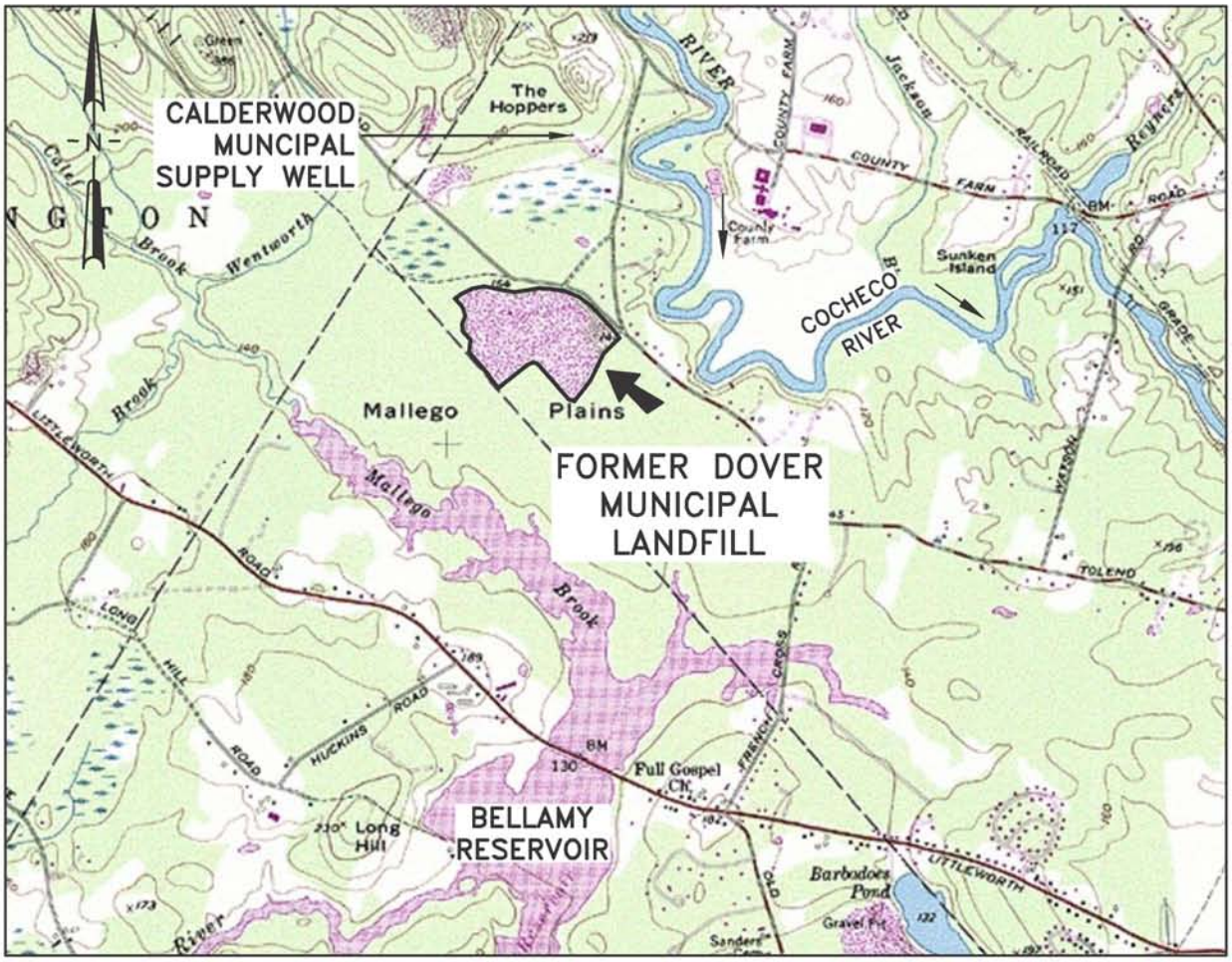
WELL ID	STRATIGRAPHIC UNIT	DEPTH OF TOP OF SCREEN	ELEVATION @ TOP OF SCREEN	DEPTH OF BOTTOM OF SCREEN	ELEVATION @ BOTTOM OF SCREEN	LENGTH OF SCREENED INTERVAL
East Side of Landfill						
SC-5US	US	9.5	140.7	14.5	135.7	5.0
SC-6US	US	4.0	140.0	9.0	135.0	5.0
MW-103S	US	14.0	130.2	19.0	125.2	5.0
MW-103U	UUI	41.5	103.0	46.5	98.0	5.0
SC-7US	US	10.0	134.8	25.0	119.8	15.0
SC-7UUI	UUI	29.0	115.5	34.0	110.5	5.0
SC-7LUI	LUI	56.0	88.6	61.0	83.6	5.0
SC-17US	US	20.0	124.4	25.0	119.4	5.0
SC-17UUI	UUI	30.0	114.6	35.0	109.6	5.0
SC-8US	US	9.0	137.6	14.0	132.6	5.0
SC-8UUI	UUI	33.0	114.1	38.0	109.1	5.0
SC-8LUI	LUI	41.0	106.1	46.0	101.1	5.0
SC-15US	US	27.0	125.1	32.0	120.1	5.0
SC15UUI	UUI	37.0	114.1	42.0	109.1	5.0
SC-16US	US	28.0	131.6	33.0	126.6	5.0
SC16UUI	UUI	38.0	121.5	43.0	116.5	5.0
EP-1S	US	6.0	135.7	16.0	125.7	10.0
EP-1I	UUI	26.0	115.7	36.0	105.7	10.0
EP-1D	LUI	50.0	91.6	60.0	81.6	10.0
B5-WT	US	1.0	143.4	10.0	134.4	9.0
SB-5D	LUI	41.0	103.5	51.0	93.5	10.0
MW-104S	US	15.0	128.1	20.0	123.1	5.0
MW-104U	UUI	31.0	112.3	36.0	107.3	5.0
SC-24S	US	5.0	134.1	15.0	124.1	10.0
SC-24I	UUI	20.0	119.3	30.0	109.3	10.0
SC-24D	LUI	40.0	99.0	45.0	94.0	5.0
West Side of Landfill						
SC-12US	US	34.0	130.6	39.0	125.6	5.0
SC-12UUI	UUI	44.0	120.4	49.0	115.4	5.0
B-4WT	US	1.0	146.5	9.5	138.0	8.5
SB-4D	UUI	34.0	113.6	44.0	103.6	10.0
SC-11US	US	4.5	142.8	9.5	137.8	5.0
SC-11UUI	UUI	16.0	131.5	21.0	126.5	5.0
SC-9US	US	20.0	130.0	25.0	125.0	5.0
MW-101U	UUI	32.5	117.7	37.5	112.7	5.0
OW-1A	US	12.5	136.9	15.0	134.4	2.5
SC-10US	US	5.0	141.8	20.0	126.8	15.0
SC-10UUI	UUI	24.0	123.2	29.0	118.2	5.0
SC-10LUI	LUI	43.0	104.0	48.0	99.0	5.0
SC-18US	US	14.0	133.0	19.0	128.0	5.0
SC-18UUI	UUI	24.0	123.0	29.0	118.0	5.0
PZ-2-S	US	10.0	136.0	24.0	122.0	14.0
PZ-2-M	UUI	26.0	119.8	35.0	110.8	9.0
PZ-2-D	LUI	37.0	109.0	47.0	99.0	10.0
PZ-5-S	US	10.0	136.6	24.0	122.6	14.0
PZ-5-M	UUI	26.0	120.5	35.0	111.5	9.0
PZ-5-D	LUI	37.0	109.5	47.0	99.5	10.0
PZ-8-S	US	10.0	135.6	24.0	121.6	14.0
PZ-8-M	UUI	26.0	119.9	35.0	110.9	9.0
PZ-8-D	LUI	37.0	108.7	47.0	98.7	10.0
B-8WT	US	1.0	144.0	10.5	134.5	9.5
SB-8D	LUI	56.0	89.1	71.0	74.1	15.0
SB-10I	UUI	30.0	115.5	40.0	105.5	10.0
SB-10D	UUI/LUI	54.0	91.5	64.0	81.5	10.0

NOTES:
1. Measurements are in feet.
2. US = Upper Sand.
3. UUI = Upper Upper Interbedded.
4. LUI = Lower Upper Interbedded.

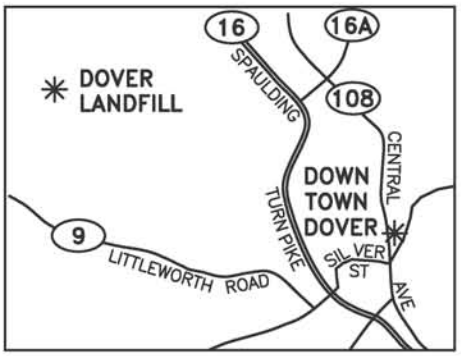
TABLE 4
SUMMARY OF SOURCE CONTROL DATA QUALITY OBJECTIVES
SOURCE CONTROL REMEDIAL ACTION
DOVER MUNICIPAL LANDFILL SUPERFUND SITE
DOVER, NEW HAMPSHIRE

Matrix of Interest	Inputs to the Decision	Sampling Location	Study Boundaries	Sampling Frequency	Sampling Methods	Decision Rule	Statistical Test Methods
Sediment from ditch	VOCs, arsenic, and disposal facility criteria	Perimeter Ditch	Perimeter Ditch	One sample per 50 linear feet of excavated area	Hand auger; SOP 013 from QAPP	Measured concentration compared to 50 mg/Kg	Direct comparison
Ground water (samples from permanent monitoring wells)	VOCs and arsenic	Existing monitoring wells	Within 200 feet of toe of Landfill	Semi-annual	Discrete sample – low flow methods SOP 011 from QAPP	Compare measured concentrations to historical landfill leachate characteristics and concentrations, and to ICLs; data may be used for future MNA at the Site	Direct comparison of discrete samples; data will be evaluated overtime to identify trends
Ground water (samples from permanent monitoring wells)	VOCs and arsenic	Existing monitoring wells	Inside and outside anticipated capture zone	Quarterly	Discrete sample – low flow methods SOP 011 from QAPP	Compare concentrations to historical landfill leachate characteristics and concentrations, and comparison to ICLs; data may be used for future MNA at the Site	Direct comparison of discrete samples; data will be evaluated overtime to identify trends
Water levels	Ground water elevation	Extraction wells and selected performance monitoring wells	At toe of Landfill and within 100 feet of toe of Landfill	Continuous (daily)	Pressure transducer SOP 019 from QAPP	Compare water level elevations to baseline conditions to estimate drawdown	Direct comparison for discrete measurements
Water levels	Ground water elevation	Existing monitoring wells	Inside and outside anticipated capture zone	Quarterly	Manual gauging SOP 006 from QAPP	Compare water level elevations to baseline conditions to estimate drawdown	Direct comparison for discrete measurements
GWE system effluent	POTW suite of analyses	Sedimentation tank	Sedimentation tank	Monthly	Manual collection	Compare measured concentrations to POTW Permit Discharge limits	Direct comparison
Accumulated sediments in GWE system	VOCs and arsenic	Lift Station, conveyance piping and sedimentation tank	GWE system components	Semi-annual, or as accumulation requires	Manual collection	Compare measured concentrations to disposal facility criteria to evaluate disposal options	Direct comparison
Site survey	Ground surface and top of well casing elevations	Existing and new well locations (as needed)	Within 400 feet of toe of Landfill	One time event	Professional survey	Data used to update existing site plans and figures, and revise surface topography, stratigraphic elevation, and water table elevation plans	NA

FIGURES



SITE AREA PLAN



LOCUS MAP
NOT TO SCALE

0 1/2 MILE 1 MILE
APPROX. SCALE IN FEET

CONTOUR INTERVAL 20 FEET

REFERENCE: TAKEN FROM USGS MAP "DOVER WEST, NH NW/4 15' QUADRANGLE, REVISED 1993.

CLIENT: DOVER GROUP				GeoInsight Practical in Nature
PROJECT: DOVER MUNICIPAL LANDFILL SUPERFUND SITE DOVER, NEW HAMPSHIRE				
TITLE: SITE LOCUS				
DESIGNED: CAB	DRAWN: NMT	CHECKED: CAB	APPROVED: MJW	
SCALE: 1" = 2,000'	DATE: 03/22/11	FILE NO.: 2009-LOCUS	PROJECT NO.: 2009-013	FIGURE NO.: 1

PLOT DATE: 3-23-11
FILE: M:\Projects\Active Projects\2009 - Dover Landfill\FIGURES-DOVER\dwgs_files_from-JUNE_2007_TO_JUNE_2010\2009-LOCUS.dwg

NOTES:

1. EXISTING CONDITIONS TAKEN FROM TOPOGRAPHIC WORKSHEET OF THE DOVER (NH) LANDFILL FOR GOLDER ASSOCIATES INC., MANCHESTER NH, BY EASTERN TOPOGRAPHICS, WOLFBORO, NH. ORIGINAL SCALE 1"=50', CONTOUR INTERVAL 2', PHOTO DATE 13 APRIL 92.

2. SITE FEATURES UPDATED IN NOVEMBER 2007, BASED UPON A SITE SURVEY PERFORMED BY VERMONT SURVEY AND ENGINEERING, INC. OF MONTPELIER, VERMONT.

3. A FOCUSED SURVEY WAS PERFORMED IN JUNE 2010 BY VERMONT SURVEY AND ENGINEERING, INC. OF MONTPELIER, VERMONT, CONSISTING OF A 1-FOOT CONTOUR INTERVAL, CENTERED ON AN APPROXIMATE 3,500-FOOT SECTION OF THE PERIMETER DITCH.

LEGEND

- EXISTING TOPOGRAPHIC CONTOUR
- PAVED ROAD
- UNPAVED ROAD OR DRIVE
- ACCESS ROAD
- GROUND WATER EXTRACTION WELL BUILDING LOCATIONS
- SEDIMENTATION BASINS ESTABLISHED FOR PHASE I ACTIVITIES
- VP #5 VALVE PIT LOCATION
- SOURCE CONTROL WORK AREA (APPROXIMATE)
- APPROXIMATE LOCATION OF NORTHWEST LANDFILL REMEDIAL SYSTEM
- APPROXIMATE LOCATION OF SOUTHERN PLUME – MGW REMEDIAL SYSTEM

NO.	DESCRIPTION	DATE

REVISIONS

CLIENT: DOVER GROUP

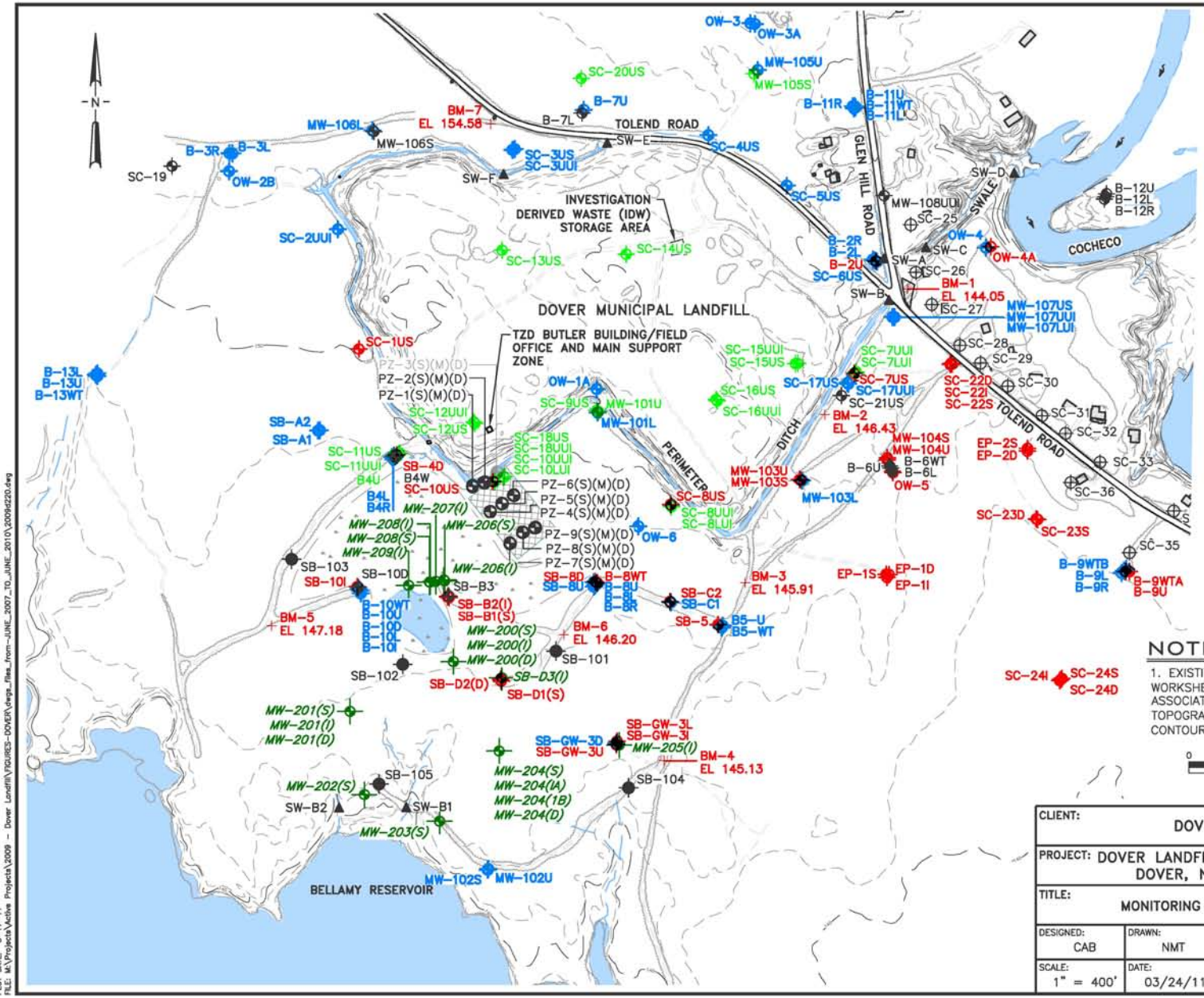
PROJECT: DOVER MUNICIPAL LANDFILL SUPERFUND SITE DOVER, NEW HAMPSHIRE

TITLE: SITE PLAN

DESIGNED:	DRAWN:	CHECKED:	APPROVED:
CAB	NMT	CAB	MJW
SCALE: 1" = 100'	DATE: 03/22/11	FILE NO.: 20090338	PROJECT NO.: 2009-013

FIGURE NO.: 2

GeoInsight
Practical in Nature



LEGEND

SC-7US	EMP WELL SAMPLING LOCATION AND DESIGNATION
SC-7UUI	ADDITIONAL WELL SAMPLING LOCATION AND DESIGNATION (DECEMBER 1995 TO PRESENT)
MW-17US	WELL LOCATIONS WHERE EMP WATER LEVELS ARE OBTAINED (IE, EMP SAMPLING IS NOT PERFORMED)
MW-208(I)	SOUTHERN PLUME PERFORMANCE MONITORING WELL
OW-2	WELL LOCATIONS WHERE WATER LEVELS ARE NOT OBTAINED AND SAMPLING IS NOT PERFORMED
SW-A	EMP SURFACE WATER SAMPLING LOCATION
SC-30	SENTINEL WELL SAMPLING LOCATION AND DESIGNATION
SW-3	SURFACE WATER GAUGING STATION
PZ-2	PEIZOMETER MONITORING POINT
150	EXISTING TOPOGRAPHIC CONTOUR
	PAVED ROAD
	UNPAVED ROAD OR DRIVE

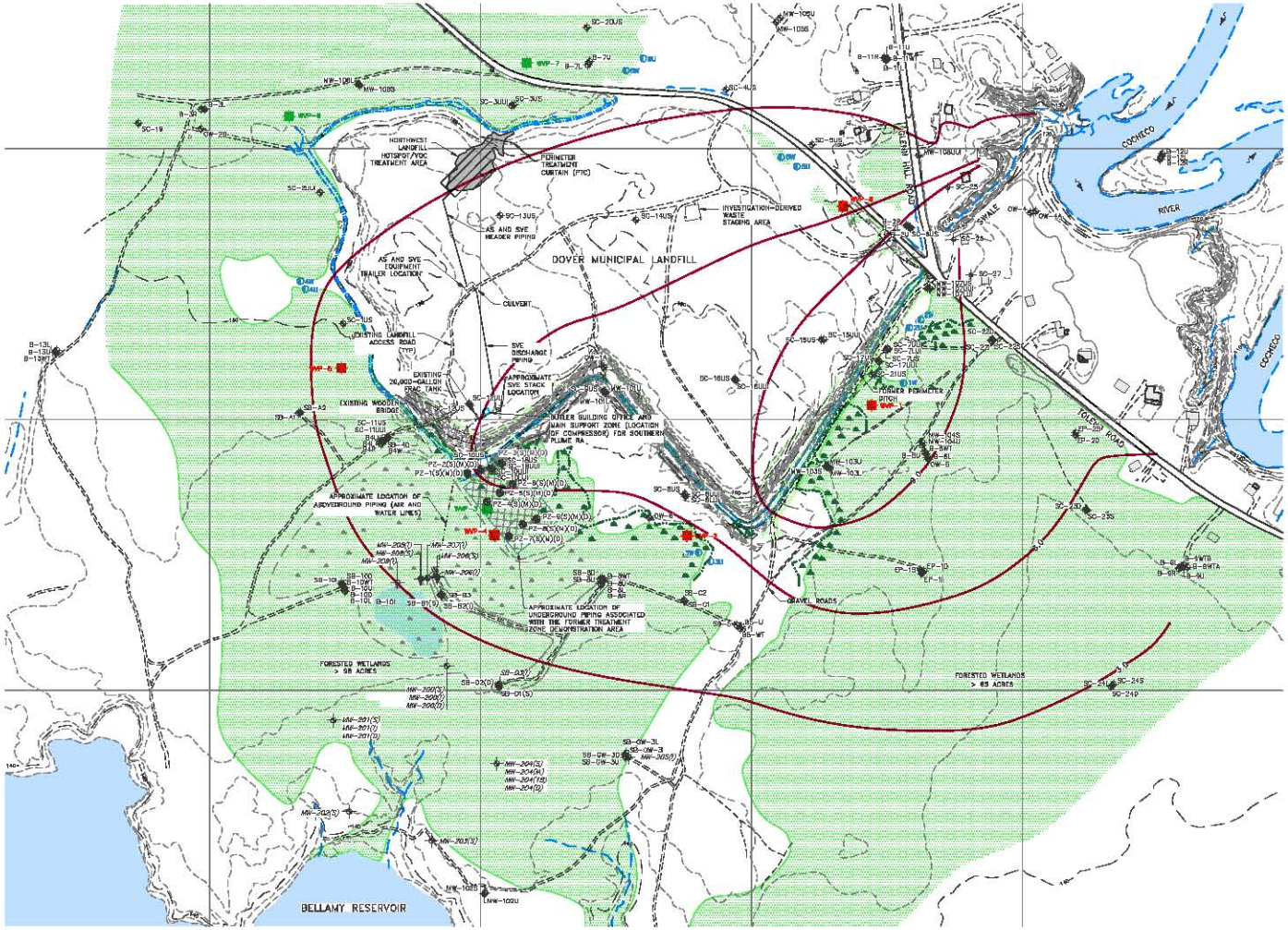
NOTES:

1. EXISTING CONDITIONS TAKEN FROM TOPOGRAPHIC WORKSHEET OF THE DOVER (NH) LANDFILL FOR GOLDER ASSOCIATES INC., MANCHESTER NH, BY EASTERN TOPOGRAPHICS, WOLFBORO, NH. ORIGINAL SCALE 1"=50', CONTOUR INTERVAL 2', PHOTO DATE: 13 APRIL 92.

CLIENT: DOVER GROUP			
PROJECT: DOVER LANDFILL SUPERFUND SITE DOVER, NEW HAMPSHIRE			
TITLE: MONITORING WELL LOCATIONS			
DESIGNED: CAB	DRAWN: NMT	CHECKED: CAB	APPROVED: MJW
SCALE: 1" = 400'	DATE: 03/24/11	FILE NO.: 2009D220	PROJECT NO.: 2009-007
FIGURE NO.: 3			

GeoInsight
Practical in Nature

PLOT DATE: 3-17-11
FILE: M:\Projects\Active Projects\2009 - Dover Landfill\FIGURES-DOVER\dwgs_files_from-JUNE_2007_TO_JUNE_2010\2009d220.dwg



NOTES:

1. EXISTING CONDITIONS TAKEN FROM TOPOGRAPHIC WORKSHEET OF THE DOVER (NH) LANDFILL FOR GOLDER ASSOCIATES INC., MANCHESTER NH, BY EASTERN TOPOGRAPHICS, MOULTONBORO, NH. ORIGINAL SCALE 1"=50', CONTOUR INTERVAL 2', PHOTO DATE: 13 APRIL 92.

2. SITE FEATURES UPDATED IN NOVEMBER 2007, BASED UPON A SITE SURVEY PERFORMED BY VERMONT SURVEY AND ENGINEERING, INC. OF MONTPELIER, VERMONT.

3. A FOCUSED SURVEY WAS PERFORMED IN JUNE 2010 BY VERMONT SURVEY AND ENGINEERING, INC. OF MONTPELIER, VERMONT, CONSISTING OF A 1-FOOT CONTOUR INTERVAL, CENTERED ON AN APPROXIMATE 3,500-FOOT SECTION OF THE PERIMETER DITCH.

4. AS = AIR SPARGE; VOC = VOLATILE ORGANIC COMPOUNDS; SVE = SOIL VAPOR EXTRACTION.

LEGEND

- 150 — EXISTING TOPOGRAPHIC CONTOUR
- PAVED ROAD
- UNPAVED ROAD OR DRIVE
- APPROXIMATE LOCATION OF NORTHWEST LANDFILL REMEDIAL SYSTEM
- FORMER TREATMENT ZONE DEMONSTRATION AREA
- FORMER PERIMETER DITCH
- APPROXIMATE BOUNDARY OF FORESTED WETLANDS (1995)
- SC-7US — EXISTING MONITORING WELL LOCATION AND DESIGNATION
- PZ-2 — PIEZOMETER MONITORING POINT
- 29,23 — HISTORICAL WETLAND DELINEATION DATA PLOTS (W=WETLAND PLOT, U=UPLAND PLOT)
- 3.0 — DRAWN DOWN CONTOUR (FEET)
- DELINEATION OF WETLAND BOUNDARY (HORMANDEAU 2010)

1995 FOI WETLAND MONITORING PLOTS

- WMP-2 — RETAINED FOR SCRA
- WMP-3 — NOT SELECTED FOR SCRA

NO.	DESCRIPTION	DATE

REVISIONS

CLIENT: DOVER GROUP

PROJECT: DOVER MUNICIPAL LANDFILL SUPERFUND SITE
DOVER, NEW HAMPSHIRE

TITLE: WETLANDS MONITORING

DESIGNED:	DRAWN:	CHECKED:	APPROVED:
CAB	NMT	CAB	MJW
SCALE: 1" = 200'	DATE: 03/22/11	FILE NO.: 20090330	PROJECT NO.: 2009-013

FIGURE NO.: 4

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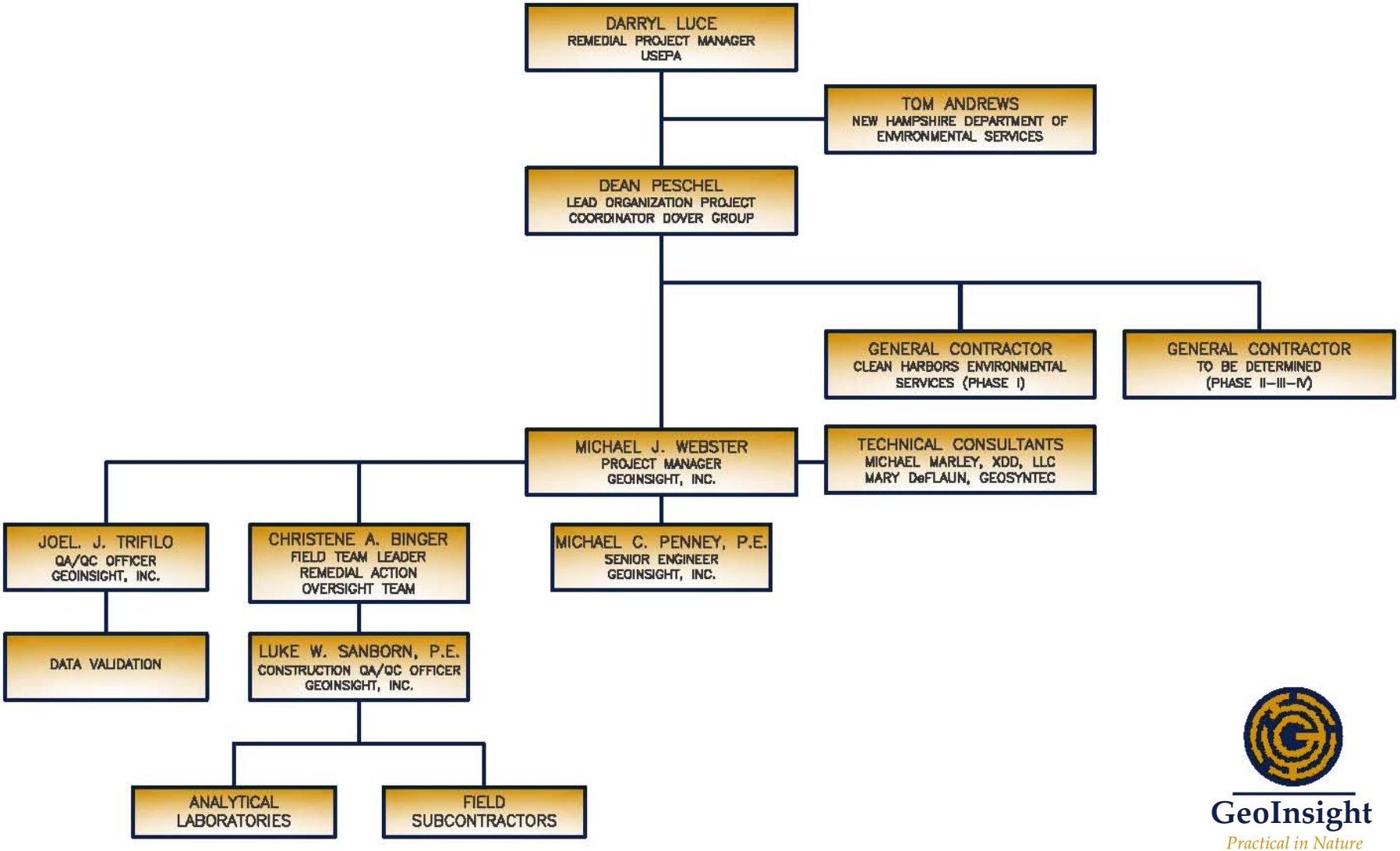
FIGURE 5
PROJECT ORGANIZATION CHART



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PLOT DATE: 3-17-11
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APPENDIX A

TECHNICAL MEMORANDUM, WETLANDS DELINEATION MEMORANDUM, CONTRACTOR WORK PLAN, AND CONTRACTOR SCHEDULE

TECHNICAL MEMORANDUM
SOURCE CONTROL REMEDIAL ACTION
PERIMETER DITCH EXCAVATION
DOVER MUNICIPAL LANDFILL SUPERFUND SITE
DOVER, NEW HAMPSHIRE

TO: Darryl Luce – USEPA, Thomas Andrews - NHDES
FROM: Michael J. Webster, Christene Binger, and Joel Trifilo
DATE: October 15, 2010
RE: Source Control Remedial Action
Acceleration of Schedule and Implementation of
Earthwork Activities - Perimeter Ditch Closure

This memorandum provides a summary of the technical approach to implementation of earthwork activities at the Dover Municipal Landfill Superfund Site. Earthwork activities include site preparation, excavation of impacted sediment, and perimeter ditch backfilling activities. This memorandum includes the technical elements of a Source Control Remedial Action (SCRA) Work Plan. The Work Area and staging areas are described in and illustrated on the following portions of the Bid Specifications and Drawing Package that was submitted with the 100% Source Control Remedial Design (SCRD):

- Drawing 1-1 – Existing Conditions Plan
- Drawing 2-1 – Proposed Conditions Plan
- Drawing 3-1 – Erosion Control Plan
- Drawing 3-2 – Erosion Control Plan Details
- Drawing 5-1 – Grading Plan
- Drawing 5-2 – Grading Plan
- Drawing 5-3 – Grading Plan
- Drawing 5-4 – Grading Plan
- Specifications - Division 31 and 32

The primary objective for accelerating Phase I activities, which are to be performed this fall, is to initiate work during low water table conditions and create a work surface for future Site activities and construction that will occur next year.

PURPOSE/OBJECTIVE

The objective of perimeter ditch closure is to remove sediment that contains arsenic concentrations above 50 mg/Kg. In addition, closure of the perimeter ditch by backfilling will eliminate seasonal discharge of shallow ground water from the western and southern portions of toe of the Landfill to the drainage swale. A portion of the backfilled ditch will be built up for construction of an access road associated with ground water extraction (GWE) remedial system components along the southern and eastern perimeter of the Landfill.

DESCRIPTION OF TASK

Closure of the perimeter ditch will start at the western portion of the Landfill (see Drawing 2-1). The western portion of the perimeter ditch will be backfilled with sand and gravel fill to the elevation of the surrounding ground surface. The portion of the ditch south of the existing bridge (Drawing 2-1) will be backfilled with structural fill during construction of an access road that will be used during SCRA activities to facilitate remedial treatment system construction. Closure of the western portion of the perimeter ditch will be conducted prior to or concurrent with remediation and closure of the southern portion of the ditch.

Approximately 650 cubic yards of sediment will be excavated. This material will be temporarily staged on the Landfill to dry-out and will be tested for waste disposal characterization analyses. The locations and estimated volumes of sediment to be removed was refined through pre-remedial characterization sampling (performed on October 6, 2010) and laboratory analyses prior to initiating excavation. After the sediment excavation activities are completed, the perimeter ditch will be backfilled with structural fill to facilitate construction of the access roadway and GWE system.

SCHEDULE AND SEQUENCE OF ACTIVITIES

Site activities will be performed in the following general order:

October 2010

- collect additional sediment samples to delineate excavation areas (completed);
- flag the forested wetland boundary (completed by Normandeau);
- treat phragmites in the ditch area (completed by Swamp, Inc.);

November to December 2010

- clear vegetation in the Work Area, outside of the wetland boundary, as shown on Drawing 3-1;
- install erosion controls as shown on Drawing 3-1;
- install dewatering stations on top of landfill;
- perform grubbing as needed in construction areas;
- initiate impacted sediment removal;
- perform focused excavations, as needed, on western side of Landfill;
- backfill western ditch;
- backfill southern ditch and raise elevation within approximately two feet of the future road elevation;
- stabilize backfilled areas, as necessary;
- characterization of stockpile and coordination of disposal; and

- disposal of impacted sediment at approved Landfill.

ADDITIONAL SEDIMENT CHARACTERIZATION

To evaluate current site conditions and better define the locations where arsenic is present in the perimeter sediment at concentrations above 50 mg/Kg (ROD, 1991), additional focused delineation activities were performed on October 6, 2010 in the areas shown on Figure 4 of the 100% SCRD. Testing results were used to refine the boundaries of the areas that required sediment to be excavated.

Consistent with previous methods, sediment samples were collected with a hand auger in accordance with Standard Operating Procedure (SOP) 13 Soil and Sediment Sampling presented in the project Quality Assurance Project Plan (QAPP). Sediment samples were delivered to Resource Laboratories, Inc. of Portsmouth, New Hampshire for total arsenic analyses.

The locations of the sediment samples are shown on Figure 1 (attached). Sample locations were generally selected to evaluate impacts at or between samples that were collected in July 2007. In the western ditch characterization area, samples were collected at the same location as previous sample SD-11 (new sample "SED-GEO-6"), and at 50- and 100-foot spacings north and south of this location. In the western flank of the eastern lobe characterization area, three samples were collected between the 2007 locations of SD-06 and SD-07, and one sample was collected form the SD-07 location. The results are summarized below:

Sample ID	Arsenic Concentration (mg/kg)	Percent Moisture
Western Flank of Southern Lobe		
SED-GEO-01	380	53.1
SED-GEO-02	28	40.4
SED-GEO-03	20	29.9
SED-GEO-04	23	14
Western Ditch Characterization Area		
SED-GEO-05	55	86.1
SED-GEO-06	120	52.2
SED-GEO-07	86	65.1
SED-GEO-08	50	31.8
SED-GEO-10	10	36.2

Based upon additional characterization sampling in the western flank of the eastern lobe, the area from SED-GEO-2 to SED-GEO-4 will not require excavation. Therefore, the excavation area in the perimeter ditch surrounding the eastern lobe will extend from Tolend Road to the area 100

feet west of SED-GEO-1 (i.e., halfway between SED-GEO-1 and SED-GEO-2), approximately 1,600 feet in length.

Based upon the results of additional characterization sampling in the western ditch, the excavation area will be approximately 150 feet in total length, extending from the area of SED-GEO-5 to SED-GEO-8.

SITE PREPARATION

Erosion Controls

Erosion, sedimentation, and stormwater controls will be established using procedures outlined in the National Pollutant Discharge Elimination System (NPDES) General Construction Permit and the City of Dover's Phase II NPDES MS4 permit. A Storm Water Pollution Prevention Plan (SWPPP), consistent with the NPDES permit requirements, was developed by the Dover Group and will be provided to the construction contractor. The general approach to establish erosion controls is described in the following paragraph.

Erosion controls will be installed along the southern perimeter of the Work Zone to inhibit soil and sediment disturbed by construction activities from discharging to adjacent forested wetlands. Erosion controls will include:

- silt fence;
- installation of a construction entrance consisting of rip-rap to reduce vehicle tracking of dirt and sediment onto Tolend Road;
- installation of temporary dewatering sedimentation stations for dewatering fluid from perimeter ditch sediment excavation; and
- installation of an impacted soil staging and dewatering pad.

Other erosion and sedimentation controls may be used by the contractor, as warranted, to manage site storm water runoff conditions including, but not limited to, stone-lined sediment traps and stone check dams. Specifications for installation of erosion and sedimentation controls are included in the Bid Specification – Division 31 and on the Drawings 3-1 and 3-2.

Clearing and Grubbing

Clearing will involve cutting and removing trees, brush, and shrubs within the limits of the Work Zone, primarily located along the southern perimeter of the Landfill prior to construction activities, or sequenced with construction activities, as appropriate. The location of the Work Zone is shown on Drawing 2-1.

Grubbing will be performed to remove stumps, roots, topsoil, or other organic materials within proposed construction areas, building locations and support structures, roads, parking areas, and utility areas. Brush and trees removed as part of site preparation will be chipped on-site, and the chips will be reuse for exposed soil stabilization along the downgradient slope of the access road, located along the southern and eastern toes of the landfill. Any excess wood chips shall remain on-site and can be reused in the spring as part of future phases of work to stabilize slopes.

Surface Water Control

If practicable, construction will be sequenced starting from the upstream sections of the ditch and progress in the downstream direction to progressively reduce the need for surface water management.

In the southern portion of the ditch, surface water flow through the excavation area will be controlled by installation of temporary dams. Prior to excavation, standing water in the trench will be pumped to temporary infiltration stations constructed on the Landfill. Hay bale check dams and silt fence, as warranted, will be used at the downstream end of the excavation to minimize the potential for downstream transport of suspended sediment from upstream surface water.

Details of the check dams and temporary infiltration stations are provided on Drawings 3-1 and 3-2, respectively.

EXCAVATION AND CONFIRMATORY SAMPLING

For the purpose of initially assessing this removal action, it was assumed that sediments will be excavated from a section of the perimeter ditch extending southwest from Tolend Road and around the eastern lobe of the Landfill (approximately 1,600 linear feet), and that the sediment will be excavated to a depth of approximately 1 foot. The estimated extent of sediment to be excavated was refined through pre-remedial sampling performed in October 2010 (as discussed above).

Sediment will be excavated from the ditch using mechanical means (e.g., bobcat, excavator, backhoe, or vacuum truck and placed into watertight containers. The initial sediment excavation activities will be conducted to a depth of approximately 1 foot or until the underlying gray silt layer is encountered, whichever occurs first. Confirmatory grab samples will be collected from the bottom of the excavated area at intervals of approximately 50 feet and analyzed for total arsenic. Consistent with previous sampling efforts, sediment samples will be collected with a hand auger and in accordance with SOP 13 Soil and Sediment Sampling of the project QAPP. In areas where arsenic is detected in the confirmatory samples at concentrations above 50 mg/Kg, additional sediment will be removed in successive 6-inch lifts, until the AROD level of 50 mg/Kg is achieved as indicated by results of analyses of confirmatory samples.

When completed, the excavated ditch areas will be backfilled with structural fill to facilitate construction of the access road.

SEDIMENT MANAGEMENT

Sediment Staging

Excavated sediment will be transported to the Landfill in watertight containers, deposited in a temporary sediment staging area, and free liquids, if present, allowed to drain prior to waste characterization and disposal.

Containment will be established to prevent potential erosion or other migration of potentially impacted sediment, and to minimize risk of contact with the materials. Stockpiles will be maintained during the work period. The staging area and stockpile layouts and construction details are presented on Drawing 3-2.

Earthmoving equipment will be steam-cleaned on the Landfill surface prior to exiting the Site. Wash water will be allowed to infiltrate the Landfill.

Sediment Disposal

Composite samples of stockpiled sediment will be collected for waste characterization to evaluate disposal options. It is anticipated that arsenic-impacted sediment removed from the perimeter ditch and other SCRA derived wastes will not be classified as hazardous under RCRA Part 261 based upon historical results of Toxicity Characteristic Leaching Procedure (TCLP) testing. Previously, during the interim remedial action conducted in December 1998, arsenic-impacted sediment was characterized as non-hazardous and disposed at Environmental Soil Management Inc. located in Loudon, New Hampshire. Based upon arsenic concentrations in sediment collected in 2007 that were similar or lower than arsenic concentrations in sediment samples collected in 1998, GeoInsight does not anticipate a significant difference in the quality of perimeter ditch sediment and anticipates that the media will be classified as non-hazardous.

Based upon historical analyses of ditch sediments, it is anticipated that the material will be accepted for use as daily cover or disposal at Waste Management's TLR-III Refuse Disposal Facility located in Rochester, New Hampshire, approximately 3 miles from the Landfill. Samples for waste characterization will be collected from sediment stockpiles located on the Landfill in accordance with the disposal facility requirements at a frequency of one sample per 250 tons up to 1,000 tons. If the amount of excavated material exceeds 1,000 tons, subsequent samples will be collected at a frequency of one sample per 500 tons. Waste Management's typical analytical requirements include:

- total RCRA 8 metals by USEPA Method 6000/7000 methods;
- total volatile organic compounds by USEPA Method 8260;
- total semi-volatile organic compounds by USEPA Method 8270;
- total pesticides by USEPA Method 8081;
- total polychlorinated biphenyls (PCBs) by USEPA Method 8082;
- ignitability/flashpoint by USEPA Method 1030;
- corrosivity/pH by USEPA Method 9045;
- reactive sulfide by USEPA Method 7.3.4.1; and
- reactive cyanide by USEPA Method 7.3.4.2.

In accordance with Waste Management's disposal criteria, if the total concentration of a TCLP-regulated constituent (40 CFR 261.24) is greater than or equal to twenty times its regulatory threshold, TCLP analysis will also be performed. Characterization data will be used to evaluate disposal options at the Waste Management facility, which include use as daily cover or disposal as special waste.

If not accepted by Waste Management, the sediment will be disposed off-site at a facility licensed to accept it based upon the results of the characterization analyses.

Transport of Sediment

Transport of materials from the Landfill will be performed by qualified personnel with appropriate training and with appropriate permits and licenses. Transport will be performed using dump trucks or roll-offs. Vehicle transport paths will be identified during the work and vehicle decontamination will be conducted as necessary whenever a vehicle leaves the Work Area. For off-site disposal of excavated materials, transport will be performed using covered trucks in accordance with applicable regulations.

WASTE DISPOSAL DOCUMENTATION

Based upon available information, the sediment will likely be transported to Waste Management's Rochester, New Hampshire facility (or another properly licensed solid waste facility) and used as daily cover or disposed as special waste. Bills of Lading will be prepared and used to record waste types and volumes. If sediment is classified as hazardous waste, alternate disposal facilities will be identified and uniform hazardous waste manifests will be prepared for and signed by a representative of the Dover Group.

PERIMETER DITCH BACKFILL AND ROAD CONSTRUCTION

When SCRA objectives are achieved, as indicated by the results of confirmatory sampling (i.e., sample results are below 50 mg/Kg), the excavated portion of the perimeter ditch will be backfilled with sand and gravel borrow (i.e., structural fill) meeting the specifications for the perimeter access road construction where the ground water extraction (GWE) system will be located.

GWE extraction system components will not be installed in or adjacent to the western portion of the perimeter ditch. Currently, an approximate 150-foot length of this section of the perimeter ditch contains sediment with arsenic concentrations above 50 mg/Kg. Therefore, the western portion of the perimeter ditch will be backfilled with sand and gravel to existing grade. The western ditch area will be stabilized for the winter with hay mulch or erosion control matting. The area will be re-vegetated with New England Wetland seed mix in the spring, during subsequent phases of activities.

ACCESS ROAD CONSTRUCTION

The access road will be constructed to support heavy equipment and trucks including drilling rigs, vacuum trucks, and service vehicles. The access road will be approximately 15 feet wide and will be constructed at an approximate elevation of 150 feet Mean Sea Level (MSL) on the west side and 147 MSL on the east side of the southern Landfill toe. The purpose of the elevated road is to allow access throughout the calendar year and to facilitate snowplowing in the winter and trenching for conveyance piping within the roadway area.

Prior to road construction, grubbing and clearing will be performed to remove organic materials from the road footprint. For this field mobilization, the road surface will be filled to design sub-grade elevations using common sand borrow and compacted in accordance with project specifications. Final road construction will not be completed until the GWE system is installed and in place (in 2011).

Preliminary estimates of common sand borrow (structural fill) needed to back fill the perimeter ditch include the following:

- western ditch, north of existing bridge 2,000 cubic yards
- southern and eastern ditch (road area) 12,000 to 15,000 cubic yards,

The City of Dover has agreed to provide access to the Glenn Hill Road Gravel pit for contractors to obtain fill materials for this project. The Glenn Hill Gravel pit is located approximately 3000 feet north of the Landfill.

QUALITY ASSURANCE/QUALITY CONTROL

Quality assurance and quality control testing and monitoring requirements are summarized in the attached Table 1. These QAQC elements were summarized from the bid specification Divisions 31 and 32 for applicable activities during the first phase of construction work scheduled for implementation in the fall of 2010. GeoInsight will observe and monitor the construction contractor and evaluate compliance with the required testing protocols.

COMPLIANCE WITH ARARs

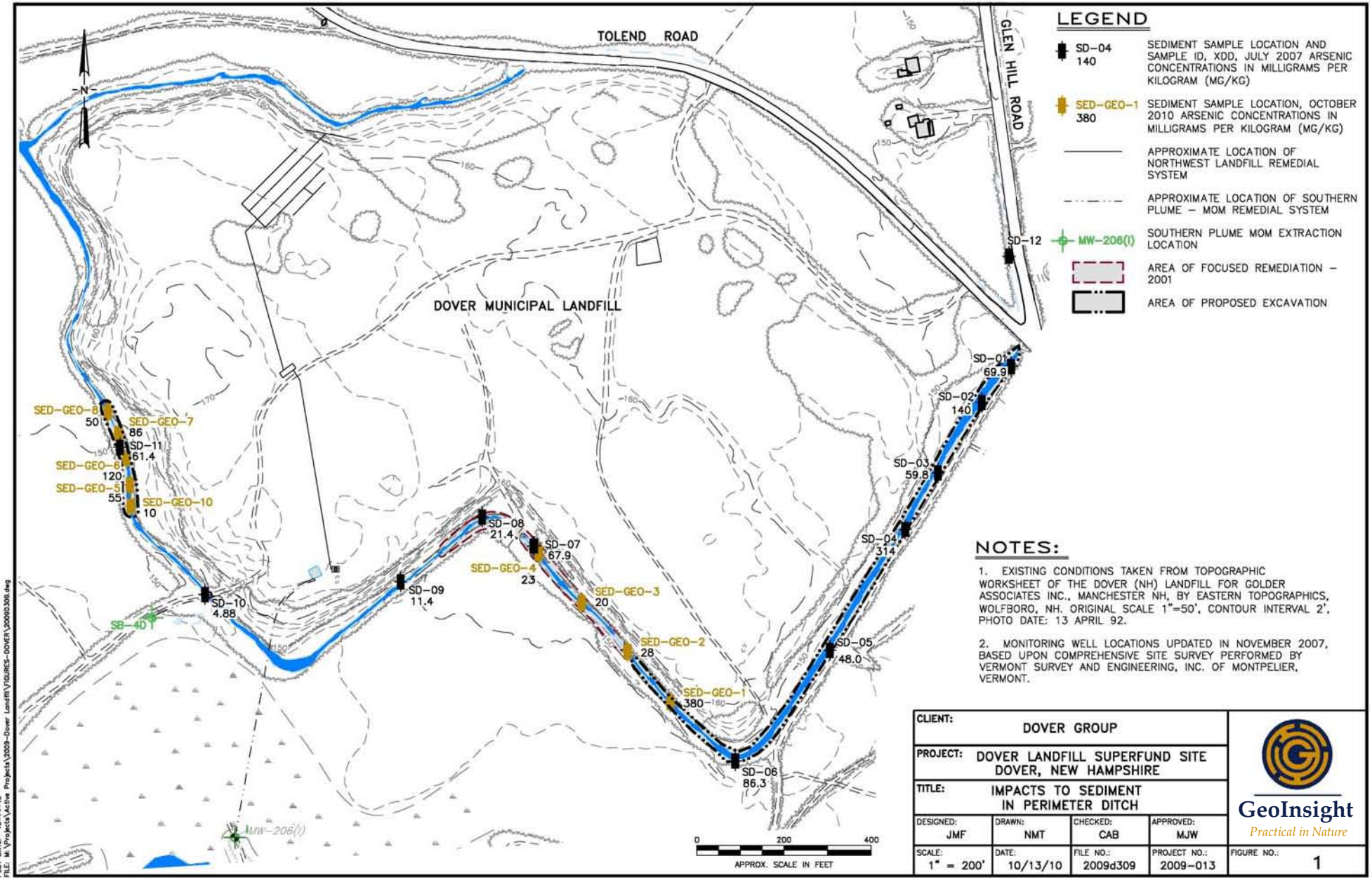
The Applicable or Relevant and Appropriate Requirements (ARAR) tables from the 100% SCRD are attached. Applicable ARARs to this phase of the construction project are highlighted.

PUBLIC NOTICE

The City of Dover will coordinate a public meeting to notify residents of the schedule for implementing the first phase of construction work at the Landfill. Dean Peschel, representative of the Dover Group, will contact the Dover Conservation Commission to notify them of construction activities and the schedule.

ATTACHMENTS:

FIGURE 1	Impacts to Sediment in Perimeter Ditch
TABLE 1	QA/QC Construction Testing and Monitoring Activities
TABLE 2A	Action Specific ARARs
TABLE 2B	Chemical Specific ARARs
TABLE 2C	Location Specific ARARs
Laboratory Analytical Data	



NOTES:

1. EXISTING CONDITIONS TAKEN FROM TOPOGRAPHIC WORKSHEET OF THE DOVER (NH) LANDFILL FOR GOLDER ASSOCIATES INC., MANCHESTER NH, BY EASTERN TOPOGRAPHICS, WOLFBORO, NH. ORIGINAL SCALE 1"=50', CONTOUR INTERVAL 2', PHOTO DATE: 13 APRIL 92.

2. MONITORING WELL LOCATIONS UPDATED IN NOVEMBER 2007, BASED UPON COMPREHENSIVE SITE SURVEY PERFORMED BY VERMONT SURVEY AND ENGINEERING, INC. OF MONTPELIER, VERMONT.

CLIENT: DOVER GROUP			
PROJECT: DOVER LANDFILL SUPERFUND SITE DOVER, NEW HAMPSHIRE			
TITLE: IMPACTS TO SEDIMENT IN PERIMETER DITCH			
DESIGNED: JMF	DRAWN: NMT	CHECKED: CAB	APPROVED: MJW
SCALE: 1" = 200'	DATE: 10/13/10	FILE NO.: 2009d309	PROJECT NO.: 2009-013

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FIGURE NO.: 1

PLOT DATE: 10-14-10
FILE: M:\Projects\Active Projects\2009-Dover Landfill\FIGURES-DOVER\20090309.dwg

TABLE 1
QA/QC CONSTRUCTION TESTING AND MONITORING ACTIVITIES
SOURCE CONTROL REMEDIAL ACTION CONSTRUCTION PROJECT
DOVER MUNICIPAL LANDFILL SUPERFUND SITE
DOVER, NEW HAMPSHIRE

System Element	Measured Property	Means of Quantification	Contractor Testing Frequency	Engineer Audit Frequency	Project Criteria
DIVISION 31 - EARTHWORK					
Erosion					
Controls	Correct Materials and Proper Installation	Visual	Prior to activity	Daily check	Control measures are as shown on the contract drawings
	Maintenance	Visual	After storm events or at least weekly	Minimum of 1 per week	The integrity of the control measures are intact
Fill and Backfill (Placement of Sand and Gravel as described in Division 32)					
Pre-Qualification	Gradation	Sieve Analysis ASTM D422	1 per material source	1 (5lb) sample per source	Material meets gradation specifications
	Classification	ASTM D2487	1 per material source	1 per source	Material meets classification specifications
	Laboratory Compaction Curve	ASTM D1557 Modified D	1 per material source	Review data	Material meets compaction curve specifications
	Analytical Contaminant Testing (VOC's, PAH's, RCRA Metals, PCB's and Pesticides/Herbicides)	Compatible with NHDES RCMP	1 per 2,000 tons	Review data	Backfill does not contain contaminants
	Stockpile Cover	Visual Inspection	1 per stockpile	Regular visual monitoring	Exposed material stockpiles are covered with at least 10 mils of ballasted polyethylene sheeting
	Dewatering Discharge	Analytical Laboratory Testing According to Contractor Dewatering Plan	Per 20,000 gallon frac tank	Review data	Discharge meets the concentration requirements of less than 10 ppb total dissolved arsenic
Construction	In-Place Density (Fill)	ASTM D1556, D2922, or D3017	1 per lift, no less than 1 per 200 cy in any one lift	Review data	Degree of compaction meets specifications
	In-Place Density (Trenching)	ASTM D1556, D2922, or D3017	1 per 250 feet of trench	Review data	Degree of compaction meets specifications
	Compaction	ASTM D1557	1 per lift	Review data	95% of max. dry unit weight for fill under structures, utilities, and access roads or 90% for other fill areas
	Moisture Content	ASTM D2216 or D3017	1 per lift compaction	Review data	Optimum +/- 2%
	Lift Thickness	Vertical Survey Information	1 per lift	1 per lift	Lift thickness of 12" or less
	Finished Grade	Measurement	Continuous	Regular visual monitoring	Required Elevations +/- 2"
	Final Thickness of Road Fill	12" Minimum Diameter Test Holes	Regular intervals along access road	Review data	Thickness meets requirements for final road fill

TABLE 1
QA/QC CONSTRUCTION TESTING AND MONITORING ACTIVITIES
SOURCE CONTROL REMEDIAL ACTION CONSTRUCTION PROJECT
DOVER MUNICIPAL LANDFILL SUPERFUND SITE
DOVER, NEW HAMPSHIRE

System Element	Measured Property	Means of Quantification	Contractor Testing Frequency	Engineer Audit Frequency	Project Criteria
Placement	Common Sand Depth	Measurement	Continuous	Regular visual monitoring	Material more than 2.5 feet below the road section sub base is common sand
	Road Gravel Depth	Measurement	Continuous	Regular visual monitoring	Road gravel is used up to 2.5 feet below the road section sub base and is the first 12" of the final road section sub base
	Recycled Asphalt Pavement (RAP)	Measurement	Continuous	Regular visual monitoring	A 6" layer of RAP is placed above the 12" road gravel
Geotextile Reinforcing Fabric					
Pre-Qualification	AOS	ASTM D4751	1 per roll	Review data	Minimum of 0.6 mm
	Puncture Strength	ASTM D6241	1 per roll	Review data	Minimum of 180 lbs.
	Permittivity	ASTM D4491	1 per roll	Review data	Minimum of 0.52 sec^{-1}
	Grab Tensile Strength (2%Strain)	ASTM D4632	1 per roll	Review data	Minimum of 400 lbs.
	Trapezoidal Tear Strength	ASTM D4533	1 per roll	Review data	Minimum of 125 lbs.
Construction	Thickness, Mass per Unit Area and Grab Tensile Strength	Measurement, ASTM D5261 and ASTM D4632	1 per roll	Random Measurements	Geotextile meets material specifications
	Soil Cover	Visual	Continuous	Regular visual monitoring	Minimum depth of 8" of soil is maintained over the geotextile at all times during back dumping and spreading of soil
	Seam Overlap	Visual	1 per seam	Review data	Seaming meets overlapping requirements in accordance with manufacturers recommendation
Geotextile Filter Fabric					
Pre-Qualification	AOS	ASTM D4751	1 per roll	Review data	Minimum of 0.2 mm
	Puncture Strength	ASTM D6241	1 per roll	Review data	Minimum of 95 lbs.
	Mass per Unit Area	ASTM D5261	1 per roll	Review data	Minimum of 5 ounces
	Grab Tensile Strength (2%Strain)	ASTM D4632	1 per roll	Review data	Minimum of 160 lbs.
	Trapezoidal Tear Strength	ASTM D4533	1 per roll	Review data	Minimum of 60 lbs.
Construction	Installation	Visual	1 per set up	1 per set up	Visual Confirmation of Proper Installation
Processed Stone					
Pre-Qualification	Gradation (Rip Rap Stone)	Sieve Analysis ASTM D422	1 per material source	Review data	$D_{85}/D_{50} > 1.6$ and $D_{85}/D_{15} > 3$

TABLE 2A
SOURCE CONTROL
ACTION SPECIFIC ARARS

Authority	Requirement	Status	Requirement Synopsis	Actions To Be Taken
Federal	Resource Conservation and Recovery Act (RCRA), 42 U.S.C. §§ 6901 *et seq.*, Standards for identification and listing of hazardous waste, 40 C.F.R. Part 261	Applicable to excavated material and material generated by treatment processes; Relevant and appropriate to material in the landfill	New Hampshire has been delegated the authority to administer these RCRA standards through its state hazardous waste management regulations (Env-Wm 400). These provisions have been adopted by the State.	Material excavated or otherwise generated during remedy implementation, including hydraulic control system installation and material generated by treatment processes, will be analyzed by appropriate test methods and, if applicable, managed in accordance with the substantive requirements of the state hazardous waste regulations. Non-hazardous materials will be disposed appropriately.
Federal	RCRA, Standards applicable to generators of hazardous wastes, 40 C.F.R. Part 262	Applicable for hazardous wastes generated from the remedial action; Relevant and Appropriate for hazardous wastes undisturbed in the landfill	New Hampshire has been delegated the authority to administer these RCRA standards through its state hazardous waste management regulations (Env-Wm 500). These provisions have been adopted by the State.	If remedial activity generates hazardous wastes, then they will be managed in accordance with the substantive requirements of the State hazardous waste regulations.
Federal	RCRA, Standards for owners and operators of hazardous waste treatment, storage, and disposal facilities, 40 C.F.R. Part 264	Applicable for hazardous wastes generated from the remedial action; Relevant and Appropriate for hazardous wastes undisturbed in the landfill	New Hampshire has been delegated the authority to administer these RCRA standards through its state hazardous waste management regulations (Env-Wm 700).	If any hazardous waste is generated from remedial activities it will be treated, stored, and disposed of under these standards. As a contingent remedy, if the hydraulic control is not effective the landfill will be capped and meet closure/post-closure requirements under these standards.
Federal	RCRA - Air Emission Standards for Process Vents, 40 CFR Part 264 Subpart AA	Relevant and Appropriate	Process vents associated with managing hazardous waste that have total organic concentrations of 10 ppm or greater. This section of RCRA has not been delegated to the State.	This ARAR does not apply to the remedy as currently designed; however, if processes to which this regulation applies are used in connection with the source control processes, air emission controls will be implemented if the applicability threshold is met.
Federal	RCRA - Air Emission Standards for Equipment Leaks, 40 CFR Part 264 Subpart BB	Relevant and Appropriate	Air emissions standards for equipment that contains or contacts RCRA waste with organic concentrations of at least 10% by weight. This section of RCRA has not been delegated to the State.	If equipment covered by this standard is used in the remedial action, and handles hazardous substances at concentrations that meet this rule's threshold, then air emission controls will be implemented.
Federal	RCRA - Air Emission Standards for Tanks, Surface Impoundments and Containers, 40 CFR Part 265 Subpart CC	Relevant and Appropriate	Air emissions standards for treatment, storage, and disposal facilities with VOC concentrations of 100 ppmv or greater.	If tanks, surface impoundments or containers are used in the remedial action and meet the applicability threshold, then air emission controls will be implemented.
Federal	Clean Water Act (CWA), Section 402 - National Pollution Discharge Elimination System standards, 33 U.S.C. § 1342; 40 C.F.R. 122-124, 131, 136	Applicable	These standards address water discharges which may be directed to surface water.	If a discharge from the remedial action is directed to surface water the discharge will be treated, if necessary, so that these standards will be achieved. Monitoring will be performed to determine whether operation and maintenance of the remedy could potentially affect nearby surface water bodies, in accordance with Env-Or-607 (see below).

TABLE 2A
SOURCE CONTROL
ACTION SPECIFIC ARARS

Authority	Requirement	Status	Requirement Synopsis	Actions To Be Taken
Federal	CWA. National Recommended Water Quality Criteria ("NRWQC"), 40 C.F.R. § 122.44	Relevant and Appropriate	These regulations establish water quality standards for protection of human health and aquatic life.	Used to develop regulatory standards for surface waters and sediments. Surface water and sediment will be monitored to evaluate whether the remedy is effective in protecting areas from the migration of contaminants from the landfill.
Federal	CWA, Phase II Stormwater Standards, 40 C.F.R. 9, 122, 123 and 124	Applicable if over one acre is disturbed; Relevant and Appropriate if less than one acre is disturbed	Storm-water control standards for construction projects between one and five acres.	These standards will be met to control stormwater runoff and prevent erosion as required.
Federal	CWA, General Pretreatment Regulations for Existing and New Sources of Pollution, 40 C.F.R. 403	Applicable	Pretreatment standards for discharges to a POTW. POTW must be in compliance with its NPDES permit in order for a remedy to discharge to the POTW under the CERCLA Off-Site Rule.	Groundwater removed from the hydraulic control system will be treated, if necessary, to meet these standards before discharge to the City's POTW.
Federal	CWA, Underground Injection Control, 40 C.F.R. 144,146,147	Applicable	Standards for discharge of treated groundwater back into the ground.	Treated groundwater or liquids generated during remedial activities conducted at the Landfill will meet these standards before being reinjected into the ground.
Federal	Clean Air Act (CAA), Air Emissions from Municipal Solid Waste Landfills, 40 C.F.R. Part 60, Subpart WWW	Relevant and Appropriate	Standards for air emissions of non-methane organic compounds (NMOCs) from municipal solid waste landfills greater than 2.5 Mg in design capacity and emitting 50 Mg/yr or more of NMOC.	If the landfill is capped under the contingent remedy, emissions of NMOCs will be managed to meet these standards if the threshold is exceeded.
Federal	CAA, National Emission Standards for Hazardous Air Pollutants (NESHAPS), 40 C.F.R. Part 61	Applicable	Emissions of 189 designated hazardous air pollutants (HAP) are addressed under these standards. Includes requirements for dust control.	Air emissions (including dust) of any HAP during the remedial action, including the contingent landfill capping remedy, will meet these standards.
Federal	OSWER Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils, 67 Federal Register 71169 (Nov. 29, 2002), http://www.epa.gov/osw/hazard/correctiveaction/eis/vapor/complete.pdf	To Be Considered	Used to evaluate potential risks associated with indoor air at residences near the Site.	Potential risks associated with indoor air at residences near the Site will be evaluated, monitored and corrected, if and as necessary, consistent with this guidance.
Federal	Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action, and Underground Storage Tank Sites. OSWER Directive 9200.4-17P, April 21, 1999. http://www.epa.gov/swerust1/directiv/d9200417.pdf	To Be Considered	Used to evaluate the monitored natural attenuation component of the remedy.	Contaminant levels in Eastern Plume shall be monitored until they naturally attenuate below risk levels, consistent with this guidance.

TABLE 2A
SOURCE CONTROL
ACTION SPECIFIC ARARS

Authority	Requirement	Status	Requirement Synopsis	Actions To Be Taken
Federal	EPA Guidance: Risk-Based Clean Closure, March 16, 1998 http://www.epa.gov/osw/hazard/correctiveaction/resources/guidance/risk/cclosfnl.pdf	To Be Considered	Used to evaluate the clean closure of the landfill at the completion of the remedy.	Landfill will be closed consistent with this guidance at the completion of the remedy. If clean closure cannot be achieved, the landfill will be capped based on RCRA C standards under the contingent remedy.
Federal	Technical Guidance for Final Covers on Haz. Waste Landfills and Surface Impoundments: EPA/530-SW-047; July, 1989.	To Be Considered	Used to develop landfill covers on hazardous waste landfills.	An appropriate cover will be placed on the landfill after clean closure is achieved. If clean closure cannot be a achieved, as a contingent remedy a RCRA C cap will be constructed consistent with the guidance.
Federal	Technical Memorandum – Revised Alternative Cap Design Guidance Proposed for Unlined, Hazardous Waste Landfills in the EPA Region I, Office of Site Remediation and Restoration (February 5, 2001) http://www.epa.gov/region1/cleanup/resource/guidance/C524.pdf	To Be Considered	Guidance on developing alternative landfill cap designs.	Guidance on developing alternative landfill cap designs. If clean closure cannot be achieved, this guidance may be considered when constructing the RCRA C cap under the contingent remedy.
State	Identification and Listing of Hazardous Wastes, N.H. Admin. Code Env-Wm 400, Toxicity Characteristic	Applicable to excavated material and material generated by treatment processes Relevant and Appropriate to material in landfill	These standards list particular hazardous wastes and identify the maximum concentration of contaminants for which the waste would be a RCRA characteristic waste. The analytical test set out in Appendix II of 40 C.F.R.. Part 261 is referred to as the Toxicity Characteristic Leaching Procedure (TCLP). The federal requirements 40 C.F.R. Part 261 are incorporated by reference.	Material excavated or otherwise generated during remedy implementation, including hydraulic control system installation and material generated by treatment processes, will be analyzed by appropriate test methods and, if applicable, managed in accordance with the substantive requirements of the state hazardous waste regulations. Non-hazardous materials will be disposed appropriately.
State	Requirements for Hazardous Waste Generators, N.H. Admin. Code Env-Wm 500 [formerly He-P Ch. 1905.06]: including Part 507 Storage Requirements; Part 513 Emergency/Remedial Actions	Relevant and Appropriate	Requires determination as to whether waste materials are hazardous and, if so, requirements for managing such materials on site prior to shipment off site. The federal requirements 40 C.F.R. Part 262 are incorporated by reference.	If remedial activity generates hazardous wastes, then they will be managed in accordance with the substantive requirements of these regulations.
State	Requirements for Owners and Operators of Hazardous Waste Facilities/Hazardous Waste Transfer Facilities, N.H. Admin. Code Env-Wm 700 [formerly He-P Ch. 1905.08]	Relevant and Appropriate	This regulation establishes requirements for owners or operators of hazardous waste sites. Part 708 incorporates by reference the federal requirements under 40 C.F.R. Part 264, including but not limited to Subpart G (closure/post closure), Subpart I (containers), Subpart J (tanks), Subpart N (landfills). Specific subsections are listed below.	This regulation establishes requirements for owners and operators of hazardous waste sites or treatment facilities. Specific sections are ARARs as described below.

TABLE 2A
SOURCE CONTROL
ACTION SPECIFIC ARARS

Authority	Requirement	Status	Requirement Synopsis	Actions To Be Taken
State	Hazardous Waste Facility, Groundwater Monitoring [formerly He-P Ch. 1905.08(d)(6) a,b], Env-Wm 702.10 – 702.13	Relevant and Appropriate	Standard requires groundwater monitoring of hazardous waste facilities.	A groundwater monitoring system will be installed and operated that is capable of detecting potential migration of hazardous waste and constituents from the landfill and in offsite plumes and will be operated as long as any contamination exceeding CERCLA risk levels is in place.
State	Hazardous Waste Facility Closure and Post-Closure Disposal Units, Env-Wm 708.02(a)(12)	Relevant and Appropriate	Closure and post-closure standards for hazardous waste facilities.	Landfill must meet clean closure standards at the completion of the remedy.
State	Hazardous Waste Facility - Use and Management of Containers, Env-Wm 708.03 (d)(1)	Relevant and Appropriate	Standards for the management of containers containing hazardous waste. Incorporates by reference the standards of 40 CFR Part 264, Subpart I.	If excavated materials or any other materials generated from implementing the remedy are hazardous waste and are managed in containers, then the containers will be managed to meet the substantive portion of this requirement.
State	Hazardous Waste Facility - Tanks, Env-Wm 708.03(d)(2)	Relevant and Appropriate	Standards for the management of tanks containing hazardous waste. Incorporates by reference the standards of 40 CFR Part 264, Subpart J.	If a tank or tank system is used for storing or treating hazardous wastes as part of Site remediation, it will be constructed with secondary containment and a leak detection system and comply with all other substantive requirements including monitoring and inspection requirements.
State	Hazardous Waste Facility - Waste Piles [formerly He-P Ch. 1905.08 (f)(1)(d)], Env-Wm 708.03(d)(4)	Relevant and Appropriate	Standards for the use of waste piles for hazardous waste. Incorporates by reference the standards of 40 CFR Part 264, Subpart L.	If temporary on-site storage of hazardous soils or materials is required, a structure will be designed, built, and operated in accordance with the specific requirements of this section.
State	Hazardous Waste Facility - Landfills, Env-Wm 708.03(d)(6)	Relevant and Appropriate	Standards for the use of hazardous waste landfills. Incorporates by reference the standards of 40 CFR Part 264, Subpart N.	The remedy will achieve clean closure of the landfill. If clean closure cannot be achieved a RCRA C cap will be constructed and maintained under these standards under the contingent remedy.
State	Contaminated Site Management, NH Admin. Code Env-Or 600: Part 607, Groundwater Management Permits; Part 608, Activity and Use Restrictions; Part 610, Monitoring; Part 611, Contaminated Soils	Applicable	Env-Or Part 607 provides for establishment of institutional controls to control use of groundwater that exceeds AGQS, requires monitoring of the groundwater quality, requires implementation of measures to restore the groundwater quality, and requires an evaluation of the effectiveness of the measures. Part 608 establishes standards for setting institutional controls to protect human health and components of the remedy. Part 610 establishes standards for monitoring groundwater, including requirements and criteria for constructing, developing, and decommissioning monitoring wells. Part 611 establishes standards for managing contaminated soils.	Institutional controls will be established to protect against use of contaminated groundwater. Activity and use restrictions will be established to prevent human exposure to contaminated groundwater and protect components of the remedy. Groundwater monitoring will be required until State groundwater standards are achieved (monitoring will be continued if additional Federal groundwater standards still need to be achieved). Groundwater monitoring and extraction wells will be installed, operated, and decommissioned under these standards. Contaminated soils generated from installation of the hydraulic control system and any other remedial activity will be managed in compliance with these standards.

TABLE 2A
SOURCE CONTROL
ACTION SPECIFIC ARARS

Authority	Requirement	Status	Requirement Synopsis	Actions To Be Taken
State	Groundwater Management and Groundwater Release Detection Permits, Env-Or 700 [generally cited as Env–Wm1403 in the ROD and AROD; section renumbered by the State]	Applicable	Establishes groundwater management standards.	Groundwater re-injected into landfill and groundwater discharged to wetlands or that ultimately discharges to surface water shall be treated to meet AGQS and shall not degrade surface water. A GMZ and a monitoring program will be established at the site and will remain in place until cleanup goals have been attained throughout the GMZ.
State	Underground Injection Control Requirements, Env-Ws 384	Applicable	The purpose of these rules is to establish standards, criteria, and procedures for underground injection to wells to prevent pollution and protect groundwater as specified in 40 CFR 9, 144, 145, and 146.	Treated groundwater or liquids generated during remedial activities conducted at the Landfill will meet these standards before being reinjected into the ground.
State	Standards for Pretreatment of Industrial Wastewater, Env-Ws 904	Applicable	Pretreatment standards for discharges to a POTW. POTW must be in compliance with its NPDES permit in order for a remedy to discharge to the POTW.	Groundwater removed from the hydraulic control system will be treated, if necessary, to meet these standards before discharge to the City's POTW.
State	Groundwater Discharge Permit and Registration Rules, Env-Wq 402 [Cited in the ROD and AROD as Env-Ws 1500]	Applicable	These regulations establish substantive requirements for discharges to groundwater, including prohibited discharges (Env-Wq 402.07), water quality sampling (Env-Wq 402.08), and compliance criteria (Env-Wq 402.22).	If the operation and maintenance of the remedy requires discharge to groundwater, these standards will be complied with.
State	Surface Water Quality Regulations, Env-Ws 1700 [only Env-Ws 1708 cited in the ROD and AROD]	Applicable	These rules establish water quality standards for the state's surface waters. Water quality criteria for toxic substances are established. See Part Env-Ws 1703 Water Quality Standards, Env-Ws 1704 Alternative Site Specific Criteria, and Env-Ws 1708 Anti-Degradation. These rules are applicable to point or non-point discharge(s) of pollutants to surface waters.	If a discharge from the remedial action is directed to surface water the discharge will be treated, if necessary, so that these standards will be achieved. Monitoring will be performed to determine whether operation and maintenance of the remedy could potentially affect nearby surface water bodies, in accordance with Env-Or-607.
State	Standards for Construction, Maintenance and Abandonment of Wells, NH Admin. Code Env-We 600	Applicable	This provision requires that wells be constructed, maintained, relocated, and/or abandoned according to these regulations.	All wells will be constructed, maintained, relocated and/or abandoned according to these regulations.
State	Ambient Air Quality Standards, Env-A300	Applicable	The purpose of this chapter is to establish ambient air quality standards for various types of pollutants emitted in or transported into the State of New Hampshire pursuant to section 109 of the Clean Air Act (Act), 40 CFR 53, and 40 CFR 50, as amended. These standards are intended to be protective of the public health and public welfare in accordance with RSA 125-C:1.	Air contaminants, especially particulate matter emissions generated during on-site activities will be controlled, to ensure that the appropriate regulatory standards are met.

TABLE 2A
SOURCE CONTROL
ACTION SPECIFIC ARARS

Authority	Requirement	Status	Requirement Synopsis	Actions To Be Taken
State	Standards Applicable to Certain New or Modified Facilities and Sources of Hazardous Air Pollutants, Env-A 500	Applicable	The purpose of this chapter is to establish state standards to regulate: (a) Certain new or modified facilities in accordance with authority delegated by the EPA under §111(c) of the Clean Air Act; and (b) Certain sources of hazardous air pollutants in accordance with authority delegated by the EPA under §112 of the Clean Air Act.	Air emissions (including dust) of any of HAP during the remedial action, including the contingent landfill capping remedy, will meet these standards.
State	Fugitive Dust, N.H. Admin. Code Env-A Part 1002	Applicable	Requires precautions to prevent, abate and control fugitive dust during specified activities, including excavation, maintenance, and construction.	Precautions to control fugitive dust emissions will be required during site remediation activities that could generate dust.
State	Regulated Toxic Air Pollutants, NH Admin. Code Env-A Part 1400 [cited as Env-A Part 1300 in the ROD and AROD]	Applicable	This regulation identifies toxic air pollutants to be regulated. These pollutants are also listed by EPA in 40 CFR 261. High, moderate and low Toxicity Classifications are established. Air toxics in these classifications are regulated when they occur in concentrations that cause adverse health effects including increased cancer risk.	If there are remedial processes that result in releases of contaminants into the air, air quality standards will be complied with during remedial activities.

TABLE 2B
SOURCE CONTROL
CHEMICAL SPECIFIC ARARS

Authority	Requirement	Status	Requirement Synopsis	Actions To Be Taken
Federal	Safe Drinking Water Act (42 U.S.C. §300f *et seq.*); National primary drinking water regulations - Maximum Contaminant Levels (MCLs) (40 C.F.R. 141, Subpart B and G)	Relevant and Appropriate	Establishes maximum contaminant levels (MCLs) for common organic and inorganic contaminants applicable to public drinking water supplies. Used as relevant and appropriate cleanup standards for aquifers and surface water bodies that are potential drinking water sources.	On and off-site ground water will attain MCLs through successful operation of the hydraulic controls and off-site disposal of contaminated groundwater to the POTW, addressing localized sources in the landfill and potentially through extraction and treatment of groundwater in the southern plume and natural attenuation in the eastern plume. Otherwise, the contingencies of capping the landfill and active treatment of groundwater in the eastern plume will meet cleanup levels in groundwater outside of the compliance boundary for the capped area and institutional controls will prevent exposure to contaminated groundwater within the capped area. Institutional controls will be maintained until risks identified under these standards are eliminated. The MCL for arsenic has been retained as a relevant and appropriate cleanup standard.
Federal	Safe Drinking Water Act (42 U.S.C. §300f *et seq* .); National primary drinking water regulations - Maximum Contaminant Level Goals (MCLGs)(40 C.F.R. 141, Subpart F)	Relevant and Appropriate for non-zero MCLGs only; MCLGs set as zero are To Be Considered	Establishes maximum contaminant level goals (MCLGs) for public water supplies. MCLGs are health goals for drinking water sources. These unenforceable health goals are available for a number of organic and inorganic compounds.	On and off-site ground water will attain nonzero MCLGs when there is no MCL or State drinking water standards, whichever is more stringent at the completion of the remedy through successful operation of the hydraulic controls and off-site disposal of contaminated groundwater to the POTW, addressing localized sources in the landfill and potentially through extraction and treatment of groundwater in the southern plume and natural attenuation in the eastern plume. Otherwise, the contingencies of capping the landfill and active treatment of groundwater in the eastern plume will meet cleanup levels in groundwater.
Federal Criteria, Advisories, and Guidance	EPA Risk Reference Dose (RfDs)	To Be Considered	RfDs are considered to be the levels unlikely to cause significant noncarcinogenic adverse health effects associated with a threshold mechanism of action in human exposure for a lifetime.	RfDs will be used to calculate residual acute human health risks as appropriate in evaluating the effectiveness of the remedy in accordance with USEPA human health risk assessment guidance for Superfund sites.
Federal Criteria, Advisories, and Guidance	EPA Carcinogenicity Slope Factor	To Be Considered	Slope factors are developed by EPA from Health Effects Assessments and present the most up-to-date information on cancer risk potency. Slope factors are developed by EPA from Health Effects Assessments by the Carcinogenic Assessment Group.	Slope factors will be used to calculate residual carcinogenic human health risks as appropriate in evaluating the effectiveness of the remedy in accordance with USEPA human health risk assessment guidance for Superfund sites.
Federal Criteria, Advisories, and Guidance	Guidelines for Carcinogen Risk Assessment EPA/630/P-03/001F (March 2005)	To Be Considered	Guidance for assessing cancer risk.	Residual risks due to carcinogens will be assessed using these guidelines.

TABLE 2B
SOURCE CONTROL
CHEMICAL SPECIFIC ARARS

Authority	Requirement	Status	Requirement Synopsis	Actions To Be Taken
Federal Criteria, Advisories, and Guidance	Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens EPA/630/R-03/003F (March 2005)	To Be Considered	Guidance of assessing cancer risks to children.	Residual risks to children due to carcinogens will be assessed using these guidelines.
Federal Criteria, Advisories, and Guidance	Health Advisories (EPA Office of Drinking Water)	To Be Considered	Health Advisories are estimates of risk due to consumption of contaminated drinking water; they consider non-carcinogenic effects only. To be considered for contaminants in groundwater that may be used for drinking water where the standard is more conservative than either federal or state statutory or regulatory standards.	Health advisories will be used to evaluate the non-carcinogenic risk resulting from exposure to certain compounds. The remedy prevents exposure to contaminants though institutional controls to restrict exposure until cleanup goals are achieved through hydraulic controls and off-site disposal of contaminated groundwater to the POTW, addressing localized sources in the landfill, potential extraction and treatment of groundwater in the southern plume, and natural attenuation in the eastern plume. Institutional controls will be maintained until risks identified under these standards are eliminated.
Federal Criteria, Advisories, and Guidance	NOAA Technical Memorandum NOS OMA 52	To Be Considered	Potential ecological risks evaluated using these thresholds.	Potential ecological risks will be evaluated using these thresholds for sediment in the swale and ditch that contain arsenic. Sediment that contains more than 50 mg/kg arsenic will be removed and disposed of offsite. Measures will be taken to prevent contaminated sediment from washing into the Cocheco River during excavation.
Federal Criteria, Advisories, and Guidance	Ontario Lowest Effect Levels 1993,1994	To Be Considered	Used to provide a spectrum of ecological risk resulting from exposure to site contaminants for use in ecological risk assessment.	Potential ecological risks will be evaluated using these thresholds. The remedial action will address identified risks to ecological receptors.
State	Drinking Water Quality Standards: NH Admin. Code Env-Ws 314 MCLs and MCLGs for Inorganics; NH Admin. Code Env-Ws 315 MCLs and MCLGs for Regulated Organics	Applicable for MCLs and non-zero MCLGs only; MCLGs set as zero are To Be Considered	State MCLs and MCLGs establish maximum contaminant levels permitted in public water supplies and are the basis of State Ambient Groundwater Quality Standards (AGQS) that are applicable to site groundwater. The regulations are generally equivalent to the Federal Safe Drinking Water Act (SDWA).	Used to establish cleanup standards for groundwater. Long-term monitoring of contaminants, based on these standards, will be performed to evaluate whether the groundwater remedies are effective in preventing the migration of contaminants and achieving drinking water standards. If not the contingent remedy, capping the landfill, will attain these standards outside of the compliance boundary for the waste management area and institutional controls will prevent exposure to contaminated groundwater within the capped area. Institutional controls will be maintained until risks identified under these standards are eliminated.
State	New Hampshire Ambient Groundwater Quality Standards (NH AGQS) (Env-Or 603.03, Table 600-1) [generally cited as Env–Wm1400 in the ROD and AROD; section renumbered by the State]	Applicable	Establishes maximum concentration levels for regulated contaminants in groundwater which result from human operations or activities. NH AGQS are equivalent to MCLs for contaminants that have MCLs. NH AGQS have been established for site groundwater contaminants for which no MCLs are established, and are derived to be protective for drinking water uses. The NH AGQS will be used for site contaminants where MCLs are not currently established (e.g., tetrahydrofuran (THF)).	Used to establish cleanup standards for groundwater. Long-term monitoring of contaminants, based on these standards, will be performed to evaluate whether the groundwater remedies are effective in preventing the migration of contaminants and achieving drinking water standards. Institutional controls will be maintained until risks identified under these standards are eliminated.

TABLE 2B
SOURCE CONTROL
CHEMICAL SPECIFIC ARARS

Authority	Requirement	Status	Requirement Synopsis	Actions To Be Taken
State	Groundwater Protection Standards: NH Admin. Code Env-Or 603.01(a) and (b) [generally cited as Env–Wm1400 in the ROD and AROD; section renumbered by the State]	Applicable	Wm-Or 603.01(a) and (b) provide that groundwater shall be suitable for use as drinking water without treatment and shall not contain any regulated contaminant in concentrations greater than ambient groundwater quality standards established in Env-Or 603.03.	Used to establish cleanup standards for groundwater. Long-term monitoring of contaminants, based on these standards, will be performed to evaluate whether the groundwater remedies are effective in preventing the migration of contaminants and achieving drinking water standards. Institutional controls will be maintained until risks identified under these standards are eliminated.
State	Nondegradation of Groundwater to Protect Surface Water: NH Admin. Code Env-Or 603.01(c) [generally cited as Env–Wm1400 in the ROD and AROD; section renumbered by the State]	Applicable	Wm-Or 603.01(c) provides that, unless naturally occurring, groundwater shall not contain any contaminants at concentrations such that groundwater to surface water results in a violation of surface water standards in any surface water body within or adjacent to the site. Env-Or 603.01 (c) therefore incorporates surface water standards set forth at Env-Ws 1700.	Used to establish cleanup standards for groundwater. Long-term monitoring of contaminants, based on these standards, will be performed to evaluate whether the groundwater remedies are effective in preventing the migration of contaminants and achieving drinking water standards. Institutional controls will be maintained until risks identified under these standards are eliminated.
Municipal	City of Dover Sewer Code Chapter 147	Applicable	The City of Dover Sewer Code describes sewer use and regulation, industrial pretreatment standards, and construction requirements for sewer and water mains.	Groundwater discharged to the POTW from the site will meet applicable standards of the City of Dover Sewer Code.
State	Title L Water Management and Protection, Chapter 485-A Water Pollution and Waste Disposal, Sections 485-A:4 (XV), 485-A:5, and 485-A:6	Applicable	Chapter 485-A establishes State and municipal pretreatment standards for the discharge of waste into the collection system or the sewage treatment facility of any municipality or other governmental entity, any waste that does not comply with such pretreatment standards.	Groundwater discharged to the POTW from the site will meet the applicable requirements of Title L Water Management and Protection.
State	Part Env-Ws 904 Standards for Pretreatment of Industrial Wastewater	Applicable	Part Env-Ws 904 establishes standards for pretreatment of industrial wastewater to prevent the indirect discharge of pollutants to a POTW which would (a) pass through, interfere with, or otherwise be incompatible with the safe and successful performance, operation, and maintenance of the POTW; (b) cause the POTW to violate any water quality standards specified in Env-Ws 1700; or (c) adversely impact sludge quality and prevent its use or disposal as other than a hazardous waste.	Groundwater discharged to the POTW from the site will meet the applicable standards for pretreatment of industrial wastewater as prescribed in Part Env-Ws 904.

TABLE 2C
SOURCE CONTROL
LOCATION SPECIFIC ARARS

Authority	Requirements	Status	Requirement Synopsis	Actions To Be Taken
Federal	Fish and Wildlife Coordination Act (16 U.S.C. §661 *et seq*.)	Applicable	Any modification of a body of water or wetland requires consultation with the U.S. Fish and Wildlife Service and the appropriate state wildlife agency to develop measures to prevent, mitigate, or compensate for losses of fish and wildlife.	Specified federal agencies will be contacted to help analyze impacts of installing and operating the hydraulic control system and discharge pipe connecting to the sewer, localized source control actions, the groundwater collection and treatment systems and any other remedial activities on wildlife in wetlands and the river.
Federal	Protection of Wetlands (40 C.F.R. § 6.302(a); Appendix A)	Applicable	This regulation codifies standards established under Executive Order 11990. Under this requirement, no activity that adversely affects a federal jurisdictional wetland shall be permitted if a practicable alternative with lesser effects is available. Action to avoid, whenever possible, the long- and short-term impacts on wetlands and to preserve and enhance wetlands.	This regulation has been eliminated from 40 C.F.R. Part 6. Compliance with the Wetlands Executive Order is currently a matter to be addressed under the Protectiveness Criterion rather than the ARAR Criterion.
Federal	Clean Water Act, Section 404 (33 U.S.C.. § 1344); Section 404(b)(1) Guidelines for Specification of Disposal Sites for Dredged or Fill Material (40 C.F.R. Part 230, 231 and 33 C.F.R. Parts 320-323)	Applicable	Under this requirement, no activity that adversely affects a federal jurisdictional wetland shall be permitted if a practicable alternative with lesser effects is available. Controls discharges of dredged or fill material to protect aquatic ecosystems.	Material excavated from wetlands and water bodies during construction of the hydraulic control system, discharge pipe to the City sewer, the groundwater collection and treatment system, from addressing the swale and from the activity of filling the perimeter ditch will be performed using the least environmentally damaging methods practicable. Measures to mitigate damages will be used during construction and operation of the remedy. Wetlands will be restored to the extent practicable.
Federal	RCRA General Facility Standards - Seismic Standards (40 CFR 264.18(a))	Relevant and Appropriate	New Hampshire has been delegated the authority to administer these RCRA standards through its state hazardous waste management regulations (Env-Wm 708.02(7)). Facility siting standards for hazardous waste facilities pertaining to seismic risks.	Construction of any on-site treatment facility will not be located within 200 feet of a fault that has had a displacement in Holocene time.
State	Criteria and Conditions for Fill and Dredge In Wetlands: RSA Ch. 482-A and NH Admin. Code Env-Wt Parts 300-400, 600, and 700 [Only En-Wt 300 identified in the ROD and AROD]	Applicable	These standards regulate filling and other activities in or adjacent to wetlands, and establish criteria for the protection of wetlands from adverse impacts on fish, wildlife, commerce, and public recreation.	Material excavated from wetlands and water bodies during construction of the hydraulic control system, discharge pipe to the City sewer, the groundwater collection and treatment system, from addressing the swale and from the activity of filling the perimeter ditch will be performed using the least environmentally damaging methods practicable. Measures to mitigate damages will be used during construction and operation of the remedy. Wetlands will be restored to the extent practicable.
State	NH Hazardous Waste Rules - Location Requirements, Seismic Standards; Env-Hw 708.02(7)	Applicable	The RCRA program is delegated to the State of New Hampshire. The NH Rules have incorporated by reference the requirements of 40 C.F.R. 264.18(a) regarding facility siting standards for hazardous waste facilities pertaining to seismic risks.	Construction of any on-site treatment facility will not be located within 200 feet of a fault that has had a displacement in Holocene time.
State	Wellhead Protection: Small Production Wells for Small Community Water Systems; Env-Dw 301 and Large Production Wells for Community Water Systems; Env-Dw 302	Relevant and Appropriate	Regulations establish wellhead protection areas around new large and small community wellheads. A small community water system means a public water system serving a population of 25-1,000 persons without street hydrant fire protection. A large community water system means a community water system which serves 1,000 persons or more or any community water system that provides fire protection.	Groundwater remediation will be conducted to prevent contamination of any small or large community wells in the vicinity of the Site.
State	Protection of the Purity of The Bellamy Reservoir and Its Watershed; Env-Ws 386.58	Applicable	The purpose of this section is to protect the purity of the water of the Bellamy Reservoir which is the principal drinking water supply for the City of Portsmouth.	Groundwater remediation will be conducted to prevent contamination of the Bellamy Reservoir or any of its tributaries.
State	Native Plant Protection Act; RSA 217A and Res 1100-1108	Applicable	Prohibits damaging plant species listed as endangered within the State.	Listed plant species will be identified and remedial activities will comply with these standards.

TABLE 2C
SOURCE CONTROL
LOCATION SPECIFIC ARARS

Authority	Requirements	Status	Requirement Synopsis	Actions To Be Taken
State	Terrain alteration adjacent to surface waters; RSA 485:17, Env-Ws 415 and Env-Wq 1500	Applicable	The purpose of these rules is to protect surface water quality from degradation resulting from any activity which significantly alters terrain or occurs in or on the border of the surface waters of the state. The permanent methods for protecting water quality described include: vegetated filter strips, grassed swales, detention ponds, wet ponds, constructed wetlands, infiltration trenches, infiltration basins and water quality inlets.	Activities performed in association with the implementation of the remedy, including installation and operation of the hydraulic control system and discharge pipeline to the sewer, will be compliant with these standards and will result in the least adverse impact to surface waters/wetlands. If the contingent remedy of capping the landfill is implemented these standards will be applied. Engineering controls (e.g. siltation controls, erosion controls) will be implemented during remedial activities to minimize harm to surface waters/wetlands. Excavated material, including well drillings, will be stockpiled and dewatered outside of wetland areas prior to off-site disposal. Wetlands would be restored (using suitable soil and vegetation) where altered temporarily by the remedy.

Project ID: Dover 2009-017
Job ID: 20158

Sample#: 20158-001
Sample ID: SED-GEO 1
Matrix: Solid Percent Dry: 46.9 %
Sampled: 10/6/10 11:15

Parameter	Result	Quant Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Analysis Time	Reference
Arsenic	**380**	0.4	ug/g	1	BJS	10/8/10	3677	10/8/10	18:27	SW3051A6010B

Sample#: 20158-002
Sample ID: SED-GEO 2
Matrix: Solid Percent Dry: 59.6 %
Sampled: 10/6/10 12:05

Parameter	Result	Quant Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Analysis Time	Reference
Arsenic	**28**	0.4	ug/g	1	BJS	10/8/10	3677	10/8/10	18:35	SW3051A6010B

Sample#: 20158-003
Sample ID: SED-GEO 3
Matrix: Solid Percent Dry: 70.1 %
Sampled: 10/6/10 12:20

Parameter	Result	Quant Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Analysis Time	Reference
Arsenic	**20**	0.2	ug/g	1	BJS	10/8/10	3677	10/8/10	18:43	SW3051A6010B

Sample#: 20158-004
Sample ID: SED-GEO 4
Matrix: Solid Percent Dry: 86 %
Sampled: 10/6/10 13:15

Parameter	Result	Quant Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Analysis Time	Reference
Arsenic	**23**	0.3	ug/g	1	BJS	10/8/10	3677	10/8/10	18:51	SW3051A6010B

Sample#: 20158-005
Sample ID: SED-GEO 5
Matrix: Solid Percent Dry: 13.9 %
Sampled: 10/6/10 15:50

Parameter	Result	Quant Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Analysis Time	Reference
Arsenic	**55**	0.5	ug/g	1	BJS	10/8/10	3677	10/8/10	18:58	SW3051A6010B

Sample#: 20158-006
Sample ID: SED-GEO 6
Matrix: Solid Percent Dry: 47.8 %
Sampled: 10/6/10 16:00

Parameter	Result	Quant Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Analysis Time	Reference
Arsenic	**120**	0.3	ug/g	1	BJS	10/8/10	3677	10/8/10	19:06	SW3051A6010B

Sample#: 20158-007
Sample ID: SED-GEO 7
Matrix: Solid Percent Dry: 34.9 %
Sampled: 10/6/10 16:10

Parameter	Result	Quant Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Analysis Time	Reference
Arsenic	**86**	0.4	ug/g	1	BJS	10/8/10	3677	10/8/10	19:14	SW3051A6010B

Project ID: Dover 2009-017
Job ID: 20158

Sample#: 20158-008
Sample ID: SED-GEO 8
Matrix: Solid Percent Dry: 68.2 %
Sampled: 10/6/10 16:20

Parameter	Result	Quant Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Analysis Time	Reference
Arsenic	**50**	0.4	ug/g	1	BJS	10/8/10	3677	10/8/10	19:22	SW3051A6010B

Sample#: 20158-010
Sample ID: SED-GEO 10
Matrix: Solid Percent Dry: 63.8 %
Sampled: 10/6/10 17:00

Parameter	Result	Quant Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Analysis Time	Reference
Arsenic	**11**	0.4	ug/g	1	BJS	10/8/10	3677	10/8/10	19:30	SW3051A6010B

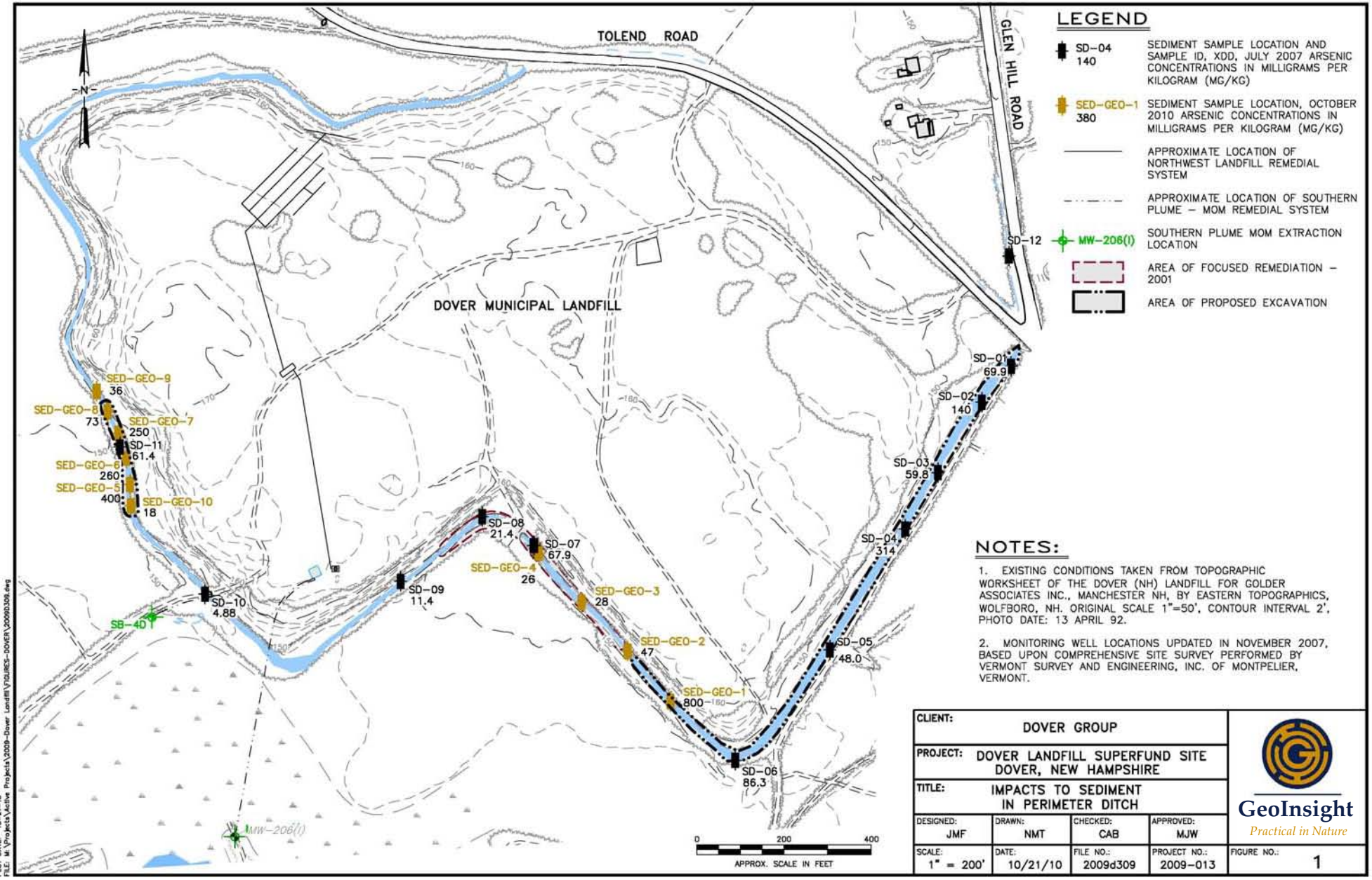
REVISION TO TECHNICAL MEMORANDUM DATED OCTOBER 15, 2010

SOURCE CONTROL REMEDIAL ACTION
PERIMETER DITCH EXCAVATION
DOVER MUNICIPAL LANDFILL SUPERFUND SITE
DOVER, NEW HAMPSHIRE

OCTOBER 21, 2010

REVISED DATA SUMMARY TABLE

Sample ID	Arsenic Concentration (mg/kg) Wet Weight Basis	Percent Moisture	Arsenic Concentration (mg/kg) Dry Weight (mg/Kg)
Western Flank of Southern Lobe			
SED-GEO-01	380	53.1	800
SED-GEO-02	28	40.4	47
SED-GEO-03	20	29.9	28
SED-GEO-04	23	14	26
Western Ditch Characterization Area			
SED-GEO-05	55	86.1	400
SED-GEO-06	120	52.2	260
SED-GEO-07	86	65.1	250
SED-GEO-08	50	31.8	73
SED-GEO-09	not reported	21.8	36
SED-GEO-10	11	36.2	18



NOTES:

1. EXISTING CONDITIONS TAKEN FROM TOPOGRAPHIC WORKSHEET OF THE DOVER (NH) LANDFILL FOR GOLDER ASSOCIATES INC., MANCHESTER NH, BY EASTERN TOPOGRAPHICS, WOLFBORO, NH. ORIGINAL SCALE 1"=50', CONTOUR INTERVAL 2', PHOTO DATE: 13 APRIL 92.

2. MONITORING WELL LOCATIONS UPDATED IN NOVEMBER 2007, BASED UPON COMPREHENSIVE SITE SURVEY PERFORMED BY VERMONT SURVEY AND ENGINEERING, INC. OF MONTPELIER, VERMONT.

CLIENT: DOVER GROUP			
PROJECT: DOVER LANDFILL SUPERFUND SITE DOVER, NEW HAMPSHIRE			
TITLE: IMPACTS TO SEDIMENT IN PERIMETER DITCH			
DESIGNED: JMF	DRAWN: NMT	CHECKED: CAB	APPROVED: MJW
SCALE: 1" = 200'	DATE: 10/21/10	FILE NO.: 2009d309	PROJECT NO.: 2009-013

GeoInsight
Practical in Nature

FIGURE NO.: 1

PLOT DATE: 10-21-10
FILE: M:\Projects\Active Projects\2009-Dover Landfill\FIGURES-DOVER\20090309.dwg

NORMANDEAU ASSOCIATES, INC.
80 Leighton Road
Falmouth ME, 04105
(207)797-7717
(207)797-7761 (Fax)
www.normandeau.com

MEMORANDUM

TO: **Lee Carbonneau**

FROM: **Jennifer West**

DATE: **October 27, 2010**

RE: **Dover Landfill Superfund Site**

Project#: **22082.000**

Normandeau Associates completed a review and delineation of wetlands at the Dover Landfill site in Dover, New Hampshire on September 28 and October 5, 2010. The focus of review was the area located south of the existing perimeter ditch on the south side of the landfill, extending from Tolend Road west to an access road crossing of the perimeter ditch. The objective of the review was to update according to current State and Federal regulations wetland mapping at the site for a proposed facility upgrade. Normandeau had previously delineated wetlands at the site in 1994. The following is a summary of the wetland methodology and a brief overview of our findings.

METHODOLOGY

Normandeau delineated wetlands according to the 2009 *Interim Regional Supplement of the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region*, which uses the three factor approach involving indicators of hydrophytic vegetation, hydric soils and wetland hydrology. The wetland boundary was flagged with consecutively numbered glo-pink "wetland delineation" flagging. Data at one set of plots were collected to document upland and wetland conditions. Wetland flags were located with a Trimble GEO-XH gps unit, which can provide sub-meter accuracy after post processing.

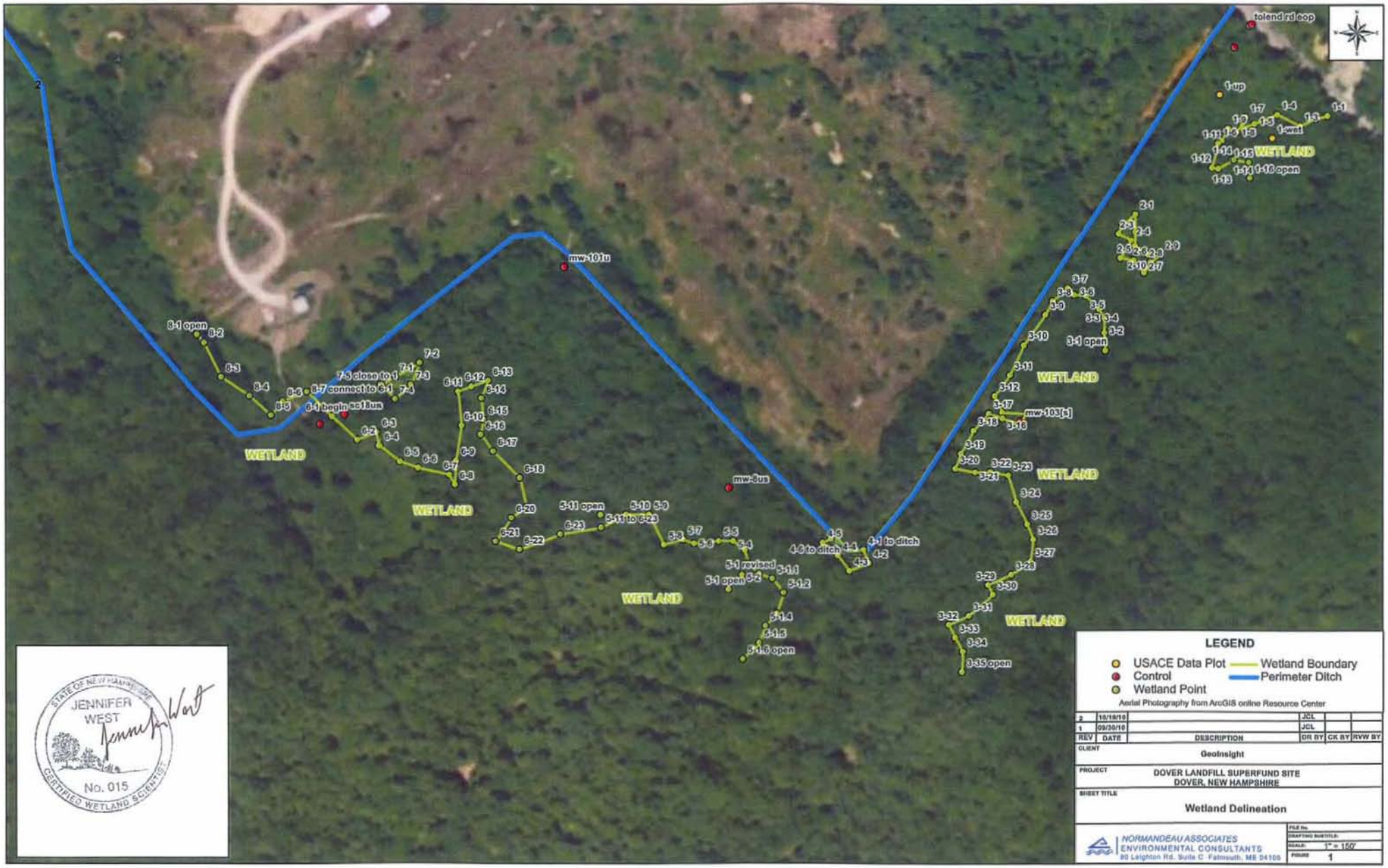
FINDINGS

The results of our review are shown on the attached figure. The wetland boundary has changed since the initial delineation in 1994, primarily as a result of refined criteria in identifying hydric soils, particularly wet Spodosols, and an increased dominance of upland plants. The soils in the survey area were mapped by the Natural Resources Conservation Service (NRCS) as somewhat poorly to poorly drained Saugatuck loamy sand [1], which are sandy soils with an eluviated Albic (E) horizon overlaying a cemented Spodic horizon. The assessment of hydric morphology in sandy soils is considered problematic due to the difficulty in differentiating morphology as a result of anaerobic conditions versus the physical characteristics of the sandy soils. Soils within the wetlands generally had a Spodic horizon (with or without cementation) within 12 inches of the mineral soil surface, which is identified as hydric soil Indicator TA6, Mesic Spodic[2] by the NRCS.

A review of the vegetation in the area near Tolend Road found that upland species are developing in the understory. It is unclear what is causing this change, whether the seasonal water table is lowering or these species are taking advantage of slight changes in microtopography.

---

[1] Natural Resources Conservation Service, 1973, Soil Survey of Strafford County, New Hampshire. US Government Printing Office, Washington D.C.
[2] Natural Resources Conservation Service, 2010, Field Indicators of Hydric Soils in the United States, Version 7.0. L.M. Vasilas, G.W. Hurt, and C.V. Noble (eds). USDA, NRCS, in cooperation with the National Technical Committee for Hydric Soils.



STATE OF NEW HAMPSHIRE
JENNIFER WEST
No. 015
CERTIFIED WETLAND SCIENTIST

LEGEND

- USACE Data Plot
- Control
- Wetland Point
- Wetland Boundary
- Perimeter Ditch

Aerial Photography from ArcGIS online Resource Center

REV	DATE	DESCRIPTION	DR BY	CK BY	RVW BY
2	10/18/10		JCL		
1	09/30/10		JCL		

CLIENT: GeoInsight

PROJECT: DOVER LANDFILL SUPERFUND SITE
DOVER, NEW HAMPSHIRE

SHEET TITLE: Wetland Delineation

NORMANDEAU ASSOCIATES
ENVIRONMENTAL CONSULTANTS
80 Leighton Rd. Suite C Falmouth, ME 04105

FILE No.
DRAFTING SUBTITLE:
SCALE: 1" = 150'
FIGURE 1

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Dover Landfill City/County: Dover Sampling Date: 10.5.10

Applicant/Owner: State: NH Sampling Point: 1-up

Investigator(s): J West + L. Carbonneau Section, Township, Range:

Landform (hillslope, terrace, etc.): outwash plain Local relief (concave, convex, none): very slight pit/mound

Slope (%): 1 Lat: Long: Datum:

Soil Map Unit Name: NWI classification: upland forest

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? NO Are "Normal Circumstances" present? Yes X No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? NO (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___	No X	**Is the Sampled Area within a Wetland?** Yes ___ No X
Hydric Soil Present?	Yes X	No ___	
Wetland Hydrology Present?	Yes ___	No X	If yes, optional Wetland Site ID:

Remarks: (Explain alternative procedures here or in a separate report.)
Early successional oak forest with white pine saplings coming in.
Problem area – sandy soils with spodosol development.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No ✓	Depth (inches): ___
Water Table Present?	Yes ___	No ✓	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No ✓	Depth (inches): ___

Wetland Hydrology Present? Yes ___ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Dry the last couple of months combined with very sandy soils – little evidence of hydrology. Redox features starting at 9" from soil surface. No evidence of primary indicators. Water table fluctuates due to sandy soils.

Dover Land fill

SOIL

Sampling Point: 1-Up

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
2-0	7.5YR 2.5/1							Oe
0-1	10YR 2/1						FSL	A
1-3	7.5YR 3/2 (80%)		matrix 7.5YR 4/2 (20%)				FSL	E, fragmented
3-7	7.5YR 2.5/3						FSL	Bhs
7+	10YR 4/4		7.5YR 3/4	5%	C	M	LFS	Bs
EOE 14"								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- X Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ___

Depth (inches): ___

Hydric Soil Present? Yes X No ___

Remarks:

Problem area - deep sands with spodic development. Redox features within 9" of soil surface (including Oe). Has features of mesic spodic item # 1.

FIIHS
IX, A.1

OR TA6

IX, A.1

Dover Landfill

VEGETATION – Use scientific names of plants.

Sampling Point: 1-Up

Tree Stratum (Plot size: 30' Radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Quercus rubra	40	✓	FACU
2. Acer rubrum	40	✓	FAC
3.			
4.			
5.			
6.			
7.			
	80 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Pinus strobus	25	✓	FACU
2. Lyonia ligustrina	5		FACW
3. Rhamnus frangula	5		FAC
4. Viburnum l. cassinoides	1		FAC
5. Amelanchier laevis	1		FAC
6. Prunus.	1		FACU
7. Robinia pseudoacacia	1		U?
Vaccinium corymbosum	1		
	40 = Total Cover		

Herb Stratum (Plot size: 5' d)	Absolute % Cover	Dominant Species?	Indicator Status
1. Rhamnus frangula	10	✓	FAC
2. Wintergreen	40	✓	FACU
3. Swamp white oak	2		FACW
4. Quercus rubra	5		FACU
5. Pinus strobus	2		FACU
6. Kalmia angustifolia	5		FAC
7. Amelanchier laevis	T		FAC
8. Rubus hispidus	2		FACW
9. Vaccinium (low bush)	10	✓	FACU
10. Pteridum aquilinum	2		FACU
11. Maianthemum canadense	T		FACU
12. Upland sedge	1		U
Populus tremuloides	T		FACU
	80 = Total Cover		

Woody Vine Stratum (Plot size: —)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 30% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ Rapid Test for Hydrophytic Vegetation
- ___ Dominance Test is >50%
- ___ Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ___ No ✓

Remarks: (Include photo numbers here or on a separate sheet.)

1/8 5/100

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Dover Landfill City/County: Dover Sampling Date: 10.5.10

Applicant/Owner: State: NH Sampling Point: 1W

Investigator(s): JWest Section, Township, Range:

Landform (hillslope, terrace, etc.): outwash terrace Local relief (concave, convex, none): pit / mound

Slope (%): 1 Lat: Long: Datum:

Soil Map Unit Name: NWI classification: PFO1 / PSS1

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? NO Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? NO (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____
Hydric Soil Present?	Yes X	No ____
Wetland Hydrology Present?	Yes X	No ____

Is the Sampled Area within a Wetland? Yes X No ____

If yes, optional Wetland Site ID:

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- X Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- X Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches): ____
Water Table Present?	Yes ____	No X	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches): ____

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No surface indicators of hydrology other than pit/mound microtopography

Cemented spodic horizon indicative of fluctuating water table

Dover landfill

SOIL

Sampling Point: 1W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
2-0	7.5YR2.5/2							Oe
0-4	7.5YR3/2	80					LFS	A
	7.5YR3/1	20						
4-8	7.5YR4/2	80					LFS	E
	Lighter sand grains	20						
8-11	5YR2.5/2						LS	Bhsm, cemented
11-	7.5YR3/4						LS	Bs, firm in place
EOE 18"								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ✓ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- X Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ___

Depth (inches): ___

Hydric Soil Present? Yes X No ___

Remarks:

Cemented spodic 10-14" below soil surface. Probable organic streaking in E horizon. Problem soils

Redox masked in Bs

TA6, - Spodic within 12"

Dover Landfill

VEGETATION – Use scientific names of plants.

Sampling Point: 1W

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer rubrum	20		
2. Swamp white oak	25	✓	FACW
3. Quercus rubra*	30	✓	FACU*
4. Betula populifolia	5		
5.			
6.			
7.			
* on mound	80	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15')			
1. Viburnum cassinoides	10		
2. Maleberry	5		
3. Vaccinium corymbosum	20	✓	FACW
4. Acer rubrum	25	✓	FAC
5.			
6.			
7.			
	60	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Mt. Ash	<1		
2. Frangula alnus	<1		
3. Wintergreen	5	✓	
4. Rubus hispidus	3		
5. Vaccinium corymbosum	15	✓	FACW
6. Clintonia spp	<1		
7. Lycopodium (princess pine)	<1		
8. Kalmia angustifolia	5	✓	FAC
9.			
10.			
11.			
12.			
	28	= Total Cover	

Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
		= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 6 (B)
(did not include Quercus rubra as UJ.)

Percent of Dominant Species That Are OBL, FACW, or FAC: 83% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ Rapid Test for Hydrophytic Vegetation
- ___ Dominance Test is >50%
- ___ Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

42 Longwater Drive, Norwell, MA 02061

(781) 792-5000
www.cleanharbors.com

Project Submittal

Project Name: Dover Municipal Landfill Superfund Site

November 18, 2010

Engineer: Luke Sanborn, P.E. (GeoInsight)

Address: 186 Granite Street, 3rd Floor, Suite A, Manchester, NH 03101

Sub-Contractor:

Address:

Manufacturer:

Address:

Supplier:

Address:

Specification/Drawing Reference:

Submittal: 013

Transmittal Record	Attention	Sent	Received	Due	Quantity	Received
Contractor to Engineer	Luke Sanborn	11/18/10			1	
Engineer to Contractor	Robert Cornwell					

Review Action Code: 1. Reviewed/No exception taken 2. Make corrections noted 3. Revise as noted and resubmit 4. Incomplete submittal, resubmit 5. Rejected. Resubmit as specified

1	2	3	4	5	Drawing/Item	Dated	Description
					1	11/17/2010	Revised Work Plan

COMMENTS:

Work plan revisions per comments on Submittal 005.

Authorized Reviewer:_____ Date:_____

Notations do not authorize changes to contract sum or time. If you are authorized to proceed with the work identified in this submittal, it is assumed that no change in the contract amount or completion date is required. If a change in the work affecting your contract amount or completion is involved, notify the CM immediately.

"People and Technology Protecting and Restoring America's Environment"

Work Plan

Clean Harbors Environmental Services, Inc. (Clean Harbors) has prepared this work plan in accordance with the information and stated objectives provided in the Dover Municipal Landfill Superfund Site Source Control Remedial Design Project September 2010 bid package and October 6, 2010 Addendum 1.

General Information

Clean Harbors has developed this work plan to summarize major anticipated tasks and measures to be taken, associated with the excavation, transport and proper off-site disposal of impacted material and backfilling and restoration of the disturbed areas. This project has multiple construction and operational activities which include, but are not limited to:

- Site Mobilization and Health & Safety
- Site Preparation and Protection of Existing Features
- Surveying
- Clearing and Chipping
- Erosion and Sediment Controls
- Grubbing and Management of Organics
- Treatment System Mobilization
- Dewatering
- Refuse Management
- Excavation, Handling and Staging of Impacted Sediment (Southern & Eastern Ditch)
- Vacuum Excavation, Handling and Staging of Impacted Sediment (Western Ditch)
- Transportation of Impacted Material for Off-Site Disposal
- Common Sand Fill in Perimeter Ditch (Western)
- Stabilization of Western Ditch
- Common Sand Fill in Perimeter Ditch (Southern and Eastern)
- Road Gravel Backfill in Perimeter Ditch (Southern and Eastern)
- Stabilization Along Construction Areas (Southern and Eastern Ditch)

Labor

The following personnel will be utilized to perform the work activities:

- Project Manager
- Site Superintendent/Health and Safety Officer
- Equipment Operators (2)
- Technicians (6)

A project organization chart detailing specific personnel to be utilized and their respective roles will be submitted prior to mobilization.

Should site conditions warrant the need to allocate additional labor to complete the scope of work in a more timely and safe manner, Clean Harbors will make all efforts to work with the client and site engineer to ensure it is obtained.

Anticipated Equipment

The following equipment will be utilized to perform the work activities:

- (1) 550 dozer
- (1) 644 loader
- (2) 240 excavators
- (1) 240 excavator with grapple bucket
- (1) Chipper (12" capacity)
- (1) Tractor w/ bush hog
- (2) Skid steer loaders
- (1) Dump truck
- (1) Pressure washer

Should site conditions warrant the need to acquire additional site equipment to complete the scope of work in a more timely and safe manner, Clean Harbors will make all efforts to work with the client and site engineer to ensure it is obtained.

Schedule

Clean Harbors' proposed schedule for site work operations is based on a 5-day work week (Monday-Friday), excluding holidays, with 10-hour work shifts. The project schedule identifies the planned sequence of site activities allowing completion of the work within the most efficient time frame. Clean Harbors intends to work most Saturdays, with prior approval, in order to shorten the overall project schedule and to avoid winter conditions.

Health & Safety Plan

A Site Specific Health & Safety Plan (HASP) will be prepared for this project and will be submitted prior to mobilization. All employees working in direct contact with impacted sediment, water, or air will have completed an OSHA 40-hour health and safety training program, an 8-hour annual refresher training program and participate in a medical monitoring program in accordance with 29 CFR 1910.120.

It is anticipated that the majority of the work will be performed using Level D personal protective equipment (PPE). Additional equipment will be available on-site to expedite PPE upgrades as required by observation of site conditions. Particulate levels will be suppressed with the application of water during excavation and backfilling, as required. The Site Specific Health and Safety Plan includes specific contingency information, but is not limited to, the names and phone numbers of key personnel, local emergency medical services, police, fire and hospital; directions to nearest hospital capable of treating potentially injured personnel; proposed

emergency response actions and necessary personal protective equipment; and spill containment program. Prior to commencing any on-site operations, the Project Manager in cooperation with the Site Superintendent/Health and Safety Officer shall advise all on-site personnel of potential emergency situations.

Site Safety and Security Controls

All work will be conducted in a manner that is protective of public health, safety, and the environment. Appropriate decontamination techniques, noise, dust and erosion controls and personal protective equipment will be used during the performance of the work.

Onsite operational working hours are generally anticipated to be 7:00 am to 5:00 pm, Monday through Friday. Daily safety meetings will be held in the morning and no noise producing equipment shall be utilized prior to 7:00 am.

To maintain site security during working hours, the Site Superintendent/ Supervisor will enforce exit/entry requirements, approve visitors entering the site, maintain a visitor log, and ensure that visitors have a valid purpose for entering the site.

Signage will be placed at site entrances to identify the site as a restricted construction area and that only authorized personnel with appropriate PPE may enter. Additionally, a sign will be posted indicating all authorized persons entering the site are required to check-in at the field office. Hazardous areas will be marked with caution tape, temporary fence or high visibility fencing and/or warning/caution signs.

Additional non-working hour security measures to protect on-site equipment/ material will be implemented as follows:

- All equipment and trailers will be locked and properly stored when not in use;
- All construction equipment will be parked in a manner so as to restrict access to the maximum extent possible;
- All materials will be secured in storage bins that will be grounded, when applicable, and locked;
- Ignition keys to mechanical equipment will be removed and secured at the end of each work shift; and
- All temporary fencing will be secured at the end of each day and kept closed during the day to the extent possible.

Dust Control

In order to ensure that there is no exposure to nuisance or hazardous dusts, to both workers on the site, and the general public in adjacent areas to the site, Clean Harbors shall take comprehensive measures to prevent any impacted sediment from becoming airborne and presenting unacceptable visible dust conditions, worker safety exposures and public health issues.

Engineering controls to prevent accumulation of dust from site activities will consist of wet suppression of the general site area, with application via a water hose, when necessary. Additionally, all waste piles will be covered as soon as possible to reduce dust.

Traffic Controls

Based upon the anticipated scope of work, truck material deliveries and waste transportation will be required on a daily basis. In order to limit the impact to the community to the extent possible, Clean Harbors will implement the following traffic control measures:

- Trucks will enter the site at a speed commensurate to the site conditions, never exceeding 10 mph.
- In order to prevent dust emissions, water will be applied to dry site access roads during site delivery hours, when necessary.
- All deliveries and site equipment will be escorted by field personnel to ensure compliance with site traffic control procedures required to protect the community and as outlined in the project specifications;

Pre-Construction Activities

Following the Notice to Proceed, Clean Harbors will conduct an initial site visit in order to review existing site conditions with GeoInsight and gather site specific details to prepare submittals. Additionally, the initial site visit shall document all existing features to be protected and shall serve as a venue to review this work plan and the various staging and access routes which need to be created. As a part of the initial site visit, pre-construction photos will be collected in order to document existing site conditions.

During this time, Clean Harbors will initiate preparation of project documentation and pre-construction submittals for issue and approval by GeoInsight, including a Site-Specific HASP.

The Clean Harbors Project Team will commence ordering all project related materials and/or supplies, in addition to making arrangements for fuel, shipping and deliveries, and the many other incidentals required for the project. Clean Harbors will also conduct any final meetings or conferences in preparation of site mobilization.

Mobilization and Initial Site Work

Mobilization to the site will occur following the above pre-construction activities and approval from GeoInsight to proceed with site work. We currently anticipate mobilizing November 4th, 2010 to begin site work.

Protection of Existing Features

Upon mobilization, Clean Harbors will begin protecting existing features. Existing features include, but are not limited to, buildings, monitoring wells, utilities, fences, walls, culverts and remediation piping. Protection of these existing features will be accomplished by placing visual

markings (flagging, construction fence, or caution tape) on or proximate to the feature and making personnel aware of the location and function of each feature during pre-construction and daily worker meetings.

Clearing and Chipping

Clean Harbors will cut trees, bushes, shrubs, saplings, grass and any other vegetation within the work area as close to the ground as possible, chip and stage onsite per the engineer's direction. The clearing of the designated areas along the entire perimeter ditch, construction entrance and main landfill entrance will be completed by utilizing equipment including, but not limited to, saws, excavators, a chipper, dump trucks and a tractor and bush hog.

The clearing will be performed by two separate crews. One crew will work north to south, beginning at the proposed alternate construction entrance off Tolend Road, north of the western ditch. The other crew will work east to west, beginning at the proposed access road to the southern ditch. Once clearing along the southern ditch is complete, the crew will then work west to east from the proposed access road to the southern ditch to the main construction entrance, east of the east ditch.

Chipping of the southern and eastern ditch will be performed concurrent to clearing, utilizing equipment on the existing access road. Chipping of the western ditch will be performed subsequent to backfill placement to ensure a suitable base for the chipping equipment is achieved. Trees cleared along the west ditch will be staged neatly on the on the eastern bank until backfill activities are complete. Once backfill activities are complete, chipping will commence along the west ditch and the chips will be spread directly to the sloped banks.

Erosion Control Installation

Erosion controls, such as silt fence and hay bales, will be installed as shown on the construction drawings (refer to Figure 3-1 and 3-2). Clean Harbors plans to install approximately 5,800 LF of silt fence on the west, south and east sides of the landfill, down gradient of the excavation areas and around the impacted sediment stockpile and dewatering pad. Additionally, hay bales will be placed around the impacted sediment stockpile and dewatering pad, and to support the perimeter silt fence, as necessary. All erosion controls will be inspected daily and after substantial weather events and any required repairs designated by the engineer will be completed immediately.

Selective Grubbing

Clean Harbors will selectively grub stumps, roots, topsoil and or other organic materials within the work areas where permanent structures and features are to be constructed per the engineering drawings. The grubbing of the designated areas along the southern and eastern ditch and construction entrances will be completed by utilizing equipment including, but not limited to excavators and dump trucks. The grubbing will be performed west to east, beginning at the designated grubbing limit south of the wooden bridge located in the western ditch to the construction entrance on Tolend Road east of the southern and Eastern ditch. All grubbing material will be disposed of properly.

Dewatering

System Mobilization

At the request of the engineer, Clean Harbors will supply and mobilize a mobile water treatment system for potentially impacted water. The treatment system components include, but are not limited to, two (2) fractionation tanks, two (2) 1,000 lb media vessels, pumps, hoses and a filter bag housing.

Western and Southern Ditch – Un-Impacted

At the request of the engineer, Clean Harbors will dewater the western and southern ditches prior to the start of any backfill operations, as well as install appropriate swales and siltation basins to protect previously dewatered sections from surface water. All dewatering activities will be under the engineers' instruction and design of dewatering structures will follow the specifications outlined in the construction drawings (Figure 3-2).

Dewatering of the western and southern ditch will require equipment including, but not limited to, pumps, hoses and a siltation basin. Prior to backfilling, excessive surface water in the ditch will be pumped to a hay bale siltation basin strategically located on the landfill surface between the western and southern ditches. The flow rate will be monitored to ensure proper flow is introduced to the siltation basin. Sampling of the discharge water will be conducted by Clean Harbors upon request of the engineer. If the results exceed the maximum limit of 10 ppb Arsenic, additional filtration equipment (indicated above) may be mobilized by Clean Harbors, following the engineers' request. Should treatment system equipment be required, Clean Harbors will utilize a combination of sand and filter bag filtration for suspended Arsenic. Should dissolved Arsenic pose an issue, either a specialty carbon or ion exchange resin will be utilized. The exact filtration method will depend on analytical results.

Southern and Eastern Ditch - Impacted

At the request of the engineer, Clean Harbors will dewater the eastern ditch prior to the start of any excavation or backfilling operations, as well as install appropriate swales and siltation basins to protect previously dewatered sections from surface water. All dewatering activities will be under the engineers' instruction and design of dewatering structures will follow the specifications outlined in the engineering drawings in (figure 3-2).

Dewatering of the Eastern ditch will utilize equipment including, but not limited to, two (2) fractionation tanks, pumps, hoses and a hay bale siltation basin. Prior to excavation and backfilling, the surface water in the ditch will be pumped into one of two 20,000 gallon fractionation tanks and will be batch tested before being discharged into a hay bale siltation basin strategically located on the cap next to the impacted sediment staging pile. The flow rate will be monitored to ensure proper flow is introduced to the siltation basin. If the results exceed the maximum limit of 10 ppb Arsenic, additional filtration equipment (indicated above) may be mobilized by Clean Harbors, following the engineers' request. Should treatment system equipment be required, Clean Harbors will utilize a combination of sand and filter bag filtration

for suspended Arsenic. Should dissolved Arsenic pose an issue, either a specialty carbon or ion exchange resin will be utilized. The exact filtration method will depend on analytical results.

Earthwork

Refuse Management Plan

In the event Clean Harbors comes into contact with refuse in a designated work area, said refuse will be immediately brought to the engineers' attention. Once the refuse has been identified and the correct plan of action, according to the Refuse Management Plan Addendum to division 31, has been determined, Clean Harbors will return to work in the area as long as all safety precautions and risks have been addressed. Clean Harbors will work intelligently to limit any disturbances of underground refuse.

Impacted Sediment Excavation

Clean Harbors shall excavate impacted sediment to depth (anticipated to be approximately 6-8 inches). The excavation of the designated areas along the southern and eastern ditch will be completed by utilizing equipment including, but not limited to, excavators, loaders and dump trucks. The excavation will be performed west to east, beginning at the designated excavation limit south of the wooden bridge located in the western ditch to the construction entrance on Tolend Road east of the southern and eastern toe ditch. The excavation will progress east, from the designated starting point, in a manor where the required depth and impacted sediment extraction is to the engineer's satisfaction. While the ditch is awaiting sediment sample confirmation and backfilling, Clean Harbors will install perpendicular wattles in distinct sections in order to mitigate the transport of impacted sediment and surface water from un-excavated areas to those areas that have been excavated and sampled.

Impacted Sediment Transportation

With the use of an existing access road along the eastern ditch and the proposed access path along the southern ditch, all impacted sediment will be live loaded into dump trucks for transportation to the impacted sediment staging pile. The use of conventional end dump trucks or rock trucks will be utilized to ensure any wet sediment, if encountered, will be properly contained and transported to the impacted sediment staging pile. A land bridge on the north side of the southern ditch will be utilized to ensure impacted sediment loads reach the staging and dewatering pad in a timely manner, while avoiding Tolend Road. As directed by the engineer, Clean Harbors shall segregate and stockpile impacted sediment in the different classification types, as specified.

Impacted Sediment Staging Management

The impacted sediment and dewatering pad will be constructed to hold the specified amount of impacted sediment outlined in the bid proposal form and built to the specifications detailed in the engineering drawings (Figure 3-2). The impacted sediment and dewatering pad will be clearly marked and posted to prevent accidental mixing from occurring and will be located in a manner

so that the correct grade and location where no potentially hazardous settling areas exist. The impacted sediment pile will be maintained daily and will be covered with a an approved polyethylene cover to prevent windblown dust and rain water infiltration.

Sediment Removal Utilizing Vacuum Truck

At the request of the engineer, Clean Harbors will supply a vacuum truck and labor to collect, transport and stage impacted sediment on the staging and dewatering pad. Composite samples of stockpiles will be collected by Clean Harbors in order to properly characterize the sediment for disposal.

Impacted Sediment Transport and Disposal

Once confirmatory results show that all the impacted sediment was excavated from the ditch, composite samples of stockpiles will be collected by Clean Harbors in order to properly characterize the sediment for disposal. Prior to any removal of impacted sediment, all information outlined in the Impacted Sediment Transport and Disposal plan will be submitted to the engineer for approval.

Upon approval from the engineer, characterized sediment will be loaded into trucks in a manner that limits/eliminates the transfer of impacted sediment to un-impacted areas. The use of polyethylene sheeting, decontamination, if needed, and the strategic placement of machinery will limit/eliminate cross contamination during loading, transportation and disposal.

All bills of lading, manifests and all other applicable documentation will be organized and submitted, as stated in the impacted material transport and disposal plan, to the engineer prior to and after disposal to the accepted landfill. All transportation and disposal of impacted material will be in accordance to the USDOT, USEPA, State and local regulations as well as any other requirements stated in the impacted material transport and disposal plan included in the project bid package.

Surveying

Following excavation activities, Clean Harbors' subcontracted PLS will perform an as-built survey of the excavation and clearing limits. The PLS will provide stamped New Hampshire Registered Scaled Record Drawings per the bid requirements.

Backfill – Western Ditch

After Clean Harbors has obtained confirmation from the engineer that the clearing of the western ditch satisfies the requirements, Clean Harbors will backfill with certified clean sand borrow. To expedite the schedule, the backfilling of the western ditch will occur concurrent to the excavation of the southern and eastern ditch. Clean Harbors will, with the engineer's approval, utilize a stockpile east of the wooden bridge to place the sand borrow as close to the ditch as possible, if the surface of the western ditch is unsatisfactory for dump truck traffic.

The backfilling of the western ditch will be completed by Clean Harbors by utilizing equipment including, but not limited to, loaders, dozers and dump trucks. Clean Harbors will use a loader and dump trucks to collect and transport the sand borrow to the western ditch. After the fill is placed in the western ditch from either on or off-road dump trucks, a dozer will be utilized to correctly grade and compact the fill to the specified requirements.

Backfill – Southern and Eastern Ditch

After Clean Harbors has obtained confirmation, from the engineer, that sediment sampling of the southern and eastern ditch satisfies the requirements and required surveying has been completed, Clean Harbors will backfill with certified clean sand borrow. To expedite the schedule, the backfilling of the southern and eastern ditch will occur west to east as the excavation of the southern and eastern ditch progresses. Clean Harbors will, with the engineer's approval, build an access road and small stockpile on the south side of the center of the southern ditch to place the sand borrow as close to the ditch as possible, if the surface of the southern ditch is unsatisfactory for dump truck traffic.

The sand borrow backfilling of the southern and eastern ditch will be completed by utilizing equipment including, but not limited to, loaders, dozers and dump trucks. Clean Harbors will use a loader and dump trucks to collect and transport the sand borrow to the southern and eastern ditch. After the fill is placed in the ditch from either on or off-road dump trucks, a dozer will be utilized to correctly grade and compact the fill to the specified requirements.

After Clean Harbors has obtained confirmation from the engineer that the sand borrow backfill and grade in the southern and eastern ditch satisfies the requirements, Clean Harbors will backfill with 2 inch minus road gravel. To expedite the schedule, the backfilling of the southern and eastern ditch will occur west to east as the sand borrow backfilling of the southern and eastern ditch progresses. Clean Harbors will, with the engineer's approval, utilize an access road and stockpile on the south side of the center of the southern ditch to place the 2 inch minus road gravel as close to the ditch as possible if the surface of the southern and eastern ditch is unsatisfactory for dump truck traffic.

The 2 inch minus road gravel backfilling of the southern and eastern ditch will be completed by utilizing equipment including, but not limited to, loaders, dozers and dump trucks. Clean Harbors will use a loader and dump trucks to collect and transport the sand borrow to the southern ditch. After the fill is placed in the southern and eastern ditch from either on or off-road dump trucks, a dozer will be utilized to correctly grade and compact the fill to the specified requirements.

Stabilization – Western Ditch

Clean Harbors will begin stabilization of the western ditch following the backfilling and grading and upon receiving the engineer's approval. Clean Harbors will utilize, a chipper and small loaders to spread the wood chips and/or supplemental mulch to the designated areas of the western ditch.

Stabilization – Southern and Eastern Ditch

Clean Harbors will begin stabilization of the southern and eastern ditch as soon as the backfilling and grading of the western ditch is completed and upon receiving the engineer's approval. Clean Harbors will use small loaders to spread available staged wood chips, from the clearing and chipping phase and/or and supplemental mulch to the designated areas of the Southern and Eastern ditch.

Surveying

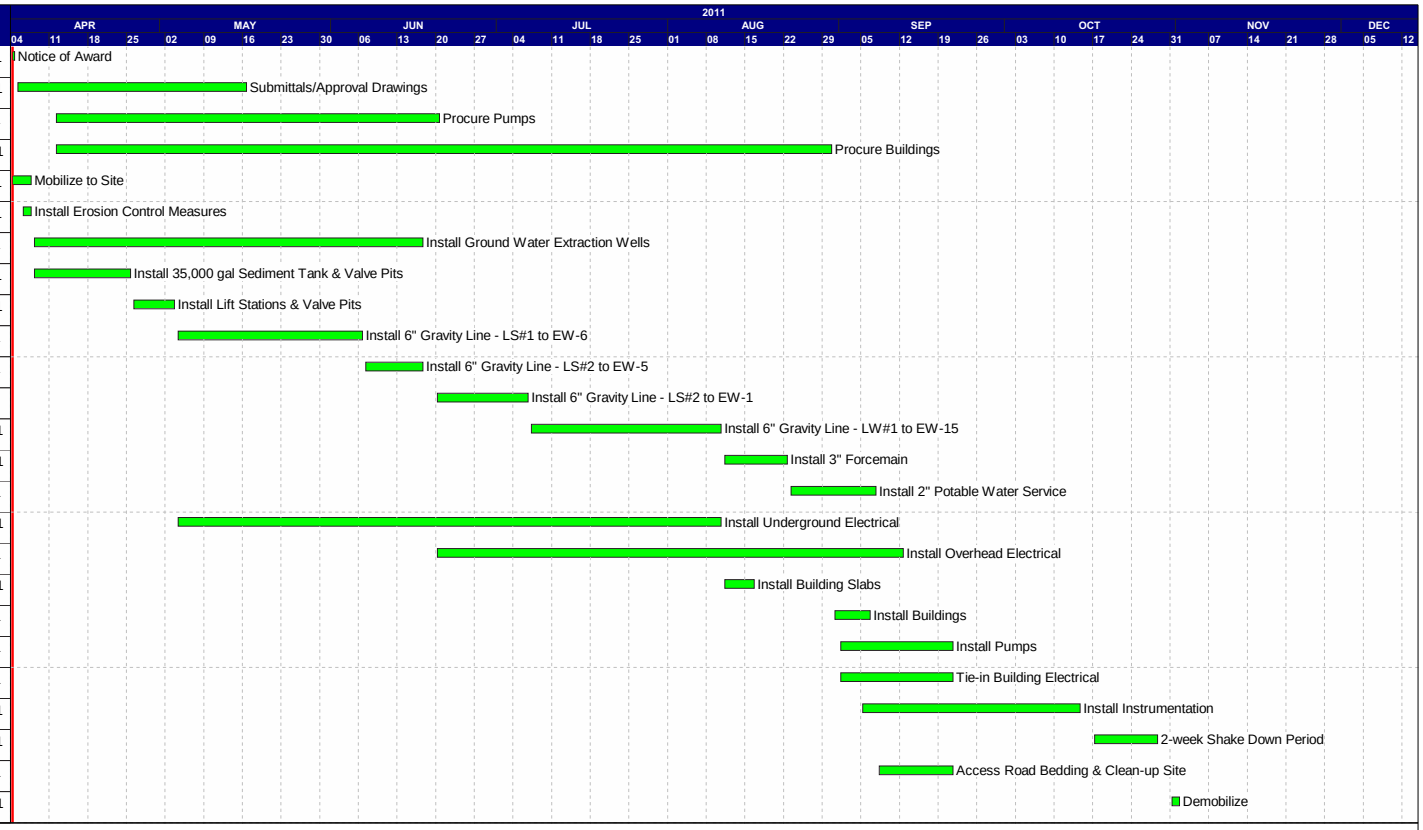
Following backfill activities, Clean Harbors' subcontracted PLS will perform an as-built survey of the backfilled and graded limits. The PLS will provide stamped New Hampshire Registered Scaled Record Drawings per the bid requirements.

De-Mobilization and Final Site Work

Equipment Decontamination

Prior to Clean Harbors demobilizing from the site, any equipment used will be completely decontaminated in order to ensure proper health and safety measures.

Act ID	Description	Orig Dur	Rem Dur	Early Start	Early Finish
1000	Notice of Award	1d	1d	04APR11	04APR11
1010	Submittals/Approval Drawings	30d	30d	05APR11	16MAY11
1020	Procure Pumps	50d	50d	12APR11	20JUN11
1030	Procure Buildings	100d	100d	12APR11	30AUG11
2000	Mobilize to Site	4d	4d	04APR11	07APR11
2010	Install Erosion Control Measures	2d	2d	06APR11	07APR11
2020	Install Ground Water Extraction Wells	51d	51d	08APR11	17JUN11
2030	Install 35,000 gal Sediment Tank & Valve	12d	12d	08APR11	25APR11
2040	Install Lift Stations & Valve Pits	6d	6d	26APR11	03MAY11
2050	Install 6" Gravity Line - LS#1 to EW-6	24d	24d	04MAY11	06JUN11
2060	Install 6" Gravity Line - LS#2 to EW-5	9d	9d	07JUN11	17JUN11
2070	Install 6" Gravity Line - LS#2 to EW-1	12d	12d	20JUN11	06JUL11
2080	Install 6" Gravity Line - LW#1 to EW-15	25d	25d	07JUL11	10AUG11
2090	Install 3" Forcemain	8d	8d	11AUG11	22AUG11
2095	Install 2" Potable Water Service	12d	12d	23AUG11	07SEP11
2100	Install Underground Electrical	70d	70d	04MAY11	10AUG11
2110	Install Overhead Electrical	60d	60d	20JUN11	12SEP11
2120	Install Building Slabs	4d	4d	11AUG11	16AUG11
2130	Install Buildings	5d	5d	31AUG11	06SEP11
2140	Install Pumps	15d	15d	01SEP11	21SEP11
2150	Tie-in Building Electrical	15d	15d	01SEP11	21SEP11
2160	Install Instrumentation	30d	30d	05SEP11	14OCT11
2170	2-week Shake Down Period	10d	10d	17OCT11	28OCT11
2180	Access Road Bedding & Clean-up Site	10d	10d	08SEP11	21SEP11
2190	Demobilize	2d	2d	31OCT11	01NOV11



Start date	04APR11
Finish date	01NOV11
Data date	04APR11
Run date	23MAR11
Page number	1A

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Sargent Corporation
Dover Landfill Superfund Site
Preliminary Schedule

- Early bar
- Progress bar
- Critical bar
- Summary bar
- Start milestone point
- Finish milestone point

APPENDIX B

CONSTRUCTION STORM WATER POLLUTION PREVENTION PLAN

CONSTRUCTION STORM WATER POLLUTION PREVENTION PLAN (CSWPPP)
NPDES CONSTRUCTION GENERAL PERMIT FOR NEW HAMPSHIRE
DOVER MUNICIPAL LANDFILL SUPERFUND SITE
SOURCE CONTROL REMEDIAL ACTION
TOLEND ROAD, DOVER, NEW HAMPSHIRE

Prepared for:

Executive Committee of the Group of
Work Settling Defendants
Dover Municipal Landfill Superfund Site

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November 8, 2010
GeoInsight Project 2009-017

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Refer to Dover Municipal Landfill Superfund Site Source Control 100% Remedial Design specifications and construction plan set for the initial erosion and sediment control plan, layout, and details.

APPENDICES

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CONSTRUCTION STORM WATER POLLUTION PREVENTION PLAN (CSWPPP)
NPDES CONSTRUCTION GENERAL PERMIT FOR NEW HAMPSHIRE
DOVER MUNICIPAL LANDFILL SUPERFUND SITE
SOURCE CONTROL REMEDIAL ACTION
TOLEND ROAD, DOVER, NEW HAMPSHIRE

1.0 INTRODUCTION

This Construction Storm Water Pollution Prevention Plan (CSWPPP) was prepared by GeoInsight, Inc. (GeoInsight; the Engineer) at the request of the Executive Committee of the Group of Work Settling Defendants (the Dover Group), to coordinate storm water aspects of the Source Control Remedial Action (SCRA) construction activities in general accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and its amendments at the Dover Municipal Landfill Superfund Site (the Site). The Dover Group retained GeoInsight to oversee the implementation of the SCRA, and designated Michael J. Webster, P.G., of GeoInsight as the Project Manager with responsibility for the administration of the activities related to implementation of the SCRA.

This CSWPPP was prepared in accordance with the National Pollution Discharge Elimination System (NPDES) Construction General Permit (CGP) and the initial erosion and sediment control requirements that are provided in the 100% Source Control Remedial Design (SCRD) Contract Drawings, dated September 24, 2010. A copy of the CGP is included in Appendix A. According to United States Environmental Protection Agency (USEPA) Office of Solid Waste and Emergency Response (OSWER) Directive 9355.7-03 dated February 19, 1992, "CERCLA response actions are exempted by law from the requirements to obtain federal, state or local permits related to any activities conducted completely on-site." CERCLA "does not remove the requirements to meet (or waive) the substantive provisions of permitting regulations that are applicable or relevant and appropriate requirements." Therefore, this CSWPPP has been prepared to meet the general requirements of the NPDES permitting process; however, submittal of a Notice of Intent (NOI) to the USEPA will not be required.

The purpose of the CSWPPP is to identify potential sources of storm water pollution (both during wet and dry weather) and develop Best Management Practices (BMPs) to minimize the potential for runoff from identified sources at the project to impact adjacent waters, and to reduce potential impacts present from storm water run-on pathways. This CSWPPP describes the implementation of BMPs and installation of systems and controls designed to reduce the transport of material due to wind, surface runoff, and/or dewatering activities. BMPs to achieve these goals were identified for this project consistent with the International Erosion Control Association document Advanced CSWPPP and BMP Planning and

Implementation, the USEPA document Storm Water Management For Construction Activities Developing Pollution Prevention Plans and Best Management Practices, dated September 1992, and the New Hampshire Department of Environmental Protections (NHDES) New Hampshire Code of Administrative Rules, Chapter Env-Wq 1500. BMPs and controls were selected based upon being readily available, ease of implementation, and straightforward design and inspection.

This CSWPPP identifies significant materials that may be a potential pollutant source, the initial erosion and sediment controls as detailed in the Contract Drawings, recommended BMPs and installation specifications that will or can be used to control erosive forces, and maintenance requirements that should be conducted regularly or after every significant storm event (a significant storm event is defined as 0.5 inch of rainfall or greater in a 24-hour period). The Contractor (identified in Section 2.2 of this CSWPPP will post a CSWPPP Project Site Plan in the project Site office detailing the limits of work, locations of significant materials, and locations of erosion and sedimentation controls.

2.0 PROJECT INFORMATION

2.1 PROJECT NAME

DOVER MUNICIPAL LANDFILL SUPERFUND SITE
SOURCE CONTROL REMEDIAL ACTION

ESTIMATED TOTAL DISTURBED AREA: 6.5 ACRES

2.2 CONTRACTOR INFORMATION

CLEAN HARBORS ENVIRONMENTAL SERVICES, INC. (CHES)
42 LONGWATER DRIVE
NORWELL, MASSACHUSETTS 02061
PHONE: (781) 792-5801
FACSIMILE: (781) 792-5938
PROJECT MANAGER: ROBERT CORNWELL

2.3 PROJECT SITE ADDRESS

INTERSECTION OF GLENN HILL ROAD AND TOLEND ROAD
DOVER, NEW HAMPSHIRE 03820

2.4 OWNER ADDRESS

EXECUTIVE COMMITTEE OF THE GROUP OF WORK SETTLING DEFENDANTS
C/O DEAN PESCHEL,
ENVIRONMENTAL PROJECTS MANAGER
288 CENTRAL AVENUE
DOVER, NEW HAMPSHIRE 03820
PHONE: (603) 516-6094
FACSIMILE: (603) 516-6463

2.5 CSWPPP PREPARER INFORMATION

GEOINSIGHT, INC.
1 MONARCH DRIVE, SUITE 201
LITTLETON, MASSACHUSETTS 01460
PHONE: (978) 679-1600
FACSIMILE: (978) 679-1600

PROJECT MANAGER
MICHAEL J. WEBSTER, P.G.

SENIOR ENGINEER
MICHAEL C. PENNEY, P.E. LICENSE NO 7608

PROJECT ENGINEER
LUKE W. SANBORN, P.E. LICENSE NO. 12543

2.6 CONTACT INFORMATION

The Contractor is considered the operator for the purpose of this CSWPPP and is defined as the party that has operational control over construction plans and specifications, including the ability to make modifications to the CSWPPP and construction operations. The Contractor has daily control of construction activities that it performs, and those of its subcontractors, and activities necessary to maintain compliance with the CSWPPP. The control includes authorization to direct workers to maintain or revise controls necessary to maintain compliance with NPDES CGP regulations. The Contractor will be the point of contact for Project personnel and will communicate with the Engineer. The Engineer is responsible for contact with regulatory officials who wish to discuss this CSWPPP or obtain information concerning storm water controls and associated performance. The CSWPPP Contact list is included in Appendix B.

2.7 PLAN AVAILABILITY

A copy of this CSWPPP and CGP will be maintained at the Site at all times and made available to the USEPA and/or authorized representatives of the USEPA at their request, to comply with NPDES regulations. This CSWPPP, inspection records, and other documents must be maintained for at least three years after the project has concluded.

2.8 POSTING REQUIREMENTS

In accordance with the CGP, a sign must be posted conspicuously near the main entrance to the construction area. The sign shall indicate the location of the CSWPPP and the name and telephone number of the Contractor.

2.9 CONSTRUCTION STORM WATER POLLUTION PREVENTION PLAN AMENDMENTS AND SIGNATORY RESPONSIBILITIES

The Contractor should reevaluate and amend the CSWPPP whenever there is a significant change in design, construction, operations, or maintenance activities that will affect the potential for discharge of pollutants to surface water bodies. THE CONTRACTOR will make the CSWPPP available for review to authorized USEPA, NHDES, and local agency officials, upon request. A CSWPPP Contact List is provided in Appendix B.

Documentation related to this CSWPPP shall be reviewed, approved, signed, and certified by an authorized the Contractor representative prior to submission, as applicable.

The CSWPPP will be updated corresponding to changes in construction activities, site conditions, responsible parties, and applicable regulations. Updates to the CSWPPP should be recorded in the CSWPPP Addenda Log included in Appendix C and on a CSWPPP Project Site Plan located in the project Site office, as may be applicable. The CSWPPP Project Site Plan should identify the specific locations of major erosion and sediment controls installed for the project, and may identify the general locations of minor or movable controls. Information contained herein should allow for response to reasonably foreseeable potential conditions associated with the planned SCRA activities at the Site based upon the existing site configuration and information made available at the time of the CSWPPP development. A written copy of this CSWPPP and associated documents will be maintained in the Contractor's office and in the Site office.

2.10 PREPARER CERTIFICATION

I certify under penalty of law that this CSWPPP and all its original attachments were prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel properly gather and evaluate the information submitted. Based upon my inquiry of those individuals responsible for obtaining said information, I believe to the best of my knowledge that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine or imprisonment for known violations.

GeoInsight, Inc.
Authorized Representative

SIGNATURE

11-15-10
DATE

Michael J. Webster, P.G.
PRINTED NAME

Regional Manager
TITLE

2.11 CONTRACTOR CERTIFICATION

I certify under penalty of law that this CSWPPP and all attachments have been reviewed by qualified personnel duly representing CHES, and that CHES will comply with the measures set forth within. I am aware that there are significant penalties for willingly violating this document, including the possibility of fine or imprisonment for known violations.

Clean Harbors Environmental Services, Inc.
Authorized Representative

SIGNATURE

11-29-10
DATE

Paul Brotti
PRINTED NAME

3.0 PROJECT DESCRIPTION

3.1 SITE DESCRIPTION

The Site consists of an area located to the southwest of Tolend Road in the west corner of the City of Dover as shown on the Site Locus (Figure 1). A large portion of the Site consists of an approximately 45 acre landfill that operated from approximately 1960 to 1979, which is surrounded by undeveloped land. The Site is bordered by the Hoppers wetland to the north, residential properties along Tolend and Glenn Hill Roads to the east, and forested wetlands to the south and west. At its closest meander point, the Cocheco River is located approximately 600 feet east/northeast of the east corner of the Site (i.e., the entrance of the Landfill along Tolend Road). Also, at its closest location, the north bank of the Bellamy Reservoir is approximately 1,500 feet south of the southwest corner of the Landfill. Land located to the west and south between the Landfill and the Bellamy Reservoir consists of undeveloped woodland and forested wetlands. Features of the Site and the surrounding areas are illustrated on Figure 2.

The Landfill surface is generally topographically flat with a slight increase in elevation (approximately 10 feet) from the east side of the Landfill to the northwest corner. The Landfill rises above the surrounding grades by approximately 10 to 15 feet. Small trees and shrubs occupy the eastern, northeastern, and localized areas of the north portion of the Landfill. The central and southern portion of the Landfill is covered by vegetation including grass and low brush. The areas around the Landfill, including where SCRA activities will occur, are also mainly flat and covered with small trees and shrubs. Wetland areas border much of the SCRA areas to the west and southwest. Access to the Landfill is via a gate and dirt access road located at the southeast corner of the Landfill, just north of the intersection of Tolend and Glenn Hill Roads. An existing metal-sided and steel-framed building (identified as the Butler Building) is located at the west end of the Landfill access road near the southwest corner of the Landfill.

3.2 CURRENT PROPERTY DRAINAGE AND STORM WATER RUNOFF

The Landfill is located in the Piscataqua-Salmon Falls watershed. A shallow drainage ditch that is located along the toe of the Landfill (known as the "perimeter ditch") collects surface water runoff and intercepts, at least seasonally, shallow ground water flow. The perimeter ditch discharges (via a series of culverts) to an erosional gully that is located to the east of the intersection of Tolend and Glenn Hill Roads. This gully is referred to as the "drainage swale" or "swale." The swale drains to the northeast, discharging to the Cocheco River approximately 800 feet northeast of the east corner of the Site (i.e., the entrance to the

Landfill along Tolend Road). The elevation of surface water in the Cocheco River (approximately 110 feet Mean Sea Level or MSL) is approximately 30 feet lower than the elevation of the ground surface along the top of the west bank of the river (which generally ranges from 142 to 144 feet MSL). The SCRA area elevation is generally only a foot or two above the elevation of the top of the west bank of the river, indicating a relatively steep gradient from the Site to the Cocheco River. The culvert draining the perimeter ditch and discharging to the Cocheco River at the east corner of the Site will be a critical storm water monitoring and control point because most land disturbing activities will be occurring within, or immediately adjacent to the perimeter ditch. Storm water from Site construction activities may also flow to the south, across the forested wetlands towards the Bellamy Reservoir. The current estimated storm water surficial flow directions are presented on Figure 3. These flow patterns are not expected to be significantly changed by the SCRA activities.

3.3 DESCRIPTION OF CONSTRUCTION ACTIVITIES

The project addressed by this CSWPPP consists of construction related to the SCRA activities on and immediately around the Landfill . The SCRA activities are fully detailed in Appendix D and E of the September 2010 100% SCRD submittal. Refer to Figures 1 and 2 for the respective Site Locus.

The limits of the SCRA area are depicted on Contract Drawing No. 2-1 titled "Proposed Conditions Overview Plan." The construction activities include the following four Phases:

- Phase I: Earthwork – in general, includes site preparation, installing erosion and sedimentation controls, clearing, grubbing, excavating impacted sediment, stockpiling excavated sediment, disposing of impacted sediment, backfilling the perimeter ditch and the excavation area, and initial construction of an on-site unpaved access road along a significant distance of the Landfill toe – Awarded to CHES;

- Phase II: Infrastructure – in general, includes installing ground water extraction wells, force and gravity conveyance piping, two on-site lift stations, one large underground sedimentation tank, a potable water line, overhead electrical service lines, and underground communications lines;

- Phase III: Ground Water Extraction System Construction - in general, includes installing extraction well pumping station enclosures and equipment; and coordinating system start-up and shake down with the Engineer; and

- Phase IV: Project Completion and Demobilization – in general, includes adding enhancements to the existing permeable cover, installing the final layers of an access road, restoration activities, and installing permanent security fencing and gates.

For the purposes of this CSWPPP, the work areas include a minimum 10-foot wide setback around the areas to be disturbed, with the distance of the buffer from the actual work area depending upon the slope and existing vegetative cover. Illustrations of the existing topography, proposed topography, limits of work, and proposed erosion controls are presented in the Contract Drawings 2-1, 3-,1 and 3-2.

3.4 ANTICIPATED WORK DURATION

Based upon the nature and extent of the expected construction operations necessary to meet the objectives of the SCRA, active field activities are anticipated to start in November 2010 and continue to December 2011. This duration may be affected by weather and actual conditions encountered at the Landfill.

3.5 ANTICIPATED WORK SEQUENCE

The general construction work sequence for the proposed improvements at the Dover Municipal Landfill Superfund Site are described in the following bullets:

Site Preparation

- installation of erosion and sedimentation controls including siltation fence, construction entrance/truck wash, and check dam(s);
- clearing and grubbing of the perimeter ditch, access areas adjacent to the perimeter ditch, staging areas, and proposed access road areas;
- installation of crushed rock fill to reinforce access roads on top of the Landfill and surrounding areas; and
- construction of staging area controls for vehicle refueling (if necessary) and for equipment/material staging.

Perimeter Ditch Closure And Access Road Construction

- installation of temporary dewatering treatment and infiltration basins to manage sediment and dewatering fluid from perimeter ditch excavation activities and utility trenching activities;
- installation of an impacted soil dewatering/staging pad on top of the Landfill;
- construction of temporary material and equipment staging areas as needed;
- excavation of impacted soil for temporary onsite storage prior to disposal offsite;
- backfilling the perimeter ditch using imported common sand borrow and road gravel to support heavy equipment and trucks including drilling rigs, vacuum trucks, and service vehicles; and
- installation of temporary stabilization measures including woodchips or haymulch on disturbed surfaces during winter months.

Infrastructure For Ground Water Extraction System

- drilling and development of fifteen (15) extraction well clusters, each consisting of three (3) wells;
- excavation to approximately 15 feet bgs and associated dewatering activities for installation of lift stations;
- excavation to approximately 12 feet bgs and associated dewatering activities for installation of a buried sedimentation tank structure;
- installation of on-site conveyance piping (force and gravity mains) and on-site lift station connections; and
- installation of pads for extraction well buildings and footings for lift station control panels.

Leachate And Ground Water Extraction System

- installation of extraction well buildings and pumping systems;
- installation of pumps and controls for on-site lift stations;

- connection of on-site conveyance piping system to the City municipal sewer lift station, including connection from sedimentation tank and bathroom; and

- GWE system start up and testing.

Permeable Cover

- preparing areas at various areas on the surface of the landfill identified to have insufficient organic cover material or visibly exposed debris;

- placement and grading of specified supplementary cover materials; and

- stabilizing with specified seed mixes and fertilizer to establish a sufficient stand of vegetation.

Project Completion

- install final access road surface;

- install permanent fencing and gates; and

- conduct As-Built survey.

Maintenance of temporary erosion and sedimentation controls, such as removal of accumulated sediment from siltation fence, should occur throughout the project as necessary. The work sequence identified above and associated activities may be altered based upon field conditions encountered, and the CSWPPP will be updated as necessary.

3.6 SENSITIVE RECEPTORS

The New Hampshire Geographically Referenced Analysis and Information Transfer (NH GRANIT) system was reviewed to evaluate the potential for sensitive receptors in the vicinity of the Site. The following potential sensitive receptors were identified

- wetland areas located generally south of the perimeter ditch and identified as swamp/marsh;

- the Cocheco River located approximately 600 feet to the southeast of the Site;

- the Bellemy Reservoir located approximately 1,200 feet to the south of the Site; and

- grasslands, forested floodplains, and high and low elevation spruce-fir forest located south and east of the Site.

A copy of the NH GRANIT Soils, Water Resources, and Wildlife data layer maps are included in Appendix D.

3.6.1 Endangered or Threatened Species & Critical Habitat Protection

Coverage under the CGP is available only if storm water discharges, allowable non-storm water discharges, and discharge-related activities are not likely to jeopardize the continued existence of species that are listed as endangered or threatened under the Endangered Species Act (ESA), or result in the adverse modification or destruction of habitat that is designated or proposed to be designated as critical under the ESA.

On November 4, 2010, an inquiry was submitted to the Natural Heritage Bureau (NHB) to evaluate the potential presence of endangered or threatened species and critical habitats in the work area. NHB evaluation of potential impact to rare or endangered species dated November 5, 2010 is included in Appendix D.

Based upon the information provided by NHB, the following criterion will be reviewed to evaluate compliance with CGP requirements:

Criterion A No federally-listed threatened or endangered species or their designated critical habitat are in the project area as defined in Appendix B; or

Criterion B Formal consultation with the Fish and Wildlife Service and/or the National Marine Fisheries Service under section 7 of the ESA has been concluded and that consultation:

i. Addressed the effects of the project's storm water discharges, allowable non-storm water discharges, and storm water discharge-related activities on federally-listed threatened or endangered species and federally-designated critical habitat, and

ii. The consultation resulted in either:

a. Biological opinion finding no jeopardy to federally-listed species or destruction/adverse modification of federally-designated critical habitat, or

b. Written concurrence from the Service(s) with a finding that the storm water discharges, allowable non-storm water discharges, and storm water discharge-related activities are not

likely to adversely affect federally-listed species or federally-designated critical habitat; or

Criterion C Informal consultation with the Fish and Wildlife Service and/or the National Marine Fisheries Service under section 7 of the ESA has been concluded and that consultation:

i. Addressed the effects of the project's storm water discharges, allowable non-storm water discharges, and storm water discharge-related activities on federally-listed threatened or endangered species and federally-designated critical habitat, and

ii. The consultation resulted in either:

a. Biological opinion finding no jeopardy to federally-listed species or destruction/adverse modification of federally-designated critical habitat, or

b. Written concurrence from the Service(s) with a finding that the storm water discharges, allowable non-storm water discharges, and storm water discharge-related activities are not likely to adversely affect federally-listed species or federally-designated critical habitat; or

Criterion D The construction activities are authorized through the issuance of a permit under section 10 of the ESA, and that authorization addresses the effects of the storm water discharges, allowable non-storm water discharges, and storm water discharge-related activities on federally-listed species and federally-designated critical habitat; or

Criterion E Storm water discharges, allowable non-storm water discharges, and storm water discharge-related activities are not likely to adversely affect any federally-listed threatened or endangered species or result in the destruction or adverse modification of federally-designated critical habitat; or

Criterion F The project's storm water discharges, allowable non-storm water discharges, and storm water discharge-related activities were already addressed in another operator's valid certification of eligibility under Criteria A-E which included your construction activities and there is no reason to believe that federally-listed species or federally-designated critical habitat not considered in the prior certification may

be present or located in the project area. By certifying eligibility under this criterion, you agree to comply with any measures or controls upon which the other operator's certification was based.

Therefore, based upon a review of the criterion, information provided by NHB, and the SCRA, storm water discharges meet the requirements of Criterion E.

3.6.2 Historic Property Protection

To be eligible for coverage under the CGP, this Property must be in compliance with the National Historic Preservation Act. According to the National Register of Historic Places online database, 16 historic places are located in Dover, NH. The County Farm Bridge, located approximately 1.5 miles from the proposed project activities. is the closest historic property. Because of the distance of the historic properties to the proposed project activities, the SCRA activities are not anticipated to affect the historic places. For reference, a copy of the National Register of Historic Places record cards for the city of Dover, New Hampshire are included in Appendix D.

3.6.3 Receiving Waters

Storm water runoff from a large portion of the Site is directed towards the Cocheco River via the perimeter ditch. Because the anticipated construction activities include filling and re-grading the perimeter ditch, storm water collected within the ditch will be managed to prevent impacted storm water from discharging to the Cocheco River. Storm water will be managed by a combination of measures including dewatering the ditch and treating and infiltrating the water on the landfill surface, installing culvert inlet controls prior to storm water leaving the Site, and diverting storm water from the perimeter ditch towards the wetlands south of the Landfill. It is anticipated that dewatering will be conducted as described in Sections 4.2.2 and 4.2.6. If accumulated water is encountered within the ditch during filling activities, the water will likely be pumped to the Landfill surface where is will be treated (if necessary) and allowed to infiltrate through the Landfill surface.

3.7 CONSISTENCY WITH TOTAL MAXIMUM DAILY LOADS

The Total Maximum Daily Load (TMDL) of a waterbody is calculated using the maximum amount of a pollutant that nearby surface water may receive and still achieve water quality standards. Construction activities typically generate suspended sediment, which may affect parameters such as turbidity and total suspended solids. Surface water bodies in the vicinity

of the Site have USEPA established TMDLs. A summary of the TMDL located in the vicinity of the SCRA is presented below.

The Bellamy Reservoir appears in the USEPA 303d List of Impaired Waters (2008) for mercury. The Cocheco River (and tributaries) appears in the USEPA 303d List of Impaired Waters (2008) for mercury, pH, Escherichia *coli*, and iron. Copies of the USEPA Waterbody Quality Assessment Report are included in Appendix D.

The USEPA is the current permitting authority for the CGP for the State of New Hampshire. According to the USEPA, construction activities that fully and properly implement CGP requirements are deemed to have achieved the requirements and comply with the assumptions of TMDL. Therefore, implementation of applicable storm water controls described in this CSWPPP are expected to achieve the requirements of TMDL.

4.0 POTENTIAL POLLUTION SOURCES AND CONTROL MEASURES

4.1 EROSION, RUNOFF, AND SEDIMENT CONTROL MEASURES

The objective of the CSWPPP is to minimize degradation of general runoff quality that leaves the work areas as sheet flow and concentrated flow. Controls and procedures will be implemented to: 1) limit the availability and exposure of potentially erodible materials; 2) minimize water generated during work activities; 3) temporarily retain or reroute surface water flow; 4) modify work activities where practicable to address weather conditions, project characteristics, and specific nature of the activities; and 5) protect and isolate the flow outlets from surface water that could potentially be degraded by work activities. However, the specific activity, project conditions, and work location will typically dictate the most appropriate BMP, or combination of BMPs, to be employed during the proposed work to be performed by the Contractor.

The Contractor shall initiate the erosion and sediment controls as outlined in the Contract Drawings. As construction and project conditions change, modifications to these controls may be necessary that may result in the installation of additional or different controls not specified in the contract. The Contractor will coordinate with the Engineer for approval of the resources to install these additional controls, where applicable.

Erosion controls (siltation fences) will generally be installed along the southern perimeter of the SCRA to inhibit soil and sediment disturbed by construction activities from discharging to adjacent forested wetlands. Additional erosion controls will include installation of a construction entrance consisting of coarse gravel to reduce vehicle tracking of dirt and sediment onto Tolend Road, installation of temporary dewatering sedimentation stations for dewatering fluid from perimeter ditch sediment excavation and utility trenching, installation of culvert inlet protection at the Tolend Road discharge location, and installation of an impacted soil staging and dewatering pad. Other erosion and sedimentation controls may be used by the Contractor, as warranted, to manage site storm water runoff conditions including, but not limited to, such measures as stone-lined sediment traps, placement of wattles, and stone check dams. Coarse aggregate material currently covers the surface of the existing Landfill entrance. The condition of the existing Landfill entrance will be evaluated for additional enhancement prior to construction activities.

The Contractor will make reasonable efforts to perform construction activities in coordination with weather conditions to generally avoid situations that might intensify project disturbance or result in a significant loss of erosion and sedimentation control effectiveness. To the extent practical, construction sequences will be chosen to maximize the

Contractor's ability to properly manage the project regarding erosion and sedimentation control and storm water management issues. The Contractor will inform its subcontractors about project-specific requirements and assist them in meeting the objective of this CSWPPP, as necessary.

Erosion and sedimentation control measures will be instituted prior to construction and assessed and maintained/modified during construction. The anticipated general locations of certain temporary and permanent erosion and sediment controls associated with the construction are indicated on Contract Drawings 3-1 and 3-2.

4.2 SIGNIFICANT MATERIALS INVENTORY

Significant materials present at the project Site will include soil and rock stockpiles, concrete, stored petroleum for fueling construction vehicles, and general litter. Construction activities will be managed in a manner that will limit the exposure of significant materials to erosive forces during each phase of the project. Construction equipment must be properly maintained and special care must be taken when fueling machinery to avoid point sources of petroleum from impacting on-site soils that could potentially migrate off-site. A list of significant materials present at the project site including storage location, storage type, implemented CSWPPP control, date of storage, and date of scheduled disposal (if applicable) should be maintained and kept with the CSWPPP in Appendix E.

4.2.1 Soil Stockpiles

Construction of temporary stockpiles may be necessary during the construction activities. The location of stockpile(s) will vary depending upon the work being performed and duration of storage, but generally will be located within the defined limits of earth work defined on Contract Drawings 2-1 and 3-1.

The nature of stockpiling of erosion-susceptible soils will be task-specific, but will be conducted to minimize impacts to storm water by utilizing, at minimum, perimeter silt fence around the downstream section of the stockpiles. Temporary covers (i.e., plastic sheeting or tarps) should also be used where practicable to isolate the stockpiles from erosive forces caused by significant precipitation and wind. In accordance with the CGP, stockpiles unused for 14 days or longer require a temporary cover or should be vegetated with a fair stand of grass.

If needed, sheeting used to cover stockpiles will be of strength consistent with the intended function of the cover. At a minimum, polyethylene sheeting of at least 10-mil thickness will

be used over stockpiled soil materials. Multiple sheets used to cover a stockpile must overlap by at least 1 foot and will be anchored by rocks, tires, bricks, or other objects of a suitable weight sufficient to maintain the security and integrity of the cover for the duration of its use. Stockpiles may be underlain by sheeting, depending upon the nature of the materials being placed in the stockpile.

4.2.2 Impacted Sediment Stockpiles

Approximately 700 cubic yards of arsenic-impacted sediment will likely be excavated from the perimeter ditch and staged at a designated location on top of the Landfill. At a minimum, the impacted sediment staging area will be surrounded with silt fence (with haybales if necessary) and covered at all times with polyethylene sheeting of at least 10-mil thickness when not actively being managed. Excavated sediment will be transported to the staging area in watertight containers, deposited, and free liquids, if present, will be allowed to drain prior to waste characterization and disposal. Pore water that drains from sediment excavated from the perimeter ditch will be allowed to infiltrate into the Landfill. Ultimately, the liquid that drains into the Landfill associated with sediment dewatering activities is expected to be captured at the toe of the Landfill by the ground water extraction system.

Transport of impacted material from the perimeter ditch to the top of the Landfill will be performed using dump trucks or roll-offs. Vehicle storage compartments will be lined with polyethylene if necessary to prevent loss of material (i.e., if the moisture content of the material is too high to be contained in the compartment without leaking out, the compartment must be lined or otherwise water-tight). Vehicle transport paths will be identified during the work and vehicle decontamination will be conducted as necessary whenever a vehicle leaves the SCRA. For off-site disposal of excavated materials, transport will be performed using covered trucks in accordance with applicable regulations.

Containment will be established to prevent potential erosion or other migration of potentially impacted sediment, and to minimize risk of contact with the materials. Stockpiles will be maintained during the work period. The staging area and stockpile layouts and construction details are presented on Drawing 3-2.

4.2.3 Erosion Pathways

Erosion rills and gulleys identified or formed during the project work will be managed by using distribution of mulch or rock to control surface runoff velocities, installing biodegradable erosion control materials, and/or alteration of flow paths such as installing temporary diversion berms. In addition, grading or installation of temporary sediment traps

may be used in combination with filters to slow flow velocity and trap suspended sediments along shallow concentrated flow pathways. The intent of the installation of controls within erosion paths will be to, first, minimize the potential for impacted storm water to flow into channels or storm water pathways and, second, to improve the quality of the storm water flowing from the work area.

4.2.4 Residual Concrete Material

The construction activities will require the use of concrete and grout. Unusable concrete, grout, and concrete rinse water should be disposed by transporting it back to the concrete batch plant/quarry (if delivered by truck). If volumes are not significant, the material can be disposed in a temporary concrete/grout washout station, where the material will be contained from migration in storm water. The concrete/grout washout station can be constructed in a similar method to the dewatering infiltration basin.

Freshly-placed concrete and grout should be covered with polyethylene or tarps in the event of precipitation to prevent erosion into surface water. On-site disposal of unusable concrete and rinse water should be performed in a manner to not create uncontrolled releases that would impact surface water bodies or create accelerated erosion of existing soils or surface runoff pathways. On-site disposal must not be located within defined flow pathways.

4.2.5 Petroleum Storage

Temporary storage of petroleum (i.e., diesel) for the fueling of equipment may be required in small quantities for the construction activities. Anticipated storage volume is not expected to exceed 500 gallons. The petroleum will be stored in an American Petroleum Institute/National Fire Protection Act approved aboveground storage tank equipped with appropriate secondary containment capable of capturing 110 percent of the stored volume.

Fueling activities should be monitored closely to avoid overfilling and incidental spills. Spills of any size should be cleaned up immediately with appropriate absorbent materials. The general location of petroleum storage areas shall be approved by the Engineer prior to placement.

4.2.6 Ground Water Management and Dewatering

Arsenic impacted ground water may be exposed during the construction activities. Exposed ground water should not be discharged to surface water. The Contractor will be required to install movable temporary dewatering systems to keep the subgrade dry and convey ground

water away from the excavations. The Contractor, to the extent feasible, should not allow storm water and ground water to comingle. Storm water that comingles with ground water shall be handled as ground water.

4.2.7 Exposed Refuse

Several types of refuse conditions may be encountered, including:

1) apparent hazardous waste as evidence by olfactory, visual, or field screening observations;

2) common municipal waste or construction debris;

3) surficial debris mixed with soil (i.e., windblown litter); and

4) contact with refuse but in a manner that does not disturb it.

Where waste is encountered, the Contractor shall limit the surface area of the exposure and also limit the disturbance of the materials until characterized by the Engineer.

Where non-hazardous waste is exposed, the Contractor will notify the Engineer and mark the area to prevent unnecessary disturbance. Exposed waste will be managed to:

- minimize the dispersal of potentially offensive odors;
- minimize the potential to attract and harbor vectors;
- promote the drainage of water away from the refuse;
- control unsightly conditions and windblown refuse;
- reduce the potential for fire;
- improve stability, as applicable; and
- facilitate achieving final grades.

Such refuse shall be covered at the end of each day and upon completion of excavation or filling activities to minimize the potential for contact with storm water. Temporary covers may be used, such as polyethylene, as well as natural soils.

Landfill records and information regarding past landfill operations indicate that hazardous materials and refuse were disposed of at the Landfill. If the Contractor encounters refuse that is suspected to be hazardous waste because of its odor, container type, appearance, or field screening observations, the measures discussed in the following paragraphs will be implemented, in addition to complying with proper health and safety activities.

If the exposed material is determined by the Engineer to warrant being designated as hazardous, further access restriction will be asserted using temporary snow fencing to define an exclusion area, as necessary. If the material is obviously volatile, reactive, or particularly odorous, the Contractor will cover it for an interim period using temporary cover methods such as soil or polyethylene tarps.

In certain circumstances, it may be possible for the waste material to be temporarily relocated to allow the work in the area to continue, although this may not be practical if containers, sludge or other materials are encountered that should not be unnecessarily disturbed. Exposed or temporarily relocated wastes must be covered to limit the potential to generate leachate from precipitation infiltration, and decrease the potential need to address impacted storm water runoff.

4.2.8 Miscellaneous Litter

General litter and incidental refuse (i.e., coffee cups and wrappers) generated from personnel at the project site have the potential to become windswept and impact nearby surface waters and properties if not disposed of properly. Personnel should diligently manage trash, and barrels with covers will be maintained at office trailers and within the Project, as practicable. Daily inspections of the work areas will be performed and litter removed as necessary.

4.3 EROSION AND SEDIMENT CONTROL MATERIALS

Materials used by the Contractor in compliance with the Contract Drawings and the intent of this CSWPPP are anticipated to be readily available and straightforward to install and maintain. The Contractor will maintain a sufficient inventory of control materials to allow prompt replacement of damaged or spent materials and prompt installation of new materials in areas of new work.

4.3.1 Standard Control Materials

Control materials to be readily available include:

- silt fence (hay bales for support as necessary);
- temporary grass seed (annual rye seed);
- berm and check dams constructed of inert material (soil, stone, and/or rock) free of silt, clay, and organics;
- non-woven geotextile fabric (6-ounce non-woven geotextile and Average Opening Size (AOS) 70 woven geotextile);
- temporary discharge basin;
- fractionation (frac) tanks;
- erosion control matting, biodegradable and semi-biodegradable as required; and
- spill kits containing absorbing devices, or approved spill absorbent.

4.3.2 Supplemental Erosion and Sediment Control Material

If conditions arise because of some unique or unforeseen combination of project site conditions, weather, and/or construction activity that require supplemental erosion and sediment control materials, the Contractor may consider the following controls to properly address the issue:

- washed 0.75-inch stone that is acceptable for check dams, drop inlet barriers, and stone-lined sediment traps;
- mulch, straw hay, or approved equivalent;
- compost and/or straw wattles;
- indigenous grass seed mixtures;
- concrete/grout washout basin; and
- olephilic booms.

5.0 BEST MANAGEMENT PRACTICE SELECTION AND IMPLEMENTATION

5.1 SELECTION OF EROSION CONTROL BEST MANAGEMENT PRACTICES

The objective of erosion control is to protect the soil and other erodible material surfaces to prevent erodible particles from being detached by precipitation or wind. Vegetative cover is the primary erosion control practice, and is the most efficient (90 percent reduction in erosion) and economical method of controlling sheet, rill, and raindrop impact erosion. Important criteria for reducing erosive forces include:

- maintain vegetative cover wherever possible, and clear and grub in stages to minimize the size of exposed areas;
- limit the availability and exposure of significant materials (in particular, potentially erodible materials by providing cover);
- perform construction procedures in a manner that, to the extent practicable, considers weather conditions, project characteristics, and specific work tasks;
- use protection measures compatible with the nature of the slope and location of the exposed area;
- establish cover as soon as possible after disturbance; and
- seed with fast growing, native grasses and/or protect exposed soil with mulch or other approved covers to provide temporary erosion control after construction activities have concluded until permanent control is established.

The following BMPs are designed to significantly reduce the contact of exposed soil with precipitation or wind, and reduce the potential for associated adverse surface water quality impacts.

5.1.1 Native Topsoil

Native topsoil shall be stripped from construction areas in a sequential manner according to the scheduling BMP previously described. Topsoil shall be stockpiled in suitable locations in a stabilized stockpile that will not erode, block drainage pathways, or interfere with site

work. The anticipated stockpile area is identified as the "Construction Staging Area" as illustrated on Contract Drawing 2-1.

Preservation of native topsoil should be performed, if feasible, to reduce the quantity of high organic-containing materials that will have to be imported for surface stabilization following the completion of construction activities. The stripped topsoil must have a high organic-matter content, a sufficient water-retaining capacity, and a sufficient nutrient content. Topsoil shall be spread sequentially on exposed areas once construction activities have been completed in accordance with the scheduling BMP. The subsurface shall be frost-free and well graded prior to topsoil placement. Once a sufficient layer of topsoil has been established (4 to 6 inches and seeded), mulch, straw, or erosion control matting shall be used (see associated BMP) for anchoring and stabilization.

Required Maintenance

Stabilization of the topsoil once placed on exposed surfaces is necessary to prevent off-site migration of soil particles (refer to mulching and permanent seeding BMPs). Until a fair stand of grass is present, topsoil areas shall be inspected regularly and after every significant rain event to ensure that the area is stabilized and identify repair efforts, if warranted.

5.1.2 Surface Roughening

Surface roughening is a technique for reducing erosion of exposed soil surfaces by "tracking or grooving" with construction equipment. This technique is suggested to reduce runoff velocity down bare slopes, to increase the infiltration rate of the soil, and to trap sediment. This technique should be used on bare slopes to reduce erosion by up to 50 percent. It is important to ensure that grooving is generally horizontal to the slope, following the slope contour. This provides an increased infiltration rate and reduces splash erosion. Back-blading or compaction of slopes by a flat roller should generally be avoided.

This technique should also be used with the mulching and permanent seeding BMP for surface stabilization. Seed, fertilizer, and straw mulch shall be applied and then tracked with the bulldozer to obtain optimum seed germination and growth (see mulching and permanent seeding BMP).

Required Maintenance

Slopes of concern shall be inspected after construction activities or after every significant storm event until vegetation is established. If damage has occurred to the slope, reestablish horizontal grooves by running a bulldozer up and down the slopes. Place mulch on slopes if tracking alone does not provide sufficient protection (see mulching BMP).

5.1.3 Mulching

Application of straw mulch, woodchips, or other suitable material to a bare soil surface may be necessary as a temporary measure to protect soil surfaces on steep slopes (3:1 or steeper). This technique protects the soil surface from raindrop impact, significantly reduces sheet flow energy, promotes infiltration, and conserves moisture. For temporarily stabilizing slopes, anticipate applying 2 to 3 tons of mulch per acre, in a thickness of approximately 2 to 4 inches, and a coverage rate of 90 percent of the soil surface. Straw mulch should be punched into the soil using tracked equipment with the grooves positioned parallel to the slope contours or using anchored biodegradable netting to minimize material from blowing or washing away. Mulches may also be applied by sprayed-on techniques.

Required Maintenance

Mulched slopes shall be inspected following every significant rainfall event (i.e., 0.5 inches or greater in a 24-hour period). In the event that riling or channeling is observed, mulch shall be reapplied and secured by the tracking technique. It should be noted that straw mulch has a useful life of 0.5 to 3 years. The use of mulch shall be continued as needed until a fair stand of grass is established.

5.1.4 Erosion Control Matting

ECM is a rolled sheet product often made of straw, coconut fiber, excelsior, or synthetic material that is enveloped in plastic or biodegradable netting to maintain its structure. ECM is an effective BMP to stabilize grass-lined drainage swales where water flow may potentially reach velocities greater than 3 to 6 feet per second, or on steep slopes (3:1 or greater). The Contractor may prefer to use ECM to temporarily stabilize permanently seeded slopes or drainage swales rather than straw hay or mulch BMPs.

Installation

Care will be taken to provide sufficient overlap and burial so that a shingled effect is achieved in the downstream direction of flow. Securing and stapling the blankets to anchor them to the ground surface shall be in accordance with the manufacturer's specifications or as per the Engineer's direction.

Maintenance

ECM shall be inspected following every significant rainfall event until sufficient vegetation is established. Gaps or undermining of the mats should be immediately repaired. The ECM shall be maintained or replaced (where used) until a fair stand of grass is established.

5.1.5 Permanent Seeding

Permanent seeding with perennial vegetative cover on disturbed soil areas is required sequentially once segments of the construction have been completed. The use of indigenous or naturally-occurring grasses is recommended to establish a healthy stand of vegetation. Seed mixtures are listed in the 100% SCRD and on Contract Drawing 8-1. Slopes designated for treatment with ECM should be seeded first and will require special seed blends. The potential for erosion will still exist during the vegetation establishment stage. Proper seeding is essential to encourage germination and fast growth. Proper seeding includes, but is not limited to:

- applying permanent seeding at the correct density and under the correct conditions where no further disturbances are planned;
- applying permanent seeding before freezing weather is anticipated or to avoid arid conditions of the late summer;
- using seeds appropriate to the season and site conditions;
- using a proper indigenous seed blend;
- adjusting pH and nutrient ratio of the soil if necessary; and
- anchoring seed with straw mulch or wood chips and track using bulldozer with grooves horizontal to the slope.

Required Maintenance

Seeded slopes shall be inspected for evidence of erosive forces including splash erosion, rilling, or channeling. Stabilization methods shall be reestablished to prevent further damage to exposed areas. Reseeding must be conducted in areas where germination rates are not acceptable.

5.1.6 Energy Dissipaters/Check Dams

Energy dissipaters are used to control erosion typically at the outlet of a channel or conduit, or in a grass lined drainage swale by reducing the velocity of flow and dissipating the energy inherent therein. A riprap-lined apron may be used to satisfy this requirement at channel or conduit outlets, but in higher flow situations, a riprap dissipater may require containment in a gabion mattress to maintain its effectiveness. The length of apron sections shall be long

enough to dissipate energy, and filter fabric or 6-inch thick minimum coarse-graded gravel layer will be required to reduce the energy-induced erosion into surface runoff.

Check dams can be used for this project in grass lined swales that receive concentrated flows and are down slope from disturbed work areas. Check dams will also be used as scour protection at the end of silt fence sections and along long lengths of silt fence sections that may accumulate shallow concentrated flows during significant precipitation events.

Required Maintenance

Periodically inspect check dams and outlet structures after a significant rainfall event to ensure that scour or undermining of device has not occurred. Check that sediment has not accumulated on the check dam surface, and remove it as necessary. This BMP shall not be removed unless directed by the Engineer.

5.2 SELECTION OF SEDIMENT CONTROL BEST MANAGEMENT PRACTICES

Erosion controls discussed above are preventative measures to reduce the amount of soil and other erodible materials that have the potential to be transported by wind or precipitation. Sedimentation control is the last line of defense for off-site transportation of sediments and can be considered a treatment technique. Because sedimentation is the product of erosion, proper sediment control must be used to keep the deposition of erodible particles that have been transported by water or wind on-site. Sediment control devices have been designed to impound potentially sediment-laden runoff for a certain retention time, as necessary to promote soil particles to settle out of suspension. It is important when implementing the BMPs listed below to consider their ability to retain and reduce the velocity of runoff rather than try to filter sediment from the runoff. The performance of structures that are designed or installed to mainly filter sediment will generally fail during significant storm events and potentially worsen the transport of sediment off-site.

5.2.1 Silt Fence

Silt fence will be used as a temporary sediment control structure consisting of semi-permeable fabric entrenched into the soil and attached to supporting stakes. Silt fence will be installed between construction areas and adjacent sensitive areas. Specifically, it shall be installed to capture and provide treatment of sheet flow from unprotected slopes during construction. Ponding is expected to occur on the upgradient side of the silt fence during a precipitation event, and is intended to provide retention time for most sediment to settle out of suspension. Silt fencing may also be installed off-contour to divert potential run-on flows

and to concentrate flows to runoff control structures if approved by the Engineer. Proper installation (i.e., securing the bottom of the fabric in a trench) is critical to ensure that the silt fence functions as intended. The following installation criteria are recommended.

Installation

- Filter fabric siltation fencing shall be a woven filter fabric having a permittivity of not less than 0.15 seconds, a water flow rate of a minimum 12 gallons per minute per square foot, and a grab tensile strength of a minimum of 100 lbs. The material shall have a high sediment filtration capacity, high slurry flow and minimum clogging characteristics.

- Silt fence will consist of woven propylene, nylon, polyester, or ethylene yarn with an Apparent Operating Size not less than 70. The fabric will include stabilizers or inhibitors or both to make the filaments resistant to deterioration resulting from exposure to sunlight or heat.

- The upright sections of fabric will be at least 36 inches in height and will be supported by hardwood stakes (4 feet, 6 inches long) driven securely into the ground and spaced not greater than 6 feet apart.

- Staples or wire should be used to secure the fabric directly to the stakes.

- The bottom edge of fabric shall be buried 6 to 8 inches in a shallow continuous trench along the alignment of the fence line, and the anchoring soil shall be well compacted to prevent short-circuiting of runoff underneath the silt fence.

- The silt fence shall be installed in such a way as to prevent runoff from passing over, under, or around the silt fence and in such a way that runoff passes through the silt fence fabric to promote filtration.

- The maximum slope upgradient of the silt fence shall be 2:1.

- Fencing shall typically be placed on contour to be most effective in sediment control applications.

- Silt fence shall be arranged in a "smile" configuration so that the ends are turned uphill, unless otherwise approved by the Engineer.

- Silt fence shall be placed at least 6 feet away from the toe of the slope to increase ponding volume. Ponding height behind the silt fence shall not exceed 18 inches.

Silt fence will be installed prior to, or concurrent with clearing and grubbing activities to provide initial sediment control. Silt fence shall be adjusted to accommodate changing project conditions and should always be positioned between construction areas and adjacent sensitive receptors or storm water control structures. Silt fence will also be used to control runoff from stockpiles on-site. As described previously, silt fence may also be used as diversion barriers when placed off-contour to channel water to stone-lined sediment traps.

Maintenance

Silt fence shall be inspected regularly and after every significant storm event. Repairs in damaged silt fence shall be made immediately. Accumulated sediment should be removed from behind the upgradient side when sediment reaches one-third the silt fence height. Silt fencing typically has a useful life of one year. Replace silt fencing as required to maintain efficiency. Remove silt fence once slopes have been adequately stabilized and all permanent erosion and runoff control structures have been completed.

5.2.2 Compost/Straw Wattle

Compost wattles can be used as a temporary sediment barrier and consist of tubular netting filled with a specified compost and wood fiber mix. Compost/straw wattles can be installed between construction areas and adjacent sensitive receptors, and used for drop inlet protection. Wattles can also be installed in place of silt fence where trenching is not possible due to frozen ground or irregular or pavement surfaces. The following installation criteria are recommended.

Installation

- Compost/straw wattles will include an outer reinforcement of photodegradable netting made of woven propylene, nylon, polyester, or ethylene yarn.

- Compost or straw used shall be weed free and derived from a well-decomposed source of organic matter.

- The compost shall be produced using an aerobic composting process meeting CFR 503 regulations, including time and temperature data indicating effective weed seed, pathogen and insect larvae kill. The compost shall be free of any refuse, contaminants or other materials toxic to plant growth. Non-composted products will not be accepted.

- The compost/straw wattles will be installed in such a way as to prevent runoff from passing over, under, or around the compost wattle and in such a way that runoff passes through the compost wattle.

- Anchoring of the wattles shall be conducted in accordance with manufactures recommendations, project conditions and as show in the Contract Drawings.

- The maximum slope upgradient of the compost/straw wattle shall be 2:1.

- They shall be placed on contour to be most effective in sediment control applications.

- Compost/straw wattles shall be arranged in a "smile" configuration so that the ends are turned uphill.

- Compost/straw wattles shall be placed at least 6 feet away from the toe of the slope to increase ponding volume. Ponding height shall not exceed two-thirds the height of the wattle diameter.

Compost/straw wattles can be installed prior to, or concurrent with clearing and grubbing activities to provide initial sediment control. Compost/straw wattles can be relatively easily adjusted to accommodate changing project conditions. Compost/straw wattles can also be used to control runoff from stockpiles on-site. Compost/straw wattles may also be used as diversion barriers when placed off contour to channel water to stone lined sediment traps.

Maintenance

Compost/straw wattles shall be inspected regularly and after every significant storm event. Repairs in damaged compost wattles shall be made immediately. Accumulated sediment should be removed from behind the upgradient side when sediment reaches one-half the compost/straw wattle height. Replace compost wattles as required to maintain efficiency. Compost/straw wattles should be removed once slopes have been adequately stabilized and all permanent erosion and runoff control structures have been completed. The compost/straw within the wattles can be broadcast over restored and existing vegetated areas and the netting disposed properly.

5.2.3 Stone Lined Sediment Trap/Basin

If BMPs are not sufficient to prevent off-site migration of sediment, stone lined sediment traps should be used to decrease the velocity of concentrated flow and allow sediment to settle out of suspension. If used, the sediment trap should be equipped with two check dams placed in series. The outlet of the sediment trap/basin must be protected with a riprap apron to prevent scour.

For drainage locations serving less than 10 acres, smaller sediment basins and/or sediment traps should be used. At a minimum, silt fences, vegetative buffer strips, or equivalent

sediment controls are required for all down slope boundaries (and for those side slope boundaries deemed appropriate as dictated by individual site conditions) of the construction area unless a sediment basin providing storage for a calculated volume of runoff from a 2-year, 24-hour storm or 3,600 cubic feet of storage per acre drained is provided.

Installation

Installation shall be in accordance with a design provided by the Engineer as show in Contract Drawing 3-2.

Maintenance

- Inspect for degradation or damage weekly and after every significant rain event.
- Repair damage as necessary.
- Remove accumulated sediment as necessary to ensure proper function.

6.0 NON STORM WATER CONTROL MEASURES AND BEST MANAGEMENT PRACTICES

The CGP applies to the discharge of storm water and certain non-storm water discharges. Examples of non-storm water discharges include the following:

- water combined with polymers for stabilizing slopes and dust suppressants (e.g., calcium chloride);
- discharges from fire-fighting activities;
- non-potable water used during testing or cleaning of new buried pipelines;
- potable water including waterline flushing;
- water used to wash vehicles where detergents are not used; and
- uncontaminated ground water.

In addition to those mentioned above, potential non-storm water discharges that may be encountered at the site and their BMPs are described below.

6.1 CONCRETE/GROUT WASHOUT STATION

Unused concrete/grout and associated washwater will need to be disposed of on-site or transported back to the batch-plant or quarry. If disposed on-site, the unused concrete/grout and washwater should be managed using a sedimentation pit or a series of compost wattles configured in a sinuous path to settle and contain the entire volume of unused concrete or washwater. The forebay of the washout station should be underlain with 10-mil thick polyethylene sheeting or filter fabric at the discharge location to aid in preventing erosion of the ground surface. These activities shall occur in designated locations on top of the landfill as approved by the Engineer.

Installation

Installation of the concrete/grout washout station should be in accordance with a design provided by the Engineer. In general, the design should provide for adequate detention and storage of the concrete/grout-laden washwater.

Maintenance

- Inspect for function daily and after each washout event.
- Remove accumulated concrete/grout when thickness exceeds 8 inches, if practicable, otherwise expand facility.
- Expand capacity by adding additional chambers to the station as necessary and to accommodate significant volumes of unused concrete/grout.
- Cover station with sheeting prior to storm events to reduce potential for ponding within station and re-suspension of concrete/grout-related sediment.

6.2 CONSTRUCTION DEWATERING DISCHARGES

Assessment of the project site conditions and proposed construction activities identified areas that could potentially intercept ground water. Dewatering discharges associated with excavation activities will be properly permitted, as may be applicable, and managed to minimize the creation of sediment-laden water (such as by using filters at pump inlets and by pumping clear water off of impoundments to avoid disturbing sediments at the bottom) and the erosion of exposed soils (such as by controlling and reducing discharge flow velocities where significant sediment is present).

Water should be directed to dewatering siltation basins indicated on the Contract Drawings or other collection structures approved by the Engineer at the Landfill surface. The basins or collection structures shall be installed and operated in accordance with a separate Dewatering Management Plan prepared by the Contractor. The basins or collection structures shall be sized such that the expected dewatering volumes can be managed within them.

The dewatering discharge will require treatment prior to discharge to limit the total dissolved arsenic concentrations to below 10 ppb of the discharge. Treatment is likely to include filtration through a resin media. Discharge is expected to be accomplished by infiltration into the Landfill. Sediment that accumulates in the basins will be excavated and transferred to the sediment dewatering stockpiles, as needed during operation of the basins, and at the end of dewatering. Treatment residuals will also be transferred to the sediment dewatering stockpiles for dewatering and off-site disposal. The temporary dams shall be removed as each segment is backfilled and the material used to construct the dams shall be stockpiled for off-site disposal unless otherwise approved by the Engineer.

6.3 LIQUID RELEASES

The Contractor personnel will implement release response procedures to address releases of significant material of a liquid nature (such as fuel oil) that could reasonably discharge into nearby surface waters. A Spill Prevention Control and Countermeasure Plan will not be required for the construction activities. Because of the sensitive nature of surrounding receptors (i.e., drinking water supply reservoirs), releases must be addressed aggressively and promptly to minimize the potential for impact to the water bodies. If releases absorbed on the ground surface are observed during operations or routine inspections, the affected solids on the ground surface will be recovered by hand or mechanical equipment as soon as possible and disposed properly. Materials and equipment used in the cleanup of this material may include Speedi-Dri, rags, shovels, backhoe, loaders, United States Department of Transportation-approved storage drum, etc. Specific material handling procedures to reduce the potential for impacted water to enter a storm water conveyance or drainage point include covering impacted solids with sheathing, use of an absorbent material, and/or deployment of an absorbent boom at drainage outfall locations. A release to the ground surface may or may not require emergency response procedures, depending on the nature of the release.

6.3.1 Material Recovery

If releases of liquids to surface water (directly or indirectly) are observed during operations or routine inspections, the source of the release will be identified and the materials (liquids or solids) will be recovered by hand or mechanical equipment. Equipment used in the cleanup of releases to surface water may include skimmers, pumps, adsorbents, bailers, etc., as deemed necessary.

Releases to surface water will be immediately reported to the Engineer. The engineer will then contact the following:

- the National Response Center (800) 424-8802;
- the NHDES Drinking Water and Ground water Bureau at (603) 271-2513; or
- the NHDES Watershed Bureau at (603) 271-3414 (weekdays) and (603) 419-9229 (weekends);

The NHDES may also be contacted through the New Hampshire State Police at (603) 271-3636.

The Contractor project management staff will maintain records of significant material releases and response actions taken. These records will be kept and periodically reviewed to reduce the chances of release reoccurrence, to assess potential improvements that could be made to response procedures, and to comply with applicable federal, State, and local regulations.

Immediately following release response actions, the affected drainage path and associated possible collection points should be closely monitored to allow recovery of as much of the released material as possible. This includes identification and collection of released material that might be caught in stagnant zones and present a continued potential for migration after initial removal of accumulated material. Free product and/or impacted surface water shall be recovered to the extent practicable, as soon as possible after a detected release. This will increase the efficiency of the response actions and serve to minimize emulsified or dissolved phase material that could pass to sensitive areas.

Pumping of liquids recovered from a release should include transfer into a secure temporary holding container/basin. Absorbent material should be placed on the release locations and below identified sources of the release, and the waste absorbent material properly disposed. Impacted soil or other solids should be excavated and stored either in appropriate containers or covered with polyethylene sheeting.

Impacted material collected during the response must be removed promptly and disposed of in accordance with federal, State, and local requirements.

6.3.2 Sorbing Devices

Adsorbent booms, pads, and/or pillows may be used to aid in absorption of petroleum impacts in the event of a release at the project site. These materials will generally include replaceable oleophilic material and will be installed such that they are easily accessible for inspection and replacement. Replaceable sorbent booms or pads shall be readily available on-site in the event of a mechanical failure that results in a chemical spill. Sorbent booms or pads will be used to contain the spill to prevent the migration of constituents. They shall be secured using a nylon rope attached to the grate or near the top of the structure as applicable.

6.4 WIND EROSION AND DUST CONTROL

During the work, the Contractor will employ dust control measures to reduce blowing and movement of particulates from exposed soil surfaces. Dust control is anticipated to be required on unpaved access roads and in the vicinity of unpaved work areas traveled or

disturbed by vehicles or equipment. Dust control will consist of controlled spraying of water (in quantities and application rates that will not cause runoff), application of mulches or temporary covers (such as stone or tarps), and/or the installation of strategically placed windscreens. The Contractor will attempt, to the extent practicable, to minimize the surface area of exposed/disturbed areas and also the length of time of exposure to limit dust generation potential.

6.4.1 Traffic Control

The Contractor will inspect vehicles and equipment for loose debris before passing onto public ways to avoid inadvertent tracking or spilling of soil off-site. In the event that sediments or other significant materials are tracked onto public ways, the Contractor will employ methods such as sweeping (either by hand or mechanical means) to contain and remove the sediments. The Contractor is responsible for directing that trucks, including those owned and operated by subcontractors, travel with their canopy completely closed. Vehicle speed limits shall be reduced on unpaved roadways where dust generation in likely.

6.4.2 Wind Barriers

The Contractor may install wind barriers to control and minimize the effects of local wind erosion in certain areas. Where wind barriers will be used, they may consist of temporary silt fence or construction fence placed to reduce the erosive force of ground-level wind currents. Fencing supporting wind barrier material will be strong enough or reinforced to withstand reasonably expected wind forces and circumstances of construction.

6.4.3 Surface Mulches

Mulching used on re-vegetated surfaces is anticipated to include wood chips, chopped hay, or straw spread mechanically or by hand, or other biodegradable mulching materials such as those used in hydroseed mixtures. The purpose of the mulch will be to reduce the energy of falling precipitation at the ground surface, moderate surface temperatures, preserve soil moisture, minimize the effects of wind erosion, and minimize the effects of water erosion at the surface. Mulching will include crimping of dry hay or straw into the soil surface using tracked machinery when a tackifier or other anchoring system is not used, such that the mulch is not blown away by wind or washed away by surface water. Mulch will typically be applied at a minimum rate of 2 to 3 tons per acre and used after final grades have been achieved. Refer to the Mulching BMP for additional information.

6.4.4 Dust Suppressants

Dust control can consist of controlled spraying of dust suppressants (in quantities and application rates that will not cause runoff). The dust suppressant may contain calcium chloride or other proprietary formulas (i.e., emulsion or polyvinyl acetate). When considering additives for the suppression of dust, determine whether the chemical is biodegradable or water-soluble and what effect its application could have on the surrounding environment, including water bodies and wildlife. Use of dust suppressants must be coordinated with the Engineer.

7.0 MINIMUM PROTECTIVE MEASURES

Certain minimum erosion and sedimentation controls shall be required for the project to improve the likelihood that storm water quality will be preserved. Silt fence will be installed in accordance with Contract Drawings 3-2, and standard practices explained in section 5.2.1 of this CSWPPP. Erosion and sedimentation controls (e.g., silt fence, haybales, wattles, etc.) should be installed between the proposed SCRA construction areas and the wetlands to the south. The impacted sediment staging areas, the construction entrance, the construction staging areas, and the temporary dewatering sedimentation basins should be established in accordance with the Contract Drawings prior to commencing work.

8.0 MAINTENANCE AND MONITORING

The Contractor or its subcontractor(s) will conduct monitoring of erosion and sedimentation control devices at a frequency sufficient to ensure intended performance of the devices and to minimize the chances of improper function failure that might lead to surface water body impacts. Monitoring will include evaluation of sheet flow areas, defined channels or other waterways, and potential discharge locations to confirm that controls are performing acceptably. NPDES CGP classifies a significant storm event as 0.5 inches or greater received within 24 hours. Monitoring will be conducted not less frequently than once per seven calendar days during the course of normal construction activities and within 24 hours of the end of a significant storm event. Site specific CSWPPP Monitoring Forms are included in Appendix F. Evaluation of dust generation will be made visually based upon wind conditions and traffic/equipment activity.

Silt fence, stockpile covers, and controls at storm water inlets will be evaluated as part of the routine monitoring protocol, and, as warranted due to precipitation events, to verify that the intended function of the controls are maintained.

The Contractor will maintain controls in good functional order throughout construction, repairing and replacing sections damaged during the construction process, as necessary. Maintenance will include the removal of large accumulations of sediment behind controls, such as silt fence, that interfere with the intended function of the system. Sediment removed during maintenance of erosion and sedimentation control systems will be handled in accordance with project-specific plans for managing excavated solids. Materials that deteriorate or that become plugged with sediment, will be removed, properly disposed of and replaced.

Sorbing devices shall be placed, replaced, and maintained as necessary. Sorbent devices shall be disposed of in accordance with regulations governing disposal of such material.

8.1 REMOVAL OF EROSION AND SEDIMENT CONTROL MEASURES

Erosion control measures will be established within the areas identified or for the conditions discussed in this CSWPPP and will remain in place for the duration of the project work. Upon approval from the Engineer, erosion and sedimentation control materials and procedures will be removed and work areas will be restored. Wooden stakes and silt fence will be collected for re-use or disposal, as applicable. Plastic sheeting and other non-biodegradable material will be collected, removed from the project area, and disposed of

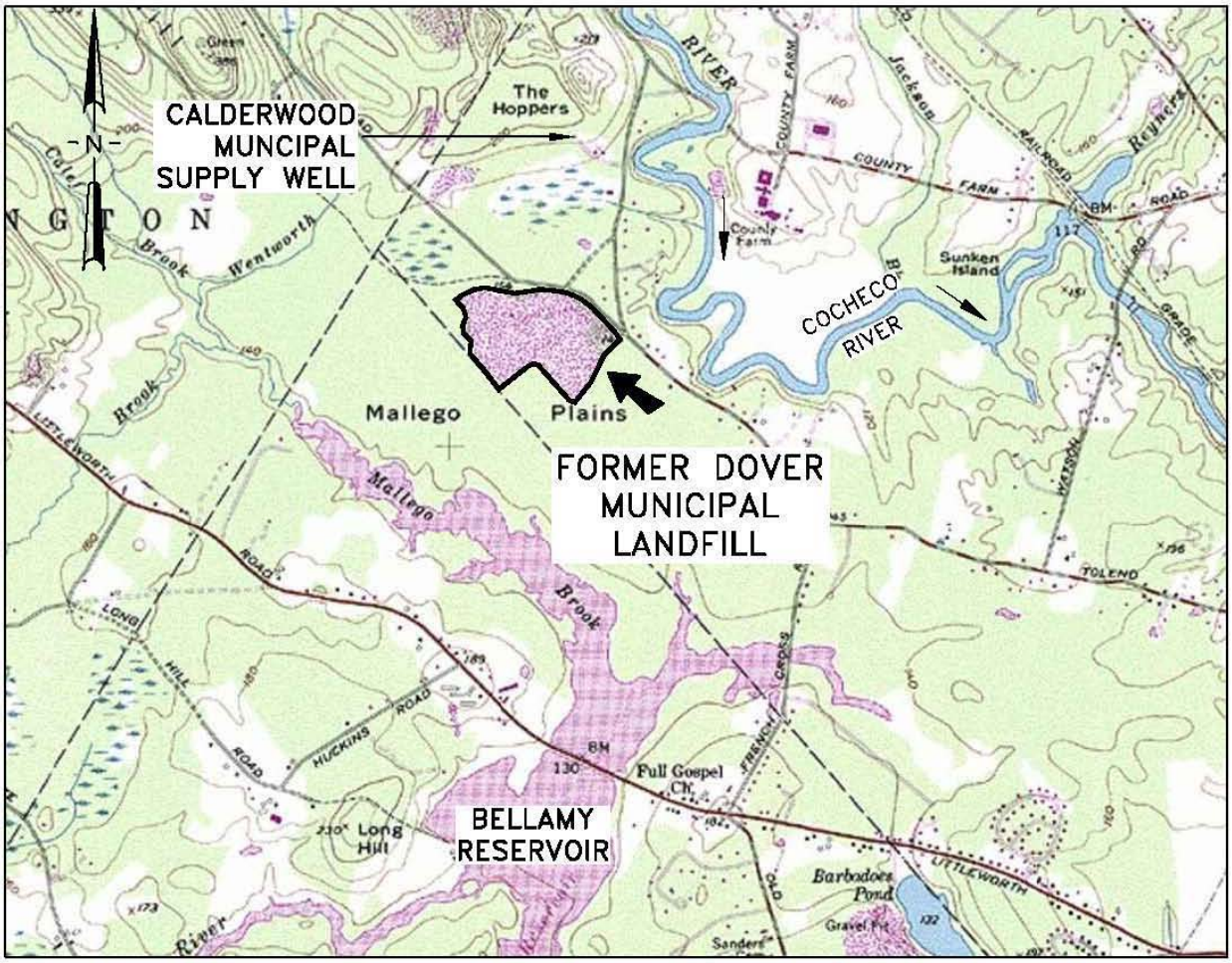
accordingly. Surfaces will be left in a graded condition that will not make them susceptible to accelerated erosion or require continued deployment of controls.

8.2 GOOD HOUSEKEEPING

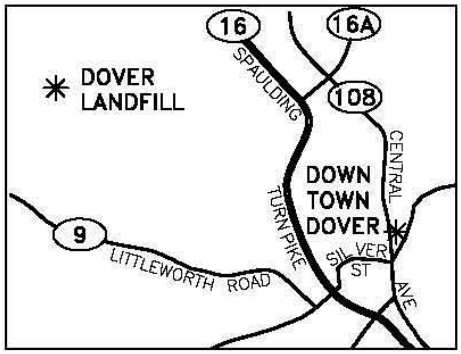
The Contractor will follow good housekeeping procedures to reduce the possibility of accidental releases and safety hazards to facility personnel. Key elements of the good housekeeping program include the following items:

- weekly monitoring of vehicles and equipment used at the project site to assess integrity of fluid containment systems and identify the need for repair or remedy of hydraulic/mechanical systems that could leak significant materials;
- weekly monitoring of excavations for the collection of water;
- regular maintenance of project vehicles and equipment to prevent de minimis releases;
- weekly monitoring of erosion and sedimentation control equipment, with prompt replacement as necessary;
- monitoring of nearby outfalls and water bodies during rain events to evaluate the effectiveness of the CSWPPP;
- proper handling, storage, and inventory of fuel and oil within project limits;
- orderly storage and inventory of significant materials and equipment; and
- prompt, routine removal of de minimis releases.

FIGURES



SITE AREA PLAN



LOCUS MAP
NOT TO SCALE

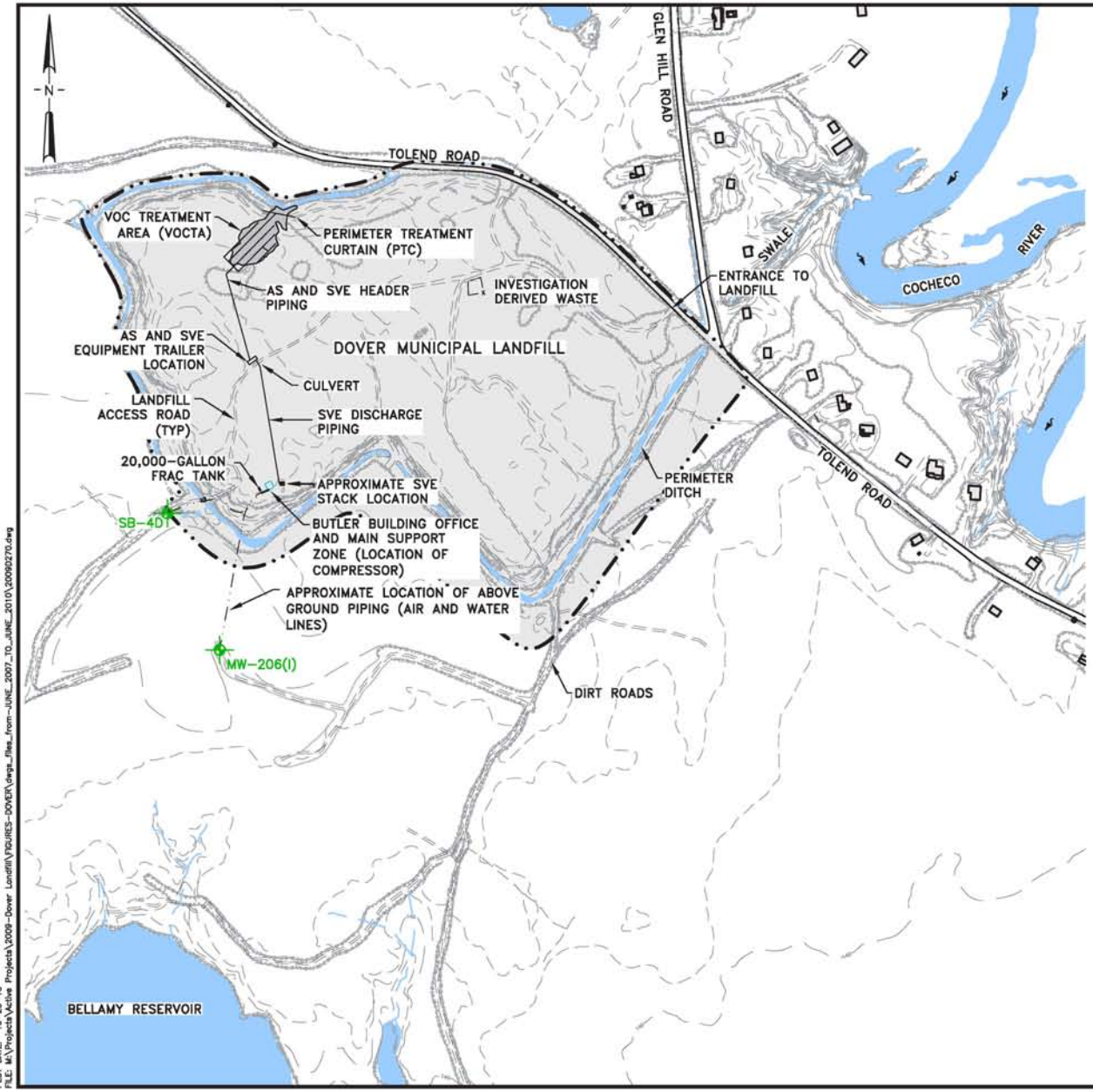
0 1/2 MILE 1 MILE
APPROX. SCALE IN FEET

CONTOUR INTERVAL 20 FEET

REFERENCE: TAKEN FROM USGS MAP "DOVER WEST, NH NW/4 15' QUADRANGLE, REVISED 1993.

CLIENT: DOVER GROUP				GeoInsight Practical in Nature
PROJECT: DOVER LANDFILL SUPERFUND SITE DOVER, NEW HAMPSHIRE				
TITLE: SITE LOCUS				
DESIGNED: CAB	DRAWN: NMT	CHECKED: CAB	APPROVED: MJW	
SCALE: AS NOTED	DATE: 09/24/10	FILE NO.: 2009-LOCUS	PROJECT NO.: 2009-006	FIGURE NO.: 1

PLOT DATE: 12-9-10
FILE: M:\Projects\Active Projects\2009-Dover Landfill\FIGURES-DOVER\dwgs_files_from-JUNE_2007_TO_JUNE_2010\2009-LOCUS.dwg



LEGEND

- 150 — EXISTING TOPOGRAPHIC CONTOUR
- PAVED ROAD
- UNPAVED ROAD OR DRIVE
- SOURCE CONTROL WORK AREA (APPROXIMATE)
- APPROXIMATE LOCATION OF NORTHWEST LANDFILL REMEDIAL SYSTEM
- APPROXIMATE LOCATION OF SOUTHERN PLUME – MOM REMEDIAL SYSTEM
- MW-206(I) — SOUTHERN PLUME MOM EXTRACTION LOCATION

NOTES:

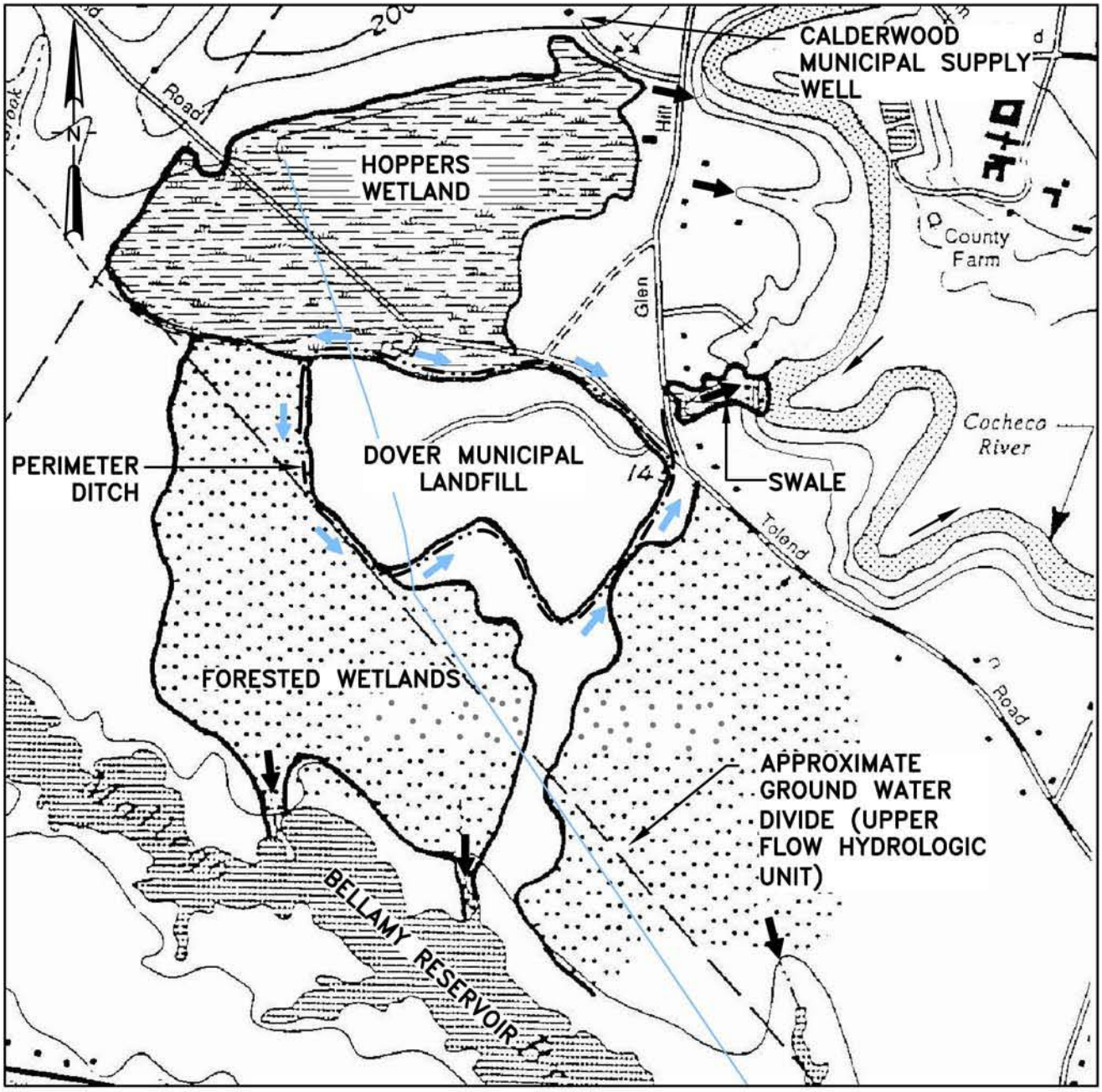
1. EXISTING CONDITIONS TAKEN FROM TOPOGRAPHIC WORKSHEET OF THE DOVER (NH) LANDFILL FOR GOLDER ASSOCIATES INC., MANCHESTER NH, BY EASTERN TOPOGRAPHICS, WOLFBORO, NH. ORIGINAL SCALE 1"=50', CONTOUR INTERVAL 2', PHOTO DATE: 13 APRIL 92.

2. SITE FEATURES UPDATED IN NOVEMBER 2007, BASED UPON COMPREHENSIVE SITE SURVEY PERFORMED BY VERMONT SURVEY AND ENGINEERING, INC. OF MONTPELIER, VERMONT.

0 400 800
APPROX. SCALE IN FEET

CLIENT: DOVER GROUP				GeoInsight Practical in Nature
PROJECT: DOVER LANDFILL SUPERFUND SITE DOVER, NEW HAMPSHIRE				
TITLE: SITE PLAN				
DESIGNED: CAB	DRAWN: NMT	CHECKED: CAB	APPROVED: MJW	
SCALE: 1" = 400'	DATE: 07/15/10	FILE NO.: 2009D270	PROJECT NO.: 2009-013	FIGURE NO.: 2

PLOT DATE: 10-26-10
FILE: M:\Projects\Active Projects\2009-Dover Landfill\FIGURES-DOVER\dwgs_files_from-JUNE_2007_TO_JUNE_2010\20090270.dwg



LEGEND

SURFACE WATER FLOW DIRECTION – PERIMETER DITCH

SURFACE WATER FLOW DIRECTION – WETLAND AREAS

0 1000' 2000'

APPROX. SCALE IN FEET

NOTES:

1. FIGURE IS BASED UPON FIGURE 2–7 OF FEBRUARY 1995 PDI REPORT.

REFERENCE: BASE MAP TAKEN FROM USGS MAP 7.5 MINUTE QUADRANGLE "DOVER WEST, DATED 1956, PHOTO REVISED 1988.

CLIENT: DOVER GROUP				GeoInsight Practical in Nature
PROJECT: DOVER LANDFILL SUPERFUND SITE DOVER, NEW HAMPSHIRE				
TITLE: SURFACE WATER FLOW DIRECTION				
DESIGNED: CAB	DRAWN: NMT	CHECKED: CAB	APPROVED: MJW	
SCALE: AS NOTED	DATE: 1/30/08	FILE NO.: 2009d204	PROJECT NO.: 2009–005	FIGURE NO.: 3

PLOT DATE: 10–26–10
FILE: M:\Projects\Active Projects\2009–Dover Landfill\FIGURES–DOVER\dwgs_files_from–JUNE_2007_TO_JUNE_2010\2009d204.dwg

APPENDIX A

NPDES CONSTRUCTION GENERAL PERMIT

NPDES General Permit for Stormwater Discharges From Construction Activities

As modified effective January 8, 2009

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National Pollutant Discharge Elimination System
General Permit for Discharges from
Large and Small Construction Activities

In compliance with the provisions of the Clean Water Act, 33 U.S.C. §1251 et. seq., (hereafter CWA or the Act), as amended by the Water Quality Act of 1987, P.L. 100-4, operators of large and small construction activities that are described in Part 1.3 of this National Pollutant Discharge Elimination System (NPDES) general permit, except for those activities excluded from authorization of discharge in Part 1.3.C of this permit are authorized to discharge pollutants to waters of the United States in accordance with the conditions and requirements set forth herein. Permit coverage is required from the "commencement of construction activities" until "final stabilization" as defined in Appendix A.

This permit shall become effective on June 30, 2008.

This permit and the authorization to discharge shall expire at midnight, June 30, 2010.

Signed:

Stephen S. Perkins, Director, Office of Ecosystem Protection
EPA Region 1

Barbara Finazzo, Director, Division of Environmental Planning and Protection
EPA Region 2

Carl-Axel P. Soderberg, Division Director, Caribbean Environmental Protection Division
EPA Region 2

Jon M. Capacasa, Director, Water Protection Division
EPA Region 3

Tinka Hyde, Director, Water Division
EPA Region 5

Miguel I. Flores, Director, Water Quality Protection Division
EPA Region 6

William A. Spratlin, Director, Water, Wetlands and Pesticides Division
EPA Region 7

Stephen S. Tuber, Assistant Regional Administrator, Office of Partnerships & Regulatory Assistance
EPA Region 8

Alexis Strauss, Director, Water Division
EPA Region 9

Michael Gearheard, Director, Office of Water and Watersheds
EPA Region 10

The signatures are for the permit conditions in Parts 1 through 10 and Appendices A through G, and for any additional conditions which apply to facilities located in the corresponding state, Indian country, or other area.

PART 1: COVERAGE UNDER THIS PERMIT

1.1 Introduction

This Construction General Permit (CGP) authorizes stormwater discharges from large and small construction activities that result in a total land disturbance of equal to or greater than one acre, where those discharges enter surface waters of the United States or a municipal separate storm sewer system (MS4) leading to surface waters of the United States subject to the conditions set forth in this permit. This permit also authorizes stormwater discharges from any other construction activity designated by EPA where EPA makes that designation based on the potential for contribution to an excursion of a water quality standard or for significant contribution of pollutants to waters of the United States. This permit replaces the permit issued in 2003 (68 FR 39087, July 1, 2003), including the modification made to that permit in 2004 (69 FR 76743, December 22, 2004).

This permit is presented in a reader-friendly, plain language format. This permit uses the terms “you” and “your” to identify the person(s) who owns or operates a “facility” or “activity” as defined in Appendix A and who must comply with the conditions of this permit. This format should allow you, the permittee and operator of a large or small construction activity, to easily locate and understand applicable requirements.

The goal of this permit is to minimize the discharge of stormwater pollutants from construction activity.

1.2 Permit Area

If your large or small construction activity is located within the areas listed in Appendix B, you may be eligible to obtain coverage under this permit. Permit coverage is actually provided by legally separate and distinctly numbered permits covering each of the areas listed in Appendix B.

1.3 Eligibility

Permit eligibility is limited to discharges from “large” and “small” construction activity, and to “new projects” and “unpermitted ongoing projects,” as defined in Appendix A or as otherwise designated by EPA. This general permit contains eligibility restrictions, as well as permit conditions and requirements. You may have to take certain actions to be eligible for coverage under this permit. In such cases, you must continue to satisfy those eligibility provisions to maintain permit authorization. If you do not meet the requirements that are a pre-condition to eligibility, then resulting discharges constitute unpermitted discharges. By contrast, if you eligible for coverage under this permit and do not comply with the requirements of the general permit, you may be in violation of the general permit for your otherwise eligible discharges.

A. Allowable Stormwater Discharges

Subject to compliance with the terms and conditions of this permit, you are authorized to discharge pollutants in:

1. Stormwater discharges associated with large and small construction activity from "new projects" and "unpermitted ongoing projects" as defined in Appendix A;
2. Stormwater discharges designated by EPA as needing a stormwater permit under 40 CFR §122.26(a)(1)(v) or §122.26(b)(15)(ii);
3. Discharges from support activities (e.g., concrete or asphalt batch plants, equipment staging yards, material storage areas, excavated material disposal areas, borrow areas) provided:
   a. The support activity is directly related to the construction site required to have NPDES permit coverage for discharges of stormwater associated with construction activity;
   b. The support activity is not a commercial operation serving multiple unrelated construction projects by different operators, and does not operate beyond the completion of the construction activity at the last construction project it supports; and
   c. Pollutant discharges from support activity areas are minimized in compliance with Part 3.1.G; and
4. Discharges composed of allowable discharges listed in 1.3.A and 1.3.B commingled with a discharge authorized by a different NPDES permit and/or a discharge that does not require NPDES permit authorization.

B. Allowable Non-Stormwater Discharges

You are authorized for the following non-stormwater discharges, provided the non-stormwater component of the discharge is in compliance with Part 5.4 (Non-Stormwater Discharges):

1. Discharges from fire-fighting activities;
2. Fire hydrant flushings;
3. Waters used to wash vehicles where detergents are not used;
4. Water used to control dust in accordance with Part 3.1.B;
5. Potable water including uncontaminated water line flushings;
6. Routine external building wash down that does not use detergents;
7. Pavement wash waters where spills or leaks of toxic or hazardous materials have not occurred (unless all spilled material has been removed) and where detergents are not used;
8. Uncontaminated air conditioning or compressor condensate;
9. Uncontaminated ground water or spring water;
10. Foundation or footing drains where flows are not contaminated with process materials such as solvents;
11. Uncontaminated excavation dewatering;
12. Landscape irrigation.

C. Limitations on Coverage

1. This permit does not authorize post-construction discharges that originate from the site after construction activities have been completed and the site has achieved final stabilization, including any temporary support activity. Post-construction

stormwater discharges from industrial sites may need to be covered by a separate NPDES permit.

2. This permit does not authorize discharges mixed with non-stormwater. This exclusion does not apply to discharges identified in Part 1.3.B, provided the discharges are in compliance with Part 5.4 (Non-Stormwater Discharges).
3. This permit does not authorize stormwater discharges associated with construction activity that have been covered under an individual permit or required to obtain coverage under an alternative general permit in accordance with Part 2.6.
4. This permit does not authorize discharges that EPA, prior to authorization under this permit, determines will cause, have the reasonable potential to cause, or contribute to an excursion above any applicable water quality standard. Where such a determination is made prior to authorization, EPA may notify you that an individual permit application is necessary in accordance with Part 2.6. However, EPA may authorize your coverage under this permit after you have included appropriate controls and implementation procedures in your permit designed to bring your discharge into compliance with water quality standards.
5. *Discharging into Receiving Waters With an Approved or Established Total Maximum Daily Load Analysis*
   a. You are not eligible for coverage under this permit for discharges of pollutants of concern to waters for which there is a total maximum daily load (TMDL) established or approved by EPA unless implement measures or controls that are consistent with the assumptions and requirements of such TMDL. To be eligible for coverage under this general permit, you must implement conditions applicable to your discharges necessary for consistency with the assumptions and requirements of such TMDL. If a specific wasteload allocation has been established that would apply to your discharge, you must implement necessary steps to meet that allocation.
   b. In a situation where an EPA-approved or established TMDL has specified a general wasteload allocation applicable to construction stormwater discharges, but no specific requirements for construction sites have been identified in the TMDL**,** you should consult with the State or Federal TMDL authority to confirm that meeting the effluent limits in Part 3 of this permit will be consistent with the approved TMDL. Where an EPA-approved or established TMDL has not specified a wasteload allocation applicable to construction stormwater discharges, but has not specifically excluded these discharges, compliance with the effluent limits in Part 3 of this permit will generally be assumed to be consistent with the approved TMDL. If the EPA-approved or established TMDL specifically precludes such discharges, the operator is not eligible for coverage under the CGP.
6. *Endangered and Threatened Species and Critical Habitat Protection*
   a. Coverage under this permit is available only if your stormwater discharges, allowable non-stormwater discharges, and stormwater discharge-related activities, as defined in Appendix A, are not likely to jeopardize the continued existence of any species that are federally-listed as endangered or threatened ("listed") under the Endangered Species Act (ESA) or result in the adverse

modification or destruction of habitat that is federally-designated as critical under the ESA ("critical habitat").

b. You are not eligible to discharge if the stormwater discharges, allowable non-stormwater discharges, or stormwater discharge-related activities would cause a prohibited "take" of federally-listed endangered or threatened species (as defined under section 3 of the ESA and 50 CFR 17.3), unless such takes are authorized under sections 7 or 10 of the ESA.

c. Determining Eligibility: You must use the process in Appendix C (ESA Review Procedures) to determine eligibility *PRIOR* to submittal of the Notice of Intent (NOI). You must meet one or more of the following six criteria (A-F) for the entire term of coverage under the permit:

Criterion A. No federally-listed threatened or endangered species or their designated critical habitat are in the project area as defined in Appendix C; or

Criterion B. Formal consultation with the Fish and Wildlife Service and/or the National Marine Fisheries Service under section 7 of the ESA has been concluded and that consultation:

i. Addressed the effects of the project's stormwater discharges, allowable non-stormwater discharges, and stormwater discharge-related activities on federally-listed threatened or endangered species and federally-designated critical habitat, and

ii. The consultation resulted in either:

a. Biological opinion finding no jeopardy to federally-listed species or destruction/adverse modification of federally-designated critical habitat, or

b. Written concurrence from the Service(s) with a finding that the stormwater discharges, allowable non-stormwater discharges, and stormwater discharge-related activities are not likely to adversely affect federally-listed species or federally-designated critical habitat; or

Criterion C. Informal consultation with the Fish and Wildlife Service and/or the National Marine Fisheries Service under section 7 of the ESA has been concluded and that consultation:

i. Addressed the effects of the project's stormwater discharges, allowable non-stormwater discharges, and stormwater discharge-related activities on federally-listed threatened or endangered species and federally-designated critical habitat, and

ii. The consultation resulted in either:

a. Biological opinion finding no jeopardy to federally-listed species or destruction/adverse modification of federally-designated critical habitat, or

b. Written concurrence from the Service(s) with a finding that the stormwater discharges, allowable non-stormwater discharges, and stormwater discharge-related activities are

not likely to adversely affect federally-listed species or federally-designated critical habitat; or

Criterion D. The construction activities are authorized through the issuance of a permit under section 10 of the ESA, and that authorization addresses the effects of the stormwater discharges, allowable non-stormwater discharges, and stormwater discharge-related activities on federally-listed species and federally-designated critical habitat; or

Criterion E. Stormwater discharges, allowable non-stormwater discharges, and stormwater discharge-related activities are not likely to adversely affect any federally-listed threatened or endangered species or result in the destruction or adverse modification of federally-designated critical habitat; or

Criterion F. The project's stormwater discharges, allowable non-stormwater discharges, and stormwater discharge-related activities were already addressed in another operator's valid certification of eligibility under Criteria A-E which included your construction activities and there is no reason to believe that federally-listed species or federally-designated critical habitat not considered in the prior certification may be present or located in the project area. By certifying eligibility under this criterion, you agree to comply with any measures or controls upon which the other operator's certification was based.

You must comply with any applicable terms, conditions, or other requirements developed in the process of meeting the eligibility requirements of the criteria in this section to remain eligible for coverage under this permit.

7. *Historic Properties*

   [Reserved]

   You are reminded that you must comply with applicable state, tribal and local laws concerning the protection of historic properties and places.

1.4 Waivers for Certain Small Construction Activities

Three scenarios exist under which small construction activities (see definition in Appendix A) may be waived from the NPDES permitting requirements detailed in this general permit. These exemptions are predicated on certain criteria being met and proper notification procedures being followed. Details of the waiver options and procedures for requesting a waiver are provided in Appendix D.

PART 2: AUTHORIZATION FOR DISCHARGES OF STORMWATER FROM CONSTRUCTION ACTIVITY

2.1 How to Obtain Authorization

To obtain coverage under this general permit, you, the operator, must prepare and submit a complete and accurate Notice of Intent (NOI), as described in this Part. Discharges are not authorized if your NOI is incomplete or inaccurate or if you were never eligible for permit coverage.

2.2 How to Submit Your NOI

You must either use EPA's electronic NOI system (accessible at www.epa.gov/npdes/eNOI or use a paper form (included in Appendix E) and then submit that paper form to:

For Regular U.S. Mail Delivery:
EPA Stormwater Notice Processing Center
Mail Code 4203M
U.S. EPA
1200 Pennsylvania Avenue, NW
Washington, DC 20460

For Overnight/Express Mail Delivery:
EPA Stormwater Notice Processing Center
Room 7420
U.S. EPA
1201 Constitution Avenue, NW
Washington, DC 20004

2.3 Authorization to Discharge Date

You are authorized to discharge stormwater from construction activities under the terms and conditions of this permit seven (7) calendar days after acknowledgment of receipt of your complete NOI is posted on EPA's NPDES website http://www.epa.gov/npdes/stormwater/cgp. The exception to this 7-day timeframe is if EPA delays your authorization based on eligibility considerations of Part 1.3 (e.g., ESA concerns). Under this circumstance, you are not authorized for coverage under this permit until you receive notice from EPA of your eligibility.

2.4 Submission Deadlines

A. *New Projects:* To obtain coverage under this permit, you must submit a complete and accurate NOI and be authorized consistent with Part 2.3 prior to your commencement of construction activities.

B. *Permitted Ongoing Projects:* Permitted ongoing projects are not eligible for coverage under this permit. If you previously received authorization to discharge for your project under the 2003 CGP, your authorization will be automatically continued under that permit until the expiration of this permit and the issuance of a new CGP, or the termination of coverage by you under the 2003 CGP, whichever is earlier. Note: If you are an operator of a permitted ongoing project and you transfer ownership of the project, or a portion thereof, to a different operator, that operator will be required to submit a complete and accurate NOI for a new project in accordance with Part 2.2.

C. *Unpermitted Ongoing Projects:* If you previously did not receive authorization to discharge for your project under the 2003 CGP and you wish to obtain coverage under this permit, you must submit an NOI within 90 days of the issuance date of this permit.

D. *Late Notifications:* Operators are not prohibited from submitting NOIs after initiating clearing, grading, excavation activities, or other construction activities. When a late NOI is submitted, authorization for discharges occurs consistent with Part 2.3. The Agency reserves the right to take enforcement action for any unpermitted discharges that occur between the commencement of construction and discharge authorization.

2.5 Continuation of the Expired General Permit

If this permit is not reissued or replaced prior to the expiration date, it will be administratively continued in accordance with the Administrative Procedure Act and remain in force and effect. If you were granted permit coverage prior to the expiration date, you will automatically remain covered by the continued permit until the earliest of:

A. Reissuance or replacement of this permit, at which time you must comply with the conditions of the new permit to maintain authorization to discharge; or

B. Your submittal of a Notice of Termination; or

C. Issuance of an individual permit for the project's discharges; or

D. A formal permit decision by EPA to not reissue this general permit, at which time you must seek coverage under an alternative general permit or an individual permit.

2.6 Requiring Coverage Under an Individual Permit or an Alternative General Permit

A. EPA may require you to apply for and/or obtain either an individual NPDES permit or coverage under an alternative NPDES general permit. Any interested person may petition EPA to take action under this paragraph. If EPA requires you to apply for an individual NPDES permit, EPA will notify you in writing that a permit application is required. This notification will include a brief statement of the reasons for this decision and an application form. In addition, if you are an existing permittee covered under this permit, the notice will set a deadline to file the application, and will include a statement that on the effective date of issuance or denial of the individual NPDES permit or the coverage or denial of coverage under the alternative general permit as it applies to you, coverage under this general permit will automatically terminate. Applications must be submitted to EPA at the applicable EPA Regional offices listed in Appendix B of this permit. EPA may grant additional time to submit the application upon your request. If you are covered under this permit and you fail to submit in a timely manner an individual NPDES permit application as required by EPA, then the applicability of this permit to you is automatically terminated at the end of the day specified by EPA as the deadline for application submittal.

B. You may request to be excluded from coverage under this general permit by applying for an individual permit. In such a case, you must submit an individual application in accordance with the requirements of 40 CFR §122.26(c)(1)(ii), with reasons supporting the request, to EPA at the applicable EPA Regional office listed in

Appendix B of this permit. The request may be granted by issuance of an individual permit or coverage under an alternative general permit if your reasons are adequate to support the request.

C. When an individual NPDES permit is issued to you (as an entity that is otherwise subject to this permit), or you are authorized to discharge under an alternative NPDES general permit, the applicability of this permit to you is automatically terminated on the effective date of the individual permit or the date of authorization of coverage under the alternative general permit, whichever the case may be. If you (as an entity that is otherwise subject to this permit) are denied an individual NPDES permit or an alternative NPDES general permit, the applicability of this permit to you is automatically terminated on the date of such denial, unless otherwise specified by EPA.

PART 3: EFFLUENT LIMITS

This section includes technology-based and water quality-based effluent limits that apply to all dischargers, unless otherwise specified. You must select, install, and maintain control measures (e.g., Best Management Practices ("BMPs"), controls, practices, etc.) for each major construction activity, identified in your Part 5 project description, to meet these effluent limits. All control measures must be properly selected, installed, and maintained in accordance with any relevant manufacturer specifications and good engineering practices. You must implement the control measures from commencement of construction activity until final stabilization is complete.

The term "minimize" as used in Part 3 means reduce and/or eliminate to the extent achievable using control measures that are technologically available and economically practicable and achievable in light of best industry practice.

3.1 Effluent Limits to Reduce Pollutants in Stormwater Discharges

You must implement control measures to minimize pollutants in stormwater discharges.

A. ***Sediment Controls:*** You must implement the following, where applicable:

1. Sediment Basins: For common drainage locations that serve an area with 10 or more acres disturbed at one time, a temporary (or permanent) sediment basin that provides storage for a calculated volume of runoff from the drainage area from a 2-year, 24-hour storm, or equivalent control measures, must be provided where attainable until final stabilization of the site. Where no such calculation has been performed, a temporary (or permanent) sediment basin providing 3,600 cubic feet of storage per acre drained, or equivalent control measures, must be provided where attainable until final stabilization of the site. When computing the number of acres draining into a common location, it is not necessary to include flows from offsite areas and flows from on-site areas that are either undisturbed or have undergone final stabilization where such flows are diverted around both the disturbed area and the sediment basin. In determining whether installing a sediment basin is attainable, the operator may consider factors such as site soils,

slope, available area on-site, etc. In any event, the operator must consider public safety, especially as it relates to children, as a design factor for the sediment basin, and alternative sediment controls must be used where site limitations would preclude a safe design.

2. For drainage locations which serve 10 or more disturbed acres at one time and where a temporary sediment basin or equivalent controls is not attainable, smaller sediment basins and/or sediment traps should be used. At a minimum, silt fences, vegetative buffer strips, or equivalent sediment controls are required for all down slope boundaries (and for those side slope boundaries deemed appropriate as dictated by individual site conditions).

3. For drainage locations serving less than 10 acres, smaller sediment basins and/or sediment traps should be used. At a minimum, silt fences, vegetative buffer strips, or equivalent sediment controls are required for all down slope boundaries (and for those side slope boundaries deemed appropriate as dictated by individual site conditions) of the construction area unless a sediment basin providing storage for a calculated volume of runoff from a 2-year, 24-hour storm or 3,600 cubic feet of storage per acre drained is provided.

B. ***Off-Site Sediment Tracking and Dust Control:*** You must minimize off-site vehicle tracking of sediments onto paved surfaces and the generation of dust. If sediment escapes the construction site, off-site accumulations of sediment must be removed at a frequency sufficient to minimize off-site impacts.

C. ***Runoff Management:*** You must divert flows from exposed soils, retain/detain flows or otherwise minimize runoff and the discharge of pollutants from exposed areas of the site. You must avoid placement of structural practices in floodplains to the degree technologically and economically practicable and achievable.

D. ***Erosive Velocity Control:*** You must place velocity dissipation devices at discharge locations and along the length of any outfall channel to provide a non-erosive flow velocity from the structure to a water course so that the natural physical and biological characteristics and functions are maintained and protected (e.g., no significant changes in the hydrological regime of the receiving water).

E. ***Post-Construction Stormwater Management:*** You must comply with any applicable federal, local, state, or tribal requirements regarding the design and installation of post-construction stormwater controls. Structural measures should be placed on upland soils to the degree practicable and achievable.

F. ***Construction and Waste Materials:*** You must:
   1. Prevent the discharge of solid materials, including building materials, to waters of the United States, except as authorized by a permit issued under section 404 of the CWA;

2. Minimize exposure of construction and waste materials to stormwater, and the occurrence of spills, through the use of storage practices, prevention and response practices, and other controls;
3. Prevent litter, construction debris, and construction chemicals (e.g., diesel fuel, hydraulic fluids, and other petroleum products) that could be exposed to stormwater from becoming a pollutant source in stormwater discharges.

G. ***Non-Construction Wastes:*** You must minimize pollutant discharges from areas other than construction (including stormwater discharges from dedicated asphalt plants and dedicated concrete plants).

H. ***Erosion Control and Stabilization:***
1. ***General Requirements:*** You must stabilize the site. You must ensure that existing vegetation is preserved where possible and that disturbed portions of the site are stabilized. You should avoid using impervious surfaces for stabilization.
2. ***Initiation Deadlines:*** You must initiate stabilization measures, except as provided below, as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased, but in no case more than 14 days after the construction activity in that portion of the site has temporarily or permanently ceased.
   i. Where stabilization by the 14th day is precluded by snow cover or frozen ground conditions, stabilization measures must be initiated as soon as practicable.
   ii. Where construction activity on a portion of the site is temporarily ceased, and earth disturbing activities will be resumed within 14 days, temporary stabilization measures do not have to be initiated on that portion of the site.
   iii. In arid, semiarid, and drought-stricken areas where initiating perennial vegetative stabilization measures is not possible within 14 days after construction activity has temporarily or permanently ceased, final vegetative stabilization measures must be initiated as soon as practicable.

I. ***Spills / Releases in Excess of Reportable Quantities:*** You are not authorized to discharge hazardous substances or oil resulting from an on-site spill. This permit does not relieve you of the federal reporting requirements of 40 CFR Part 110, 40 CFR Part 117 and 40 CFR Part 302 relating to spills or other releases of oils or hazardous substances.

Where a release containing a hazardous substance or oil in an amount equal to or in excess of a reportable quantity established under either 40 CFR Part 110, 40 CFR Part 117 or 40 CFR Part 302, occurs during a 24-hour period:

- you must provide notice to the National Response Center (NRC) (800–424–8802; in the Washington, DC, metropolitan area call 202–267–2675) in accordance with the requirements of 40 CFR Part 110, 40 CFR Part 117 and 40 CFR Part 302 as soon as site staff have knowledge of the discharge; and

- you must, within 7 calendar days of knowledge of the release, provide a description of the release, the circumstances leading to the release, and the date of the release. You must also implement measures to prevent the reoccurrence of such releases and to respond to such releases.

3.2 Effluent Limits to Reduce Pollutants in Non-Stormwater Discharges

You must minimize any non-stormwater discharges authorized by this permit.

3.3 Effluent Limits Related to Endangered Species

You must protect federally-listed endangered or threatened species, or federally-designated critical habitat to maintain eligibility under Part 1.3.C.6.

3.4 Attainment of Water Quality Standards

A. You must select, install, implement and maintain control measures at your construction site that minimize pollutants in the discharge as necessary to meet applicable water quality standards. In general, except in situations explained in Part 3.4.B below, your stormwater controls developed, implemented, and updated consistent with the other provisions of Part 3 are considered as stringent as necessary to ensure that your discharges do not cause or contribute to an excursion above any applicable water quality standard.

B. At any time after authorization, EPA may determine that your stormwater discharges may cause, have reasonable potential to cause, or contribute to an excursion above any applicable water quality standard. If such a determination is made, EPA will require you to:

   i. Modify your stormwater controls in accordance with Part 3.6 to address adequately the identified water quality concerns;
   ii. Submit valid and verifiable data and information that are representative of ambient conditions and indicate that the receiving water is attaining water quality standards; or
   iii. Cease discharges of pollutants from construction activity and submit an individual permit application according to Part 2.6.

All written responses required under this part must include a signed certification consistent with Appendix G, Section 11.

3.5 Consistency with Total Maximum Daily Loads

If you are discharging into a water with an EPA established or approved TMDL, you must implement measures to ensure that your discharge of pollutants from the site is consistent with the assumptions and requirements of the EPA-established or approved TMDL, including any specific wasteload allocation that has been established that would apply to your discharge. See Part 1.3.C.5 for further information on determining permit eligibility related to TMDLs.

3.6 Maintenance of Control Measures

A. You must maintain all control measures and other protective measures in effective operating condition. If site inspections required by Part 4 identify BMPs that are not operating effectively, you must perform maintenance as soon as possible and before the next storm event whenever practicable to maintain the continued effectiveness of stormwater controls.

B. If existing BMPs need to be modified or if additional BMPs are necessary for any reason, you must complete implementation before the next storm event whenever practicable. If implementation before the next storm event is impracticable, you must implement alternative BMPs as soon as possible.

C. You must remove sediment from sediment traps or sedimentation ponds when design capacity has been reduced by 50 percent.

D. You must remove trapped sediment from a silt fence before the deposit reaches 50 percent of the above-ground fence height (or before it reaches a lower height based on manufacturer's specifications).

3.7 Training of Employees

You must train employees and subcontractors as necessary to make them aware of the applicable control measures implemented at the site so that they follow applicable procedures.

3.8 Applicable State, Tribal, or Local Programs

You must ensure that the stormwater controls implemented at your site are consistent with all applicable federal, state, tribal, or local requirements for soil and erosion control and stormwater management.

PART 4: INSPECTIONS

A. ***Inspection Frequency:*** You must conduct inspections in accordance with one of the two schedules listed below. You must specify in your SWPPP which schedule you will be following.
   1. At least once every 7 calendar days, OR
   2. At least once every 14 calendar days and within 24 hours of the end of a storm event of 0.5 inches or greater.

B. ***Case-by-Case Reductions in Inspection Frequency:*** You may reduce your inspection frequency to at least once every month if:
   1. The entire site is temporarily stabilized,
   2. Runoff is unlikely due to winter conditions (e.g., site is covered with snow, ice, or the ground is frozen), or
   3. Construction is occurring during seasonal arid periods in arid areas and semi-arid areas.

C. ***Inspection Waiver for Frozen Conditions:*** A waiver of the inspection requirements is available until one month before thawing conditions are expected to result in a discharge if all of the following requirements are met:
   1. The project is located in an area where frozen conditions are anticipated to continue for extended periods of time (i.e., more than one month);
   2. Land disturbance activities have been suspended; and
   3. The beginning and ending dates of the waiver period are documented in the SWPPP.

D. ***Qualified Personnel:*** Inspections must be conducted by qualified personnel (provided by the operator or cooperatively by multiple operators). "Qualified personnel" means a person knowledgeable in the principles and practice of erosion and sediment controls who possesses the skills to assess conditions at the construction site that could impact stormwater quality and to assess the effectiveness of any sediment and erosion control measures selected to control the quality of stormwater discharges from the construction activity.

E. ***Scope of Inspections:*** Inspections must include all areas of the site disturbed by construction activity and areas used for storage of materials that are exposed to precipitation. Inspectors must look for evidence of, or the potential for, pollutants entering the stormwater conveyance system. Sedimentation and erosion control measures must be observed to ensure proper operation. Discharge locations must be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to waters of the United States, where accessible. Where discharge locations are inaccessible, nearby downstream locations must be inspected to the extent that such inspections are practicable. Locations where vehicles enter or exit the site must be inspected for evidence of off-site sediment tracking.

F. ***Reductions in Scope of Inspections for Stabilized Areas:*** Once a definable area has been finally stabilized, no further inspection requirements apply to that portion of the site (e.g., earth-disturbing activities around one of three buildings in a complex are done and the area is finally stabilized, one mile of a roadway or pipeline project is done and finally stabilized, etc).

G. ***Utility Line Inspections:*** Utility line installation, pipeline construction, and other examples of long, narrow, linear construction activities may limit the access of inspection personnel to the areas described in Part 4.E above. Inspection of these areas could require that vehicles compromise temporarily or even permanently stabilized areas, cause additional disturbance of soils, and increase the potential for erosion. In these circumstances, controls must be inspected on the same frequencies as other construction projects, but representative inspections may be performed. For representative inspections, personnel must inspect controls along the construction site for 0.25 mile above and below each access point where a roadway, undisturbed right-of-way, or other similar feature intersects the construction site and allows access to the areas described above. The conditions of the controls along each inspected 0.25 mile segment may be considered as representative of the condition of controls along

that reach extending from the end of the 0.25 mile segment to either the end of the next 0.25 mile inspected segment, or to the end of the project, whichever occurs first.

H. ***Inspection Report:*** For each inspection required above, you must complete an inspection report. At a minimum, the inspection report must include:
1. The inspection date;
2. Names, titles, and qualifications of personnel making the inspection;
3. Weather information for the period since the last inspection (or since commencement of construction activity if the first inspection) including a best estimate of the beginning of each storm event, duration of each storm event, approximate amount of rainfall for each storm event (in inches), and whether any discharges occurred;
4. Weather information and a description of any discharges occurring at the time of the inspection;
5. Location(s) of discharges of sediment or other pollutants from the site;
6. Location(s) of BMPs that need to be maintained;
7. Location(s) of BMPs that failed to operate as designed or proved inadequate for a particular location;
8. Location(s) where additional BMPs are needed that did not exist at the time of inspection; and
9. Corrective action required including implementation dates.

The inspection report must be signed in accordance with Appendix G, Section 11 of this permit.

PART 5: STORMWATER POLLUTION PREVETNION PLANS (SWPPPs)

5.1 Stormwater Pollution Prevention Plan Framework

You must prepare a SWPPP before submitting your Notice of Intent (NOI) for permit coverage. At least one SWPPP must be developed for each construction project covered by this permit and the stormwater controls implemented at your site must be documented in the SWPPP. If you prepared a SWPPP for coverage under a previous NPDES permit, you must review and update the SWPPP prior to submitting your NOI.

The SWPPP does not contain effluent limitations; the technology and water quality-based effluent limitations are contained in Part 3 of this permit. The SWPPP is intended to document the selection, design, installation, and implementation of control measures that are being used to comply with the effluent limitations set forth in Part 3.

The SWPPP must:
1. Identify all potential sources of pollutants that may reasonably be expected to affect the quality of stormwater discharges from the construction site; and
2. Describe control measures to be used to meet the effluent limits set forth in Part 3.

5.2 SWPPP Contents: Site and Activity Description

A. ***Construction Site Operators:*** The SWPPP must identify all operators for the project site, and the areas of the site over which each operator has control.

B. ***Nature of Construction Activity:*** The SWPPP briefly must describe the nature of the construction activity, including:
   1. The function of the project (e.g., low density residential, shopping mall, highway, etc.);
   2. The intended sequence and timing of activities that disturb soils at the site;
   3. Estimates of the total area expected to be disturbed by excavation, grading, or other construction activities, including dedicated off-site borrow and fill areas; and
   4. A general location map (e.g., USGS quadrangle map, a portion of a city or county map, or other map) with enough detail to identify the location of the construction site and waters of the United States within one mile of the site.

C. ***Site Map:*** The SWPPP must contain a legible site map, showing the entire site, identifying:
   1. Direction(s) of stormwater flow and approximate slopes anticipated after grading activities;
   2. Areas of soil disturbance and areas that will not be disturbed (or a statement that all areas of the site will be disturbed unless otherwise noted);
   3. Locations of major structural and nonstructural BMPs identified in the SWPPP;
   4. Locations where stabilization practices are expected to occur;
   5. Locations of off-site material, waste, borrow or equipment storage areas;
   6. Locations of all waters of the United States (including wetlands);
   7. Locations where stormwater discharges to a surface water; and
   8. Areas where final stabilization has been accomplished and no further construction-phase permit requirements apply.

D. ***Construction and Waste Materials:*** The SWPPP must include a description of construction and waste materials expected to be stored on-site with updates as appropriate.

E. ***Locations of Other Industrial Stormwater Discharges:*** The SWPPP must describe and identify the location and description of any stormwater discharge associated with industrial activity other than construction at the site. This includes stormwater discharges from dedicated asphalt plants and dedicated concrete plants that are covered by this permit.

5.3 Description of Control Measures to Reduce Pollutant Discharges

A. ***Control Measures:*** The SWPPP must include a description of all control measures that will be implemented to meet the effluent limits in Part 3. For each major activity identified in the project description the SWPPP must clearly document appropriate control measures, the general sequence during the construction process in which the

measures will be implemented, and which operator is responsible for the control measure's implementation.

B. ***Stabilization:*** The SWPPP must include a description of interim and permanent stabilization practices for the site, including a schedule of when the practices will be implemented.

C. ***Post-Authorization Records:*** The following records must be maintained with the SWPPP following authorization under this permit:
   1. Dates when grading activities occur;
   2. Dates when construction activities temporarily or permanently cease on a portion of the site; and
   3. Dates when stabilization measures are initiated.

5.4 Non-Stormwater Discharges

The SWPPP must identify all allowable sources of non-stormwater discharges listed in Part 1.3.B of this permit, except for flows from fire fighting activities that are combined with stormwater discharges associated with construction activity at the site. The SWPPP must also describe the pollution prevention measures used to eliminate or reduce non-stormwater discharges consistent with Part 3.2.

5.5 Documentation of Permit Eligibility Related to Endangered Species

The SWPPP must include documentation supporting a determination of permit eligibility with regard to Endangered Species, including:

A. Information on whether federally-listed endangered or threatened species, or federally-designated critical habitat may be in the project area;

B. Whether such species or critical habitat may be adversely affected by stormwater discharges or stormwater discharge-related activities from the project;

C. Results of the Appendix C listed species and critical habitat screening determinations;

D. Confirmation of delivery of NOI to EPA or to EPA's electronic NOI system. This may include an overnight, express or registered mail receipt acknowledgment; or electronic acknowledgment from EPA's electronic NOI system;

E. Any correspondence for any stage of project planning between the U.S. Fish and Wildlife Service (FWS), EPA, the U.S. National Marine Fisheries Service (NMFS), or others and you regarding listed species and critical habitat, including any notification that delays your authorization to discharge under this permit; and

F. A description of measures necessary to protect federally-listed endangered or threatened species, or federally-designated critical habitat.

5.6 Documentation of Permit Eligibility Related to Total Maximum Daily Loads

The SWPPP must include documentation supporting a determination of permit eligibility with regard to waters that have an EPA-established or approved TMDL, including:

A. Identification of whether your discharge is identified, either specifically or generally, in an EPA-established or approved TMDL and any associated allocations, requirements, and assumptions identified for your discharge;

B. Summaries of consultation with State or Federal TMDL authorities on consistency of SWPPP conditions with the approved TMDL, and

C. Measures taken by you to ensure that your discharge of pollutants from the site is consistent with the assumptions and requirements of the EPA-established or approved TMDL, including any specific wasteload allocation that has been established that would apply to your discharge.

See Part 1.3.C.5 for further information on determining permit eligibility related to TMDLs.

5.7 Copy of Permit Requirements

Copies of this permit and of the signed and certified NOI form that was submitted to EPA must be included in the SWPPP. Also, upon receipt, a copy of the letter from the EPA Stormwater Notice Processing Center notifying you of their receipt of your administratively complete NOI must also be included as a component of the SWPPP.

5.8 Applicable State, Tribal, or Local Programs

The SWPPP must be updated as necessary to reflect any revisions to applicable federal, state, tribal, or local requirements that affect the stormwater controls you implement at your site.

5.9 Inspections

A record of each inspection and of any actions taken in accordance with Part 4 must be retained with the SWPPP for at least three years from the date that permit coverage expires or is terminated. The inspection reports must identify any incidents of non-compliance with the permit conditions. Where a report does not identify any incidents of non-compliance, the report must contain a certification that the construction project or site is in compliance with this permit.

5.10 Maintaining an Updated Plan

The SWPPP must be modified:

A. To reflect modifications to stormwater control measures made in response to a change in design, construction, operation, or maintenance at the construction site that has or could have a significant effect on the discharge of pollutants to the waters of the United States that has not been previously addressed in the SWPPP.

B. If during inspections or investigations by site staff, or by local, state, tribal or federal officials, it is determined that the existing stormwater controls are ineffective in eliminating or significantly minimizing pollutants in stormwater discharges from the construction site.

C. Based on the results of an inspection, as necessary to properly document additional or modified BMPs designed to correct problems identified. Revisions to the SWPPP must be completed within seven (7) calendar days following the inspection.

5.11 Signature, Plan Review and Making Plans Available

A. ***Retention of SWPPP:*** A copy of the SWPPP (including a copy of the permit), NOI, and acknowledgement letter from EPA must be retained at the construction site (or other location easily accessible during normal business hours to EPA, a state, tribal or local agency approving sediment and erosion plans, grading plans, or stormwater management plans; local government officials; the operator of a municipal separate storm sewer receiving discharges from the site; and representatives of the U.S. Fish and Wildlife Service or the National Marine Fisheries Service) from the date of commencement of construction activities to the date of final stabilization. If you have day-to-day operational control over SWPPP implementation, you must have a copy of the SWPPP available at a central location on-site for the use of all those identified as having responsibilities under the SWPPP whenever they are on the construction site. If an on-site location is unavailable to store the SWPPP when no personnel are present, notice of the plan's location must be posted near the main entrance at the construction site.

B. ***Main Entrance Signage:*** A sign or other notice must be posted conspicuously near the main entrance of the construction site. If displaying near the main entrance is infeasible, the notice can be posted in a local public building such as the town hall or public library. The sign or other notice must contain the following information:
   1. A copy of the completed Notice of Intent as submitted to the EPA Stormwater Notice Processing Center; and
   2. If the location of the SWPPP or the name and telephone number of the contact person for scheduling SWPPP viewing times has changed (i.e., is different than that submitted to EPA in the NOI), the current location of the SWPPP and name and telephone number of a contact person for scheduling viewing times.

   For linear projects, the sign or other notice must be posted at a publicly accessible location near the active part of the construction project (e.g., where a pipeline project crosses a public road).

C. ***Availability of SWPPP:*** SWPPPs must be made available upon request by EPA; a state, tribal or local agency approving sediment and erosion plans, grading plans, or stormwater management plans; local government officials; the operator of a municipal separate storm sewer receiving discharges from the site; and representatives of the U.S. Fish and Wildlife Service or the National Marine Fisheries Service to the requestor. The copy of the SWPPP that is required to be kept on-site or

locally available must be made available, in its entirety, to the EPA staff for review and copying at the time of an on-site inspection.

D. ***Signature and Certification:*** All SWPPPs must be signed and certified in accordance with Appendix G, Section 11.

5.12 Requirements for Different Types of Operators

You may meet one or both of the operational control components in the definition of operator found in Appendix A. Part 5.12.C applies to all permittees having control over only a portion of a construction site.

A. If you have operational control over construction plans and specifications, you must ensure that:
   1. The project specifications meet the minimum requirements of this Part and all other applicable permit conditions;
   2. The SWPPP indicates the areas of the project where the operator has operational control over project specifications, including the ability to make modifications in specifications;
   3. All other permittees implementing portions of the SWPPP (or their own SWPPP) who may be impacted by a change to the construction plan are notified of such changes in a timely manner; and
   4. The SWPPP indicates the name of the party(ies) with day-to-day operational control of those activities necessary to ensure compliance with the SWPPP or other permit conditions.

B. If you have operational control over day-to-day activities, you must ensure that:
   1. The SWPPP meets the minimum requirements of this Part and identifies the parties responsible for implementation of control measures identified in the plan;
   2. The SWPPP indicates areas of the project where you have operational control over day-to-day activities;
   3. The SWPPP indicates the name of the party(ies) with operational control over project specifications (including the ability to make modifications in specifications).

C. If you have operational control over only a portion of a larger project (e.g., one of four homebuilders in a subdivision), you are responsible for compliance with all applicable effluent limits, terms, and conditions of this permit as it relates to your activities on your portion of the construction site, including protection of endangered species, critical habitat, and historic properties, and implementation of control measures described in the SWPPP. You must ensure either directly or through coordination with other permittees, that your activities do not render another party's pollutant discharge controls ineffective. You must either implement your portion of a common SWPPP or develop and implement your own SWPPP.
   For more effective coordination of BMPs and opportunities for cost sharing, a cooperative effort by the different operators at a site to prepare and participate in a comprehensive SWPPP is encouraged. Individual operators at a site may, but are not

required to, develop separate SWPPPs that cover only their portion of the project provided reference is made to other operators at the site. In instances where there is more than one SWPPP for a site, cooperation between the permittees is encouraged to ensure the stormwater discharge control measures are consistent with one another (e.g., provisions to protect listed species and critical habitat).

PART 6: TERMINATION OF COVERAGE

6.1 Submitting a Notice of Termination

Submit a complete and accurate Notice of Termination (NOT) either electronically (strongly encouraged) at www.epa.gov/npdes/eNOI or by completing the paper Notice of Termination form included in Appendix F of this permit and submitting that form to the address listed in Part 2.2.

6.2 When to Submit a Notice of Termination

You may only submit a Notice of Termination (NOT) after one or more of the following conditions have been met:

A. Final stabilization has been achieved on all portions of the site for which you are responsible;

B. Another operator has assumed control according to Appendix G, Section 11.C over all areas of the site that have not been finally stabilized;

C. Coverage under an individual or alternative general NPDES permit has been obtained; or

D. For residential construction only, temporary stabilization has been completed and the residence has been transferred to the homeowner.

The NOT must be submitted within 30 days of one of the above conditions being met. Authorization to discharge terminates at midnight of the day the NOT is signed.

PART 7: RETENTION OF RECORDS

Copies of the SWPPP and all documentation required by this permit, including records of all data used to complete the NOI to be covered by this permit, must be retained for at least three years from the date that permit coverage expires or is terminated. This period may be extended by request of EPA at any time.

PART 8: REOPENER CLAUSE

8.1 Procedures for Modification or Revocation

Permit modification or revocation will be conducted according to 40 CFR §122.62, §122.63, §122.64 and §124.5.

8.2 Water Quality Protection

If there is evidence indicating that the stormwater discharges authorized by this permit cause, have the reasonable potential to cause or contribute to an excursion above any applicable water quality standard, you may be required to obtain an individual permit in accordance with Part 2.6 of this permit, or the permit may be modified to include different limitations and/or requirements.

8.3 Timing of Permit Modification

EPA may elect to modify the permit prior to its expiration (rather than waiting for the new permit cycle) to comply with any new statutory or regulatory requirements, such as for effluent limitation guidelines that may be promulgated in the course of the current permit cycle.

PART 9: STANDARD PERMIT CONDITIONS

The federal regulations require that the Standard Conditions provisioned at 40 CFR §122.41 be applied to all NPDES permits. You are required to comply with those Standard Conditions, details of which are provided in Appendix G.

PART 10: PERMIT CONDITIONS APPLICABLE TO SPECIFIC STATES, INDIAN COUNTRY, OR TERRITORIES

The provisions of this Part provide modifications or additions to the applicable conditions of this permit to reflect specific additional conditions required as part of the state or tribal CWA Section 401 certification process, or the Coastal Zone Management Act (CZMA) certification process, or as otherwise established by the permitting authority. The specific additional revisions and requirements only apply to activities in those specific states, Indian country, and federal facilities. States, Indian country, and federal facilities not included in this Part do not have any modifications or additions to the applicable conditions of this permit.

A. Region 1

1. MAR100000: Commonwealth of Massachusetts, except Indian country
   a. State Water Quality Statutes, Regulations, and Policies:
      i. You must comply with the Massachusetts Clean Waters Act (Ch. 21, ss. 26-53).
      ii. You must comply with the conditions in 314 CMR 4.00 - Surface Water Quality Standards.
      iii. You must comply with the conditions in 314 CMR 3.00 - Surface Water Discharge Permit Program.
      iv. You must comply with the Wetlands Protection Act, Ch. 131, s. 40 and its regulations, 310 CMR 10.00 and any order of Conditions issued by a Conservation Commission or a Superseding Order of Conditions issued by the Massachusetts Department of Environmental Protection.

b. Department of Environmental Protection Storm Water Management Policy:
   i. You must comply with the Massachusetts Storm Water Management Policy, and applicable Storm Water Performance Standards, as prescribed by state regulations promulgated under the authority of the Massachusetts Clean Waters Act, MGL Ch. 21, ss. 26-53 and the Wetlands Protection Act Ch. 131, s. 40.
c. Other State Environmental Laws, Regulations, Policies:
   i. You must comply with the Massachusetts Endangered Species Act [MESA] (MGL Ch. 313A and regulations at 321 CMR 10.00) and any actions undertaken to comply with this storm water permit, shall not result in non-compliance with the MESA.
   ii. You must not conduct activities under this permit that will interfere with implementation of mosquito control work conducted in accordance with Chapter 252 including, s. 5A thereunder and MassDEP Guideline Number BRP G01-02, West Nile Virus Application of Pesticides to Wetland Resource Areas and Buffer Zones, and Public Water Systems.
d. Other Department Directives:
   i. The Department may require you to perform water quality monitoring during the permit term if monitoring is necessary for the protection of public health or the environment as designated under the authority at 314 CMR 3.00.
   ii. The Department may require you to provide measurable verification of the effectiveness of BMPs and other control measures in your management program, including water quality monitoring.
   iii. The Department has determined that compliance with this permit does not protect you from enforcement actions deemed necessary by the Department under its associated regulations to address an imminent threat to the public health or a significant adverse environmental impact which results in a violation of the Massachusetts Clean Waters Act, Ch. 21, ss. 26-53.
   iv. The Department reserves the right to modify the 401 Water Quality Certification if any changes, modifications or deletions are made to the general permit. In addition, the Department reserves the right to add and/or alter the terms and conditions of its 401 Water Quality Certification to carry out its responsibilities during the term of this permit with respect to water quality, including any revisions to 314 CMR 4.00, Surface Water Quality Standards.
e. Permit Compliance
   i. Should any violation of the Massachusetts Surface Water Quality Standards (314 CMR 4.00) or the conditions of this certification occur, the Department will direct you to correct the violations(s). The Department has the right to take any action as authorized by the General Laws of the Commonwealth to address the violation of this permit or the MA Clean Waters Act and the regulations promulgated thereunder. Substantial civil and criminal penalties are authorized under MGL Ch. 21, s. 42 for discharging into Massachusetts' waters in violation of an order or permit issued by this Department. This

certification does not relieve you of the duty to comply with other applicable Massachusetts statutes and regulations.

2. NHR100000: State of New Hampshire
   a. If you disturb 100,000 square feet or more of contiguous area, you must also apply for a "Significant Alteration of the Terrain Permit from DES pursuant to RSA 485-A:17 and Env-Ws 415. This requirement applies to the disturbances of only 50,000 square feet when construction occurs within the protected shoreline (see RSA 483-B and Env-Ws 1400).
   b. You must determine that any excavation dewatering discharges are not contaminated before they will be authorized as an allowable non-storm water discharge under this permit (see Subpart 1.3.B). The water is considered uncontaminated if there is no groundwater contamination within 1,000 feet of the discharge. Information on groundwater contamination can be generated over the Internet via the NHDES web site http://www.des.state.nh.us (One Stop Data Retrieval, Onestop Master Site Table). The web site also provides E-mail access to an NHDES Site Remediation Contact to answer questions about using the Web site.
   c. You must treat any uncontaminated excavation dewatering discharges as necessary to remove suspended solids and turbidity. The discharges must be sampled at a location prior to mixing with storm water at least once per week during weeks when discharges occur. The samples must be analyzed for total suspended solids (TSS) and must meet monthly average and maximum daily TSS limitations of 50 milligrams per liter (mg/L) and 100 mg/L, respectively. TSS (a.k.a. Residue, Nonfilterable) analysis and sampling must be performed in accordance with Tables IB (parameter, units and method) and II (required containers, preservation techniques and holding times) in 40 CFR 136.3 (see: http://www.access.gpo.gov/nara/cfr/waisidx_02/40cfr136_02.html). Records of any sampling and analysis must be maintained and kept with the SWPPP for at least three years after final site stabilization.
   d. During site design and preparation of the storm water pollution prevention plan (SWPPP), you must consider opportunities for groundwater recharge using on-site infiltration. The SWPPP must include a description of any on-site infiltration that will be installed as a post construction storm water management measure (see Subpart 3.4.E) or reasons for not employing such measures. For design considerations for infiltration measures see the September 2001 DES publication titled "Managing Storm Water as a Valuable Resource" which is available online at: http://www.des.state.nh.us/StormWater/construction.htm. Loss of annual recharge to groundwater should be minimized through the use of infiltration measures wherever feasible.

B. Region 2 – No additional requirements.

C. Region 5

1. MNR100000: Indian Country within the State of Minnesota

a. *Fond du Lac Band of Lake Superior Chippewa*

i. A copy of the Storm Water Pollution Prevention Plan must be submitted to the following office at least thirty (30) days in advance of sending the Notice of Intent (NOI) to EPA:

Fond du Lac Reservation
Office of Water Protection
1720 Big Lake Road
Cloquet, MN 55720

CGP applicants are encouraged to work with the FDL Office of Water Protection in the identification of all proposed receiving waters.

ii. Copies of the NOI and the Notice of Termination (NOT) must be sent to the Fond du Lac Office of Water Protection at the same time they are submitted to EPA.

iii. This certification does not pertain to any new discharge to Outstanding Reservation Resource Waters (ORRW) as described in §105 b.3 of the Fond du Lac Water Quality Standards (Ordinance #12/98). Although additional waters may be designated in the future, currently Perch Lake, Rice Portage Lake, Miller Lake, Deadfish Lake and Jaskari Lake are designated as ORRWs. New dischargers wishing to discharge to an ORRW must obtain an individual permit for stormwater discharges from large and small construction activities.

iv. All work shall be carried out in such a manner as will prevent violations of water quality criteria as stated in the Water Quality Standards of the Fond du Lac Reservation, Ordinance 12/98 as amended. This includes, but is not limited to, the prevention of any discharge that causes a condition in which visible solids, bottom deposits, or turbidity impairs the usefulness of water of the Fond du Lac Reservation for any of the uses designated in the Water Quality Standards of the Fond du Lac Reservation. These uses include wildlife, aquatic life, warm and cold water fisheries, subsistence fishing (netting), primary contact recreation, cultural, wild rice areas, aesthetic waters, agriculture, navigation and commercial.

v. Appropriate steps shall be taken to ensure that petroleum products or other chemical pollutants are prevented from entering waters of the Fond du Lac Reservation. All spills must be reported to the appropriate emergency management agency, and measures shall be taken immediately to prevent the pollution of waters of the Fond du Lac reservation, including groundwater.

vi. This certification does not authorize impacts to cultural, historical, or archeological features or sites, or properties that may be eligible for such listing.

b. *Grand Portage Band of Lake Superior Chippewa* **[Coverage not yet available]**

2. WIR100000: Indian Country within the State of Wisconsin, except the Sokaogon Chippewa Community.

a. No additional requirements

Note: Facilities within the Sokaogon Chippewa Community are not eligible for stormwater discharge coverage under this permit. Contact the Region 5 office for an individual permit application.

D. Region 6

1. NMR100000: The State of New Mexico, except Indian country
   a. In addition to all other provisions of this permit, operators who intend to obtain authorization under this permit for all new stormwater discharges must satisfy the conditions in Part 10.C.1.b., unless a TMDL has been established for the receiving stream which specifies a waste load allocation (WLA) for construction stormwater discharges or the receiving stream is a Tier 3 water, in which case Part 10.C.1.c. applies.
   b. The SWPPP must include site-specific interim and permanent stabilization, managerial, and structural solids, erosion, and sediment control best management practices (BMPs) and/or other controls that are designed to prevent to the maximum extent practicable an increase in the sediment yield and flow velocity from pre-construction, pre-development conditions to assure that applicable standards in 20.6.4 NMAC, including the antidegradation policy, or WLAs are met. This requirement applies to discharges both during construction and after construction operations have been completed. The SWPPP must identify, and document the rationale for selecting these BMPs and/or other controls. The SWPPP must also describe design specifications, construction specifications, maintenance schedules (including a long term maintenance plan), criteria for inspections, as well as expected performance and longevity of these BMPs. BMP selection must be made based on the use of appropriate soil loss prediction models (such as SEDCAD 4.0, RUSLE, SEDIMOT II, MULTISED, etc.), or equivalent, generally accepted (by professional erosion control specialists), soil loss prediction tools. The operator(s) must demonstrate, and include documentation in the SWPPP, that implementation of the site-specific practices will assure that the applicable standards or WLAs are met, and will result in sediment yields and flow velocities that, to the maximum extent practicable, will not be greater than the sediment yield levels and flow velocities from pre-construction, pre-development conditions. The SWPPP must be prepared in accordance with good engineering practices by qualified (e.g., CPESC certified, engineers with appropriate training, etc.) erosion control specialists familiar with the use of soil loss prediction models and design of erosion and sediment control systems based on these models (or equivalent soil loss prediction tools). The operator(s) must design, implement, and maintain BMPs in the manner specified in the SWPPP.
   c. Operators are not eligible to obtain authorization under this permit for all new stormwater discharges to outstanding national resource waters (ONRWs) (also referred to as "Tier 3: waters). According to the Antidegradation Policy at Paragraph 3 of Subsection A of 20.6.4.8 NMAC, in part, "ONRWs may include, but are not limited to, surface waters of the state within national and state monuments, parks, wildlife refuges, waters of exceptional recreational or

ecological significance, and waters identified under the Wild and Scenic Rivers Act." No ONRWs exist at the time this permit is being finalized; however, during the term of the permit, if a receiving water is designated as an ONRW, the operator must obtain an individual permit for stormwater discharges from large and small construction activities.

d. Stormwater discharges associated with construction activity that the State has determined to be or may reasonably be expected to be contributing to a violation of an applicable standard, including the antidegradation policy, are not authorized by this permit. *Note: Upon receipt of this determination, NMED anticipates that, within a reasonable period of time, EPA will notify the general permittee to apply for and obtain an individual NPDES permit for these discharges per 40 CFR Part 122.28(b)(3).*

e. Inspections required under Part 4 must be conducted at least once every 14 calendar days and within 24 hours of the end of a storm event of 0.5 inches or greater. The option for inspections at least once per 7 calendar days is not available. The Inspection Waivers provided in Part 4.B and C still apply.

f. Permittees can use temporary erosion controls as described in item 3 of the Appendix A definition of "Final Stabilization" as a method for final stabilization under the permit only under the following conditions:

If this option is selected, you must notify SWQB at the address listed in item g. below at the time the NOT is submitted to EPA. The information to be submitted includes:

- A copy of the NOT;
- Contact information, including individual name or title, address, and phone number for the qualified (see CGP Part 4.10.D) party responsible for implementing the final stabilization measures; and
- The date that the temporary erosion control practice was implemented (this is always prior to, and sometimes significantly prior to, submission of an NOT) and the projected timeframe that the 70% native vegetative cover requirements are expected to be met. (Note that if more than three years is required to establish 70 percent of the natural vegetative cover, this technique cannot be used or cited for fulfillment of the final stabilization requirement – you remain responsible for establishment of final stabilization)

SWQB also requires that you periodically (minimum once/year) inspect and properly maintain the area until the criteria for final stabilization, as defined in Appendix A, item 3 of the CGP, have been met. You must prepare an inspection report documenting the findings of these inspections and signed in accordance with Appendix G, Section 11 of the CGP. This inspection record must be retained along with the SWPPP for three years after the NOT is submitted for the site and additionally submitted to SWQB at the address listed in item g. below. The inspections must at a minimum include the following:

- Observations of all areas of the site disturbed by construction activity;

- Best Management Practices (BMPs)/post-construction storm water controls must be observed to ensure they are effective;
- An assessment of the status of vegetative re-establishment; and
- Corrective actions required to ensure vegetative success within three years, and control of pollutants in storm water runoff from the site, including implementation dates.

Signed copies of discharge monitoring reports, individual permit applications, and all other reports required by the permit to be submitted, shall also be sent to:

Program Manager
Point Source Regulation Section
Surface Water Quality Bureau
New Mexico Environment Department
P.O. Box 26110
Santa Fe, NM 87502

2. NMR10000I: Indian country within the State of New Mexico, except Navajo Reservation Lands that are covered under Arizona permit AZR10000I and Ute Mountain Reservation Lands that are covered under Colorado permit COR10000I
   a. *Pueblo of Acoma.* The following conditions apply only to facilities on or bordering the Pueblo of Acoma with discharges into or flowing into waters of the Pueblo.
      i. A copy of the Notice of Intent and Notice of Termination must be submitted to the Haaku Water Office at the address below at the same time they are submitted to EPA. A copy of the storm water pollution prevention plan must be provided to the Haaku Water Office upon request.
      ii. HAAKU WATER OFFICE
      PO Box 309
      Pueblo of Acoma, NM 87034
   b. *Pueblo of Isleta.* The following conditions apply only to discharges on the Pueblo of Isleta.
      i. Subpart 1.3.C.4, (Eligibility, Limitations on Coverage) first sentence, is revised to read: "This permit does not authorize discharges that EPA or the Pueblo of Isleta, prior to authorization under this permit, determines will cause, have the reasonable potential to cause, or contribute to an excursion above any applicable water quality standard or impairment of a designated use of receiving waters."
      ii. Subpart 2.2. (How to Submit) is amended to require: Copies of all Notices of Intent submitted to EPA must also be sent concurrently to the Pueblo of Isleta at the following address. Discharges are not authorized by this permit unless an accurate and complete Notice of Intent has been submitted to the Pueblo of Isleta.

      <u>Regular U.S. Mail Delivery</u>
      Natural Resources Department
      Pueblo of Isleta

P.O. Box 1270
Isleta, NM 87022

Overnight/Express Mail Delivery
Natural Resources Department
Building L
11000 Broadway, SE
Albuquerque, NM 87105

iii. Part 2 (Authorizations for Discharges of Storm Water from Construction Activity), second sentence, is amended to read: "Discharges are not authorized if your NOI is incomplete or inaccurate, if you failed to submit a copy of the NOI to the Pueblo of Isleta, or if you were never eligible for permit coverage.

iv. Subpart 5.3 (Description of Control Measures to Reduce Pollutant Discharges), section A, last sentence, is amended to read: "For each major activity identified in the project description the SWPPP must clearly describe appropriate control measures, the general sequence during the construction process in which the measures will be implemented, and which operator is responsible for the control measure's implementation and maintenance."

v. Subpart 5.7 (Copy of Permit Requirements), first sentence, is revised to read "Copies of this permit and of the signed and certified NOI form that was submitted to the Pueblo of Isleta and EPA must be included in the SWPPP."

vi. Subpart 4. (Inspections), section A is revised to read "Inspections must be conducted at least once every 7 calendar days and within 24 hours of the end of a storm event of 0.5 inches or greater."

vii. Subpart 4. (Inspections), section H, last paragraph, is amended to add: "Copies of inspection reports that identify incidents of noncompliance shall be sent to Pueblo of Isleta at the address listed in Subpart 2.2." (See above)

viii. Subpart 5.11. (Signature, Plan Review and Making Plans Available), section A, first sentence is amended to read:

"A copy of the SWPPP (including a copy of the permit), NOI, and acknowledgement letter from EPA must be retained at the construction site (or other location easily accessible during normal business hours to the Pueblo of Isleta's Natural Resources Department, EPA, a state, tribal or local agency approving sediment and erosion plans, grading plans, or storm water management plans; local government officials; the operator of a municipal separate storm sewer receiving discharges from the site; and representatives of the U.S. Fish and Wildlife Service or the National Marine Fisheries Service) from the date of commencement of construction activities to the date of final stabilization."

ix. Subpart 5.11. (Signature, Plan Review and Making Plans Available), section C. is amended to read: "SWPPPs must be made available upon request by EPA; representatives of the Pueblo of Isleta Natural Resources Department, a state, tribal or local agency approving sediment and erosion plans, grading

plans, or storm water management plans; local government officials; the operator of a municipal separate storm sewer receiving discharges from the site; and representatives of the U.S. Fish and Wildlife Service or the National Marine Fisheries Service to the requestor. The copy of the SWPPP that is required to be kept on-site or locally available must be made available, in its entirety, to the EPA staff and the Pueblo of Isleta's Natural Resources Department staff for review and copying at the time of an on-site inspection.

x. Subpart 3.1.A (Sediment Controls), is amended to add: "Erosion and sediment controls shall be designed to retain sediment on-site."

xi. Subpart 3.1.I (Spills/Releases in Excess of Reportable Quantities), first bullet is amended to read: "you must provide notice to the Pueblo of Isleta Natural Resources Department (505-869-5748) and the National Response Center (NRC) (800–424–8802; in the Washington, DC, metropolitan area call 202–426– 2675) in accordance with the requirements of 40 CFR Part 110, 40 CFR Part 117 and 40 CFR Part 302 as soon as site staff have knowledge of the discharge; and"

xii. Subpart 3.4.B (Attainment of Water Quality Standards After Authorization), is amended to add: "You must provide the Pueblo of Isleta, at the address listed in Subpart 2.2, with a copy of the EPA notification, modifications to your storm water controls, data and certification required by EPA."

xiii. Subpart 6.1. (Submitting a Notice of Termination) is amended to add: Copies of all Notices of Termination submitted to EPA must also be sent concurrently to the Pueblo of Isleta at the following address in Subpart 2.2.

xiv. Any correspondence, other than NOIs and NOTs, with the Pueblo of Isleta concerning storm water discharges authorized by this permit shall sent one of the addresses in Subpart 2.2.

xv. Appendix G, Section 9, first sentence is amended to read: "You must allow the Pueblo of Isleta's Natural Resources Department, EPA, or an authorized representative (including an authorized contractor acting as a representative of the Administrator), upon presentation of credentials and other documents as may be required by law, to:…"

xvi. Appendix G, Section 12, subsections A- H are amended to require that when you must notify EPA of an event (e.g., planned changes, anticipated noncompliance, transfers, required reporting due to potential adverse effects or environmental impacts or other noncompliance matters), the Pueblo of Isleta must also be notified.

xvii. Parties wishing to apply for an Equivalent Analysis Waiver (see Appendix D, Section C) must provide a copy of the waiver analysis to the Pueblo of Isleta at the address specified in Subpart 2.2 at the time it is submitted to EPA.

c. *Ohkay Owingeh (San Juan Pueblo).* The following conditions apply only to discharges on Ohkay Owinegeh.

i. Copies of the Notice of Intent (NOI) and Notice of Termination (NOT) must be provided to the Pueblo at the time it is provided to the Environmental Protection Agency, at the following address. A copy of the Storm Water Pollution Prevention Plan must be provided to the Pueblo upon request.

Office of Environmental Affairs
P.O. Box 717
Ohkay Owingeh, NM 87566

ii. Appendix G, Section 10 (Monitoring and records), item D is amended to add: "All monitoring must be conducted in accordance with the Pueblo of San Juan's Quality Assurance Project Plan."

d. *Pueblo of Nambé.* The following conditions apply only to discharges on the Pueblo of Nambé.

i. Copies of the Notice of Intent (NOI), Notice of Termination (NOT), and any analytical data must be provided to the Nambé Pueblo Department of Environment and Natural Resources (DENR) at the time it is provided to the Environmental Protection Agency, at the following address. A copy of the Storm Water Pollution Prevention Plan must be provided to the Pueblo upon request.

ii. All correspondence chall be sent to:

Pueblo of Nambé
Department of Environment and Natural Resources
Rt. 1 Box 117-BB
Santa Fe, NM 87506
505-455-2036 ext. 120 fax: 505-455-8873

e. *Pueblo of Picuris.* The following conditions apply only to discharges on the Pueblo of Picuris.

i. Copies of the Notice of Intent (NOI), Notice of Termination (NOT), and any analytical data (e.g. Discharge Monitoring Reports, etc.) or any other reports must be provided to the Pueblo at the time it is provided to the Environmental Protection Agency. A copy of the Storm Water Pollution Prevention Plan must be provided to the Pueblo upon request.

ii. All correspondence shall be sent to:

Cordell Arellano
Director, Environment Department
Pueblo of Picuris
PO Box 158
Penasco, NM 87553

f. *Pueblo of Pojoaque.* The following conditions apply only to discharges on the Pueblo of Pojoaque.

i. Copies of the Notice of Intent (NOI), Notice of Termination (NOT), and any analytical data (e.g. Discharge Monitoring Reports, etc.) or any other reports must be provided to the Pueblo at the time it is provided to the Environmental Protection Agency. A copy of documents related to the

Storm Water Pollution Prevention Plan must be provided to the Pueblo upon request.

ii. All correspondence shall be sent to:

Luke Mario Duran
Director, Environment Department
Pueblo of Pojoaque
5 West Gutierrez, Suite 2b
Santa Fe, NM 87506

g. *Pueblo of Taos.* The following conditions apply only to discharges on the Pueblo of Taos.

i. Copies of the Notice of Intent (NOI) and Notice of Termination (NOT) must be provided to the Taos Pueblo Governor's Office and the Taos Pueblo Environmental Office at the same time as or prior to submission to the Environmental Protection Agency. A copy of the Storm Water Pollution Prevention Plan must be provided to Pueblo environmental personnel upon request.

ii. All correspondence for both the Taos Pueblo Governor's Office and the Taos Pueblo Environmental Office (same address) shall be sent to:

Governor/ Taos Pueblo Environmental Office (as applicable)
Taos Pueblo
PO Box 1846
Taos, NM 87571

h. *Pueblo of Sandia*. The following conditions apply only to discharges on the Pueblo of Sandia.

i. A copy of the Notice of Intent (NOI) must be provided to the Pueblo at the same, (or prior to) the time it is submitted to the Environmental Protection Agency.

ii. The Pueblo of Sandia objects to use of Low Rainfall Erosivity Waivers (see Appendix D, Part A) for any small construction activities on the Pueblo, so this waiver will not be available for construction projects on the Pueblo. Permittees wishing to apply for all other waivers (see Appendix D) must provide a copy of the waiver certification or analysis to the Pueblo of Sandia Environment Department.

iii. The Storm Water Pollution Prevention Plan (SWPPP) must be available to the Pueblo of Sandia either electronically or hard copy upon request for review. The SWPPP must be made available at least fourteen (14) days before construction begins. The fourteen (14) day period will give Tribal staff time to become familiar with the project site, prepare for construction inspections, and determine compliance with the Pueblo of Sandia Water Quality Standards. Failure to provide a SWPPP to the Pueblo of Sandia may result in denial of the discharge or construction delay.

iv. Discharges are not authorized by this permit unless and until:

a. An accurate and complete NOI has been submitted to the Pueblo; AND

b. An "Authorization to Proceed Letter" with any site specific mitigation requirements has been received from the Pueblo of Sandia following their review of the NOI and SWPPP and the permittee complies with all applicable requirements therein.

v. Before submitting a Notice of Termination (NOT), permittees must clearly demonstrate to the Pueblo of Sandia Environment Department though a site visit or documentation that requirements for site stabilization have been met and any temporary erosion control structures have been removed (or operational control is being passed to another operator). A short letter concurring that conditions for submittal of an NOT have met will be sent to the permittee by the Pueblo. Upon receipt of this letter, and provided the all other applicable requirements of the permit are met, the permittee will be eligible to submit and NOT.

vi. You must telephone the Pueblo of Sandia Environment Department at (505) 867-4533 of any noncompliance that may endanger human health or the environment within ten (10) hours of becoming aware of the circumstance.

vii. All corresondance shall be sent to:

Scott Bulgrin, Water Quality Manager
Pueblo of Sandia
481 Sandia Loop
Bernalillo, NM 87004

i. *Santa Clara Pueblo*. The following conditions apply only to discharges on the Santa Clara Pueblo.

i. Copies of the Notice of Intent (NOI) and Notice of Termination (NOT) must be provided to the Pueblo of Santa Clara Office of Environmental Affairs when they are submitted to the Environmental Protection Agency.

ii. A copy of the storm water pollution prevention plan must be made available to the Pueblo of Santa Clara Office of Environmental Affairs upon request.

iii. Construction site operators must notify the Pueblo of Santa Clara Office of Environmental Affairs by telephone at (505) 753-7326 of any non-compliance discharges that may endanger human health or the environment within twenty-fout (24) hours of becoming aware of the discharge.

iv. All correspondence shall be sent to:

Santa Clara Office of Environmental Affairs Taos Pueblo
One Kee Street
PO Box 580
Espanola, NM 87532
505-753-7326 Tel
505-747-2728 Fax

j. *Pueblo of Tesuque.* The following conditions apply only to discharges on the Pueblo of Tesuque.

i. Copies of the Notice of Intent (NOI), Notice of Termination (NOT), and any analytical data (e.g. Discharge Monitoring Reports, etc.) or any other

reports must be provided to the Pueblo at the time it is provided to the Environmental Protection Agency.

ii. A copy of documents related to the Storm Water Pollution Prevention Plan must be provided to the Pueblo upon request.

iii. All correspondence shall be sent to:

Ryan Swazo-Hinds
Sr. Envirionmental Technician
Pueblo of Tesuque
Environment Department
Rt. 42, Box 360-T
Santa Fe, NM 87506

3. OKR10000F: Discharges in the State of Oklahoma that are not under the authority of the Oklahoma Department of Environmental Quality, including activities associated with oil and gas exploration, drilling, operations, and pipelines (includes SIC Groups 13 and 46, and SIC codes 492 and 5171), and point source discharges associated with agricultural production, services, and silviculture (includes SIC Groups 01, 02, 07, 08, 09).
   a. In accordance with Oklahoma's Water Quality Standards (OAC 785:45-5-25), Subpart 1.3.C. (Limitations on Coverage) is modified to add paragraphs 8 and 9 as follows:

      "8. For activities located within the watershed of any Oklahoma Scenic River, including the Illinois River, Flint Creek, Barren Fork Creek, Upper Mountain Fork, Little Lee Creek, and Big Lee Creek or any water or watershed designated "ORW" (Outstanding Resource Water) in Oklahoma's Water Quality Standards, this permit may only be used to authorize discharges from temporary construction activities. Discharges from any on-going activities such as sand and gravel mining or any other mineral mining are not authorized.

      9. For activities located within the watershed of any Oklahoma Scenic River, including the Illinois River, Flint Creek, Barren Fork Creek, Upper Mountain Fork, Little Lee Creek, and Big Lee Creek or any water or watershed designated "ORW" (Outstanding Resource Water) in Oklahoma's Water Quality Standards, this permit may not be used to authorize discharges from support activities, including concrete or asphalt batch plants, equipment staging yards, material storage areas, excavated material disposal areas, or borrow areas."
4. OKR10000I: Indian country within the State of Oklahoma.
   a. In order to protect downstream waters subject to the state of Oklahoma's Water Quality Standards (OAC 785:45-5-25) where receiving waters flow from Indian Country to State waters, Subpart 1.3.C. (Limitations on Coverage) is modified to add paragraphs 8 and 9 as follows:

      "8. For activities located within the watershed of any Oklahoma Scenic River, including the Illinois River, Flint Creek, Barren Fork Creek, Upper Mountain Fork, Little Lee Creek, and Big Lee Creek or any water or watershed designated

"ORW" (Outstanding Resource Water) in Oklahoma's Water Quality Standards, this permit may only be used to authorize discharges from temporary construction activities. Discharges from any on-going activities such as sand and gravel mining or any other mineral mining are not authorized.

9. For activities located within the watershed of any Oklahoma Scenic River, including the Illinois River, Flint Creek, Barren Fork Creek, Upper Mountain Fork, Little Lee Creek, and Big Lee Creek or any water or watershed designated "ORW" (Outstanding Resource Water) in Oklahoma's Water Quality Standards, this permit may not be used to authorize discharges from support activities, including concrete or asphalt batch plants, equipment staging yards, material storage areas, excavated material disposal areas, or borrow areas."

b. *Pawnee Nation of Oklahoma*. The following conditions apply only to discharges on the Pawnee Nation of Oklahoma.
   i. Copies of the Notice of Intent (NOI) and Notice of Termination (NOT) must be provided to the Pawnee Nation at the same time they are submitted to the Environmental Protection Agency.
   ii. A copy of the storm water pollution prevention plan must be made available to Pawnee Nation Department of Environmental Conservation and Safety upon request.
   iii. Construction site operators must notify the Pawnee Nation Department of Environmental Conservation and Safety by telephone at (918) 762-3655 immediately of any non-compliance with any provision of the permit conditions.
   iv. All correspondence shall be sent to:

   Pawnee Nation
   Department of Environmental Conservation and Safety
   PO Box 470
   Pawnee, OK 74058

5. TXR10000F: Discharges in the State of Texas that are not under the authority of the Texas Commission on Environmental Quality, including activities associated with the exploration, development, or production of oil or gas or geothermal resources, including transportation of crude oil or natural gas by pipeline.

   NOTE: This permit does not create an obligation to obtain a permit where such obligation does not already exist under federal statute or regulation. For more information on the Clean Water Act §§ 402(l)(2) permitting exemption for uncontaminated discharges of storm water from oil and gas exploration, production, processing, or treatment operations or transmission facilities, visit: http://cfpub.epa.gov/npdes/stormwater/oilgas.cfm

D. Region 8

1. MTR10000I:
   a. Confederated Salish and Kootenai Tribes. The following conditions only apply for projects on the Flathead Indian Reservation:

i. Permittees must send a Stormwater Pollution Prevention Plan (SWPPP) to the Tribe at least 30 days before construction starts;
ii. Before submitting a Notice of Termination (NOT), permittees must clearly demonstrate to an appointed tribal staff person during an on-site inspection that requirements for site stabilization have been met;
iii. Permittees submitting electronic Notices of Intents (eNOI's) to USEPA must cc a copy to NRD-EPD@cskt.org; and
iv. Written NOIs, SWPPPs, and NOTs shall be mailed to:

Confederated Salish and Kootenai Tribes
National Resources Department
Department Head
P.O. Box 278
Pablo, MT 59855

Permittees may also submit their SWPPP and NOT to NRD-EPD@cskt.org

b. Fort Peck Tribes. The following conditions only apply for projects on the Fort Peck Indian Reservation:
i. The permittee must send a copy of the Notice of Intent (NOI) and the Notice of Termination (NOT) to the Tribes at the same time that the NOI and NOT is submitted to EPA. Copies of the NOI and NOT shall be accepted either electronically or hard copy format and should be sent to:

Deb Madison
Environmental Programs Manager
Fort Peck Assiniboine & Sioux Tribes
P.O. Box 1027
Poplar, MT 59255
Tel: 406.768.2389 Fax: 406.768.5606
E-mail: 2horses@nemont.net

ii. A copy of the proposed SWPPP at the time of NOI/NOT submissions must be sent to the Tribes to ensure that upon closure of the site and/or activities all environmental commitments have been met.

c. Northern Cheyenne Reservation. The following conditions only apply for projects on the Northern Cheyenne Indian Reservation:
i. Permittees must contact the Northern Cheyenne Environmental Protection Department at (406) 477-6506 prior to authorization to discharge under the general permit;
ii. The Tribe shall review and approve SWPPPs prior to approval; and
iii. The Tribe shall review and improve BMPs on site to ensure that Tribal water quality standards are protected.

E. Region 9

1. ASR100000: The Island of American Samoa
   a. Discharges authorized by the general permit shall meet all applicable American Samoa water quality standards.
   b. Permittees discharging under the general permit shall comply with all conditions of the permit.

3. AZR10000I: Indian country lands within the State of Arizona, including Navajo Reservation lands in New Mexico and Utah
   a. White Mountain Apache Tribe. The following condition applies only for projects on the White Mountain Apache Reservation: All NOIs for proposed stormwater discharge coverage shall be provided to the following address:

      Tribal Environmental Planning Office
      P.O. Box 2109
      Whiteriver, AZ 85941

   b. Hoopa Valley Tribe. The following conditions apply only for projects on the Hoopa Valley Reservation:
      i. All notices of intent submitted for stormwater discharges under the general permit in Hoopa Valley Indian Reservation (HVIR) shall be submitted to the Tribal Environmental Protection Agency (TEPA); and
      ii. All pollution prevention plans for stormwater discharge in HVIR shall be submitted to TEPA for review and approval.

   c. 29 Palms Band of Mission Indians. The following conditions apply only for projects on the 29 Palms Band of Mission Indians Reservation:
      i. The 29 Palms Tribal EPA is informed of any future changes made to the proposed CGP;
      ii. For each permitted activity, the U.S. EPA will ensure that all terms and conditions of the proposed CGP are complied with;
      iii Notices of intent must be submitted to the 29 Palms Tribal EPA for review, comment and tracking;
      iv. Copies of stormwater pollution prevention plans (SWPPPs) and supporting Best Management Practices (BMPs) must be submitted to the 29 Palms Tribal EPA for review and compliance;
      v. Copies of all monitoring reports must be provided to the 29 Palms Tribal EPA;
      vi. Depending on the permitted activity, the 29 Palms Tribal EPA reserves the right to stipulate additional monitoring requirements; and
      vii. In order to meet the requirements of Tribal law, including water quality standards, each of the conditions cited in the proposed CGP and the Twenty-Nine Palms Band of Mission Indians certification shall not be made any less stringent.

d. Hualapai Tribe. The following conditions apply only for projects on the Hualapai Reservation:

   i. All notices of intent for proposed stormwater discharges under the CGP and all pollution prevention plans for stormwater discharges on Hualapai Tribal lands shall be submitted to the Water Resource Program through the Tribal Chairman for review and approval, P.O. Box 179, Peach Springs, AZ 86434.

e. Pyramid Lake Paiute Tribe. The following conditions apply only for projects on the Pyramid Lake Paiute Reservation:

   i. All notices of intent (NOIs) must be submitted to the Tribe for review, comments and tracking;

   ii. copies of all Stormwater Pollution Prevention Plan (SWPPPs) and supporting Best Management Practices (BMPs) must be submitted to the Pyramid Lake Paiute Tribe for review and concurrence;

   iii. copies of the criteria for Effluent Limitations Guidelines (ELGs) and the criteria for proposed Qualifying Local Programs (QLPs) to be used for sediment and erosion control pursuant to 40 CFR 122.44(s) be provided to the Pyramid Lake Paiute Tribe; and

   iv. copies of all monitoring reports must be provided to the Pyramid Lake Paiute Tribe.

4. MPR100000: Commonwealth of the Northern Mariana Islands (CNMI)

   a. An Earthmoving and Erosion Control Permit shall be obtained from the CNMI DEQ prior to any construction activity covered under the NPDES general permit.

   b. All conditions and requirements set forth in the USEPA NPDES general permit for discharges from large and small construction must be complied with.

   c. A SWPPP for storm water discharges from construction activity must be approved by the Director of the CNMI DEQ prior to the submission of the NOI to USEPA. The CNMI address for the submittal of the SWPPP for approval is:

      Commonwealth of the Northern Mariana Islands
      Office of the Governor
      Director, Division of Environmental Quality (DEQ)
      P.O. Box 501304 C.K.
      Saipan, MP 96950-1304

   d. An NOI to be covered by the general permit for discharges from large and small construction sites must be submitted to CNMI DEQ (use above address) and USEPA, Region 9, in the form prescribed by USEPA, accompanied by a SWPPP approval letter from CNMI DEQ.

   e. The NOI must be postmarked seven (7) calendar days prior to any storm water discharges and a copy must be submitted to the Director of CNMI DEQ (use above address) no later than seven (7) calendar days prior to any stormwater discharges.

f. Copies of all monitoring reports required by the NPDES general permit must be submitted to CNMI DEQ (use above address).

g. In accordance with section 10.3(h) and (i) of the CNMI water quality standards, CNMI DEQ reserves the right to deny coverage under the general permit and to require submittal of an application for an individual NPDES permit based on a review of the NOI or other information made available to the Director.

F. Region 10

1. AKR100000: The State of Alaska, except Indian country

a. For Storm Water Pollution Prevention Plans

i. Operators of construction projects disturbing at least one acre of land but less than five acres of land shall submit a copy of the Notice of Intent (NOI) to the Alaska Department of Environmental Conservation (ADEC) at the same time it is submitted to the EPA. Submittals to ADEC shall be made to the following address

Alaska Department of Environmental Conservation
Wastewater Discharge/Storm Water
555 Cordova St.
Anchorage, AK 99501

ii. Operators of construction projects that disturb five or more acres of land and that are located outside the areas of the local governments described in numbers iii, iv, v, or vi below, shall submit a copy of the Storm Water Pollution Prevention Plan (SWPPP) and a copy of the NOI to ADEC for review. The SWPPP shall be accompanied by the state-required plan review fee (see 18 AAC 72.955).

iii. Within the Municipality of Anchorage

(1) Operators of construction projects disturbing one or more acres of land shall submit a copy of the SWPPP to either ADEC or the Municipality based on the project type and operator as shown in the following table

Project Type	Submit SWPPP to
Government (federal, state, municipal) road projects and other government transportation projects such as ports, railroads or airports	ADEC
Utility projects for which the utility is initiating the work	Municipality
Work that requires a Building Permit	Municipality
Non-publicly funded transportation projects	Municipality

(2) Submittal of the SWPPP to the Municipality should be made before or at the same time the NOI is submitted to the EPA and ADEC and shall be accompanied by any Municipality-required fee. Copies of the SWPPP shall be submitted to the Municipality at the following address

Municipality of Anchorage
Office of Planning Development and Public Works
4700 South Elmore Rd.
PO Box 196650
Anchorage, AK 99519-6650

(3) Submittals to ADEC shall include a copy of the SWPPP and a copy of the NOI for review and shall be accompanied by the state-required plan review fee (see 18 AAC 72.995).

iv. Within the urbanized area boundary of the Fairbanks North Star Borough check with the Borough for the latest requirements.

Fairbanks North Star Borough
Department of Public Works
PO Box 71267
Fairbanks, AK 99707

v. Within the urbanized area boundary of the City of Fairbanks

(1) Operators of privately-funded construction projects disturbing one or more acres of land shall submit a copy of the SWPPP to the City of Fairbanks.

(2) Submittal of the SWPPP to the City of Fairbanks should be made before or at the same time the NOI is submitted to the EPA and ADEC and shall be accompanied by any City-required fee. Copies of the SWPPP shall be submitted to the City of Fairbanks at the following address

City of Fairbanks
Engineering Division
800 Cushman St
Fairbanks, AK 99701

(3) Operators of publicly-funded projects disturbing one or more acres of land shall submit a copy of the SWPPP and a copy of the NOI to ADEC for review, and shall be accompanied by the state-required plan review fee (see 18 AAC 72.995).

vi. Within the urbanized area boundary of the City of North Pole

(1) Operators of privately-funded construction projects disturbing one or more acres of land shall submit a copy of the SWPPP to the City of North Pole.

(2) Submittal of the SWPPP to the City of North Pole should be made before or at the same time the NOI is submitted to the EPA and ADEC and shall be accompanied by any City-required fee. Copies of the SWPPP shall be submitted to the City of North Pole at the following address

City of North Pole
Department of Public Works
125 Snowman Lane
North Pole, AK 99705

(3) Operators of publicly-funded projects disturbing one or more acres of land shall submit a copy of the SWPPP and a copy of the NOI to ADEC for review, and shall be accompanied by the state-required plan review fee (see 18 AAC 72.995).

vii. For hardrock mines that are designed to process 500 or more tons per day and intend to file a Notice of Intent to begin construction under this permit

(1) The operator shall submit their SWPPP to ADEC for review at least 90 days before the start of construction,

(2) Representatives of the operator and the prime site construction contractor shall meet with ADEC representatives in a pre-construction conference at least 20 days before the start of construction to discuss the details of the SWPPP and stormwater management during construction,

(3) The operator shall submit to ADEC addendums to the SWPPP that address any planned physical alterations, additions to the permitted facility, or unanticipated conditions that arise during planned construction that could significantly change the nature, or increase the quantity, of pollutants discharged from the facility, and

(4) The operator shall have at least one person on-site during construction who is qualified and trained in the principles and practices of erosion and sediment control and has the authority to direct the maintenance of storm water best management practices.

b. For Post-Construction (Permanent) Storm Water Control Measures (Section 3.1.E *[Post-Construction Stormwater Management]* of the CGP)

   i. Operators of construction projects who construct, alter, install, modify, or operate any part of a storm water treatment system and are located outside the Municipality of Anchorage, shall submit a copy of the engineering plans to ADEC for review at the address given above (see 18 AAC 72.600).

   ii. Operators of construction projects who construct, alter, install, modify, or operate any part of a storm water treatment system and are located inside the Municipality of Anchorage, shall submit a copy of the engineering plans to the respective government agency based on project type, as indicated in the table in a.iii.*(1)* above, for review at the addresses given in a.i. or a.iii.*(2)* above.

2. IDR100000: The State of Idaho, except Indian country

a. *303(d)-listed Water Bodies with Approved TMDLs.*
   Discharges of storm water will be consistent with load allocations established by the applicable TMDL.

b. *303(d)-listed Water Bodies without Approved TMDLs (High Priority)*
   If a TMDL has not been established for a high priority 303(d)-listed water body, then discharges of storm water may not cause an increase in the total load of listed pollutant(s) in the receiving water body.

c. *303(d)-listed Water Bodies without Approved TMDLs (Medium or Low Priority)*
   If a TMDL has not been established for a medium or low priority 303(d)-listed water body, then best management practices shall be employed as necessary to prohibit further impairment of the designated or existing beneficial uses in the receiving water body.

d. *Best Management Practices (BMPs)*
   BMPs must be designed, implemented, and maintained by the permittee to fully protect and maintain the beneficial uses of the receiving water body. The permittee should select appropriate BMPs that are either authorized by the

appropriate designated agency as defined in Idaho Water Quality Standards (IDAPA 58.01.02), recommended in IDEQ's *Catalog of Stormwater BMPs for Idaho Cities and Counties*, or recommended by other local government entities or guidance documents.

e. *Equivalent Analysis Waiver* - Use of the "Equivalent Analysis Waiver" in Appendix D of the permit is not authorized.

f. Operators may contact the Idaho Department of Environmental Quality regional office nearest the construction activity for more information about impaired waterways:

Boise Regional Office:
1445 N. Orchard
Boise ID 83706-2239
Tel: (208)373-0550
Fax: (208)373-0287

Grangeville Satellite Office:
300 W. Main
Grangeville ID 83530
Tel: (208)983-0808
Fax: (208)983-2873

Pocatello Regional Office:
444 Hospital Way #300
Pocatello ID 83201
Tel: (208)236-6160
Fax: (208)236-6168

McCall Satellite Office:
502 N. 3rd Street #9A
P.O. Box 4654
McCall, ID 83638
Tel: (208)634-4900
Fax: (208)634-9405

Idaho Falls Regional Office:
900 N. Skyline, Suite B
Idaho Falls, ID 83402
Tel: (208)528-2650
Fax: (208)528-2695

Twin Falls Regional Office:
1363 Fillmore
Twin Falls, ID 83301
Tel: (208)736-2190
Fax: (208)736-2194

Coeur d'Alene Regional Office:
2110 Ironwood Parkway
Coeur d'Alene ID 83814
Tel: (208)769-1422
Fax: (208)769-1404

Lewiston Regional Office:
1118 "F" Street
Lewiston, ID 83501
Tel: (208)799-4370
Toll Free: 1-877-541-3304
Fax: (208)799-3451

3. ORR10000I: Indian country within the State of Oregon, except Fort McDermitt Reservation lands (see Region 9):

a. Confederated Tribes of the Umatilla Indian Reservation.
The following conditions apply only for projects within the exterior boundaries of the Umatilla Indian Reservation:
   i. The operator shall be responsible for achieving compliance with the Confederated Tribes of the Umatilla Indian Reservation's (CTUIR) Water Quality Standards.
   ii. The operator must submit all Storm Water Pollution Prevention Plans required under this general permit to the CTUIR Water Resources Program for review and determination that the SWPPP is sufficient to meet Tribal Water Quality Standards prior to the beginning of any discharge activities taking place.
   iii. The operator must submit a copy of the Notice of Intent (NOI) to be covered by this general permit to the CTUIR Water Resources Program at the address below, at the same time it is submitted to EPA.
   iv. The operator shall be responsible for reporting an exceedance of Tribal Water Quality Standards to the CTUIR Water Resources Program at the same time it is reported to EPA.
      Confederated Tribes of the Umatilla Indian Reservation
      Water Resources Program
      P.O. Box 638
      Pendleton, OR 97801
      (541) 966-2420
   v. At least 45 days prior to beginning any discharge activities, the operator must submit a copy of the Notice of Intent to be covered under this general permit and an assessment of whether the undertaking has the potential to affect historic properties to CTUIR Tribal Historic Preservation Office (THPO) at the address below. If the project has potential to affect historic properties, the operator must define the area of potential effect (APE). The operator must provide the THPO at least 30 days to comment on the APE as defined.

vi. If the project is an undertaking, the operator must conduct a cultural resource investigation. All fieldwork must be conducted by qualified personnel (as outlined by the Secretary of the Interior's Standards and Guidelines found at http://www.nps.gov/history/local-law/arch_stnds_0.htm). All fieldwork must be documented using Oregon Reporting Standards (as outlined at http://egov.oregon.gov/OPRD/HCD/ARCH/arch_pubsandlinks.shtml). The resulting report must be submitted to the THPO for concurrence before any ground disturbing work can occur. The operator must provide the THPO at least 30 days to review and respond to all reports.
The operator must obtain THPO concurrence in writing. If historic properties are present, this written concurrence will outline measures to be taken to prevent or mitigate effects to historic properties.

Confederated Tribes of the Umatilla Indian Reservation
Cultural Resources Protection Program
Tribal Historic Preservation Office
P.O. Box 638
Pendleton, OR 97801
(541) 966-2340

b. Confederated Tribes of Warm Springs.
The following conditions apply only for projects on the Warm Springs Indian Reservation:

i. All activities covered by this NPDES general permit occurring within a designated riparian buffer zone as established in Ordinance 74 (Integrated Resource Management Plan or IRMP) must be reviewed, approved and permitted through the Tribe's Hydraulic Permit Application process, including payment of any applicable fees.

ii. All activities covered by this NPDES general permit must follow all applicable land management and resource conservation requirements specified in the IRMP.

iii. Operators of activities covered by this NPDES general permit must submit a Storm Water Pollution Prevention Plan to the Tribe's Water Control Board at the following address for approval at least 30 days prior to beginning construction activity:

Chair, Warm Springs Water Control Board
P.O. Box C
Warm Springs, Oregon 97761

4. WAR10000F: Federal Facilities in the State of Washington, except those located on Indian Country

a. Discharges shall not cause or contribute to a violation of surface water quality standards (Chapter 173-201A WAC), ground water quality standards (Chapter 173-200 WAC), sediment management standards (Chapter 173-204 WAC), and human health-based criteria in the National Toxics Rule (40 CFR Part 131.36). Discharges that are not in compliance with these standards are not authorized.

b. Prior to the discharge of stormwater and non-stormwater to waters of the state, the Permittee shall apply all known, available, and reasonable methods of prevention, control, and treatment (AKART). This includes the preparation and implementation of an adequate Stormwater Pollution Prevention Plan (SWPPP), with all appropriate best management practices (BMPs) installed and maintained in accordance with the SWPPP and the terms and conditions of this permit.

c. Sampling & Numeric Effluent Limitations – For Sites Discharging to Certain Waterbodies on the 303(d) List or with an Applicable TMDL

   i. Permittees that discharge to water bodies listed as impaired by the State of Washington under Section 303(d) of the Clean Water Act for turbidity, fine sediment, high pH or phosphorus, shall conduct water quality sampling according to the requirements of this section.

      (1) The operator must retain all monitoring results required by this section as part of the SWPPP. All data and related monitoring records must be provided to EPA or the Washington Department of Ecology upon request.

      (2) The operator must notify EPA when the discharge turbidity or discharge pH exceeds the water quality standards as defined in Parts 10.F.4.d.ii and e.ii below, in accordance with the reporting requirements of Part G.12.F of this permit. All reports must be submitted to EPA at the following address:
      U.S EPA Region 10
      NPDES Compliance Unit - Attn: Federal Facilities Compliance Officer
      1200 6th Avenue, Suite 900
      OCE-133
      Seattle, WA 98101
      (206) 553-1846

   ii. All references and requirements associated with Section 303(d) of the Clean Water Act mean the most current listing by Ecology of impaired waters that exists on November 16, 2005, or the date when the operator's complete NOI is received by EPA, whichever is later.

Parameter identified in 303(d) listing	Parameter/Units	Analytical Method	Sampling Frequency	Water Quality Standard
Turbidity Fine Sediment Phosphorus	Turbidity/NTU	SM2130 or EPA180.1	Weekly, if discharging	If background is 50 NTU or less: 5 NTU over background; or If background is more than 50 NTU: 10% over background
High pH	pH/Standard Units	pH meter	Weekly, if discharging	In the range of 6.5 – 8.5

d. Discharges to waterbodies on the 303(d) list for turbidity, fine sediment, or phosphorus

   i. Permittees which discharge to waterbodies on the 303(d) list for turbidity, fine sediment, or phosphorus shall conduct turbidity sampling at the

following locations to evaluate compliance with the water quality standard for turbidity:

(1) Background turbidity shall be measured in the 303(d) listed receiving water immediately upstream (upgradient) or outside the area of influence of the discharge; and

(2) Discharge turbidity shall be measured at the point of discharge into the 303(d) listed receiving waterbody, inside the area of influence of the discharge; **or**
Alternatively, discharge turbidity may be measured at the point where the discharge leaves the construction site, rather than in the receiving waterbody.

ii. Based on sampling, if the discharge turbidity ever exceeds the water quality standard for turbidity (more than 5 NTU over background turbidity when the background turbidity is 50 NTU or less, or more than a 10% increase in turbidity when the background turbidity is more than 50 NTU), all future discharges shall comply with a numeric effluent limit which is equal to the water quality standard for turbidity. If a future discharge exceeds the water quality standard for turbidity, the permittee shall:

(1) Review the SWPPP for compliance with the permit and make appropriate revisions within 7 days of the discharge that exceeded the standard;

(2) Fully implement and maintain appropriate source control and/or treatment BMPs as soon as possible, but no later than 10 days of the discharge that exceeded the standard;

(3) Document BMP implementation and maintenance in the site log book;

(4) Continue to sample daily until discharge turbidity meets the water quality standard for turbidity.

e. Discharges to waterbodies on the 303(d) list for High pH

i. Permittees which discharge to waterbodies on the 303(d) list for high pH shall conduct sampling at one of the following locations to evaluate compliance with the water quality standard for pH (in the range of 6.5 – 8.5):

(1) pH shall be measured at the point of discharge into the 303(d) listed waterbody, inside the area of influence of the discharge; or

(2) Alternatively, pH may be measured at the point where the discharge leaves the construction site, rather than in the receiving water.

ii. Based on the sampling set forth above, if the pH ever exceeds the water quality standard for pH (in the range of 6.5 – 8.5), all future discharges shall comply with a numeric effluent limit which is equal to the water quality standard for pH. If a future discharge exceeds the water quality standard for pH, the permittee shall:

(1) Review the SWPPP for compliance with the permit and make appropriate revisions within 7 days of the discharge;

(2) Fully implement and maintain appropriate source control and/or treatment BMPs as soon as possible, but no later than 10 days of the discharge that exceeded the standards;

(3) Document BMP implementation and maintenance in the site log book;

(4) Continue to sample daily until discharge meets the water quality standard for pH (in the range of 6.5 – 8.5).

f. Sampling & Limitations – For Sites Discharging to TMDLs

i. Discharges to waterbodies subject to an applicable Total Maximum Daily Load (TMDL) for turbidity, fine sediment, high pH, or phosphorus, shall be consistent with the assumptions and requirements of the TMDL.

(1) Where an applicable TMDL sets specific waste load allocations or requirements for discharges covered by this permit, discharges shall be consistent with any specific waste load allocations or requirements established by the applicable TMDL.

a. Discharges shall be sampled weekly, or as otherwise specified by the TMDL, to evaluate compliance with the specific waste load allocations or requirements.

b. Analytical methods used to meet the monitoring requirements shall conform to the latest revision of the Guidelines Establishing Test Procedures for the Analysis of Pollutants contained in 40 CFR Part 136.

(2) Where an applicable TMDL has established a general waste load allocation for construction stormwater discharges, but no specific requirements have been identified, compliance with this permit will be assumed to be consistent with the approved TMDL.

(3) Where an applicable TMDL has not specified a waste load allocation for construction stormwater discharges, but has not excluded these discharges, compliance with this permit will be assumed to be consistent with the approved TMDL.

(4) Where an applicable TMDL specifically precludes or prohibits discharges from construction activity, the operator is not eligible for coverage under this permit.

ii. Applicable TMDL means a TMDL for turbidity, fine sediment, high pH, or phosphorus, which has been completed and approved by EPA prior to November 16, 2005, or prior to the date the operator's complete NOI is received by EPA, whichever is later.
Information on impaired waterways is available from the Department of Ecology website at:
http://www.ecy.wa.gov/programs/wq/stormwater/construction/impaired.html
or by phone: 360-407-6460.

5. WAR10000I: Indian country within the State of Washington

a. Kalispel Tribe.

The following conditions apply only for projects on the Kalispel Reservation:

i. The permittee shall be responsible for achieving compliance with the Kalispel Tribe's Water Quality Standards.
ii. The permittee shall submit a copy of the Notice of Intent (NOI) to be covered by the general permit to the Kalispel Tribe Natural Resources Department at the same time as it submitted to the U.S. EPA
iii. The permittee shall submit all Storm Water Prevention Plans (SWPP) to the Kalispel Tribe Natural Resources Department thirty (30) days prior to beginning any discharge activities for review.
iv. Prior to any land disturbing activities on the Kalispel Indian Reservation and its dependent communities, the permittee shall obtain a cultural resource clearance letter from the Kalispel Natural Resource Department.
v. All tribal correspondence pertaining to the general permit for discharges of construction stormwater shall be sent to:

Kalispel Tribe Natural Resources Department
PO Box 39
Usk, WA 99180

b. Lummi Nation

The following conditions apply only for projects on the Lummi Reservation:

i. Pursuant to Lummi Code of Laws (LCL) 17.05.020(a), the operator must obtain a land use permit from the Lummi Planning Department as provided in Title 15 of the Lummi Code of Laws and regulations adopted thereunder.
ii. Pursuant to LCL 17.05.020(a), each operator shall develop and submit a Storm Water Pollution Prevention Plan to the Lummi Water Resources Division for review and approval by the Water Resources Manager prior to beginning any discharge activities.
iii. Pursuant to LCL Title 17, each operator shall be responsible for achieving compliance with the Water Quality Standards for Surface Waters of the Lummi Indian Reservation (Lummi Administrative Regulations [LAR] 17 LAR 07.010 through 17 LAR 07.210).
iv. Each operator shall submit a copy of the Notice of Intent to the Lummi Water Resources Division at the same time it is submitted to the Environmental Protection Agency (EPA).
v. Storm Water Pollution Prevention Plans and Notices of Intent shall be submitted to:

Lummi Natural Resources Department
ATTN: Water Resources Manager
2616 Kwina Road
Bellingham, WA 98226

vi. Refer to the Lummi Nation website at *http://www.lummi-nsn.gov* to review a copy of Title 17 of the Lummi Code of Laws and the references upon which the conditions identified above are based.

c. Makah Tribe

The following conditions apply only for projects on the Makah Reservation:

i. The operator shall be responsible for achieving compliance with the Makah Tribe's Water Quality Standards.
ii. The operator shall submit a Storm Water Pollution Prevention Plan to the

Makah Tribe Water Quality Program and Makah Fisheries Habitat Division for review and approval at least thirty (30) days prior to beginning any discharge activities.

iii. The operator shall submit a copy of the Notice of Intent to the Makah Tribe Water Quality Program and Makah Fisheries Habitat Division at the same time it is submitted to EPA.

iv. Storm Water Pollution Prevention Plans and Notices of Intent shall be submitted to:

Makah Fisheries Water Quality and Habitat Division
PO Box 115
Neah Bay, WA 98357

d. Puyallup Tribe of Indians.
The following conditions apply only to stormwater discharges from large and small construction activities that result in a total land disturbance of equal to or greater than one acre, where those discharges enter surface waters of the Puyallup Tribe:

i. Each permittee shall be responsible for achieving compliance with the Puyallup Tribe's Water Quality Standards, including antidegradation provisions. The Puyallup Natural Resources Department will conduct an antidegradation review for permitted activities that have the potential to affect water quality. The antidegradation review will be consistent with the Tribe's Antidegradation Implementation Procedures.

ii. The permittee shall be responsible for meeting any additional permit requirements imposed by EPA necessary to comply with the Puyallup Tribe's antidegradation policies if the discharge point is located within 1 linear mile upstream of waters designated by the Tribe.

iii. Each permittee shall submit a copy of the Notice of Intent (NOI) to be covered by the general permit to the Puyallup Tribal Natural Resources Department at the address listed below at the same time it is submitted to EPA.

Puyallup Tribe of Indians
3009 E. Portland Avenue
Tacoma, WA 98404
ATTN: Natural Resources Department

iv. All supporting documentation and certifications in the NOI related to coverage under the general permit for Endangered Species Act purposes shall be submitted to the Puyallup Tribal Natural Resources Department for review.

v. If EPA requires coverage under an individual or alternative permit, the permittee shall submit a copy of the permit to the Puyallup Tribal Natural Resources Department at the address listed above.

vi. The permittee shall submit all stormwater pollution prevention plans to the Puyallup Tribal Natural Resources Department for review and approval prior to beginning any activities resulting in a discharge to tribal waters.

Appendix A - Definitions and Acronyms

Definitions

"Arid Areas" means areas with an average annual rainfall of 0 to 10 inches.

"Best Management Practices" (BMPs) means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the discharge of pollutants to waters of the United States. BMPs also include treatment requirements, operating procedures, and practice to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

"Commencement of Construction Activities" means the initial disturbance of soils associated with clearing, grading, or excavating activities or other construction-related activities (e.g., stockpiling of fill material).

"Control Measure" as used in this permit, refers to any BMP or other method used to prevent or reduce the discharge of pollutants to waters of the United States.

"CWA" means the Clean Water Act or the Federal Water Pollution Control Act, 33 U.S.C. section 1251 et seq.

"Discharge" when used without qualification means the "discharge of a pollutant."

"Discharge of Stormwater Associated with Construction Activity" as used in this permit, refers to a discharge of pollutants in stormwater from areas where soil disturbing activities (e.g., clearing, grading, or excavation), construction materials or equipment storage or maintenance (e.g., fill piles, borrow area, concrete truck chute washdown, fueling), or other industrial stormwater directly related to the construction process (e.g., concrete or asphalt batch plants) are located.

"Eligible" means qualified for authorization to discharge stormwater under this general permit.

"Facility" or "Activity" means any "point source" or any other facility or activity (including land or appurtenances thereto) that is subject to regulation under the NPDES program.

"Federal Facility" means any buildings, installations, structures, land, public works, equipment, aircraft, vessels, and other vehicles and property, owned by, or constructed or manufactured for the purpose of leasing to, the Federal government.

"Final Stabilization" means that:

1. All soil disturbing activities at the site have been completed and either of the two following criteria are met:
    a. a uniform (e.g,, evenly distributed, without large bare areas) perennial vegetative cover with a density of 70 percent of the native background

vegetative cover for the area has been established on all unpaved areas and areas not covered by permanent structures, or

b. equivalent permanent stabilization measures (such as the use of riprap, gabions, or geotextiles) have been employed.

2. When background native vegetation will cover less than 100 percent of the ground (e.g., arid areas, beaches), the 70 percent coverage criteria is adjusted as follows: if the native vegetation covers 50 percent of the ground, 70 percent of 50 percent (0.70 X 0.50 = 0.35) would require 35 percent total cover for final stabilization. On a beach with no natural vegetation, no stabilization is required.
3. In arid and semi-arid areas only, all soil disturbing activities at the site have been completed and both of the following criteria have been met:
   a. Temporary erosion control measures (e.g., degradable rolled erosion control product) are selected, designed, and installed along with an appropriate seed base to provide erosion control for at least three years without active maintenance by you,
   b. The temporary erosion control measures are selected, designed, and installed to achieve 70 percent vegetative coverage within three years.
4. For individual lots in residential construction, final stabilization means that either:
   a. The homebuilder has completed final stabilization as specified above, or
   b. The homebuilder has established temporary stabilization including perimeter controls for an individual lot prior to occupation of the home by the homeowner and informing the homeowner of the need for, and benefits of, final stabilization.
5. For construction projects on land used for agricultural purposes (e.g., pipelines across crop or range land, staging areas for highway construction, etc.), final stabilization may be accomplished by returning the disturbed land to its preconstruction agricultural use. Areas disturbed that were not previously used for agricultural activities, such as buffer strips immediately adjacent to ‘‘water of the United States,’’ and areas which are not being returned to their preconstruction agricultural use must meet the final stabilization criteria (1) or (2) or (3) above.

“Indian country” is defined at 40 CFR §122.2 to mean:

1. All land within the limits of any Indian reservation under the jurisdiction of the United States Government, notwithstanding the issuance of any patent, and, including rights-of-way running through the reservation;
2. All dependent Indian communities with the borders of the United States whether within the originally or subsequently acquired territory thereof, and whether within or without the limits of a state; and
3. All Indian allotments, the Indian titles to which have not been extinguished, including rights-of-ways running through the same.

“Large Construction Activity” is defined at 40 CFR §122.26(b)(14)(x) and incorporated here by reference. A large construction activity includes clearing, grading, and excavating resulting in a land disturbance that will disturb equal to or greater than five acres of land or will disturb less than five acres of total land area but is part of a larger common plan of development or sale that will ultimately disturb equal to or greater than five acres. Large

construction activity does not include routine maintenance that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of the site.

"Municipal Separate Storm Sewer System" or "MS4" is defined at 40 CFR §122.26(b)(8) to mean a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, manmade channels, or storm drains):

1. Owned and operated by a state, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, stormwater, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 208 of the CWA that discharges to waters of the United States;
2. Designed or used for collecting or conveying stormwater;
3. Which is not a combined sewer; and
4. Which is not part of a Publicly Owned Treatment Works (POTW) as defined at 40 CFR §122.2.

"New Project" means the "commencement of construction activities" occurs after the effective date of this permit.

"Ongoing Project" means the "commencement of construction activities" occurs before the effective date of this permit.

"Operator" for the purpose of this permit and in the context of stormwater associated with construction activity, means any party associated with a construction project that meets either of the following two criteria:

1. The party has operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications; or
2. The party has day-to-day operational control of those activities at a project which are necessary to ensure compliance with a SWPPP for the site or other permit conditions (e.g., they are authorized to direct workers at a site to carry out activities required by the SWPPP or comply with other permit conditions). This definition is provided to inform permittees of EPA's interpretation of how the regulatory definitions of "owner or operator" and "facility or activity" are applied to discharges of stormwater associated with construction activity.

"Owner or operator" means the owner or operator of any ''facility or activity'' subject to regulation under the NPDES program.

"Permitting Authority" means the United States Environmental Protection Agency, EPA, a Regional Administrator of the Environmental Protection Agency or an authorized representative.

"Point Source" means any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock concentrated animal feeding operation, landfill leachate collection system, vessel or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural stormwater runoff.

"Pollutant" is defined at 40 CFR §122.2. A partial listing from this definition includes: dredged spoil, solid waste, sewage, garbage, sewage sludge, chemical wastes, biological materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt, and industrial or municipal waste.

"Project Area" means:
− The areas on the construction site where stormwater discharges originate and flow toward the point of discharge into the receiving waters (including areas where excavation, site development, or other ground disturbance activities occur) and the immediate vicinity. (Example: 1. Where bald eagles nest in a tree that is on or bordering a construction site and could be disturbed by the construction activity or where grading causes stormwater to flow into a small wetland or other habitat that is on the site that contains listed species.)
− The areas where stormwater discharges flow from the construction site to the point of discharge into receiving waters. (Example: Where stormwater flows into a ditch, swale, or gully that leads to receiving waters and where listed species (such as amphibians) are found in the ditch, swale, or gully.)
− The areas where stormwater from construction activities discharge into receiving waters and the areas in the immediate vicinity of the point of discharge. (Example: Where stormwater from construction activities discharges into a stream segment that is known to harbor listed aquatic species.)
− The areas where stormwater BMPs will be constructed and operated, including any areas where stormwater flows to and from BMPs. (Example: Where a stormwater retention pond would be built.)
− The areas upstream and /or downstream from construction activities discharges into a stream segment that may be affected by the said discharges. (Example: Where sediment discharged to a receiving stream settles downstream and impacts a breeding area of a listed aquatic species.)

"Receiving water" means the "Water of the United States" as defined in 40 CFR §122.2 into which the regulated stormwater discharges.

"Runoff coefficient" means the fraction of total rainfall that will appear at the conveyance as runoff.

"Semi-Arid Areas" means areas with an average annual rainfall of 10 to 20 inches.

"Site" means the land or water area where any "facility or activity" is physically located or conducted, including adjacent land used in connection with the facility or activity.

"Small Construction Activity" is defined at 40 CFR §122.26(b)(15) and incorporated here by reference. A small construction activity includes clearing, grading, and excavating resulting in a land disturbance that will disturb equal to or greater than one (1) acre and less than five (5) acres of land or will disturb less than one (1) acre of total land area but is part of a larger common plan of development or sale that will ultimately disturb equal to or greater than one (1) acre and less than five (5) acres. Small construction activity does not include routine maintenance that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of the site.

"Stormwater" means stormwater runoff, snow melt runoff, and surface runoff and drainage.

"Stormwater Discharge-Related Activities" as used in this permit, include: activities that cause, contribute to, or result in stormwater point source pollutant discharges, including but not limited to: excavation, site development, grading and other surface disturbance activities; and measures to control stormwater including the siting, construction and operation of BMPs to control, reduce or prevent stormwater pollution.

"Total Maximum Daily Load" or "TMDL" means the sum of the individual wasteload allocations (WLAs) for point sources and load allocations (LAs) for nonpoint sources and natural background. If a receiving water has only one point source discharger, the TMDL is the sum of that point source WLA plus the LAs for any nonpoint sources of pollution and natural background sources, tributaries, or adjacent segments. TMDLs can be expressed in terms of either mass per time, toxicity, or other appropriate measure.

"Waters of the United States" is as defined at 40 CFR §122.2.

"Wetland" means those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

ACRONYMS

BMP - Best Management Practices
CGP - Construction General Permit
CFR - Code of Federal Regulations
CWA - Clean Water Act
EPA - United States Environmental Protection Agency
ESA - Endangered Species Act
FWS - United States Fish and Wildlife Service
MS4 - Municipal Separate Storm Sewer System
MSGP - Multi-Sector General Permit
NHPA - National Historic Preservation Act
NMFS - United States National Marine Fisheries Service
NOI - Notice of Intent

NOT - Notice of Termination
NPDES - National Pollutant Discharge Elimination System
POTW - Publicly Owned Treatment Works
SHPO - State Historic Preservation Officer
SWPPP - Stormwater Pollution Prevention Plan
THPO - Tribal Historic Preservation Officer
TMDL - Total Maximum Daily Load
WQS - Water Quality Standard

Appendix B - Permit Areas Eligible for Coverage

Permit coverage for stormwater discharges from construction activity occurring within the following areas is provided by legally separate and distinctly numbered permits:

1. EPA Region 1: CT, MA, ME, NH, RI, VT

US EPA, Region 01
Office of Ecosystem Protection
NPDES Stormwater Program
1 Congress St, Suite 1100 (CMU)
Boston, MA 02114-2023

The States of Connecticut, Maine, Rhode Island, and Vermont are the NPDES Permitting Authority for the majority of discharges within their respective states.

Permit No.	Areas of Coverage/Where EPA is Permitting Authority
MAR100000	Commonwealth of Massachusetts (except Indian country)
MAR10000I	Indian country within the State of Massachusetts
CTR10000I	Indian country within the State of Connecticut
NHR100000	State of New Hampshire
RIR10000I	Indian country within the State of Rhode Island
VTR10000F	Federal Facilities in the State of Vermont

2. EPA Region 2: NJ, NY, PR, VI

For NJ, NY, and VI:
US EPA, Region 02
NPDES Stormwater Program
290 Broadway, 24th Floor
New York, NY 10007-1866

For PR:
US EPA, Region 02
Caribbean Environmental Protection Division
NPDES Stormwater Program
1492 Ponce de Leon Ave
Central Europa Building, Suite 417
San Juan, PR 00907-4127

The State of New York is the NPDES Permitting Authority for the majority of discharges within its state. The State of New Jersey and the Virgin Islands are the NPDES Permitting Authority for all discharges within their respective states.

Permit No.	Areas of Coverage/Where EPA is Permitting Authority
NYR10000I	Indian country within the State of New York
PRR100000	The Commonwealth of Puerto Rico

3. EPA Region 3: DE, DC, MD, PA, VA, WV

US EPA, Region 03
NPDES Stormwater Program
1650 Arch St
Philadelphia, PA 19103

The State of Delaware is the NPDES Permitting Authority for the majority of discharges within its state. Maryland, Pennsylvania, Virginia, and West Virginia are the NPDES Permitting Authority for all discharges within their respective states.

Permit No.	Areas of Coverage/Where EPA is Permitting Authority
DCR100000	The District of Columbia
DER10000F	Federal Facilities in the State of Delaware

4. EPA Region 4: AL, FL, GA, KY, MS, NC, SC, TN

US EPA, Region 04
Water Management Division
NPDES Stormwater Program
61 Forsyth St SW
Atlanta, GA 30303-3104

Coverage Not Available. Construction activities in Region 4 must obtain permit coverage under an alternative permit.

5. EPA Region 5: IL, IN, MI, MN, OH, WI

US EPA, Region 05
NPDES & Technical Support
NPDES Stormwater Program
77 W Jackson Blvd
(WN-16J)
Chicago, IL 60604-3507

The States of Michigan, Minnesota, and Wisconsin are the NPDES Permitting Authority for the majority of discharges within their respective states. The States of Illinois, Indiana, and Ohio are the NPDES Permitting Authorities for all discharges within their respective states.

Permit No.	Areas of coverage/where EPA is Permitting Authority
MIR10000I	Indian country within the State of Michigan
MNR10000I	Indian country within the State of Minnesota, except the Grand Portage Band of Chippewa
WIR10000I	Indian country within the State of Wisconsin, except the Sokaogon Chippewa (Mole Lake) Community.

6. EPA Region 6: AR, LA, OK, TX, NM (except see Region 9 for Navajo lands, and see Region 8 for Ute Mountain Reservation lands)

US EPA, Region 06
NPDES Stormwater Program
1445 Ross Ave, Suite 1200
Dallas, TX 75202-2733

The States of Louisiana, Oklahoma, and Texas are the NPDES Permitting Authority for the majority of discharges within their respective state. The State of Arkansas is the NPDES Permitting Authority for all discharges within its respective state.

Permit No.	Areas of coverage/where EPA is Permitting Authority
LAR10000I	Indian country within the State of Louisiana
NMR100000	The State of New Mexico, except Indian country
NMR10000I	Indian country within the State of New Mexico, except Navajo Reservation Lands that are covered under Arizona permit AZR10000I and Ute Mountain Reservation Lands that are covered under Colorado permit COR10000I.
OKR10000I	Indian country within the State of Oklahoma
OKR10000F	Discharges in the State of Oklahoma that are not under the authority of the Oklahoma Department of Environmental Quality, including activities associated with oil and gas exploration, drilling, operations, and pipelines (includes SIC Groups 13 and 46, and SIC codes 492 and 5171), and point source discharges associated with agricultural production, services, and silviculture (includes SIC Groups 01, 02, 07, 08, 09).
TXR10000F	Discharges in the State of Texas that are not under the authority of the Texas Commission on Environmental Quality (formerly TNRCC), including activities associated with the exploration, development, or production of oil or gas or geothermal resources, including transportation of crude oil or natural gas by pipeline.
TXR10000I	Indian country within the State of Texas.

7. EPA Region 7: IA, KS, MO, NE (except see Region 8 for Pine Ridge Reservation Lands)

US EPA, Region 07
NPDES Stormwater Program
901 N 5th St
Kansas City, KS 66101

The States of Iowa, Kansas, and Nebraska are the NPDES Permitting Authority for the majority of discharges within their respective states. The State of Missouri is the NPDES Permitting Authority for all discharges within its state.

Permit No.	Areas of coverage/where EPA is Permitting Authority
IAR10000I	Indian country within the State of Iowa
KSR10000I	Indian country within the State of Kansas
NER10000I	Indian country within the State of Nebraska, except Pine Ridge Reservation lands (see Region 8)

8. EPA Region 8: CO, MT, ND, SD, WY, UT (except see Region 9 for Goshute Reservation and Navajo Reservation Lands), the Ute Mountain Reservation in NM, and the Pine Ridge Reservation in NE.

US EPA, Region 08
NPDES Stormwater Program
999 18th St, Suite 300
(EPR-EP)
Denver, CO 80202-2466

The States of Colorado, Montana, North Dakota, South Dakota, Utah, and Wyoming are the NPDES Permitting Authority for the majority of discharges within their respective states.

Permit No.	Areas of coverage/where EPA is Permitting Authority
COR10000F	Federal Facilities in the State of Colorado, except those located on Indian country
COR10000I	Indian country within the State of Colorado, as well as the portion of the Ute Mountain Reservation located in New Mexico
MTR10000I	Indian country within the State of Montana
NDR10000I	Indian country within the State of North Dakota, as well as that portion of the Standing Rock Reservation located in South Dakota (except for the portion of the lands within the former boundaries of the Lake Traverse Reservation which is covered under South Dakota permit SDR10000I listed below)
SDR10000I	Indian country within the State of South Dakota, as well as the portion of the Pine Ridge Reservation located in Nebraska and the portion of the lands within the former boundaries of the Lake

	Traverse Reservation located in North Dakota (except for the Standing Rock Reservation which is covered under North Dakota permit NDR10000I listed above)
UTR10000I	Indian country within the State of Utah, except Goshute and Navajo Reservation lands (see Region 9)
WYR10000I	Indian country within the State of Wyoming

9. EPA Region 9: CA, HI, NV, Guam, American Samoa, the Commonwealth of the Northern Mariana Islands, the Goshute Reservation in UT and NV, the Navajo Reservation in UT, NM, and AZ, the Duck Valley Reservation in ID, and the Fort McDermitt Reservation in OR.

US EPA, Region 09
NPDES Stormwater Program
75 Hawthorne St
San Francisco, CA 94105-3901

The States of Arizona, California and Nevada are the NPDES Permitting Authority for the majority of discharges within their respective states. The State of Hawaii is the NPDES Permitting Authority for all discharges within its state.

Permit No.	Areas of coverage/where EPA is Permitting Authority
ASR100000	The Island of American Samoa
AZR10000I	Indian country within the State of Arizona, as well as Navajo Reservation lands in New Mexico and Utah
CAR10000I	Indian country within the State of California
GUR100000	The Island of Guam
JAR100000	Johnston Atoll
MWR100000	Midway Island and Wake Island
MPR100000	Commonwealth of the Northern Mariana Islands
NVR10000I	Indian country within the State of Nevada, as well as the Duck Valley Reservation in Idaho, the Fort McDermitt Reservation in Oregon and the Goshute Reservation in Utah

10. EPA Region 10: AK, WA, ID (except see Region 9 for Duck Valley Reservation Lands), and OR (except see Region 9 for Fort McDermitt Reservation).

US EPA, Region 10
NPDES Stormwater Program
1200 6th Ave (OW-130)
Seattle, WA 98101-1128
Phone: (206) 553-6650

The States of Oregon and Washington are the NPDES Permitting Authority for the majority of discharges within their respective states.

Permit No.	Areas of coverage/where EPA is Permitting Authority
AKR100000	The State of Alaska, except Indian country
AKR10000I	Indian country within the state of Alaska
IDR100000	The State of Idaho, except Indian country
IDR10000I	Indian country within the State of Idaho, except Duck Valley Reservation lands (see Region 9)
ORR10000I	Indian country within the State of Oregon, except Fort McDermitt Reservation lands (see Region 9)
WAR10000F	Federal Facilities in the State of Washington, except those located on Indian country
WAR10000I	Indian country within the State of Washington

Appendix C - Endangered Species Act Review Procedures

You must meet at least one of the six criteria in Part 1.3.C.6 to be eligible for coverage under this permit. You must follow the procedures in this Appendix to assess the potential effects of stormwater discharges and stormwater discharge-related activities on listed species and their critical habitat. When evaluating these potential effects, operators must evaluate the entire project area.

For purposes of this Appendix, the term "project area" is inclusive of the term "Action Area." Action area is defined in 50 CFR §402.02 as all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action.

This includes areas beyond the footprint of the construction area that may be affected by stormwater discharges and stormwater discharge related activities. "Project area" is defined in Appendix A.

(Operators who are eligible and able to certify eligibility under Criterion B, C, D, or F of Part 1.3.C.6 because of a previously issued ESA section 10 permit, a previously completed ESA section 7 consultation, or because the operator's activities were already addressed in another operator's certification of eligibility may proceed directly to Step Four.)

Step One: Determine if Listed Threatened or Endangered Species are Present On or Near Your Project Area

You must determine, to the best of your knowledge, whether listed species are located on or near your project area. To make this determination, you should:

- Determine if listed species are in your county or township. The local offices of the U.S. Fish and Wildlife Service (FWS), National Marine Fisheries Service (NMFS), and State or Tribal Heritage Centers often maintain lists of federally listed endangered or threatened species on their internet sites. Visit http://www.epa.gov/npdes/stormwater/cgp to find the appropriate site for your state or check with your local office. In most cases, these lists allow you to determine if there are listed species in your county or township.
- If there are listed species in your county or township, check to see if critical habitat has been designated and if that area overlaps or is near your project area.
- Contact your local FWS, NMFS, or State or Tribal Heritage Center to determine if the listed species could be found on or near your project area and if any critical habitat areas have been designated that overlap or are near your project area. Critical habitat areas maybe designated independently from the listed species for your county, so even if there are no listed species in your county or township, you must still contact one of the agencies mentioned above to determine if there are any critical habitat areas on or near your project area.

You can also find critical habitat designations and associated requirements at 50 CFR Parts 17 and 226. http://www.access.gpo.gov.

- If there are no listed species in your county or township, no critical habitat areas on or near your project area, or if your local FWS, NMFS, or State or Tribal Heritage Center indicates that listed species are not a concern in your part of the county or township, you may check box A on the Notice of Intent Form.
- If there are listed species and if your local FWS, NMFS, or State or Tribal Heritage Center indicates that these species could exist on or near your project area, you will need to do one or more of the following:
  - Conduct visual inspections: This method may be particularly suitable for construction sites that are smaller in size or located in non-natural settings such as highly urbanized areas or industrial parks where there is little or no natural habitat, or for construction activities that discharge directly into municipal stormwater collection systems.
  - Conduct a formal biological survey. In some cases, particularly for larger construction sites with extensive stormwater discharges, biological surveys may be an appropriate way to assess whether species are located on or near the project area and whether there are likely adverse effects to such species. Biological surveys are frequently performed by environmental consulting firms. A biological survey may in some cases be useful in conjunction with Steps Two, Three, or Four of these instructions.
  - Conduct an environmental assessment under the National Environmental Policy Act (NEPA). Such reviews may indicate if listed species are in proximity to the project area. Coverage under the CGP does not trigger such a review because the CGP does not regulate new sources (that is, dischargers subject to New Source Performance Standards under section 306 of the Clean Water Act), and is thus statutorily exempted from NEPA. See CWA section 511(c). However, some construction activities might require review under NEPA for other reasons such as federal funding or other federal involvement in the project.
  - If listed threatened or endangered species or critical habitat are present in the project area, you must look at impacts to species and/or habitat when following Steps Two through Four. Note that many but not all measures imposed to protect listed species under these steps will also protect critical habitat. Thus, meeting the eligibility requirements of this CGP may require measures to protect critical habitat that are separate from those to protect listed species.

Step Two: Determine if the Construction Activity's Stormwater Discharges or Stormwater Discharge- Related Activities Are Likely to Adversely Affect Listed Threatened or Endangered Species or Designated Critical Habitat

To receive CGP coverage, you must assess whether your stormwater discharges or stormwater discharge related activities is likely to adversely affect listed threatened or endangered species or designated critical habitat that are present on or near your project area.

Potential adverse effects from stormwater discharges and stormwater discharge-related activities include:

- *Hydrological.* Stormwater discharges may cause siltation, sedimentation or induce other changes in receiving waters such as temperature, salinity or pH. These effects will vary with the amount of stormwater discharged and the volume and condition of the receiving water. Where a stormwater discharge constitutes a minute portion of the total volume of the receiving water, adverse hydrological effects are less likely. Construction activity itself may also alter drainage patterns on a site where construction occurs that can impact listed species or critical habitat.
- *Habitat.* Excavation, site development, grading, and other surface disturbance activities from construction activities, including the installation or placement of stormwater BMPs, may adversely affect listed species or their habitat. Stormwater may drain or inundate listed species habitat.
- *Toxicity.* In some cases, pollutants in stormwater may have toxic effects on listed species.

The scope of effects to consider will vary with each site. If you are having difficulty determining whether your project is likely to adversely affect listed species or critical habitat, or one of the Services has already raised concerns to you, you must contact the appropriate office of the FWS, NMFS or Natural Heritage Center for assistance. If adverse effects are not likely, then you may check box E on the NOI form and apply for coverage under the CGP. If the discharge may adversely effect listed species or critical habitat, you must follow Step Three.

Step Three: Determine if Measures Can Be Implemented to Avoid Adverse Effects
If you make a preliminary determination that adverse effects are likely to occur, you can still receive coverage under Criterion E of Part 1.3.C.6 of the CGP if appropriate measures are undertaken to avoid or eliminate the likelihood of adverse effects prior to applying for CGP coverage. These measures may involve relatively simple changes to construction activities such as re-routing a stormwater discharge to bypass an area where species are located, relocating BMPs, or by changing the "footprint" of the construction activity. You should contact the FWS and/or NMFS to see what appropriate measures might be suitable to avoid or eliminate the likelihood of adverse impacts to listed species and/or critical habitat. (See 50 CFR §402.13(b)). This can entail the initiation of informal consultation with the FWS and/or NMFS (described in more detail in Step Four).

If you adopt measures to avoid or eliminate adverse affects, you must continue to abide by those measures for the duration of the construction project and coverage under the CGP. These measures must be described in the SWPPP and are enforceable CGP conditions and/or conditions for meeting the eligibility criteria in Part 1.3. If appropriate measures to avoid the likelihood of adverse effects are not available, you must follow Step Four.

Step Four: Determine if the Eligibility Requirements of Criterion B, C, D, or F of Part 1.3.C.6 Can Be Met
Where adverse effects are likely, you must contact the FWS and/or NMFS. You may still be eligible for CGP coverage if any likely adverse effects can be addressed through meeting Criterion B, C, D, or F of Part 1.3.C.6 of the CGP. These criteria are as follows:

1. *An ESA Section 7 Consultation Is Performed for Your Activity (See Criterion B or C of Part 1.3.C.6 of the CGP).*

Formal or informal ESA section 7 consultation is performed with the FWS and/or NMFS that addresses the effects of your stormwater discharges and stormwater discharge-related activities on federally-listed and threatened species and designated critical habitat. FWS and/or NMFS may request that consultation take place if any actions are identified that may affect listed species or critical habitat. In order to be eligible for coverage under this permit, consultation must result in a "no jeopardy opinion" or a written concurrence by the Service(s) on a finding that your stormwater discharge(s) and stormwater discharge-related activities are not likely to adversely affect listed species or critical habitat (For more information on consultation, see 50 CFR §402). If you receive a "jeopardy opinion," you may continue to work with the FWS and/or NMFS and your permitting authority to modify your project so that it will not jeopardize listed species or designated critical habitat.

Most consultations are accomplished through informal consultation. By the terms of this CGP, EPA has automatically designated operators as non-federal representatives for the purpose of conducting informal consultations. See Part 1.3.C.6 and 50 CFR §402.08 and §402.13. When conducting informal ESA section 7 consultation as a non-federal representative, you must follow the procedures found in 50 CFR Part 402 of the ESA regulations. You must notify FWS and/or NMFS of your intention and agreement to conduct consultation as a non-federal representative.

Consultation may occur in the context of another federal action at the construction site (e.g., where ESA section 7 consultation was performed for issuance of a wetlands dredge and fill permit for the project or where a NEPA review is performed for the project that incorporates a section 7 consultation). Any terms and conditions developed through consultations to protect listed species and critical habitat must be incorporated into the SWPPP. As noted above, operators may, if they wish, initiate consultation with the Services at Step Four.

Whether ESA section 7 consultation must be performed with either the FWS, NMFS or both Services depends on the listed species that may be affected by the operator's activity. In general, NMFS has jurisdiction over marine, estuaries, and anadromous species. Operators should also be aware that while formal section 7 consultation provides protection from incidental takings liability, informal consultation does not.

2. *An Incidental Taking Permit Under Section 10 of the ESA is Issued for the Operators Activity (See Criterion D of Part 1.3.C.6 of the CGP).*

Your construction activities are authorized through the issuance of a permit under section 10 of the ESA and that authorization addresses the effects of your stormwater discharge(s) and stormwater discharge-related activities on federally-listed species and designated critical habitat. You must follow FWS and/or NMFS procedures when applying for an ESA Section 10 permit (see 50 CFR §17.22(b)(1) for FWS and §222.22

for NMFS). Application instructions for section 10 permits for FWS and NMFS can be obtained by accessing the FWS and NMFS websites (http://www.fws.gov and http://www.nmfs.noaa.gov) or by contacting the appropriate FWS and NMFS regional office.

3. *You are Covered Under the Eligibility Certification of Another Operator for the Project Area (See Criterion F of Part 1.3.C.6 of the CGP).*

Your stormwater discharges and stormwater discharge-related activities were already addressed in another operator's certification of eligibility under Criteria A through E of Part 1.3.C.6 which also included your project area. For example, a general contractor or developer may have completed and filed an NOI for the entire project area with the necessary Endangered Species Act certifications (criteria A-E), subcontractors may then rely upon that certification and must comply with any conditions resulting from that process. By certifying eligibility under Criterion F of Part 1.3.C.6, you agree to comply with any measures or controls upon which the other operator's certification under Criterion B, C, or D of Part 1.3.C.6 was based. Certification under Criterion F of Part 1.3.C.6 is discussed in more detail in the Fact Sheet that accompanies this permit.

You must comply with any terms and conditions imposed under the eligibility requirements of Criterion A through F to ensure that your stormwater discharges and stormwater discharge-related activities are protective of listed species and/or critical habitat. Such terms and conditions must be incorporated in the project's SWPPP. If the eligibility requirements of Part 1.3.C.6 cannot be met, then you are not eligible for coverage under the CGP. In these instances, you may consider applying to EPA for an individual permit.

Appendix D - Small Construction Waivers and Instructions

These waivers are only available to stormwater discharges associated with small construction activities (i.e., 1-5 acres). As the operator of a small construction activity, you may be able to qualify for a waiver in lieu of needing to obtain coverage under this general permit based on: (A) a low rainfall erosivity factor, (B) a TMDL analysis, or (C) an equivalent analysis that determines allocations for small construction sites are not needed. Each operator, otherwise needing permit coverage, must notify EPA of its intention for a waiver. It is the responsibility of those individuals wishing to obtain a waiver from coverage under this general permit to submit a complete and accurate waiver certification as described below. Where the operator changes or another is added during the construction project, the new operator must also submit a waiver certification to be waived.

A. Rainfall Erosivity Waiver

Under this scenario the small construction project's rainfall erosivity factor calculation ("R" in the Revised Universal Soil Loss Equation) is less than 5 during the period of construction activity. The operator must certify to the EPA that construction activity will occur only when the rainfall erosivity factor is less than 5. The period of construction activity begins at initial earth disturbance and ends with final stabilization. Where vegetation will be used for final stabilization, the date of installation of a stabilization practice that will provide interim non-vegetative stabilization can be used for the end of the construction period, provided the operator commits (as a condition of waiver eligibility) to periodically inspect and properly maintain the area until the criteria for final stabilization as defined in the construction general permit have been met. If use of this interim stabilization eligibility condition was relied on to qualify for the waiver, signature on the waiver with its certification statement constitutes acceptance of and commitment to complete the final stabilization process. The operator must submit a waiver certification to EPA prior to commencing construction activities.

Note: The rainfall erosivity factor "R" is determined in accordance with Chapter 2 of Agriculture Handbook Number 703, Predicting Soil Erosion by Water: A Guide to Conservation Planning With the Revised Universal Soil Loss Equation (RUSLE), pages 21–64, dated January 1997; United States Department of Agriculture (USDA), Agricultural Research Service.

EPA has developed an online rainfall erosivity calculator to help small construction sites determine potential eligibility for the rainfall erosivity waiver.You can access the calculator from EPA's website at: www.epa.gov/npdes/stormwater/lew. The R factor can easily be calculated by using the construction site latitude/longitude or address and estimated start and end dates of construction. This calculator may also be useful in determining the time periods during which construction activity could be waived from permit coverage. You may find that moving your construction activity by a few weeks or expediting site stabilization will allow you to qualify for the waiver. Use this online calculator or the Construction Rainfall Erosivity Waiver Fact Sheet

(www.epa.gov/npdes/pubs/fact3-1.pdf) to assist in determining the R Factor for your small construction site.

If you are the operator of the construction activity and eligible for a waiver based on low erosivity potential, you may submit a rainfall erosivity waiver electronically via EPA's eNOI system (www.epa.gov/npdes/eNOI) or provide the following information on the waiver certification form in order to be waived from permitting requirements:

1. Name, address and telephone number of the construction site operators;
2. Name (or other identifier), address, county or similar governmental subdivision, and latitude/longitude of the construction project or site;
3. Estimated construction start and completion (i.e., final stabilization) dates, and total acreage (to the nearest quarter acre) to be disturbed;
4. The rainfall erosivity factor calculation that applies to the active construction phase at your project site; and
5. A statement, signed and dated by an authorized representative as provided in Appendix G, Subsection 11, that certifies that the construction activity will take place during a period when the value of the rainfall erosivity factor is less than five.

You can access the waiver certification form from EPA's website at: (http://www.epa.gov/npdes/pubs/construction_waiver_form.pdf). Paper copies of the form must be sent to one of the addresses listed in Part D of this section.

Note: If the R factor is 5 or greater, you cannot apply for the rainfall erosivity waiver, and must apply for permit coverage as per Subpart 2.1 of the construction general permit, unless you qualify for the Water Quality Waiver as described below.

If your small construction project continues beyond the projected completion date given on the waiver certification, you must recalculate the rainfall erosivity factor for the new project duration. If the R factor is below five (5), you must update all applicable information on the waiver certification and retain a copy of the revised waiver as part of the site SWPPP. The new waiver certification must be submitted prior to the projected completion date listed on the original waiver form to assure your exemption from permitting requirements is uninterrupted. If the new R factor is five (5) or above, you must submit an NOI as per Part 2.

B. TMDL Waiver

This waiver is available if EPA has established or approved a TMDL that addresses the pollutant(s) of concern and has determined that controls on stormwater discharges from small construction activity are not needed to protect water quality. The pollutant(s) of concern include sediment (such as total suspended solids, turbidity or siltation) and any other pollutant that has been identified as a cause of impairment of any water body that will receive a discharge from the construction activity. Information on TMDLs that have been established or approved by EPA is available from EPA online at http://www.epa.gov/owow/tmdl/ and from state and tribal water quality agencies.

If you are the operator of the construction activity and eligible for a waiver based on compliance with an EPA established or approved TMDL, you must provide the following information on the Waiver Certification form in order to be waived from permitting requirements:

1. Name, address and telephone number of the construction site operator(s);
2. Name (or other identifier), address, county or similar governmental subdivision, and latitude/longitude of the construction project or site;
3. Estimated construction start and completion (i.e., final stabilization) dates, and total acreage (to the nearest quarter acre) to be disturbed;
4. The name of the water body(s) that would be receiving stormwater discharges from your construction project;
5. The name and approval date of the TMDL;
6. A statement, signed and dated by an authorized representative as provided in Appendix G, Subsection 11, that certifies that the construction activity will take place and that the stormwater discharges will occur, within the drainage area addressed by the TMDL.

C. Equivalent Analysis Waiver

This waiver is available for non-impaired waters only. The operator can develop an equivalent analysis that determines allocations for his small construction site for the pollutant(s) of concern or determines that such allocations are not needed to protect water quality. This waiver requires a small construction operator to develop an equivalent analysis based on existing in-stream concentrations, expected growth in pollutant concentrations from all sources, and a margin of safety.

If you are a construction operator who wants to use this waiver, you must develop your equivalent analysis and provide the following information to be waived from permitting requirements:

1. Name, address and telephone number of the construction site operator(s);
2. Name (or other identifier), address, county or similar governmental subdivision, and latitude/longitude of the construction project or site;
3. Estimated construction start and completion (i.e., final stabilization) dates, and total acreage (to the nearest quarter acre) to be disturbed;
4. The name of the water bodies that would be receiving stormwater discharges from your construction project;
5. Your equivalent analysis;
6. A statement, signed and dated by an authorized representative as provided in Appendix G, Subsection 11, that certifies that the construction activity will take place and that the stormwater discharges will occur, within the drainage area addressed by the equivalent analysis.

D. Waiver Deadlines and Submissions

1. Waiver certifications must be submitted prior to commencement of construction activities.
2. If you submit a TMDL or equivalent analysis waiver request, you are not waived until EPA approves your request. As such, you may not commence construction activities until receipt of approval from EPA.
3. Late Notifications: Operators are not prohibited from submitting waiver certifications after initiating clearing, grading, excavation activities, or other construction activities. The Agency reserves the right to take enforcement for any unpermitted discharges that occur between the time construction commenced and waiver authorization is granted.

Submittal of a waiver certification is an optional alternative to obtaining permit coverage for discharges of stormwater associated with small construction activity, provided you qualify for the waiver. Any discharge of stormwater associated with small construction activity not covered by either a permit or a waiver may be considered an unpermitted discharge under the Clean Water Act. As mentioned above, EPA reserves the right to take enforcement for any unpermitted discharges that occur between the time construction commenced and either discharge authorization is granted or a complete and accurate waiver certification is submitted. EPA may notify any operator covered by a waiver that they must apply for a permit. EPA may notify any operator who has been in non-compliance with a waiver that they may no longer use the waiver for future projects. Any member of the public may petition EPA to take action under this provision by submitting written notice along with supporting justification.

Complete and accurate Rainfall Erosivity waiver certifications not otherwise submitted electronically via EPA's eNOI system (www.epa.gov/npdes/eNOI) must be sent to one of the following addresses:

Regular U.S. Mail Delivery
EPA Stormwater Notice Processing Center
Mail Code 4203M
U.S. EPA
1200 Pennsylvania Avenue, NW
Washington, DC 20460

Overnight/Express Mail Delivery
EPA Stormwater Notice Processing Center
Room 7420
U.S. EPA
1201Constitution Avenue, NW
Washington, DC 20004

Complete and accurate TMDL or equivalent analysis waiver requests must be sent to the applicable EPA Region office specified in Appendix B.

Appendix E - Notice of Intent Form and Instructions

From the effective date of this permit, operators are to use the Notice of Intent Form contained in this Appendix to obtain permit coverage.

This Form Replaces Form 3510-9 (8-98)
Refer to the Following Pages for Instructions

Form Approved OMB Nos. 2040-0188 and 2040-0211

NPDES FORM

United States Environmental Protection Agency
Washington, DC 20460

Notice of Intent (NOI) for Storm Water Discharges Associated with Construction Activity Under an NPDES General Permit

Submission of this Notice of Intent (NOI) constitutes notice that the party identified in Section II of this form requests authorization to discharge pursuant to the NPDES Construction General Permit (CGP) permit number identified in Section I of this form. Submission of this NOI also constitutes notice that the party identified in Section II of this form meets the eligibility requirements of the CGP for the project identified in Section III of this form. Permit coverage is required prior to commencement of construction activity until you are eligible to terminate coverage as detailed in the CGP. To obtain authorization, you must submit a complete and accurate NOI form. Refer to the instructions at the end of this form.

I. Permit Number

II. Operator Information

Name:

IRS Employer Identification Number (EIN): –

Mailing Address:

Street:

City: State: Zip Code: -

Phone: - - Fax (optional): - -

E-mail:

III. Project/Site Information

Project/Site Name:

Project Street/Location:

City: State: Zip Code: -

County or similar government subdivision:

Latitude/Longitude (Use one of three possible formats, and specify method)

Latitude
1. __ __° __ __′ __ __″ N (degrees, minutes, seconds)
2. __ __° __ __. __ __′ N (degrees, minutes, decimal)
3. __ __. __ __ __ __° N (degrees decimal)

Longitude
1. __ __ __° __ __′ __ __″ W (degrees, minutes, seconds)
2. __ __ __° __ __. __ __′ W (degrees, minutes, decimal)
3. __ __ __. __ __ __ __° W (degrees decimal)

Method: ☐ U.S.G.S. topographic map ☐ EPA web site ☐ GPS ☐ Other:

If you used a U.S.G.S. topographic map, what was the scale? _____

Project located in Indian Country? ☐ YES ☐ NO

If yes, name of reservation, or if not part of a reservation, put "Not Applicable:" _____

Estimated Project Start Date: / / (Month Day Year)

Estimated Project Completion Date: / / (Month Day Year)

Estimated Area to be Disturbed (to the nearest quarter acre): .

IV. SWPPP Information

Has the SWPPP been prepared in advance of filing this NOI? ☐ YES ☐ NO

Location of SWPP for Viewing: ☐ Address in Section II ☐ Address in Section III ☐ Other
If other:

SWPPP Street:

City: State: Zip Code: -

SWPPP Contact Information (if different than that in Section II):

Name:

Phone: - - Fax (optional): - -

E-mail:

V. Discharge Information

Identify the name(s) of waterbodies to which you discharge. _____

_____

Is this discharge consistent with the assumptions and requirements of applicable EPA approved or established TMDL(s)? ☐ YES ☐ NO

VI. Endangered Species Protection

Under which criterion of the permit have you satisfied your ESA eligibility obligations?

☐ A ☐ B ☐ C ☐ D ☐ E ☐ F

If you select criterion F, provide permit tracking number of operator under which you are certifying eligibility:

VII. Certification Information

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 am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Print Name:

Title:

Signature: _____ Date:

E-mail: _____

NOI Preparer (Complete if NOI was prepared by someone other than the certifier)

Prepared by:

Organization:

Phone: - - Ext. E-mail: _____

Instructions for Completing EPA Form 3510-9

Notice of Intent (NOI) for Storm Water Discharges Associated with Construction Activity Under an NPDES General Permit

NPDES Form Date | This Form Replaces Form 3510-9 (8/98) | Form Approved OMB Nos. 2040-0188 and 2040-0211

Who Must File an NOI Form

Under the provisions of the Clean Water Act, as amended (33 U.S.C. 1251 et. seq.; the Act), federal law prohibits storm water discharges from certain construction activities to waters of the U.S. unless that discharge is covered under a National Pollutant Discharge Elimination System (NPDES) Permit. Operator(s) of construction sites where one or more acres are disturbed, smaller sites that are part of a larger common plan of development or sale where there is a cumulative disturbance of at least one acre, or any other site specifically designated by the Director, must submit an NOI to obtain coverage under an NPDES general permit. Each person, firm, public organization, or any other entity that meets either of the following criteria must file this form: (1) they have operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications; or (2) they have day-to-day operational control of those activities at the project necessary to ensure compliance with SWPPP requirements or other permit conditions. If you have questions about whether you need an NPDES storm water permit, or if you need information to determine whether EPA or your state agency is the permitting authority, refer to *www.epa.gov/npdes/stormwater/cgp* or telephone the Storm Water Notice Processing Center at (866) 352-7755.

Where to File NOI Form

See the applicable CGP for information on where to send your completed NOI form.

Completing the Form

Obtain and read a copy of the appropriate EPA Storm Water Construction General Permit for your area. To complete this form, type or print uppercase letters, in the appropriate areas only. Please place each character between the marks (abbreviate if necessary to stay within the number of characters allowed for each item). Use one space for breaks between words, but not for punctuation marks unless they are needed to clarify your response. If you have any questions on this form, refer to *www.epa.gov/npdes/stormwater/cgp* or telephone the Storm Water Notice Processing Center at (866) 352-7755. Please submit original document with signature in ink . do not send a photocopied signature.

Section I. Permit Number

Provide the number of the permit under which you are applying for coverage (see Appendix B of the general permit for the list of eligible permit numbers).

Section II. Operator Information

Provide the legal name of the person, firm, public organization, or any other entity that operates the project described in this application. An operator of a project is a legal entity that controls at least a portion of site operations and is not necessarily the site manager. Provide the employer identification number (EIN from the Internal Revenue Service; IRS), also commonly referred to as your taxpayer ID. If the applicant does not have an EIN enter “NA” in the space provided. Also provide the operator’s mailing address, telephone number, fax number (optional) and e-mail address (to be notified via e-mail of NOI approval when available). Correspondence for the NOI will be sent to this address.

Section III. Project/Site Information

Enter the official or legal name and complete street address, including city, state, zip code, and county or similar government subdivision of the project or site. If the project or site lacks a street address, indicate the general location of the site (e.g., Intersection of State Highways 61 and 34). Complete site information must be provided for permit coverage to be granted.

The applicant must also provide the latitude and longitude of the facility either in degrees, minutes, seconds; degrees, minutes, decimal; or decimal format. The latitude and longitude of your facility can be determined in several different ways, including through the use of global positioning system (GPS) receivers, U.S. Geological Survey (U.S.G.S.) topographic or quadrangle maps, and EPA’s web-based siting tools, among others. Refer to *www.epa.gov/npdes/stormwater/cgp* for further guidance on the use of these methodologies. For consistency, EPA requests that measurements be taken from the approximate center of the construction site. Applicants must specify which method they used to determine latitude and longitude. If a U.S.G.S. topographic map is used, applicants are required to specify the scale of the map used.

Indicate whether the project is in Indian country, and if so, provide the name of the Reservation. If the project is in Indian Country Lands that are not part of a Reservation, indicate “not applicable” in the space provided.

Enter the estimated construction start and completion dates using four digits for the year (i.e., 05/27/1998). Enter the estimated area to be disturbed including but not limited to: grubbing, excavation, grading, and utilities and infrastructure installation. Indicate to the nearest quarter acre. Note: 1 acre = 43,560 sq. ft.

Section IV. SWPPP Information

Indicate whether or not the SWPPP was prepared in advance of filing the NOI form. Check the appropriate box for the location where the SWPPP may be viewed. Provide the name, fax number (optional), and e-mail address of the contact person if different than that listed in Section II of the NOI form.

Section V. Discharge Information

Enter the name(s) of receiving waterbodies to which the project’s storm water will discharge. These should be the first bodies of water that the discharge will reach. (Note: If you discharge to more than one waterbody, please indicate all such waters in the space provided and attach a separate sheet if necessary.) For example, if the discharge leaves your

site and travels through a roadside swale or a storm sewer and then enters a stream that flows to a river, the stream would be the receiving waterbody. Waters of the U.S. include lakes, streams, creeks, rivers, wetlands, impoundments, estuaries, bays, oceans, and other surface bodies of water within the confines of the U.S. and U.S. coastal waters. Waters of the U.S. do not include man-made structures created solely for the purpose of wastewater treatment. U.S. Geological Survey topographical maps may be used to make this determination. If the map does not provide a name, use a format such as "unnamed tributary to Cross Creek". If you discharge into a municipal separate storm sewer system (MS4), you must identify the waterbody into which that portion of the storm sewer discharges. That information should be readily available from the operator of the MS4.

Indicate whether your storm water discharges from construction activities will be consistent with the assumptions and requirements of applicable EPA approved or established TMDL(s). To answer this question, refer to www.epa.gov/npdes/stormwater/cgp for state- and regional-specific TMDL information related to the construction general permit. You may also have to contact your EPA regional office or state agency. If there are no applicable TMDLs or no related requirements, please check the "yes" box in the NOI form.

Section VI. Endangered Species Information

Indicate for which criterion (i.e., A, B, C, D, E, or F) of the permit the applicant is eligible with regard to protection of federally listed endangered and threatened species, and designated critical habitat. See Part 1.3.C.6 and Appendix C of the permit. If you select criterion F, provide the permit tracking number of the operator under which you are certifying eligibility. The permit tracking number is the number assigned to the operator by the Storm Water Notice Processing Center after EPA acceptance of a complete NOI.

Section VII. Certification Information

All applications, including NOIs, must be signed as follows: *For a corporation:* By a responsible corporate officer. For the purpose of this Section, a responsible corporate officer means:

(i) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long-term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

For a partnership or sole proprietorship: By a general partner or the proprietor, respectively; or

For a municipality, state, federal, or other public agency: By either a principal executive officer or ranking elected official. For purposes of this Part, a principal executive officer of a federal agency includes (i) the chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrator of EPA).

Include the name, title, and email address of the person signing the form and the date of signing. An unsigned or undated NOI form will not be considered eligible for permit coverage. If the NOI was prepared by someone other than the certifier (for example, if the NOI was prepared by the facility SWPPP contact or a consultant for the certifier's signature), include the name, organization, phone number and email address of the NOI preparer.

Paperwork Reduction Act Notice

Public reporting burden for this application is estimated to average 3.7 hours. This estimate includes time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. Send comments regarding the burden estimate, any other aspect of the collection of information, or suggestions for improving this form, including any suggestions which may increase or reduce this burden to: Chief, Information Policy Branch 2136, U.S. Environmental Protection, Agency, 1200 Pennsylvania Avenue, NW, Washington, D.C. 20460. Include the OMB control number on any correspondence. Do not send the completed form to this address.

Visit this website for mailing instructions:
www.epa.gov/npdes/stormwater/mail

Visit this website for instructions on how to submit electronically:
www.epa.gov/npdes/stormwater/enoi

Appendix F - Notice of Termination Form and Instructions

From the effective date of this permit, operators are to use the Notice of Termination Form contained in this Appendix to terminate permit coverage.

This Form Replaces Form 3517-7 (8-98)
Refer to the Following Page for Instructions

Form Approved OMB Nos. 2040-0086 and 2040-0211

NPDES FORM

United States Environmental Protection Agency
Washington, DC 20460

Notice of Termination (NOT) of Coverage Under an NPDES General Permit for Stormwater Discharges Associated with Construction Activity

Submission of this Notice of Termination constitutes notice that the party identified in Section II of this form is no longer authorized to discharge stormwater associated with construction activity under the NPDES program from the site identified in Section III of this form. All necessary information must be included on this form. Refer to the instructions at the end of this form.

I. Permit Information

NPDES Stormwater General Permit Tracking Number: _____

Reason for Termination (Check only one):

- ☐ Final stabilization has been achieved on all portions of the site for which you are responsible.
- ☐ Another operator has assumed control, according to Appendix G, Section 11.C of the CGP, over all areas of the site that have not been finally stabilized.
- ☐ Coverage under an alternative NPDES permit has been obtained.
- ☐ For residential construction only, temporary stabilization has been completed and the residence has been transferred to the homeowner.

II. Operator Information

Name: _____

IRS Employer Identification Number (EIN): __ – _____

Mailing Address:

Street: _____

City: _____ State: __ Zip Code: _____ - ____

Phone: ___ - ___ - ____ Fax (optional): ___ - ___ - ____

E-mail: _____

III. Project/Site Information

Project/Site Name: _____

Project Street/Location: _____

City: _____ State: __ Zip Code: _____ - ____

County or similar government subdivision: _____

IV. Certification Information

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 am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Print Name: _____

Print Title: _____

Email: _____

Signature: _____

Date: _____

Instructions for Completing EPA Form 3510-13

Notice of Termination (NOT) of Coverage Under an NPDES General Permit for Stormwater Discharges Associated with Construction Activity

NPDES Form | This Form Replaces Form 3517-7 (8-98) | Form Approved OMB Nos. 2040-0086 and 2040-0211

Who May File an NOT Form
Permittees who are presently covered under the EPA-issued National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges Associated with Construction Activity may submit an NOT form when final stabilization has been achieved on all portions of the site for which you are responsible; another operator has assumed control in accordance with Appendix G, Section 11.C of the General Permit over all areas of the site that have not been finally stabilized; coverage under an alternative NPDES permit has been obtained; or for residential construction only, temporary stabilization has been completed and the residence has been transferred to the homeowner.

"Final stabilization" means that all soil disturbing activities at the site have been completed and that a uniform perennial vegetative cover with a density of at least 70% of the native background vegetative cover for the area has been established on all unpaved areas and areas not covered by permanent structures, or equivalent permanent stabilization measures (such as the use of riprap, gabions, or geotextiles) have been employed. See "final stabilization" definition in Appendix A of the Construction General Permit for further guidance where background native vegetation covers less than 100 percent of the ground, in arid or semi-arid areas, for individual lots in residential construction, and for construction projects on land used for agricultural purposes.

Completing the Form
Type or print, using uppercase letters, in the appropriate areas only. Please place each character between the marks. Abbreviate if necessary to stay within the number of characters allowed for each item. Use only one space for breaks between words, but not for punctuation marks unless they are needed to clarify your response. If you have any questions about this form, refer to *www.epa.gov/npdes/stormwater/cgp* or telephone the Stormwater Notice Processing Center at (866) 352-7755. Please submit original document with signature in ink - do not send a photocopied signature.

Section I. Permit Number
Enter the existing NPDES Stormwater General Permit Tracking Number assigned to the project by EPA's Stormwater Notice Processing Center. If you do not know the permit tracking number, refer to *www.epa.gov/npdes/stormwater/cgp* or contact the Stormwater Notice Processing Center at (866) 352-7755.

Indicate your reason for submitting this Notice of Termination by checking the appropriate box. Check only one:

Final stabilization has been achieved on all portions of the site for which you are responsible.

Another operator has assumed control according to Appendix G, Section 11.C over all areas of the site that have not been finally stabilized.

Coverage under an alternative NPDES permit has been obtained.

For residential construction only, if temporary stabilization has been completed and the residence has been transferred to the homeowner.

Section II. Operator Information
Provide the legal name of the person, firm, public organization, or any other entity that operates the project described in this application and is covered by the permit tracking number identified in Section I. The operator of the project is the legal entity that controls the site operation, rather than the site manager. Provide the employer identification number (EIN from the Internal Revenue Service; IRS). If the applicant does not have an EIN enter "NA" in the space provided. Enter the complete mailing address, telephone number, and email address of the operator. Optional: enter the fax number of the operator.

Section III. Project/Site Information
Enter the official or legal name and complete street address, including city, state, zip code, and county or similar government subdivision of the project or site. If the project or site lacks a street address, indicate the general location of the site (e.g., Intersection of State Highways 61 and 34). Complete site information must be provided for termination of permit coverage to be valid.

Section IV. Certification Information
All applications, including NOIs, must be signed as follows:
For a corporation: By a responsible corporate officer. For the purpose of this Part, a responsible corporate officer means: (i) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy-or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long-term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

For a partnership or sole proprietorship: By a general partner or the proprietor, respectively; or

For a municipality, state, federal, or other public agency: By either a principal executive officer or ranking elected official. For purposes of this Part, a principal executive officer of a federal agency includes (i) the chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrator of EPA).

Include the name, title, and email address of the person signing the form and the date of signing. An unsigned or undated NOT form will not be considered valid termination of permit coverage.

Paperwork Reduction Act Notice
Public reporting burden for this application is estimated to average 0.5 hours per notice, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. Send comments regarding the burden estimate, any other aspect of the collection of information, or suggestions for improving this form including any suggestions which may increase or reduce this burden to: Chief, Information Policy Branch, 2136, U.S. Environmental Protection Agency, 1200 Pennsylvania Avenue, NW, Washington, DC 20460. Include the OMB number on any correspondence. Do not send the completed form to this address.

Visit this website for mailing instruction:
www.epa.gov/npdes/stormwater/mail

Visit this website for instructions on how to submit electronically:
www.epa.gov/npdes/stormwater/enoi

Appendix G - Standard Permit Conditions

STANDARD PERMIT CONDITIONS

1. Duty To Comply

You must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application.

A. You must comply with effluent standards or prohibitions established under section 307(a) of the Clean Water Act for toxic pollutants and with standards for sewage sludge use or disposal established under section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement.

B. The Clean Water Act provides that any person who violates section 301, 302, 306, 307, 308, 318 or 405 of the Act, or any permit condition or limitation implementing any such sections in a permit issued under section 402, or any requirement imposed in a pretreatment program approved under sections 402(a)(3) or 402(b)(8) of the Act, is subject to a civil penalty not to exceed the maximum amounts authorized by Section 309(d) of the Act and the Federal Civil Penalties Inflation Adjustment Act (28 U.S.C. §2461 note) as amended by the Debt Collection Improvement Act (31 U.S.C. §3701 note) (currently $27,500 per day for each violation).

   The Clean Water Act provides that any person who negligently violates sections 301, 302, 306, 307, 308, 318, or 405 of the Act, or any condition or limitation implementing any of such sections in a permit issued under section 402 of the Act, or any requirement imposed in a pretreatment program approved under section 402(a)(3) or 402(b)(8) of the Act, is subject to criminal penalties of $2,500 to $25,000 per day of violation, or imprisonment of not more than 1 year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than $50,000 per day of violation, or by imprisonment of not more than 2 years, or both. Any person who knowingly violates such sections, or such conditions or limitations is subject to criminal penalties of $5,000 to $50,000 per day of violation, or imprisonment for not more than 3 years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than 6 years, or both. Any person who knowingly violates section 301, 302, 303, 306, 307, 308, 318 or 405 of the Act, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of the Act, and who knows at that time that he thereby places another person in imminent danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of not more than $250,000 or imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than $500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in section 309(c)(3)(B)(iii) of the CWA, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than $1,000,000 and can be fined up to $2,000,000 for second or subsequent convictions.

C. Any person may be assessed an administrative penalty by the Administrator for violating section 301, 302, 306, 307, 308, 318 or 405 of this Act, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of this Act. Pursuant to 40 CFR Part 19 and the Act, administrative penalties for Class I violations are not to exceed the maximum amounts authorized by Section 309(g)(2)(A) of the Act and the Federal Civil Penalties Inflation Adjustment Act (28 U.S.C. §2461 note) as amended by the Debt Collection Improvement Act (31 U.S.C. §3701 note) (currently $11,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $27,500). Pursuant to 40 CFR Part 19 and the Act, penalties for Class II violations are not to exceed the maximum amounts authorized by Section 309(g)(2)(B) of the Act and the Federal Civil Penalties Inflation Adjustment Act (28 U.S.C. §2461 note) as amended by the Debt Collection Improvement Act (31 U.S.C. §3701 note) (currently $11,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $137,500).

2. Duty to Reapply

If you wish to continue an activity regulated by this permit after the expiration date of this permit, you must apply for and obtain a new permit.

3. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for you in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

4. Duty to Mitigate

You must take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

5. Proper Operation and Maintenance

You must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by you to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of backup or auxiliary facilities or similar systems which are installed by you only when the operation is necessary to achieve compliance with the conditions of this permit.

6. Permit Actions

This permit may be modified, revoked and reissued, or terminated for cause. Your filing of a request for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

7. Property Rights

This permit does not convey any property rights of any sort, or any exclusive privileges.

8. Duty to Provide Information

You must furnish to EPA, within a reasonable time, any information which EPA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. You must also furnish to EPA upon request, copies of records required to be kept by this permit.

9. Inspection and Entry

You must allow EPA, or an authorized representative (including an authorized contractor acting as a representative of the Administrator), upon presentation of credentials and other documents as may be required by law, to:

A. Enter upon your premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;
B. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
C. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and
D. Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the Clean Water Act, any substances or parameters at any location.

10. Monitoring and Records

A. Samples and measurements taken for the purpose of monitoring must be representative of the monitored activity.
B. You must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least 3 years from the date of the sample, measurement, report or application. This period may be extended by request of EPA at any time.
C. Records of monitoring information must include:
    1. The date, exact place, and time of sampling or measurements;
    2. The individual(s) who performed the sampling or measurements;
    3. The date(s) analyses were performed
    4. The individual(s) who performed the analyses;
    5. The analytical techniques or methods used; and
    6. The results of such analyses.
D. Monitoring results must be conducted according to test procedures approved under 40 CFR Part 136 or, in the case of sludge use or disposal, approved under 40 CFR Part 136 unless otherwise specified in 40 CFR Part 503, unless other test procedures have been specified in the permit.
E. The Clean Water Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both.

11. Signatory Requirements

A. All applications, including NOIs, must be signed as follows:
    1. For a corporation: By a responsible corporate officer. For the purpose of this Part, a responsible corporate officer means: (i) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any

other person who performs similar policy- or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

2. For a partnership or sole proprietorship: By a general partner or the proprietor, respectively; or
3. For a municipality, state, federal, or other public agency: By either a principal executive officer or ranking elected official. For purposes of this Part, a principal executive officer of a federal agency includes (i) the chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrator of EPA).

B. All reports required by this permit, including SWPPPs, must be signed by a person described in Appendix G, Subsection 11.A above or by a duly authorized representative of that person. A person is a duly authorized representative only if:
   1. The authorization is made in writing by a person described in Appendix G, Subsection 11.A;
   2. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position); and
   3. The signed and dated written authorization is included in the SWPPP. A copy must be submitted to EPA, if requested.

C. Changes to Authorization. If an authorization under Part 2.1 is no longer accurate because a different operator has responsibility for the overall operation of the construction site, a new NOI satisfying the requirements of Part 2.1 must be submitted to EPA prior to or together with any reports, information, or applications to be signed by an authorized representative. The change in authorization must be submitted within the time frame specified in Part 2.4, and sent to the address specified in Part 2.2.

D. Any person signing documents required under the terms of this permit must include the following 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 am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

E. The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both.

12. Reporting Requirements

A. Planned changes. You must give notice to EPA as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when:
   1. The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR §122.29(b); or
   2. The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR §122.42(a)(1).

B. Anticipated noncompliance. You must give advance notice to EPA of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

C. Transfers. This permit is not transferable to any person except after notice to EPA. EPA may require modification or revocation and reissuance of the permit to change the name of the permittee and incorporate such other requirements as may be necessary under the Clean Water Act. (See 40 CFR §122.61; in some cases, modification or revocation and reissuance is mandatory.)

D. Monitoring reports. Monitoring results must be reported at the intervals specified elsewhere in this permit.
   1. Monitoring results must be reported on a Discharge Monitoring Report (DMR) or forms provided or specified by EPA for reporting results of monitoring of sludge use or disposal practices.
   2. If you monitor any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 or, in the case of sludge use or disposal, approved under 40 CFR Part 136 unless otherwise specified in 40 CFR Part 503, or as specified in the permit, the results of this monitoring must be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by EPA.
   3. Calculations for all limitations which require averaging of measurements must use an arithmetic mean.

E. Compliance schedules. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date.

F. Twenty-four hour reporting.

1. You must report any noncompliance which may endanger health or the environment. Any information must be provided orally within 24 hours from the time you become aware of the circumstances. A written submission must also be provided within five days of the time you become aware of the circumstances. The written submission must contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.
2. The following shall be included as information which must be reported within 24 hours under this paragraph.
   a. Any unanticipated bypass which exceeds any effluent limitation in the permit. (See 40 CFR §122.41(g).)
   b. Any upset which exceeds any effluent limitation in the permit
   c. Violation of a maximum daily discharge limitation for any of the pollutants listed by EPA in the permit to be reported within 24 hours. (See 40 CFR §122.44(g).)

13. EPA may waive the written report on a case-by-case basis for reports under Appendix G, Subsection 12.F.2 if the oral report has been received within 24 hours.

G. Other noncompliance. You must report all instances of noncompliance not reported under Appendix G, Subsections 12.D, 12.E, and 12.F, at the time monitoring reports are submitted. The reports must contain the information listed in Appendix G, Subsection 12.F.

H. Other information. Where you become aware that you failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Permitting Authority, you must promptly submit such facts or information.

13. Bypass

A. Definitions.
   1. Bypass means the intentional diversion of waste streams from any portion of a treatment facility
   2. Severe property damage means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

B. Bypass not exceeding limitations. You may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of Appendix G, Subsections 13.C and 13.D.

C. Notice–
   1. Anticipated bypass. If you know in advance of the need for a bypass, you must submit prior notice, if possible at least ten days before the date of the bypass.
   2. Unanticipated bypass. You must submit notice of an unanticipated bypass as required in Appendix G, Subsection 12.F (24-hour notice).

D. Prohibition of bypass.
   1. Bypass is prohibited, and EPA may take enforcement action against you for bypass, unless:
      a. Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;
      b. There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and
      c. You submitted notices as required under Appendix G, Subsection 13.C.
   2. EPA may approve an anticipated bypass, after considering its adverse effects, if EPA determines that it will meet the three conditions listed above in Appendix G, Subsection 13.D.1.

14. Upset

A. Definition. Upset means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond your reasonable control. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

B. Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the requirements of Appendix G, Subsection 14.C are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.

C. Conditions necessary for a demonstration of upset. A permittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:
   1. An upset occurred and that you can identify the cause(s) of the upset;
   2. The permitted facility was at the time being properly operated; and
   3. You submitted notice of the upset as required in Appendix G, Subsection 12.F.2.b(24 hour notice).
   4. You complied with any remedial measures required under Appendix G, Section 4.

D. Burden of proof. In any enforcement proceeding, you, as the one seeking to establish the occurrence of an upset, has the burden of proof.

APPENDIX B

CSWPPP CONTACT LIST

CONTACT LIST
DOVER MUNICIPAL LANDFILL SUPERFUND SITE
SOURCE CONTROL REMEDIAL DESIGN
TOLEND ROAD, NEW HAMPSHIRE

PROJECT TITLE	CONTACT COMPANY/ CONTACT NAME	ADDRESS/TELEPHONE
OWNER	Work Settling Defendants for the Dover Municipal Landfill Superfund Site Dean Peschel	Dover Landfill Exec. Committee City of Dover 288 Central St Dover, NH 03820
PROJECT MANAGER	GeoInsight, Inc. Michael J. Webster Christene A. Binger	1 Monarch Drive, Suite 201 Littleton, MA 01460 Phone: (978) 679-1600 Fax: (978) 679-1601
PROJECT ENGINEER	GeoInsight, Inc. Luke W. Sanborn, P.E.	186 Granite Street, 3rd Floor Manchester, NH 03101 Phone: (800) 217-1953 Fax: (603) 314-0821
CONTRACTOR	Clean Harbors Environmental Services, Inc. Robert Cornwell	42 Longwater Drive Norwell, MA, 02061 Phone: (781) 792-5801 Fax: (781) 792-5938

EMERGENCY CONTACT INFORMATION

CONTACT	TELEPHONE
Christene A. Binger (GeoInsight, Inc.)	(617) 803-8108
Luke Sanborn	(603) 300-6406
National Response Center	(800) 424-8802
NH DES Drinking Water and Groundwater Bureau	(603) 271-2513
NH DES Watershed Bureau	(603) 271-3414 (weekdays) (603) 419-9229 (weekends)
Hampshire State Police	(603) 271-3636
City of Dover Fire Department	**911** and (603) 516-6150
City of Dover Police	**911** and (603) 742-4646

APPENDIX C

CSWPPP ADDENDA LOG

ADDENDA LOG
DOVER MUNICIPAL LANDFILL SUPERFUND SITE
SOURCE CONTROL REMEDIAL DESIGN
TOLEND ROAD, NEW HAMPSHIRE

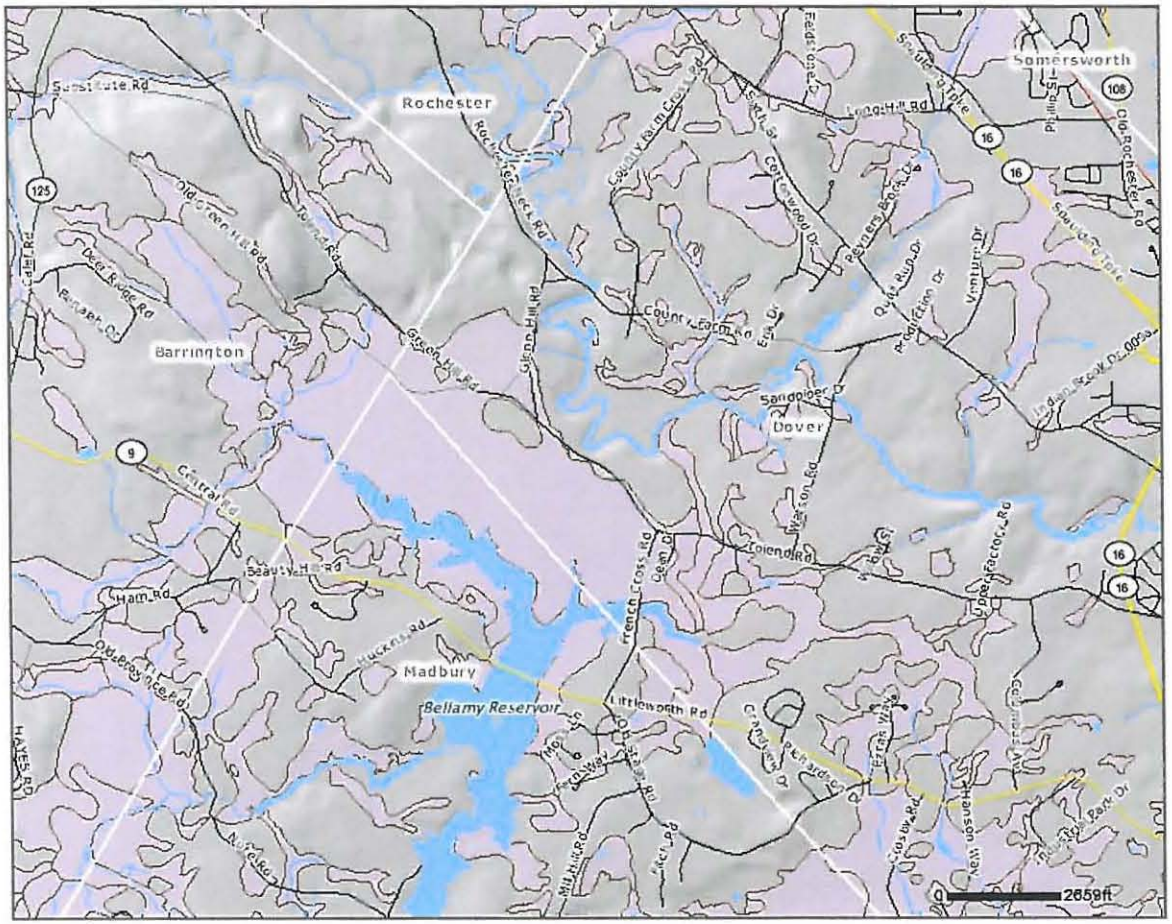
REVISION NUMBER	REVISION DATE	DESCRIPTION OF REVISION
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

APPENDIX D

NH GRANIT MAPS
RARE SPECIES AND EXEMPLARY NATURAL COMMUNITIES
WATER QUALITY ASSESSMENT REPORTS
HISTORIC PROPERTY CARDS

NH GRANIT DATA MAPPER

Soils: SOILS: DOVER, NH



Location Map

Map Produced: October 12, 2010

GRANIT Complex Systems Research Center

UNIVERSITY of NEW HAMPSHIRE

NH GRANIT DATA MAPPER

Soils: SOILS: DOVER, NH

Legend

Roads

- Class I: primary system
- Class II: secondary system
- Class III: state recreational
- Class IV: within compacts
- Class V: municipal
- Class VI: unmaintained municipal
- Class VII: federal highway

Political Boundaries

- State
- County
- Town

Watersheds

Streams

- Perennial Stream
- Intermittent Stream

Lakes

- Lake/Pond
- Reservoir

Rivers

- River
- Canal/Ditch

Soils: Hydric

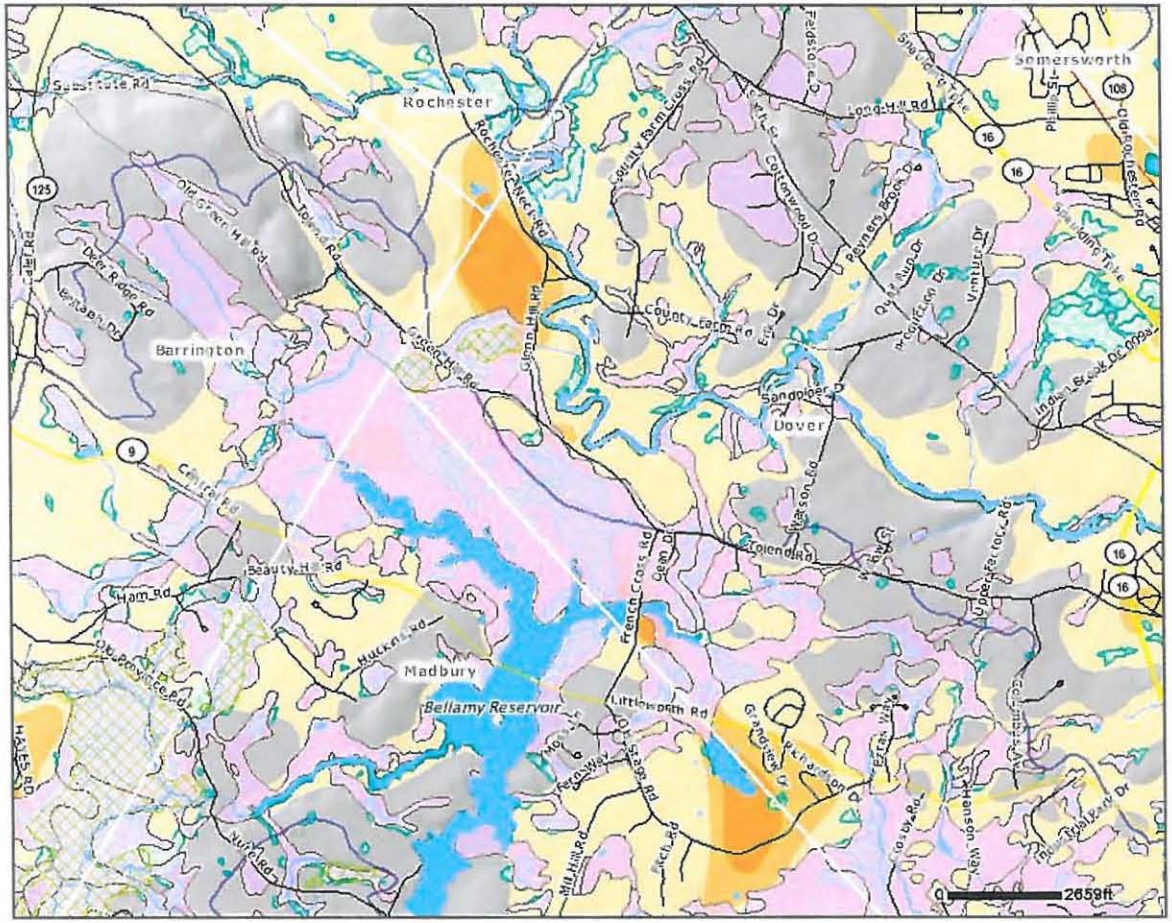
Data Sources

All data are maintained and/or distributed by NH GRANIT. See www.granit.unh.edu for detailed documentation on individual data layers.

Digital data in NH GRANIT represent the efforts of the contributing agencies to record information from the cited source materials. Complex Systems Research Center, under contract to the NH Office of Energy and Planning, and in consultation with cooperating agencies, maintains a continuing program to identify and correct errors in these data. OEP, CSRC, and the cooperating agencies make no claim as to the validity or reliability or to any implied uses of these data.

NH GRANIT DATA MAPPER

Water Resources: WATER RESOURCES: Dover, NH



Location Map

Map Produced: October 12, 2010

GRANIT Complex Systems Research Center

UNIVERSITY of NEW HAMPSHIRE

NH GRANIT DATA MAPPER

Water Resources: WATER RESOURCES: Dover, NH

Legend

Roads

- Class I: primary system
- Class II: secondary system
- Class III: state recreational
- Class IV: within compacts
- Class V: municipal
- Class VI: unmaintained municipal
- Class VII: federal highway

Political Boundaries

- State
- County
- Town

Watersheds

Subwatersheds

Stream Type

- Perennial Stream
- Intermittent Stream
- Canal/Ditch

Water Bodies

- Lake/Pond
- Reservoir
- Swamp/Marsh

Other Water Features

- River
- Spillway
- Inundation Area
- Dam/Weir
- Canal/Ditch
- Rapids

Hydric Soils

Wetlands

- Estuarine
- Lacustrine
- Marine
- Palustrine
- Riverine

Aquifer Transmissivity

- Less than 2000 ft^2/day
- 2000-4000 ft^2/day
- Greater than 4000 ft^2/day

Data Sources

All data are maintained and/or distributed by NH GRANIT. See www.granit.unh.edu for detailed documentation on individual data layers.

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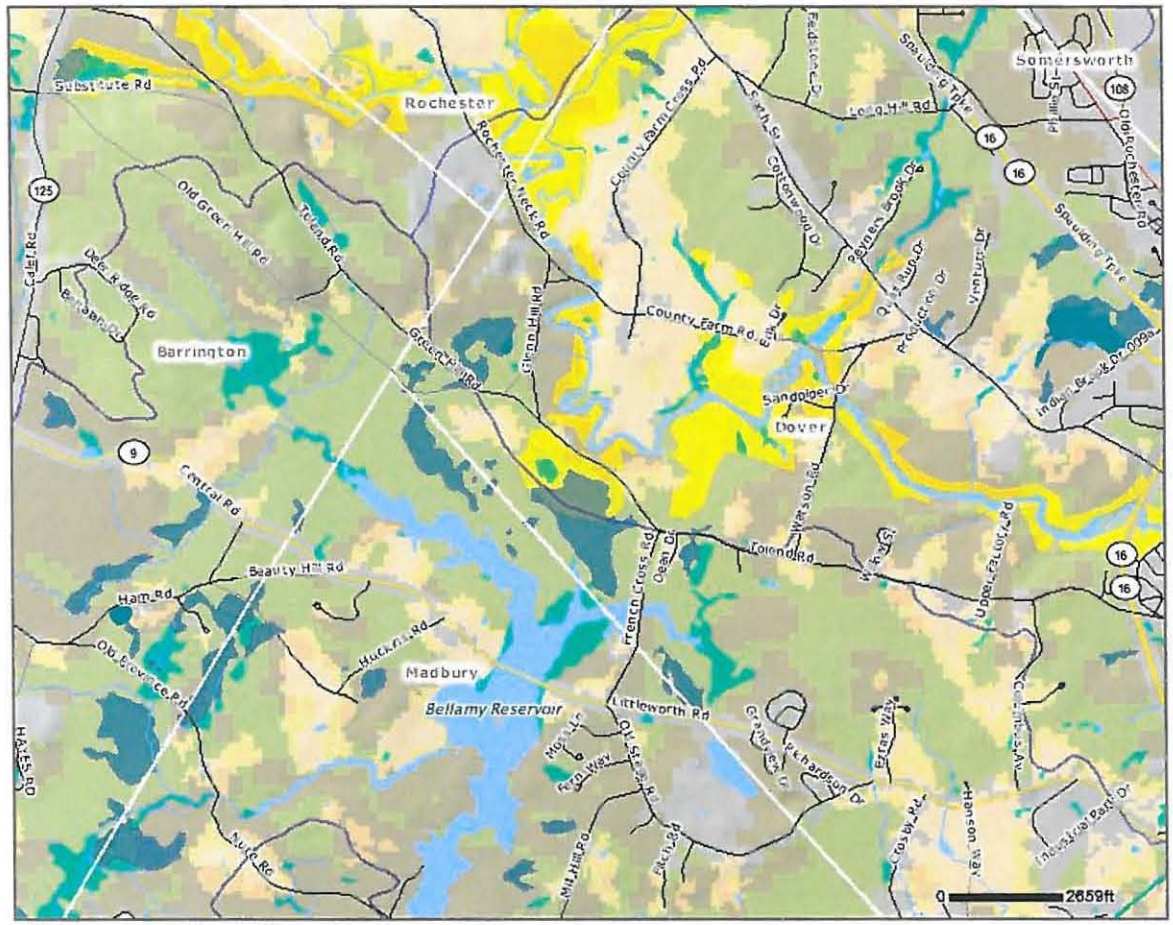
NH GRANIT DATA MAPPER

Wildlife: WILDLIFE: DOVER, NH



Location Map

Map Produced: October 12, 2010

GRANIT Complex Systems Research Center

UNIVERSITY of NEW HAMPSHIRE

NH GRANIT DATA MAPPER

Wildlife: WILDLIFE: DOVER, NH

Legend

Roads

- Class I: primary system
- Class II: secondary system
- Class III: state recreational
- Class IV: within compacts
- Class V: municipal
- Class VI: unmaintained municipal
- Class VII: federal highway

Political Boundaries

- State
- County
- Town

Ecoregional Subsections

Watershed Groupings

Watersheds

Subwatershed Condition

Streams

- Perennial Stream
- Intermittent Stream
- Canal/Ditch

Lakes

- Lake/Pond

Rivers

- River
- Canal/Ditch

WAP: Dune

WAP: Salt Marsh

WAP: Coastal Island

WAP: Peatland

WAP: Wet Meadow-Shrub Wetland

WAP: Cliff

WAP: Rocky Ridge or Talus Slope

WAP: Alpine

WAP: Forest Floodplain

WAP: Pine Barren

WAP: Grassland

WAP: High-Elevation Spruce-Fir Forest

WAP: Lowland Spruce-Fir Forest

WAP: Northern Hardwood-Conifer Forest

WAP: Appalachian-Oak-Pine Forest

WAP: Hemlock-Hardwood-Pine Forest

Data Sources

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To: Jesse Freeman, GeoInsight, Inc.
One Monarch Drive, Suite 201

Littleton, MA 01460

From: NH Natural Heritage Bureau

Date: 11/5/2010 (valid for one year from this date)

Re: Review by NH Natural Heritage Bureau of request submitted 11/4/2010

NHB File ID: NHB10-2731 **Applicant:** GeoInsight, Inc.

Location: Dover, Madbury
Dover Municipal Landfill at the Intersection of Tolend Road and Glenn Hill Road

Project Description: Remove impacted sediment from a drainage ditch, backfill the drainage ditch to prevent further impct sediment build-up, construct an access road along the permiter of the landfill, and construct a ground water extraction system along the access road.

The NH Natural Heritage database has been checked by staff of the NH Natural Heritage Bureau and/or the NH Nongame and Endangered Species Program for records of rare species and exemplary natural communities near the area mapped below. The species considered include those listed as Threatened or Endangered by either the state of New Hampshire or the federal government.

It was determined that, although there was a NHB record (e.g., rare wildlife, plant, and/or natural community) present in the vicinity, we do not expect that it will be impacted by the proposed project. This determination was made based on the project information submitted via the NHB Datacheck Tool on 11/4/2010, and can not be used for any other project.

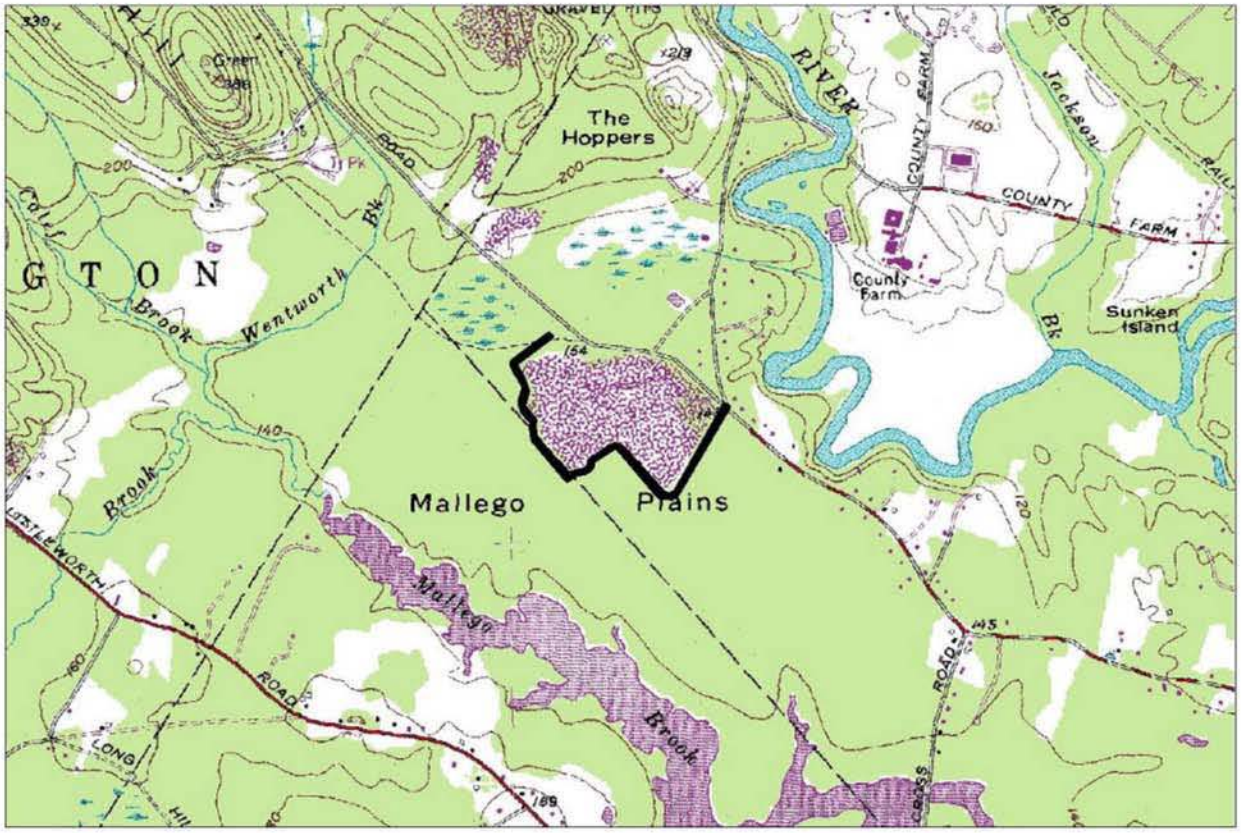
Department of Resources and Economic Development
Division of Forests and Lands
(603) 271-2214 fax: 271-6488

DRED/NHB
PO Box 1856
Concord NH 03302-1856

MAP OF PROJECT BOUNDARIES FOR: **NHB10-2731**

NHB10-2731

NH Natural Heritage Bureau



0.25 0 0.25 0.5 0.75 1 Miles

1:18000

Valid for one year from this date 05 Nov 2010

Department of Resources and Economic Development
Division of Forests and Lands
(603) 271-2214 fax: 271-6488

DRED/NHB
PO Box 1856
Concord NH 03302-1856

Watershed Assessment, Tracking & Environmental Results

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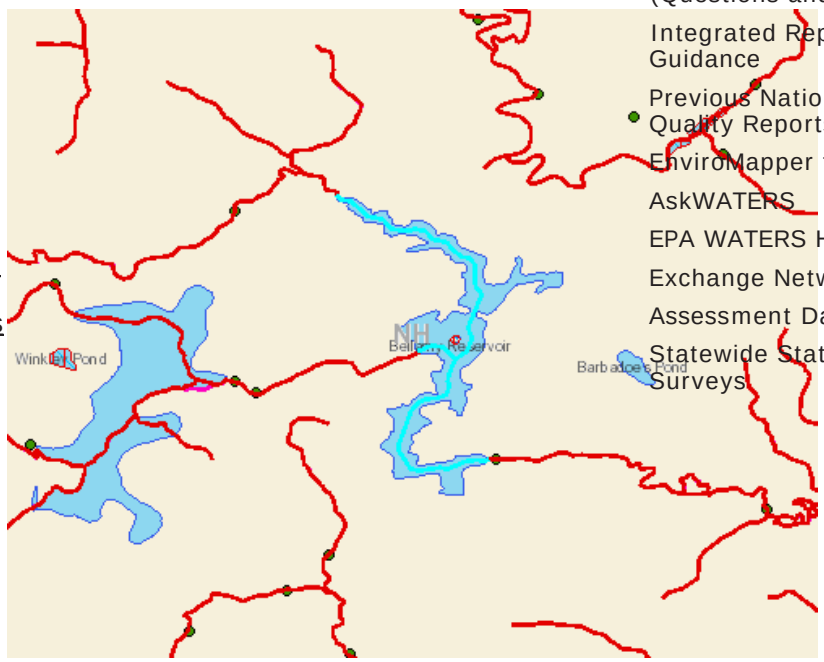
Water Quality Assessment Status
Causes of Impairment
Probable Sources
Contributing to Impairments
TMDLs That Apply to This Waterbody

2008 Waterbody Report for Bellamy Reservoir, Madbury, Pws



Click on the waterbody for an interactive map

Frequent Questions
About This Database (Integrated Report)
Assessing Water Quality (Questions and Answers)
Integrated Reporting Guidance
Previous National Water Quality Reports
EnviroMapper for Water
AskWATERS
EPA WATERS Homepage
Exchange Network
Assessment Database
Statewide Statistical Surveys

State: New Hampshire
Waterbody ID: NHLAK600030903-02
Location: 010600030903, Bellamy Reservoir, Madbury, Public Water Supply, Cls-A, Unknown Fishery, 154.67634ha
State Waterbody Type: Freshwater Lake
EPA Waterbody Type: Lakes, Reservoirs, and Ponds
Water Size: 382.2
Units: acres
Watershed Name: Piscataqua-Salmon Falls

Data are also available for these years: 2002 2004 2006

Water Quality Assessment Status for Reporting Year 2008

http://iaspub.epa.gov/tmdl_waters10/attains_waterbody.control?p_list_id=&p_au_id=NHLAK600030903-02&p_cycle=2008&p_state=NH

Last updated on Thursday, October 21, 2010

The overall status of this waterbody is Impaired.

Description of this table

Designated Use	Designated Use Group	Status
Aquatic Life	Fish, Shellfish, And Wildlife Protection And Propagation	Not Assessed
Drinking Water After Adequate Treatment	Public Water Supply	Good
Fish Consumption	Aquatic Life Harvesting	Impaired
Primary Contact Recreation	Recreation	Not Assessed
Secondary Contact Recreation	Recreation	Not Assessed
Wildlife	Fish, Shellfish, And Wildlife Protection And Propagation	Not Assessed

Causes of Impairment for Reporting Year 2008

Description of this table

Cause of Impairment	Cause of Impairment Group	Designated Use (s)	State TMDL Development Status
Mercury	Mercury	Fish Consumption	

Probable Sources Contributing to Impairment for Reporting Year 2008

Description of this table

Probable Source	Probable Source Group	Cause(s) of Impairment
Atmospheric Deposition - Toxics	Atmospheric Deposition	Mercury

TMDLs That Apply to this waterbody

No TMDL data have been recorded by EPA for this waterbody.

Watershed Assessment, Tracking & Environmental Results

Return to home page

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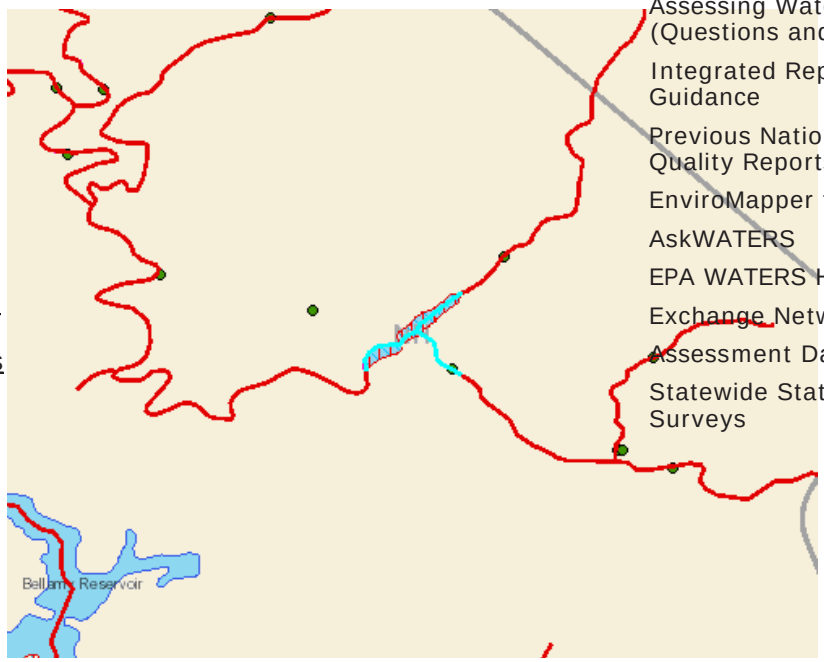
Water Quality Assessment Status
Causes of Impairment
Probable Sources
Contributing to Impairments
TMDLs That Apply to This Waterbody
Previous Causes of Impairment Now Attaining All Uses

2008 Waterbody Report for Cocheco River, Imp



Click on the waterbody for an interactive map

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AskWATERS
EPA WATERS Homepage
Exchange Network
Assessment Database
Statewide Statistical Surveys

State: New Hampshire
Waterbody ID: NHIMP600030608-02
Location: 010600030608, Cocheco River, Imp #067.02, Watson Waldron Dam, 54 Acres, 18 Feet High, Unknown Fishery
State Waterbody Type: Impoundment
EPA Waterbody Type: Lakes, Reservoirs, and Ponds
Water Size: 54
Units: acres
Watershed Name: Piscataqua-Salmon Falls

Data are also available for these years: 2002 2004 2006

Water Quality Assessment Status for Reporting Year 2008

The overall status of this waterbody is Impaired.

Description of this table

Designated Use	Designated Use Group	Status
Aquatic Life	Fish, Shellfish, And Wildlife Protection And Propagation	Impaired
Drinking Water After Adequate Treatment	Public Water Supply	Good
Fish Consumption	Aquatic Life Harvesting	Impaired
Primary Contact Recreation	Recreation	Impaired
Secondary Contact Recreation	Recreation	Good
Wildlife	Fish, Shellfish, And Wildlife Protection And Propagation	Not Assessed

Causes of Impairment for Reporting Year 2008

Description of this table

Cause of Impairment	Cause of Impairment Group	Designated Use (s)	State TMDL Development Status
Escherichia Coli (E. Coli)	Pathogens	Primary Contact Recreation	TMDL completed
Mercury	Mercury	Fish Consumption	
pH	pH/Acidity/Caustic Conditions	Aquatic Life	TMDL needed

Probable Sources Contributing to Impairment for Reporting Year 2008

Description of this table

Probable Source	Probable Source Group	Cause(s) of Impairment
Atmospheric Deposition - Toxics	Atmospheric Deposition	Mercury
Source Unknown	Unknown	pH; Escherichia Coli (E. Coli)

TMDLs That Apply to this waterbody

http://iaspub.epa.gov/tmdl_waters10/attains_waterbody.control?p_list_id=&p_au_id=NHIMP600030608-02&p_cycle=2008&p_state=NH

Last updated on Thursday, October 21, 2010

Description of this table

TMDL Document Name	TMDL Date	TMDL Pollutant Description	TMDL Pollutant Source Type	Cause(s) of Impairment Addressed
Ne Regional Mercury Tmdl	Dec-20-2007	Mercury	Nonpoint Source	Mercury
New Hampshire Statewide Bacteria	Sep-21-2010	Escherichia Coli (E. Coli)	Point/Nonpoint Source	Escherichia Coli (E. Coli)

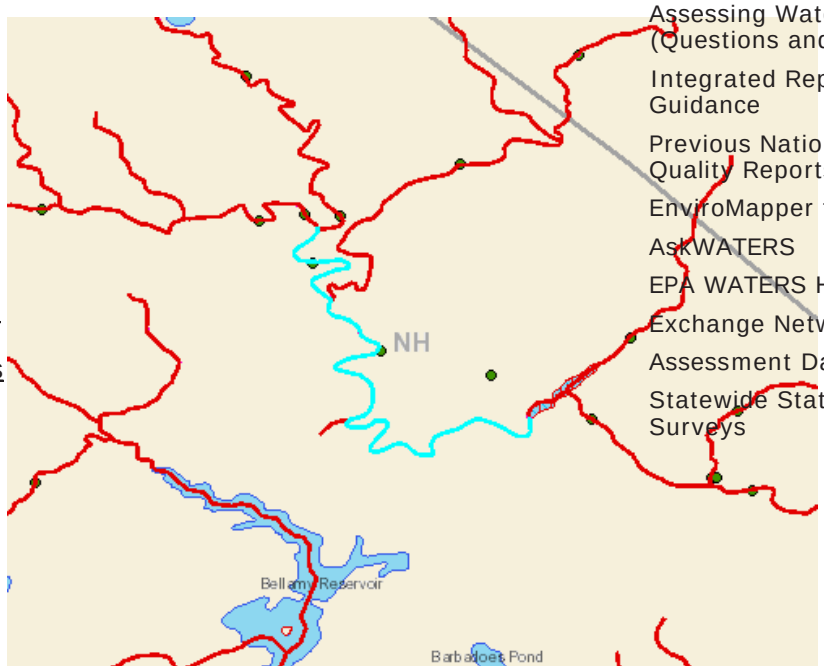
Watershed Assessment, Tracking & Environmental Results

Return to home page

On This Page

Water Quality Assessment Status
Causes of Impairment
Probable Sources Contributing to Impairments
TMDLs That Apply to This Waterbody
Previous Causes of Impairment Now Attaining All Uses

2008 Waterbody Report for Cocheco River



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Assessing Water Quality (Questions and Answers)
Integrated Reporting Guidance
Previous National Water Quality Reports
EnviroMapper for Water
AskWATERS
EPA WATERS Homepage
Exchange Network
Assessment Database
Statewide Statistical Surveys

State: New Hampshire
Waterbody ID: NHRIV600030608-03
Location: 010600030608, Cocheco River, Unknown Fishery
State Waterbody Type: River
EPA Waterbody Type: Rivers and Streams
Water Size: 3.77
Units: miles
Watershed Name: Piscataqua-Salmon Falls

Data are also available for these years: 2002 2004 2006

Water Quality Assessment Status for Reporting Year 2008

The overall status of this waterbody is Impaired.

Description of this table

Designated Use	Designated Use Group	Status
Aquatic Life	Fish, Shellfish, And Wildlife Protection And Propagation	Impaired
Drinking Water After Adequate Treatment	Public Water Supply	Good
Fish Consumption	Aquatic Life Harvesting	Impaired
Primary Contact Recreation	Recreation	Impaired
Secondary Contact Recreation	Recreation	Good
Wildlife	Fish, Shellfish, And Wildlife Protection And Propagation	Not Assessed

Causes of Impairment for Reporting Year 2008

Description of this table

Cause of Impairment	Cause of Impairment Group	Designated Use (s)	State TMDL Development Status
Dissolved Oxygen Saturation	Organic Enrichment/Oxygen Depletion	Aquatic Life	TMDL needed
Escherichia Coli (E. Coli)	Pathogens	Primary Contact Recreation	TMDL completed
Mercury	Mercury	Fish Consumption	
pH	pH/Acidity/Caustic Conditions	Aquatic Life	TMDL needed

Probable Sources Contributing to Impairment for Reporting Year 2008

Description of this table

Probable Source	Probable Source Group	Cause(s) of Impairment
Atmospheric Deposition - Toxics	Atmospheric Deposition	Mercury
Source Unknown	Unknown	Dissolved Oxygen Saturation; pH; Escherichia Coli (E. Coli)

TMDLs That Apply to this waterbody

Description of this table

http://iaspub.epa.gov/tmdl_waters10/attains_waterbody.control?p_list_id=&p_au_id=NHRIV0000030608-03&p_cycle=2008&p_state=NH Last updated on Thursday, October 21, 2010

TMDL Document Name	TMDL Date	TMDL Pollutant Description	TMDL Pollutant Source Type	Cause(s) of Impairment Addressed
Ne Regional Mercury Tmdl	Dec-20-2007	Mercury	Nonpoint Source	Mercury
New Hampshire Statewide Bacteria	Sep-21-2010	Escherichia Coli (E. Coli)	Point/Nonpoint Source	Escherichia Coli (E. Coli)

Watershed Assessment, Tracking & Environmental Results

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Causes of Impairment
Probable Sources Contributing to Impairments
TMDLs That Apply to This Waterbody
Previous Causes of Impairment Now Attaining All Uses

2008 Waterbody Report for Unnamed Trib. To Cocheco River, Dover (From Landfill)

Click on the waterbody for an interactive map

Frequent Questions
About This Database (Integrated Report)
Assessing Water Quality (Questions and Answers)
Integrated Reporting Guidance
Previous National Water Quality Reports
EnviroMapper for Water
AskWATERS
EPA WATERS Homepage
Exchange Network
Assessment Database
Statewide Statistical Surveys

State: New Hampshire
Waterbody ID: NHRIV600030608-14
Location: 010600030608, Unnamed Trib. To Cocheco River, Dover (From Landfill)
State Waterbody Type: River
EPA Waterbody Type: Rivers and Streams
Water Size: .15
Units: miles
Watershed Name: Piscataqua-Salmon Falls

Data are also available for these years: 2002 2004 2006

Water Quality Assessment Status for Reporting Year 2008

The overall status of this waterbody is Impaired.

Description of this table

Designated Use	Designated Use Group	Status
Aquatic Life	Fish, Shellfish, And Wildlife Protection And Propagation	Impaired
Drinking Water After Adequate Treatment	Public Water Supply	Good
Fish Consumption	Aquatic Life Harvesting	Impaired
Primary Contact Recreation	Recreation	Not Assessed
Secondary Contact Recreation	Recreation	Not Assessed
Wildlife	Fish, Shellfish, And Wildlife Protection And Propagation	Not Assessed

Causes of Impairment for Reporting Year 2008

Description of this table

Cause of Impairment	Cause of Impairment Group	Designated Use (s)	State TMDL Development Status
Iron	Metals (other than Mercury)	Aquatic Life	TMDL needed
Mercury	Mercury	Fish Consumption	

Probable Sources Contributing to Impairment for Reporting Year 2008

Description of this table

Probable Source	Probable Source Group	Cause(s) of Impairment
Atmospheric Deposition - Toxics	Atmospheric Deposition	Mercury
Landfills	Land Application/Waste Sites/Tanks	Iron

TMDLs That Apply to this waterbody

Description of this table

http://iaspub.epa.gov/tmdl_waters10/attains_waterbody.control?p_au_id=NHRIV600030608&p_cycle=2008&p_state=NH&p_report_type= Last updated on Thursday, October 21, 2010

TMDL Document Name	TMDL Date	TMDL Pollutant Description	TMDL Pollutant Source Type	Cause(s) of Impairment Addressed
Ne Regional Mercury Tmdl	Dec-20-2007	Mercury	Nonpoint Source	Mercury

Watershed Assessment, Tracking & Environmental Results

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Causes of Impairment
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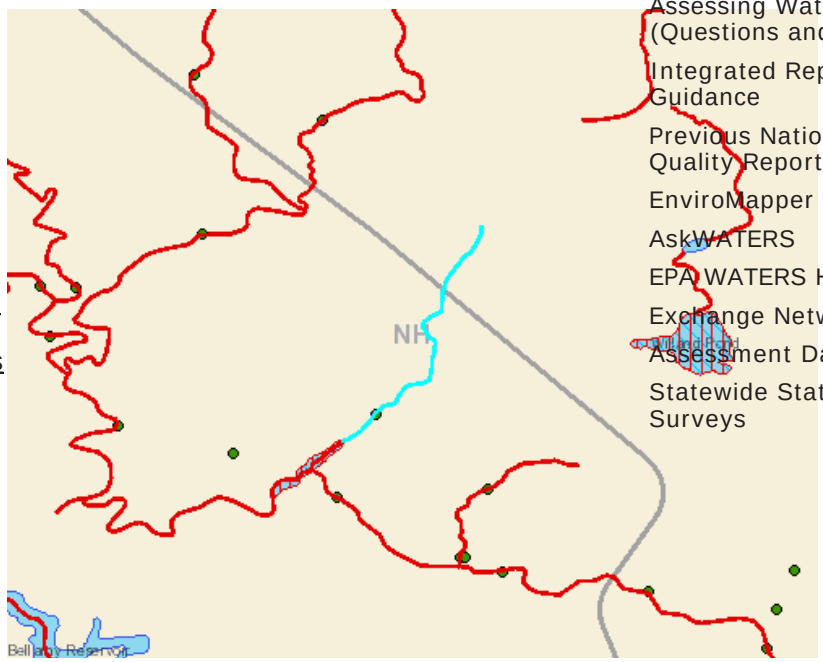
TMDLs That Apply to This Waterbody
Previous Causes of Impairment Now Attaining All Uses

2008 Waterbody Report for Reyners Brook



Click on the waterbody for an interactive map

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EnviroMapper for Water
AskWATERS
EPA WATERS Homepage
Exchange Network
Assessment Database
Statewide Statistical Surveys

State: New Hampshire
Waterbody ID: NHRIV600030608-04
Location: 010600030608, Reyners Brook, Unknown Fishery
State Waterbody Type: River
EPA Waterbody Type: Rivers and Streams
Water Size: 1.71
Units: miles
Watershed Name: Piscataqua-Salmon Falls

Data are also available for these years: 2002 2004 2006

Water Quality Assessment Status for Reporting Year 2008

The overall status of this waterbody is Impaired.

Description of this table

Designated Use	Designated Use Group	Status
Aquatic Life	Fish, Shellfish, And Wildlife Protection And Propagation	Not Assessed
Drinking Water After Adequate Treatment	Public Water Supply	Good
Fish Consumption	Aquatic Life Harvesting	Impaired
Primary Contact Recreation	Recreation	Impaired
Secondary Contact Recreation	Recreation	Not Assessed
Wildlife	Fish, Shellfish, And Wildlife Protection And Propagation	Not Assessed

Causes of Impairment for Reporting Year 2008

Description of this table

Cause of Impairment	Cause of Impairment Group	Designated Use(s)	State TMDL Development Status
Escherichia Coli (E. Coli)	Pathogens	Primary Contact Recreation	TMDL completed
Mercury	Mercury	Fish Consumption	

Probable Sources Contributing to Impairment for Reporting Year 2008

Description of this table

Probable Source	Probable Source Group	Cause(s) of Impairment
Atmospheric Deposition - Toxics	Atmospheric Deposition	Mercury
Source Unknown	Unknown	Escherichia Coli (E. Coli)

TMDLs That Apply to this waterbody

Description of this table

TMDL Document Name	TMDL Date	TMDL Pollutant Description	TMDL Pollutant Source Type	Cause(s) of Impairment Addressed
Ne Regional Mercury Tmdl	Dec-20-2007	Mercury	Nonpoint Source	Mercury

New Hampshire Statewide Bacteria	Sep-21-2010	Escherichia Coli (E. Coli)	Point/Nonpoint Source	Escherichia Coli (E. Coli)

http://iaspub.epa.gov/tmdl_waters10/attains_waterbody.control?p_au_id=NHRIV600030608-04&p_cycle=2008&p_state=NH&p_report_type=T Last updated on Thursday, October 21, 2010

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3. About **DjVu** and **plugin help**

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JPG | DjVu

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Back River Farm [Image]

URL:	**http://pdfhost.focus.nps.gov/docs/NRHP/Text/84003236.pdf** Link will open in a new browser window
URL:	**http://pdfhost.focus.nps.gov/docs/NRHP/Photos/84003236.pdf** Link will open in a new browser window
Publisher:	National Park Service
Published:	06/22/1984
Access:	Public access
Restrictions:	All Rights Reserved
Format/Size:	Physical document with text, photos and map
Language:	eng: English
Note:	Bay View Rd.
Item No.:	84003236 *NRIS (National Register Information System)*
Subject:	**ARCHITECTURE/ENGINEERING**
Subject:	**ARCHITECTURE**
Subject:	**BUILDING**
Subject:	**1750-1799**
Keywords:	1750
Place:	NEW HAMPSHIRE -- Strafford County -- Dover

Record Number: 397887

Record Owner: National Register of Historic Places

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Choose format:
JPG | **DjVu**

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County Farm Bridge [Image]

URL:	**http://pdfhost.focus.nps.gov/docs/NRHP/Text/75000237.pdf** Link will open in a new browser window
URL:	**http://pdfhost.focus.nps.gov/docs/NRHP/Photos/75000237.pdf** Link will open in a new browser window
Publisher:	National Park Service
Published:	05/21/1975
Access:	Public access
Restrictions:	All Rights Reserved
Format/Size:	Physical document with text, photos and map
Language:	eng: English
Note:	NW of Dover on County Farm Rd.
Item No.:	75000237 *NRIS (National Register Information System)*
Subject:	**EVENT**
Subject:	**ARCHITECTURE/ENGINEERING**
Subject:	**ENGINEERING**
Subject:	**TRANSPORTATION**
Subject:	**STRUCTURE**
Subject:	**1875-1899**
Keywords:	1875
Place:	NEW HAMPSHIRE -- Strafford County -- Dover vicinity

Record Number: 368362

Record Owner: National Register of Historic Places

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JPG | **DjVu**

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2. takes about 20 seconds
3. About **DjVu** and **plugin help**

Choose format:

JPG | **DjVu**

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First Parish Church [Image]

URL:	**http://pdfhost.focus.nps.gov/docs/NRHP/Text/82001696.pdf** Link will open in a new browser window
URL:	**http://pdfhost.focus.nps.gov/docs/NRHP/Photos/82001696.pdf** Link will open in a new browser window
Publisher:	National Park Service
Published:	03/11/1982
Access:	Public access
Restrictions:	All Rights Reserved
Format/Size:	Physical document with text, photos and map
Language:	eng: English
Note:	218 Central Ave.
Item No.:	82001696 *NRIS (National Register Information System)*
Subject:	**ARCHITECTURE/ENGINEERING**
Subject:	**ARCHITECTURE**
Subject:	**FEDERAL**
Subject:	**BUILDING**
Subject:	**1825-1849**
Subject:	**1800-1824**
Keywords:	Davis,Capt. James;1825
Place:	NEW HAMPSHIRE -- Strafford County -- Dover

Record Number: 387135

Record Owner: National Register of Historic Places

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JPG | **DjVu**

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1. Choose the option for Autoinstallation
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3. About **DjVu** and **plugin help**

Choose format:

JPG | **DjVu**

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First Parish Church Site-Dover Point [Image]

URL:	**http://pdfhost.focus.nps.gov/docs/NRHP/Text/83001153.pdf** Link will open in a new browser window
URL:	**http://pdfhost.focus.nps.gov/docs/NRHP/Photos/83001153.pdf** Link will open in a new browser window
Publisher:	National Park Service
Published:	05/27/1983
Access:	Public access
Restrictions:	All Rights Reserved
Format/Size:	Physical document with text, photos and map
Language:	eng: English
Note:	Dover Point Rd.
Item No.:	83001153 *NRIS (National Register Information System)*
Subject:	**EVENT**
Subject:	**INFORMATION POTENTIAL**
Subject:	**EXPLORATION/SETTLEMENT**
Subject:	**HISTORIC - NON-ABORIGINAL**
Subject:	**SITE**
Keywords:	Walderne,Richard;1653;1654;1720
Place:	NEW HAMPSHIRE -- Strafford County -- Dover

Record Number: 391415

Record Owner: National Register of Historic Places

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JPG | **DjVu**

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3. About **DjVu** and **plugin help**

Choose format:

JPG | **DjVu**

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Garrison Hill Park and Tower [Image]

URL:	**http://pdfhost.focus.nps.gov/docs/NRHP/Text/87001413.pdf** Link will open in a new browser window
URL:	**http://pdfhost.focus.nps.gov/docs/NRHP/Photos/87001413.pdf** Link will open in a new browser window
Publisher:	National Park Service
Published:	09/11/1987
Access:	Public access
Restrictions:	All Rights Reserved
Format/Size:	Physical document with text, photos and map
Language:	eng: English
Note:	Abbie Sawyer Memorial Dr.
Item No.:	87001413 *NRIS (National Register Information System)*
Subject:	**ARCHITECTURE/ENGINEERING**
Subject:	**ENTERTAINMENT/RECREATION**
Subject:	**SITE**
Subject:	**1900-1924**
Subject:	**1875-1899**
Keywords:	Worcester,J.R. & Co.;1880;1912
Place:	NEW HAMPSHIRE -- Strafford County -- Dover

Record Number: 406943

Record Owner: National Register of Historic Places

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1. Choose the option for Autoinstallation
2. takes about 20 seconds
3. About DjVu and plugin help

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Hale, William, House [Image]

URL:	http://pdfhost.focus.nps.gov/docs/NRHP/Text/80000309.pdf Link will open in a new browser window
URL:	http://pdfhost.focus.nps.gov/docs/NRHP/Photos/80000309.pdf Link will open in a new browser window
Publisher:	National Park Service
Published:	11/18/1980
Access:	Public access
Restrictions:	All Rights Reserved
Format/Size:	Physical document with text, photos and map
Language:	eng: English
Note:	5 Hale St.
Item No.:	80000309 *NRIS (National Register Information System)*
Subject:	ARCHITECTURE/ENGINEERING
Subject:	ARCHITECTURE
Subject:	FEDERAL
Subject:	BUILDING
Subject:	1800-1824
Keywords:	Johnson,Bradbury;Pendexter,George,& Edward;1806
Place:	NEW HAMPSHIRE -- Strafford County -- Dover

Record Number: 380804

Record Owner: National Register of Historic Places

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3. About DjVu and plugin help

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Public Market [Image]

URL:	http://pdfhost.focus.nps.gov/docs/NRHP/Text/85000541.pdf Link will open in a new browser window
URL:	http://pdfhost.focus.nps.gov/docs/NRHP/Photos/85000541.pdf Link will open in a new browser window
Publisher:	National Park Service
Published:	03/07/1985
Access:	Public access
Restrictions:	All Rights Reserved
Format/Size:	Physical document with text, photos and map
Language:	eng: English
Note:	93 Washington St.
Item No.:	85000541 *NRIS (National Register Information System)*
Subject:	ARCHITECTURE/ENGINEERING
Subject:	PERSON
Subject:	ARCHITECTURE
Subject:	COMMERCE
Subject:	COMMUNITY PLANNING AND DEVELOPMENT
Subject:	INDUSTRY
Subject:	CLASSICAL REVIVAL
Subject:	BUILDING
Subject:	1875-1899
Subject:	1825-1849
Keywords:	Tappan,Stephen;Tappan,Stephen;1846;1889;1927
Place:	NEW HAMPSHIRE -- Strafford County -- Dover

Record Number: 399049

Record Owner: National Register of Historic Places

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1. Choose the option for Autoinstallation
2. takes about 20 seconds
3. About **DjVu** and **plugin help**

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Reade, Michael, House [Image]

URL:	**http://pdfhost.focus.nps.gov/docs/NRHP/Text/80000314.pdf** Link will open in a new browser window
URL:	**http://pdfhost.focus.nps.gov/docs/NRHP/Photos/80000314.pdf** Link will open in a new browser window
Publisher:	National Park Service
Published:	02/12/1980
Access:	Public access
Restrictions:	All Rights Reserved
Format/Size:	Physical document with text, photos and map
Language:	eng: English
Note:	43 Main St.
Item No.:	80000314 *NRIS (National Register Information System)*
Subject:	**ARCHITECTURE/ENGINEERING**
Subject:	**PERSON**
Subject:	**ARCHITECTURE**
Subject:	**COMMERCE**
Subject:	**BUILDING**
Subject:	**1750-1799**
Keywords:	Reade,Michael;1780
Place:	NEW HAMPSHIRE -- Strafford County -- Dover

Record Number: 380809

Record Owner: National Register of Historic Places

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JPG | **DjVu**

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2. takes about 20 seconds
3. About **DjVu** and **plugin help**

Choose format:
JPG | **DjVu**

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Religious Society of Friends Meetinghouse [Image]

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URL:	**http://pdfhost.focus.nps.gov/docs/NRHP/Photos/80000421.pdf** Link will open in a new browser window
Publisher:	National Park Service
Published:	02/29/1980
Access:	Public access
Restrictions:	All Rights Reserved
Format/Size:	Physical document with text, photos and map
Language:	eng: English
Note:	141 Central Ave.
Item No.:	80000421 *NRIS (National Register Information System)*
Subject:	**EVENT**
Subject:	**ARCHITECTURE/ENGINEERING**
Subject:	**ARCHITECTURE**
Subject:	**POLITICS/GOVERNMENT**
Subject:	**RELIGION**
Subject:	**SOCIAL HISTORY**
Subject:	**BUILDING**
Subject:	**1750-1799**
Keywords:	1768
Place:	NEW HAMPSHIRE -- Strafford County -- Dover

Record Number: 380912

Record Owner: National Register of Historic Places

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2. takes about 20 seconds
3. About **DjVu** and **plugin help**

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Sawyer Building [Image]

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URL:	**http://pdfhost.focus.nps.gov/docs/NRHP/Photos/80000316.pdf** Link will open in a new browser window
Publisher:	National Park Service
Published:	05/23/1980
Access:	Public access
Restrictions:	All Rights Reserved
Format/Size:	Physical document with text, photos and map
Language:	eng: English
Note:	4--6 Portland St.
Item No.:	80000316 *NRIS (National Register Information System)*
Subject:	**EVENT**
Subject:	**ARCHITECTURE/ENGINEERING**
Subject:	**ARCHITECTURE**
Subject:	**COMMERCE**
Subject:	**FEDERAL**
Subject:	**BUILDING**
Subject:	**1850-1874**
Subject:	**1825-1849**
Subject:	**1800-1824**
Keywords:	1812;1825
Place:	NEW HAMPSHIRE -- Strafford County -- Dover

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Subject:	**DISTRICT**
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Subject:	**BUILDING**
Subject:	**1875-1899**
Keywords:	Vaughan,Henry;1891;1893
Place:	NEW HAMPSHIRE -- Strafford County -- Dover

Record Number: 397892

Record Owner: National Register of Historic Places

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Subject:	**ARCHITECTURE**
Subject:	**SOCIAL HISTORY**
Subject:	**BUILDING**
Subject:	**1900-1924**
Subject:	**1875-1899**
Keywords:	1881;1907
Place:	NEW HAMPSHIRE -- Strafford County -- Dover

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Subject:	**ARCHITECTURE**
Subject:	**BEAUX ARTS**
Subject:	**BUILDING**
Subject:	**1900-1924**
Keywords:	Taylor,James K.;1911
Place:	NEW HAMPSHIRE -- Strafford County -- Dover

Record Number: 404203

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Published:	07/24/1980
Access:	Public access
Restrictions:	All Rights Reserved
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Language:	eng: English
Note:	182 Central Ave.
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Subject:	PERSON
Subject:	ARCHITECTURE
Subject:	CONSERVATION
Subject:	EDUCATION
Subject:	FEDERAL
Subject:	BUILDING
Subject:	1800-1824
Subject:	1650-1699
Keywords:	Palmer,Captain William;Hale,John Parker;1675;1813;1818
Place:	NEW HAMPSHIRE -- Strafford County -- Dover

Record Number: 380812

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Published:	12/02/1982
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Subject:	**EDUCATION**
Subject:	**LITERATURE**
Subject:	**SOCIAL HISTORY**
Subject:	**GREEK REVIVAL**
Subject:	**BUILDING**
Subject:	**1825-1849**
Keywords:	Pendexter,George;1835
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APPENDIX E

SIGNIFICANT MATERIALS INVENTORY

SIGNIFICANT MATERIALS INVENTORY
DOVER MUNICIPAL LANDFILL SUPERFUND SITE
SOURCE CONTROL REMEDIAL DESIGN
TOLEND ROAD, NEW HAMPSHIRE

NO.	MATERIAL	STORAGE LOCATION	STORAGE TYPE	SWPPP CONTROLS	DATE STORED	DISPOSAL/USE SCHEDULE/DATE TO BE DISPOSED	DISPOSAL /USE DATE
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							

SIGNIFICANT MATERIALS INVENTORY
DOVER MUNICIPAL LANDFILL SUPERFUND SITE
SOURCE CONTROL REMEDIAL DESIGN
TOLEND ROAD, NEW HAMPSHIRE

NO.	MATERIAL	STORAGE LOCATION	STORAGE TYPE	SWPPP CONTROLS	DATE STORED	DISPOSAL/USE SCHEDULE/DATE TO BE DISPOSED	DISPOSAL /USE DATE
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

APPENDIX F

CSWPPP MONITORING FORMS

NPDES MONITORING AND MAINTENANCE REPORT FORM
DOVER MUNICIPAL LANDFILL SUPERFUND SITE
SOURCE CONTROL REMEDIAL DESIGN
TOLEND ROAD, NEW HAMPSHIRE

MONITOR: _____ DATE:_____ MONITORING TYPE: ☐ WEEKLY ☐ STORM EVENT

WEATHER CONDITIONS: _____

DESCRIPTION OF STORM WATER DISCHARGE (if occurring):_____

_____

STATUS OF PREVIOUS CORRECTIVE ACTIONS: _____

_____

_____

Certification of CSWPPP Compliance

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 am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Print:_____ Signature:_____

NPDES MONITORING AND MAINTENANCE REPORT FORM
DOVER MUNICIPAL LANDFILL SUPERFUND SITE
SOURCE CONTROL REMEDIAL DESIGN
TOLEND ROAD, NEW HAMPSHIRE

AREA/LOCATION	CONSTRUCTION ACTIVITIES	STABILIZATION MEASURES	CONDITION	REQUIRED MAINTENANCE or CORRECTIVE ACTIONS

NPDES MONITORING AND MAINTENANCE REPORT FORM
DOVER MUNICIPAL LANDFILL SUPERFUND SITE
SOURCE CONTROL REMEDIAL DESIGN
TOLEND ROAD, NEW HAMPSHIRE

AREA/LOCATION	CONSTRUCTION ACTIVITIES	STABILIZATION MEASURES	CONDITION	REQUIRED MAINTENANCE or CORRECTIVE ACTIONS

APPENDIX C

CONSTRUCTION QUALITY ASSURANCE PROJECT PLAN

CONSTRUCTION QUALITY ASSURANCE PROJECT PLAN
DOVER MUNICIPAL LANDFILL SUPERFUND SITE
TOLEND ROAD
DOVER, NEW HAMPSHIRE

Prepared For:

Executive Committee of the Group of Work Settling Defendants
Dover Municipal Landfill Superfund Site Dover, New Hampshire 03820

Prepared By:

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Littleton, Massachusetts 01460
info@geoinc.com
www.geoinsightinc.com
Tel.: 978-679-1600
Fax: 978-679-1601

March 24, 2011

GeoInsight Project 2009-017

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Figure 1 Project Organization Chart

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- Lift Station
- Sedimentation Tank/Valve Pit #2
- Valve Pit #1 (Potable Water Meter)
- Valve Pit #3
- Valve Pits #4 and #5

Daily Activities Checklist
Results of Field In-Situ Density Tests
Field Inspection Report
Work Problem/Deficiency and Resolution Form
CQA/QC Audit Checklist – Record Keeping
CQA/QC Audit Checklist – Daily Field Notes

ACRONYMS

CQAPP	Construction Quality Assurance Project Plan
CQA/QC	Construction Quality Assurance and Quality Control
GWE	Ground Water Extraction
mg/Kg	milligrams per kilogram
NHDES	New Hampshire Department of Environmental Services
QAPP	Quality Assurance Project Plan
RPR	Resident Project Representative
SCRA	Source Control Remedial Action
SCRD	Source Control 100% Remedial Design
USEPA	United States Environmental Protection Agency

CONSTRUCTION QUALITY ASSURANCE PROJECT PLAN
DOVER MUNICIPAL LANDFILL SUPERFUND SITE
TOLEND ROAD
DOVER, NEW HAMPSHIRE

1.0 INTRODUCTION

This Construction Quality Assurance Project Plan (CQAPP) was prepared to establish quality assurance measures to be implemented during the Source Control Remedial Action (SCRA) Construction Project at the Dover Municipal Landfill Superfund Site (the Site) in Dover, New Hampshire. A background and overview of the SCRA, including remedial objectives, is presented in Section 1.0 of the December 29, 2010 Source Control 100% Remedial Design (SCRD). The specific activities, procedures, and criteria by which the SCRA is to be performed are described in a separate SCRA Work Plan that references this CQAPP as an appendix.

In general, the project includes, but is not limited to: implementation of short and long-term erosion control measures, site clearing and grubbing, removal of impacted sediment along the perimeter ditch, backfilling the perimeter ditch and preparation of subgrades, placement and compaction of soil and for subbase stability, placement of structural fill, installation of ground water extraction wells, installation of a sedimentation tank and lift stations, installation of conveyance piping, installation of foundations/footings for extraction well buildings and lift station control panels, installation of electrical service infrastructure, construction of support buildings, construction of access roads, and placement and grading of supplemental Landfill cover materials.

Inspection and verification activities are required to demonstrate that materials used and construction techniques employed provide final products and systems that meet the intent of project design drawings and technical specifications. This document describes the activities that will be performed as part of this documentation process. The responsibility, authority, and lines of communication for construction inspection and verification activities are discussed in Section 2.0. Anticipated meetings to communicate project performance and

important elements of the design, quality assurance program, and schedule are described in Section 3.0. Section 4.0 describes the major construction activities that are addressed by the CQAPP and provides a summary of the general types of construction quality assurance and quality control (CQA/QC) activities associated with each major construction task. Section 5.0 describes anticipated oversight, inspection, sampling, and testing activities associated with construction of the SCRA. Documentation of construction quality assurance and quality control activities are discussed in Section 6.0.

Project CQA/QC are specifically based upon information presented in SCRA project documents, including:

- the December 29, 2010 SCRD that includes technical specifications (Appendix A) and design drawings (Appendix E);
- the SCRA Work Plan that includes the Construction Storm Water Pollution Prevention Plan, the Site-Specific Health and Safety Plan, and this CQAPP; and
- the Contract Agreement including supplemental conditions and other appended or referenced plans.

These documents listed above are collectively referred to herein as the Contract Documents.

The CQAPP addresses material and construction standards, test procedures, and general guidance for CQA personnel in charge of monitoring the construction of the Site remedy. The Construction Contractor (as defined in Section 2.5) or Contractor-designated subcontractor shall conduct CQA/QC testing to monitor construction work. The Owner (as defined in Section 2.3) will engage an Engineer to monitor the CQA/QC testing, CQA/QC records, the performance and overall quality of the work, and certify that the completed project complies with the requirements of the contract specifications. The Engineer or an Engineer-appointed subcontractor may duplicate CQA/QC testing if deemed necessary to ensure data quality.

Table 1 summarizes the anticipated CQA/QC tasks associated with the SCRA Construction Project. Field Inspection Forms for critical components of the SCRA are attached in Appendix A.

2.0 RESPONSIBILITY AND AUTHORITY

2.1 GENERAL

The following sections describe the responsibilities and authorities of the principal organizations and individuals involved in the construction of the Dover Municipal Landfill Superfund Site SCRA Construction Project. Identifying responsibilities facilitates establishing proper lines of communication and an effective, timely decision-making process during the Construction Project. Figure 1 presents the SCRA Construction Project Organization Chart.

2.2 REGULATORY AGENCIES

United States Environmental Protection Agency (USEPA) Remedial Project Manager:

Darryl Luce
USEPA Region 1
5 Post Office Square, Suite 100
Boston, Massachusetts 02109-3912
Tel: (617) 918-1336
Fax: (617) 918-1199
Luce.Darryl@epamail.epa.gov

New Hampshire Department of Environmental Services (NHDES) Remedial Project Manager:

Thomas Andrews
Waste Management Division
Hazardous Waste Remediation Bureau
P.O. Box 95
29 Hazen Drive
Concord, New Hampshire 03302
Tel: (603) 271-2910
Fax: (603) 271-2456
Thomas.Andrews@des.nh.gov

The above Agencies have the authority to issue authorization to proceed with SCRA construction activities and have the authority to disapprove bidders and contractors selected by the Facility Owner/Operator. The regulatory Agencies also have the responsibility and authority to review and accept or reject design revisions or requests for variance that are submitted by the Engineer.

2.3 FACILITY OWNER/OPERATOR

The Executive Committee of Work Settling Defendants (referred to herein as the Owner) are those parties identified in Appendix D and Appendix E of the 2007 Amended Consent Decree who are responsible for the implementation of the SCRA. The designated contact for the Owner is:

Dean Peschel
Environmental Project Manager
City of Dover
288 Central Avenue
Dover, New Hampshire 03820-4169
Tel: (603) 516-6094
Fax: (603) 516-0033
d.peschel@dover.nh.gov

The Owner has the responsibility and authority to select and dismiss non-regulatory organizations involved in Site activities and for coordinating access to and general management of the Landfill properties. The Owner also has the responsibility for communicating with and interacting with the local community and residents proximal to the Landfill during the completion of SCRA construction activities.

2.4 ENGINEER

GeoInsight, as the Engineer, will provide a Project Engineer, CQA Officer, and Resident Project Representative (RPR) for construction of the SCRA. The responsibilities of these individuals are outlined in the paragraphs that follow. The Engineer is responsible for

assisting the Owner in preparing necessary design plans and specifications, documents to be included as part of the bid package, and bid summary information. The Engineer is also responsible for assisting the Owner with oversight of construction activities, maintaining administrative documentation regarding the construction, and providing approval certification of the completed construction. Design and specification changes will be approved by the Engineer prior to implementation.

2.4.1 Project Engineer

The Project Engineer's responsibilities are expected to include coordinating, reviewing, evaluating, and reporting on design activities, field inspection, work changes, and project summary information. The Project Engineer will act as the main point of contact between the Contractor (as defined in Section 2.5), the Owner, and the regulatory Agencies. The Project Engineer may act as the CQA Officer during certain evaluation and reporting activities and will identify and document deviations from the plans, specifications, and CQA Plan, and then coordinate the oversight and reporting of subsequent corrective actions. When necessary, the Project Engineer will be responsible for communicating construction and design changes to the regulatory Agencies.

The minimum qualifications of the Project Engineer shall include possessing registration as a professional engineer in the State of New Hampshire and have adequate formal training, and practical, technical, and managerial experience to review inspection reports, prepare daily and weekly progress reports, manage field and related administrative staff, evaluate design plans and specifications, and effectively communicate technical and administrative details to relevant parties.

2.4.2 CQA Officer

The Engineer's CQA Officer will oversee the Contractor's QA/QC testing and inspection activities, review associated CQA/QC documentation, evaluate conformance of the

construction with the design and technical specifications in accordance with the Contract Documents, and report such information to the Project Engineer. The CQA Officer is also responsible for conducting internal audits of CQA/QC activities and may recommend duplicating certain CQA/QC tests to confirm data quality. The Project Engineer or RPR (as described in Section 2.4.3) may act as the CQA Officer during certain evaluation and reporting activities.

The minimum qualifications of the Engineer's CQA Officer will include relative design experience and experience regarding QA/QC auditing methods and documentation.

2.4.3 Resident Project Representative

The Resident Project Representative (RPR) will be present at the Site as the representative of the Project Engineer and the Owner to oversee daily construction activities and facilitate performance of the work in accordance with the bid documents. In general, the RPR will communicate daily with the Contractor regarding observed and planned operations, confirm that work observed meets project requirements, where apparent, identify and evaluate potential change order conditions, contact the Project Engineer and CQA Officer to provide regular project status updates, and implement activities requested by the Project Engineer and CQA Officer that may assist in improving the quality of construction and documentation of activities. In addition, the following list summarizes the general methodology that the RPR will use to visually monitor and document the Contractor's daily performance and operations:

- observe and document that work practices of the Contractor follow the technical specifications;
- maintain a daily activity log to document actual activities performed and site conditions observed;
- observe and check the Contractor's measurements of material quantities, locations, and elevations to evaluate addition or deduction from the bid amount, if required;

- review the Contractor's submittals and forward them to the Project Engineer in a timely manner;
- maintain required documentation in a systematic fashion to allow thorough and efficient review by the CQA Officer, Owner, or other authorized representatives (e.g., USEPA or NHDES);
- photograph or otherwise document project tasks and progress, as warranted; and
- prepare and document information necessary to develop an as-built construction report upon project completion.

The minimum qualifications of the RPR shall include having adequate formal training, and practical, technical, and managerial experience to review inspection reports, prepare daily progress summaries, evaluate design plans and specifications, and effectively communicate technical and administrative details to relevant parties.

2.4.4 Field CQA Personnel

Field CQA personnel (primarily anticipated to be the RPR, Project Engineer, or other specific technical staff supplied by the Engineer) are responsible for making observations, evaluating testing performed by the Contractor, and/or performing independent field tests to promote construction in accordance with the approved project plans and specifications. Field CQA personnel will report to the CQA Officer on a daily basis or as often as necessary to relate progress and findings of work and material conformance to acceptable quality or design requirements. Field CQA personnel will oversee collection of samples for off-site testing with the cooperation of the Contractor.

2.5 CONSTRUCTION CONTRACTOR

The Construction Contractor (Contractor) is the person, corporation, or firm who is responsible for the construction of the remedy in accordance with its Contract Agreement with the Owner. The Contractor will be responsible to construct the remedy in strict accordance with design criteria, plans, and specifications and with its contract with the

Owner. The Contractor shall furnish all labor, materials, supplies, equipment, tools, and all other facilities necessary to the proper and complete construction of the project as required by the SCRD Contract Documents, and as specified herein. The Contractor will demonstrate compliance with project requirements by performing pre-qualification and construction testing and providing documentation required by the technical specifications and the manufacturer's recommendations. The Contractor will also submit to the Project Engineer a project plan for sequencing of work, construction quality control protocol, and the methods for implementing the project plan. The Contractor will be responsible for meeting all CQA/QC requirements required by the Contract Documents and/or manufacturer's specifications. The Contractor will determine when an area is ready for CQA/QC testing and/or evaluation and will notify the Project Engineer or RPR prior to conducting CQA/QC activities so that the Engineer's representative can be present to witness the activities, if warranted.

Contractor will have sole responsibility for the health, safety, and welfare of its employees, subcontractors and agents in connection with performance of the SCRA Construction Project. The Contractor will prepare and submit to the Engineer three copies of a Project Health & Safety Plan for Site work involving potential contact with hazardous material including; landfill gas, impacted sediment, impacted ground water, excavated solid waste, leachate, leachate seeps, and surface runoff during and after storms. The Plan will be reviewed by the Engineer; however, this review and conformance with this Plan by the Contractor in no way relieve the Contractor of its responsibility for safety during all work.

The Contractor must be approved by the Owner and must be qualified based upon demonstrated previous experience in construction of the SCRA components. The Contractor must be able to provide adequate, qualified personnel, equipment, and vendor/supplier relationships to meet the requirements of the project, including the construction schedule.

2.6 CONSTRUCTION MATERIALS TESTING SERVICES

Independent CQA testing laboratories will be hired by the Contractor (or its subcontractors) to provide on-site and off-site sampling and analyses to meet the requirements of the Contract Documents (as discussed in greater detail in subsequent sections). Testing is anticipated to mainly include field and laboratory analyses of soil, concrete, and geosynthetic materials (if utilized) to:

- evaluate conformance with project requirements and approve the materials for use;
- confirm consistency of material quality during implementation; and
- to evaluate proper placement, density, and moisture content.

Testing requirements are summarized in Table 1.

Minimum qualifications for testing laboratories will include accreditation by:

- American Association for Laboratory Accreditation;
- American Association of State Highway and Transportation Officials; and/or
- United States Army Corps of Engineers Validation.

Testing laboratories must also be able to provide documentation of the ability and experience to perform required tests by the required, standardized methods.

3.0 PROJECT MEETINGS

3.1 PRE-CONSTRUCTION MEETING

After selection and notification of the successful bidder, but prior to the commencement of the work, a pre-construction meeting will be held. Meeting attendees are anticipated to include representatives of the Owner, the Project Engineer, RPR, Contractor's Project Manager, Contractor's Site Superintendent, and representatives from the Contractor's significant subcontractors, as applicable. The pre-construction meeting will be arranged by the Engineer who will also invite representatives of State and Federal Agencies having jurisdiction, and relevant utility companies. Subjects associated with CQA/QC that will be discussed during this meeting are expected to include:

- familiarizing each organization with the CQAPP and its objectives relative to the design criteria, plans, and specifications;
- evaluating changes to the CQAPP that are needed to ensure that the project will be constructed to meet or exceed the specified design;
- reviewing the responsibilities of each organization and lines of authority and communication;
- discussing the established procedures and protocols for observations and tests (including sampling strategies) and corrective actions for unacceptable results;
- reviewing methods for documenting and reporting inspection and testing data, and distributing and storing such documentation;
- identifying unique design features of the project to discuss potential construction challenges or conflicts and resolve questions from the parties regarding the intent of the required work;
- reviewing the Contractor's plans for managing equipment and materials and planned work methods; and
- conducting a site reconnaissance, as necessary, to view areas of interest.

3.2 PROJECT PROGRESS MEETINGS

Project progress meetings are anticipated to be held weekly during periods of remedy construction (or more frequently if deemed necessary by the Owner, Project Engineer, or Contractor). Meeting attendees should include, at a minimum, the Project Engineer and/or CQA Officer, RPR, the Contractor's Project Manager, and the Contractor's Site Supervisor. CQA-related subjects that may be addressed during these meetings, as applicable, include:

- a brief discussion regarding the previous period's activities and progress;
- reviewing each organization's role relative to the CQAPP and design criteria, plans, and specifications;
- verifying that the equipment used for testing meets the test requirements and that the tests will be conducted according to standardized procedures defined by the CQAPP or as otherwise required;
- reviewing CQA/QC activities and measures completed by the various parties, the results or findings of the program to date, and changes that may be needed in procedures or materials to improve quality, if necessary;
- procedures for reporting to the CQA Officer the results of inspections, including work that is not of acceptable quality or that fails to meet the specified design or the intent of the design;
- coordinating collection of samples for off-site testing with the cooperation of the Contractor;
- discussing the upcoming period's planned activities and progress;
- discussing anticipated or potential construction, testing, or health and safety issues;
- addressing testing procedures, submittals, inspection, and testing activities required for the upcoming period's work; and
- discussing the construction and QCA testing schedule and the schedule of subsequent meetings.

3.3 PROBLEM OR WORK DEFICIENCY MEETINGS/WORK STOPPAGE

The Engineer may at any time request to convene a meeting to discuss a work problem or deficiency. Meeting attendees should, in general, include the same parties identified to attend progress meetings. The purpose of such a meeting will be to define and discuss identified issue(s), review potential solution(s), and implement a plan to resolve the issue(s). These meetings will be documented by the RPR or CQA Officer, with the outcome communicated to affected parties.

Work stoppage may result from a variety of reasons, but typically occurs due to inclement weather, health and safety concern, a contractual dispute, a performance specification disagreement, or a significant QA/QC problem. A QA/QC concern is defined as material or workmanship that does not meet the requirements of the Contract Documents and this CQAPP, and that could pose a short-term or long-term quality issue relative to the intended design, performance requirements, or proposed site reuse. A CQA/QC concern could also include an obvious significant defect in material or workmanship, even if there is apparent conformance with plans, specifications, and the CQAPP.

3.4 SUBSTANTIAL COMPLETION MEETING

When work on the remedy is nearly complete, a substantial completion meeting will be held on-site so that the Project Engineer may certify the status of work completed. The meeting is anticipated to consist of a site reconnaissance and review of documents, testing, and corrective actions (as applicable) as of the date of the substantial completion. The work performed by the Contractor will not be considered substantially complete until all pertinent CQA/QC issues that might be outstanding are fully resolved.

3.5 FINAL PROJECT MEETING

A final review will be made by the Project Engineer to evaluate whether the SCRA work was completed in accordance with the Contract Documents. A punch list of work outstanding, if any, will be compiled and transmitted to the Contractor's Project Manager. The work performed by the Contractor will not be considered 100% complete until all pertinent CQA/QC issues that might be outstanding are fully resolved and all warranties or guarantees are acceptably in force.

4.0 CQA/QC ACTIVITIES

4.1 GENERAL

This section provides an overview of the major construction activities that will be addressed by this CQAPP and lists the general types of CQA/QC activities associated with each of the major construction tasks. Table 1 summarizes the planned CQA/QC activities associated with the major construction activities and will serve as one of the primary guiding documents with regard to evaluating Contractor performance from a CQA/QC perspective.

4.2 SITE PREPARATION

Site preparation activities will consist of establishing vertical and horizontal surveying controls at the Site, installing or repairing security fence as needed, setting up a field office trailer, installing erosion and sedimentation controls, clearing and grubbing areas within the Work Zone along the proposed ground water extraction (GWE) system at the toe of the Landfill, upgrading existing roads on the Landfill to facilitate truck access (if and as needed), and constructing staging areas and security controls. CQA/QC activities include verifying and documenting that:

- erosion and sedimentation controls (including hay bales, silt fences, filter socks, check dams, mulching, etc.) have been installed according to Contract Documents, and the integrity of the erosion and sedimentation controls remains intact throughout the duration of the remedy construction;

- the Contractor has installed stabilized construction road entrance(s) at all points where traffic will be entering or exiting the Site, the entrance meets minimum requirements established in the Contract Documents, and stabilized construction road entrance(s) are monitored and maintained by the Contractor throughout the duration of the construction project;

- clearing and grubbing to remove vegetation in the Work Zone is limited to areas identified in the Contract Documents and is maintained throughout the duration of the construction project; and

- site security (i.e., fencing, access gate, etc.) is established and maintained.

4.3 PERIMETER DITCH EXCAVATION

Ditch closure activities will include excavation of arsenic-impacted sediment in the eastern, southern, and western portions of the perimeter ditch. In addition, temporary dewatering of the excavated areas may be required.

4.3.1 Dewatering

Dewatering may be necessary during excavation of the perimeter ditch sediments to facilitate the removal activities and the placement of backfill materials. CQA/QC measures are anticipated to include observation and documentation that:

- the Contractor is managing dewatering activities in accordance with the Dewatering Plan and other Contract Documents; and
- dewatering fluids are being sampled and handled in accordance with the Contract Documents.

4.3.2 Impacted Sediment Removal, Transport, and Disposal

CQA/QC measures are anticipated to include observation and documentation that:

- initial sediment excavation activities are conducted to a depth of approximately 1 foot or until the underlying gray silt later is encountered, whichever is encountered first;
- confirmatory grab samples are collected from the bottom and sidewalls of the excavated area at intervals of approximately 50 feet and analyzed for total arsenic;
- sediment samples and associated QA samples are collected in accordance with the Site-specific Quality Assurance Project Plan (QAPP);
- areas where arsenic is detected in the confirmatory samples at concentrations above 50 milligrams per kilogram (mg/Kg), additional sediment will be removed in

successive 6-inch lifts, until the Amended Record of Decision level of 50 mg/Kg is achieved;

- excavated sediment is transported to the Landfill in watertight containers, deposited in a temporary sediment staging area, and free liquids, if present, allowed to drain prior to waste characterization and disposal; and

- sediment meets disposal criteria of receiving facility and is transported by a licensed hauler.

4.4 BACKFILLING AND ACCESS ROAD CONSTRUCTION

The access road will be constructed to support heavy equipment and trucks including drilling rigs, vacuum trucks, and service vehicles. The access road will be approximately 15 feet wide and will be constructed at a preliminary elevation of 150 feet above mean sea level. The purpose of the elevated road is to allow access throughout the calendar year.

4.4.1 Subgrade Preparation

The existing topography (a portion of which is within the footprint of the perimeter ditch excavation) will require backfilling and grading to achieve the subgrade elevations anticipated for access road construction. Preparation for this work may include cutting and filling the existing contours along the toe of the Landfill to the Contract-required grades and placing and compacting a cover layer over the graded area. CQA/QC measures are anticipated to include observation and documentation (via elevation survey as applicable) that:

- prepared grades conform to the Contract Drawings and that grading is performed in accordance with the other pertinent specifications;

- backfill materials are tested in accordance with the requirements listed in Table 1;

- the subgrade is compacted according to plans and specifications;

- backfilling and compacting the excavated ditch area with common sand borrow (where access road will not be not located) or sand and gravel (beneath access road),

as required to complete the work shown on the Contract Drawings; and

- unsuitable debris from subgrade preparations is segregated from the reusable fill and stockpiled for appropriate on-site or off-site disposal as per the Engineer.

4.4.2 Geotextile Reinforcing Fabric and Filter Fabric

Reinforcement of the roadway soils (whether at the bottom of new fill or within the new fill material) may be required in locations where the natural subgrade is observed to be weak or unstable with regard to proper support of the road section. The Engineer shall evaluate natural subgrades with the Contractor prior to filling operations to assess the need for such reinforcement and where in the cross-section materials/fabric will be installed (i.e., on top of the existing natural subgrade after clearing and grubbing, or just below the 12-inch layer of road gravel subbase of the final road section).

In addition, filter fabric will be used when preparing the bedding for several Site structures. Separation and filtration between stone and subgrade is required at numerous locations in the Contract Drawings, including below manholes, vaults, the sedimentation tank, construction entrance, and below culvert outfall aprons.

CQA/QC measures are anticipated to include observation and documentation that:

- geotextile fabric(s) meets material specifications and is installed in accordance with the Contract Documents;
- geotextile fabric(s) is stored in such a way to be protected from sunlight, weather, dirt, and debris during shipment and prior to use; and
- during installation, the geotextile may be tested by the Engineer at a random frequency for criteria including mass per unit area, thickness, and grab tensile strength, as summarized in Table 1.

4.4.3 Common Fill Layer

Common borrow fill material will be used to elevate existing grades to the subgrade topography for the proposed access road. CQA/QA activities for the common fill layer installation will include control of lift thicknesses to 12 inches, visual examination and grain-size testing, compaction testing, survey of the final grades, and review of Contractor testing in accordance with requirements outlined in Table 1.

4.4.4 Road Gravel and Recycled Asphalt Pavement

The 12-inch road gravel layer will be placed to facilitate a stable access road. The subgrade will need to be prepared and then placement of a geotextile reinforcing material (if necessary) prior to the road gravel, to limit settlement and ruts formed by heavy vehicle traffic. The 6-inch recycled asphalt layer will be placed over the gravel layer will allow future re-grading that may be warranted because of minor settlement or wear, will allow for infiltration of precipitation, and will assist in controlling dust. CQA and QC activities include verifying and documenting that:

- road gravel and recycled asphalt pavement meets material specifications and is installed in accordance with the Contract Documents;
- final grades and slopes are checked;
- proper compacted lift thickness was achieved (based upon visual evaluation); and
- review testing results in accordance with Table 1.

4.5 GROUND WATER EXTRACTION SYSTEM CONSTRUCTION

The Contractor will construct the components of the GWE system in accordance with the Contract Documents. The Engineer will assess the Contactor's adherence to the Contract Documents by evaluating CQA/QC at multiple stages of the construction process including initial equipment installation, field testing, and system startup. Additional information

regarding GWE system equipment installation and testing is presented in Section 5.3. Specific requirements for each component of the system are summarized in the following sections and on Table 1.

4.5.1 Ground Water Extraction Wells and Pumps

GWE wells will be installed along the Landfill perimeter in 15 extraction well clusters, each consisting of three (3) wells, drilled to depths of approximately 25 feet, 45 feet, and 65 feet, respectively. Actual depths will be dependent upon field conditions and will be approved by the Engineer during drilling activities. Each extraction well will be fitted with a surface-mounted positive displacement pump. CQA/QC activities will include the following:

- observation of borehole construction;
- collection of soil samples to evaluate screen placement (i.e., observing changes in strata, etc.);
- inspection of materials and observation of the procedures used to construct and install the well including the well screen, riser pipe, filter pack, bentonite, and placement of centralizers;
- observation and documentation of the development of each extraction well including the procedure used and the amount of water purged from the well and water level data at the completion of well development;
- inspection of the procedures used to install pump and associated piping, level sensors, totalizers, etc.; and
- observation of pump field testing and system start-up procedures.

Observations noted in the field regarding the installation of the GWE wells (including CQA/QC data) will be recorded on the Soil Boring/Monitoring Well Logs included in the project QAPP.

4.5.2 On-Site Conveyance System

The on-Site conveyance system consists of piping from each well to two main gravity conveyance lines, two lift stations (one will transfer extracted ground water from the west side of the Landfill and one will transfer extracted water from the east side of the Landfill), a force main that conveys water from the lift stations to a sedimentation tank, and all associated valve pits, clean outs, and miscellaneous fittings. Trenching associated with the installation of the on-Site conveyance system will be completed after construction of the access road. CQA and QC activities will include the following:

Piping (Gravity and Force Mains)

- observations of procedures used to excavate the pipeline trench and to prepare the bedding;
- dewatering of the excavation, if warranted, is conducted in accordance with the Dewatering Plan;
- inspection of procedures used to lay the piping in the trench, including the Contractor's surveying of pipe slopes;
- inspection of pipe fittings and joint fusing procedures;
- visual inspection of pipeline prior to backfilling;
- inspection of pipe pressure and leakage testing including Contractor's documentation;
- inspection of materials used to backfill trench including review of geotechnical testing data and observation of backfilling operation;
- installation of pipe insulation, if warranted; and
- observation of installation procedures, field testing, and system start up procedures.

- observations of procedures used to excavate and to prepare the bedding/subgrade;
- inspection of procedures used to install precast and cast-in-place structures, including the Contractor's surveying of base elevations;
- dewatering of the excavation, if warranted, is conducted in accordance with the Dewatering Plan;
- inspection of concrete design mix submittals;
- review data for slump, temperature, and compressive strength tests;
- inspection of bedding material including review of geotechnical testing data and observation of compaction procedures;
- coatings and liners are installed as specified in Contract Documents;
- inspection of pressure and leakage testing of pump port connections;
- review wall thickness measurements (one test per structure);
- visual inspection of tank tightness; and
- observation and documentation of installation procedures, field testing, and system start up procedures.

4.5.3 Support Buildings

Support buildings will be located on the western and eastern sides of the Landfill to accommodate components of the GWE system including piping manifolds, equipment, electronic controls, a field office, and a restroom. Support buildings will consist of pre-fabricated buildings that can be installed on slab-on-grade foundations. CQA/QC activities will include the following:

- pre-cast buildings and foundations are installed in accordance with the Contract Documents;

- variations from the manufacturer's recommendations and/or specifications presented in the Contract Documents are documented by the Contractor and approved by the Engineer; and

- documentation of the installation procedures.

4.5.4 Utilities

This section applies to the construction of the potable water line and all electrical work to be completed at the Site. An electrical supply (anticipated to be a three-phase electrical power line) and a potable water line will be extended from Tolend Road along the perimeter access road at the toe of the Landfill. CQA/QC activities will include the following:

- inspection and observation of potable water line piping and appurtenances;

- meters, controls, and all other electrical components are installed in accordance with the Contract Documents;

- variations from the manufacturer's recommendations and/or specifications presented in the Contract Documents are documented by the Contractor; and

- observation and documentation of installation procedures, field testing, and system start up procedures.

4.6 PERMEABLE COVER

4.6.1 Gravel/Sand Layer

The 6-inch gravel and sand layer will be placed to cover exposed debris on the Landfill surface. This material will prevent direct contact with exposed waste and facilitate and support vegetative growth. CQA/QC activities include verifying and documenting that:

- visual examination - exposed debris areas is be covered with a minimum of 6 inches of bank run gravel; this material will be applied so as to extend at least two feet beyond the outer boundary of each exposed area on all sides; and

- gravel and sand materials and application meet plans and specifications.

4.6.2 Vegetative Layer/Seed Mixture

The 6-inch vegetative layer will be placed to facilitate establishment of vegetative growth to stabilize areas of exposed soil (i.e., areas of permeable cover augmentation, side slopes of the new access road, and areas otherwise disturbed by the SCRA Construction Project). These areas will subsequently be vegetated with a seed mixture compatible with the area and climate. CQA/QC activities include verifying and documenting that:

- final grades and slopes are checked;
- seeded areas are adequately protected from erosion;
- seeding and mulching materials and applications meet plans and specifications based upon successful vegetative growth; and
- testing results are reviewed in accordance with Table 1.

5.0 OVERSIGHT AND SAMPLING

5.1 OVERSIGHT

The Contractor and Engineer will obtain information, coordinate testing, take measurements, and record findings to fulfill the requirements of this CQAPP. In general, the Engineer will conduct independent review testing and measurements, as needed, to evaluate the Contractor's testing and measurement results and to confirm that the Contractor is following the requirements of this CQAPP.

5.2 MATERIAL SAMPLING

5.2.1 Overview

Representative sampling and testing of the materials and construction techniques used during the SCRA Construction Project will be performed to provide quantification of the quality of the work and an indication of expected future performance. The Contract Documents provide the required sampling and testing approach to verify and document that the various construction elements adhere to plans and specifications and describe material submittals, visual, and measurement monitoring, and construction materials testing standards.
A summary of these requirements is presented in Table 1.

5.2.2 Material Submittals

Material submittals allow for assessment of material suitability by the Engineer prior to use in the SCRA Construction Project. Review of submittals is intended to assure that materials comply with plans and specifications. Material submittals are identified in the technical specifications documents and must be accepted by the Engineer prior to use on the project.

5.2.3 Visual and Measurement Monitoring

Visual monitoring and measurement are the most significant elements in planned construction quality control strategies and include material placement testing and verification. Consistent and regular observations and physical measurements by qualified and competent personnel (i.e., the Contractor CQA personnel or their subcontractors) are primary activities of the CQAPP. For construction of the SCRA, Engineer oversight will include, at a minimum, one full-time, on-site RPR for the project who will be responsible for visual monitoring and measurement. During certain phases of the construction, the Contractor's CQA personnel and the RPR are expected to be on-site full time. The type, frequency, and methods of construction monitoring are presented in Table 1.

5.2.4 Standard Construction Materials Testing

Standard construction materials testing employed by approved laboratories performing CQA/QC testing will be based upon identified industry standards such as, but not limited to, those set forth by the American Society for Testing and Materials.

5.3 EQUIPMENT TESTING AND INSPECTION SERVICES

Equipment testing and inspection services are intended to ensure proper installation and operation of each system component. These services will be conducted by the Contractor and will be monitored and approved by the Engineer. The Contractor will be responsible for documenting all inspection services including initial installation checks, field testing, and system start up and "shake down" procedures and providing this documentation to the Engineer. The Contractor will provide the Engineer adequate notice of such inspections so that a representative of the Engineer can arrange to be present, as necessary. These services must be completed and approved before final inspection and contract closeout requirements can be met. In addition to the documentation provided by the Contractor, Equipment Testing

and Inspection Forms (Appendix A) will be maintained by the Engineer to ensure adequate quality control.

5.3.1 Equipment Installation Check

An experienced, competent, and authorized service representative of the manufacturer of each item of equipment, or other person acceptable to Engineer, shall visit the Site and inspect, check, and adjust, if necessary, and approve the equipment installation. In each case, the equipment manufacturer's representative or other person authorized by Engineer to perform the installation check will be present when the equipment is placed in operation and will revisit the Site as often as necessary until all trouble is corrected and the equipment installation and operation are satisfactory in the opinion of the Engineer. The work described under the Contract Documents will not be accepted as complete until satisfactory equipment installation has been performed in accordance with the requirements of the bid specification.

5.3.2 Field Testing

Subsequent to equipment installation and checkout, the Contractor will field test the equipment in the presence of Engineer and in accordance with applicable technical specifications. During the field tests, the equipment shall be subjected to various full load and partial load conditions and emergency operating and shutdown conditions. The ability of the equipment to operate in the prescribed manner without overheating, jamming, excessive noise or vibration, or evidence of excessive wear in accordance with the technical specifications will be demonstrated to the Engineer. The Contractor will maintain records of each field test showing operating temperatures and pressures, motor current and voltage, speed, flow rate and other pertinent data. Copies of all recorded test data and information will be provided to the Engineer.

Should the results of the tests indicate that the equipment has failed to perform in accordance with the requirements of the Contract Documents the Contractor will make modifications or

adjustments as required for satisfactory operation, including replacement of any or all components, if necessary. Following the modifications or adjustments, the Contractor will repeat the field tests. This procedure will be repeated until the results of the field tests indicate that the equipment has satisfied the requirements of the Contract Documents, per the Engineer's discretion.

5.3.3 System Startup

During the initial operation period, the Contractor will perform a functional test on each piece of equipment. The test will consist of operation of the equipment on a normal duty cycle for a sufficient period of time to determine satisfactory operation. To the maximum extent practical, the test will exercise the full capabilities of all equipment, including remote operation, instrumented control schemes, alternate modes of operation, and emergency operation. After the functional test is completed, the Contractor will operate the system continuously for two weeks to confirm system operation.

Following the two-week period, the Contractor will certify to the Owner, in writing, that the equipment is fully operational and capable of meeting operating requirements. Certification of start-up and full testing shall be performed using the services of an authorized representative trained in this type service. Written certification will be provided to the Engineer and will indicate that tests were made in accordance with the manufacturer's recommendations, that the test and start-up operation has been satisfactory, and that the equipment is fully operational under design requirements.

5.4 TREATMENT OF OUTLIERS AND CORRECTIVE ACTIONS

Construction materials, especially soils, can be variable. However, occasional outliers may not be significant to the overall performance and objectives of the construction, and some construction techniques were developed in recognition that outliers may exist. The Engineer will apply the No Defects Criterion to this project, and outliers will be treated with corrective

actions in the following manner. If a test does fail and it is believed that the failure represents inadequate materials or construction procedures, then the extent of the failed area or significance of the failure will be identified. The failed area will then be addressed by repair, reinstallation, or other activities intended to bring the failure into conformance with project requirements. For materials that are not subject to 100 percent inspection, this approach may require further testing to identify the failed area. In the case of soil materials, the area or material in question can be reworked and retested by the Contractor and accepted by the Engineer if retesting results show specification compliance.

In the case of other material defects or unacceptable performance identified by the Engineer, CQA personnel, or the Contractor, the Contractor will be responsible for demonstrating, through whatever testing might be required, which portions of the work should be allowed to remain, to the satisfaction of the Engineer. The locations of repairs will be referenced to the site baseline and grid system. Observations, measurements, samples, and tests will be documented according to Section 6.0 of this CQA Plan.

6.0 DOCUMENTATION

6.1 RECORD KEEPING

Documentation of CQA/QC activities provides one of the most effective means to measure the quality of a final product. The Engineer will be responsible for documenting, through accumulated submittals, testing results, required descriptive remarks, data sheets, and checklists provided by the Contractor or obtained independently, that the acceptable CQA/QC activities were accomplished. Documentation and data collected by the Contractor and Engineer during the construction activities will be available at the Site upon request. Daily record keeping will be a compilation of a number of elements described in the subsections that follow.

6.1.1 Field Notes/Daily Activities Checklist

Observations noted in the field pertaining to plans or specifications will be recorded in a bound field book that is dedicated to the SCRA Construction Project. CQA/QC information cited for each daily entry are expected to include:

- date;
- weather observations;
- Contractor personnel and subcontractors on-site;
- submittals and materials received and tests completed and results referenced or attached;
- special or unusual events, including failed work and/or corrective actions needed;
- field observations, including time of observation, daily project progress, the nature of work being performed, and associated CQA/QC activities being conducted by the Contractor;
- records of photos and videos taken (see Section 6.2);

- site sketches and diagrams;
- reference to other pertinent notes, such as meeting notes;
- visitors to the site; and
- signature of RPR at the end of each day's entries.

Notes will be legible and concise, and written in ink on consecutive numbered pages.

Daily Activities Checklists will be included with the daily summary of activities that may also include materials and equipment submittals, Equipment and Testing and Inspection Forms, materials tracking information, the Contractor's daily report, and subcontractor-submitted information, as applicable. The Daily Checklists are intended as a record that key aspects of construction oversight have been completed daily. A copy of the checklists and forms are presented in Appendix A.

6.1.2 In-Situ Density Test Results

In-situ density testing will be conducted by the Contractor or Contractor-designated subcontractor. The Engineer will observe these testing procedures and make real-time decisions based upon the testing results. Because decisions based upon this data will be made prior to receiving data transmittals from the testing company, the Engineer will maintain separate records of observations and data acquired during observed testing procedures. Data from these tests will be logged on the Results of In-situ Density Tests form attached in Appendix A. At a minimum, these data sheets will include the following information:

- test number, date, and location;
- test elevation;
- field dry density;

- field moisture content;
- maximum dry density;
- optimum moisture; and
- observed percent compaction.

6.1.3 Submittals

Submittals received from the Contractor will be logged by the Engineer with regard to the title of the submittal, the date received, form of transmittal, and its status. The Engineer will then evaluate each submittal for compliance to the requirements in the Contract Documents and will either approve, approve with corrections, request a revision, or reject the submittal. Records of the submittal receipt, its rejection (if applicable), and its acceptance will be stored electronically to the project file.

6.1.4 Equipment Testing, Inspection, and Start Up Documentation

Equipment testing and inspection services will be documented to ensure proper installation and operation of each system component. These services will be conducted by the Contractor and will be monitored and approved by the Engineer. The Contractor will be responsible for documenting all inspection services including initial installation checks, field testing, and system start up and "shake down" and providing this documentation to the Engineer. In addition to the documentation provided by the Contractor, Equipment and Testing and Inspection Forms (Appendix A) will be maintained by the Engineer to ensure adequate quality control. Component-specific Equipment Testing and Inspection Forms will be maintained for the following system components or groups of components:

- extraction well buildings including components in and attached to the building (i.e., pumps, totalizers, valves, pressure transducers, methane sensors, lighting, heaters, etc.);
- valve pits and associated piping, instrumentation, and manholes;

- lift stations and associated pumps, piping, instrumentation, and manholes; and
- the sedimentation tank and associated piping, instrumentation, and manholes.

Observations noted in the field pertaining to system components or materials not covered by the component-specific Equipment and Testing and Inspection Forms listed above will be recorded on generic Field Inspection Report Forms. Field Inspection Report Forms are attached in Appendix A.

6.2 PHOTOGRAPHS AND VIDEOS

Photographs and/or videos may be used to visually document construction activities and progress. Photographs will be cross-referenced with field observations recorded in notes and on field data record sheets, and with construction problem and solution records. Information will be recorded for each photograph or video taken regarding the following information:

- project name and number;
- initials of project member responsible for taking the photograph or video;
- date the picture or video was taken; and
- description of the subject.

Photographs and videos will be stored digitally in the project's electronic file and will be part of the final project record.

6.3 NON-CONFORMANCE AND CHANGE REQUEST REPORTING

Work that does not, in the RPR's opinion, conform to the SCRA construction plans and specifications will be documented and reported to the CQA Officer and Project Engineer. Non-conformance will be reported to the Contractor as soon as practicable by the Engineer either verbally or in writing. The non-conformance will be resolved and corrective action

taken by the Contractor as soon as practicable. If the corrective action results in the work conforming to the plans and specifications, the action shall be documented and accepted. If a change is required, a formal Change Order may be instituted using approved procedures described in the Contract Documents. Non-conformances reported to the Contractor in writing will be conveyed via a Work Problem/Deficiency Form (Appendix A).

6.4 AUDIT REPORTS

Audits of the Contractor's CQA/QC records provided to the Engineer, the RPR's oversight records, and other documentation relevant to construction quality control tracking will be conducted at periodic intervals. These audits will verify that established CQA/QC procedures are being followed by the Contractor, and that the RPR is adequately monitoring these CQA/QC activities. Follow-up audits may be conducted to ensure correction of deficiencies and to verify continuing compliance with required CQA/QC procedures. These audits will be performed by either the Project Engineer and/or the CQA Officer. Audit checklists are included in Appendix A.

6.5 CONSTRUCTION PROGRESS REPORTS

A written status report of construction activities in progress will be submitted by the Engineer to the Owner periodically throughout the duration of the construction activities. The status report will include the following information:

- a description of the work completed during the period;
- an amended construction schedule, if the anticipated schedule deviates from the construction schedule of record;
- design changes implemented, if appropriate; and
- damage and repair information for damage that has the potential to adversely affect the integrity of systems operations, life expectancy, or performance.

6.6 CONSTRUCTION QUALITY MANAGEMENT REPORT

At the completion of the project, an As-Built Construction Report will be prepared by the Contractor and submitted to the Engineer. The As-Built Construction Report will include field documentation and measurements, laboratory and field test results, photographs, audit results, and other relevant documents to demonstrate that the construction was performed in accordance with the Contract Documents. The report will document that acceptable CQA/QC information was obtained for the work and will provide a set of record as-built drawings, as well as a final survey. The As-Built Construction Report will be stamped by a Professional Engineer registered in the State of New Hampshire to certify that the construction activities described in the report were completed in accordance with the final plans and specifications.

TABLES

TABLE 1
SUMMARY OF CQA/QC CONSTRUCTION TESTING AND MONITORING ACTIVITIES
DOVER MUNICIPAL LANDFILL SUPERFUND SITE
DOVER, NEW HAMPSHIRE

System Element	Measured Property	Means of Quantification	Contractor Testing Frequency	Engineer Audit Frequency	Project Criteria
DIVISION 03 - CONCRETE					
Cast-In-Place Concrete					
Pre-Qualification	Nominal Aggregate Size	ASTM C 33	1 per contractor furnished mix-design	Review data	Material meets maximum nominal aggregate size number 67
	Slump Test	ACI 211.1, ACI 301, ACI 318/318M	1 per contractor furnished mix-design	Review data	Range of slump is 2 (±1) inches
	Water-Cement Air Ratio	ACI 211.1, ACI 301, ACI 318/318M	1 per contractor furnished mix-design	Review data	Concrete meets maximum water-cement air ratio of 0.45 (by weight)
Construction	Concrete Placement	Visual inspection by qualified agency	Continuous on-site monitoring for placement of greater than 1 cy concrete	Review data	Construction is in conformance with the Contract Documents
	Air Entrainment	ACI 211.1, ACI 301, ACI 318/318M	1 per contractor furnished mix-design	Review data	Concrete meets air entrainment requirements of 6 (±2) percent
	Concrete Temperature	ACI 305R Figure 2.1.5	1 per batch (min.) or every 20 cy (max.) of concrete	Review data	Required temp. is maintained to prevent the evaporation rate from exceeding 0.2 lb water per sq. ft. exposed concrete per hour
	Slump Test	ASTM C 143	At start of placement, when test cylinders are made, and for each batch (min.) or every 20 cy (max.) of concrete	Review data	Range of slump is 2 (±1) inches
	Compressive Strength Test	ASTM C 39	(5) test cylinders for each set of tests (ASTM C31/C31M) for concrete placed each day shall be taken not less than: 1 per day, 1 per 100 cy concrete, or 1 per 5,000 sq ft surface area for slabs or walls	Review data	Samples meet 28-day compressive strength (f'c) requirements set forth in the Contract Document
Precast Concrete Structures					
Pre-Qualification	Concrete Strength	ASTM C478	1 per tank section	Review data	Minimum concrete strength of 5,000 psi at 28 days
	Wall Thickness	Measurement	1 per barrel or tank section	Review data	Wall thicknesses for barrel and tank sections meet minimum requirements set forth in the
Construction	Level Subgrade	Laser Level	1 per tank or lift station installation	Review data	Less than 0.125 inch vertical differential per 15 foot horizontal
Post-Construction	Tightness Test	Visual Inspection	1 per buried structure, after backfill	1 visual inspection per contractor test	All section joints and pipe penetrations are free of leaks

TABLE 1
SUMMARY OF CQA/QC CONSTRUCTION TESTING AND MONITORING ACTIVITIES
DOVER MUNICIPAL LANDFILL SUPERFUND SITE
DOVER, NEW HAMPSHIRE

System Element	Measured Property	Means of Quantification	Contractor Testing Frequency	Engineer Audit Frequency	Project Criteria
DIVISION 13 - SPECIAL STRUCTURES					
Fabricated Engineered Structures					
Post-Construction	Installation	Visual Inspection	Upon completion of installation	Visual Inspection	Building components have been erected, connected, and installed according to the manufacturers recommendations with sufficient tolerances to render the buildings weather-tight
DIVISION 25 - INTEGRATED AUTOMATION					
Instrumentation and Controls					
Post-Construction	LEL Methane Meter Repeatability of Readings and Response Time	Visual Recording	1 per meter, upon completion of installation	Review data	Repeatability of readings is within 1% full scale (2PPM) and response time is less than 12 seconds
	Complete System Test (all circuits, instrumentation, alarm signals, control systems and devices)	System Operation	Upon completion of installation	Review data	Three copies of the test results in a 3-ring binder are provided to the Engineer
DIVISION 26 - ELECTRICAL					
Grounding					
Post-Construction	Resistance	System Grounding	Upon completion of installation	Review data	Hardcopy test results are provided to the Engineer and show that the total resistance for grounding the entire system is less than 5 ohms
DIVISION 31 - EARTHWORK					
Erosion Controls					
Installation	Correct Materials/Proper Installation and Location	Visual	Prior to activity	Daily check	Control measures are as shown on the contract drawings
Maintenance	Condition/Function	Visual	After storm events or at least weekly	Minimum of 1 per week	The integrity and function of the control measures are sufficient
Fill and Backfill (Placement of Sand and Gravel as described in Division 32)					
Pre-Qualification	Gradation	Sieve Analysis ASTM D422	1 per material source	Contractor provides 1 (5lb) sample per source for visual inspection and/or duplicate testing TBD by Engineer	Material meets gradation specifications
	Classification	ASTM D2487	1 per material source	Review data	Material meets classification specifications
	Laboratory Compaction Curve	ASTM D1557 Modified D	1 per material source	Review data	Material meets compaction curve specifications
	Analytical Contaminant Testing (VOC's, PAH's, RCRA Metals, PCB's and Pesticides/Herbicides)	Compatible with NHDES Env-Or-600	1 per 2,000 tons	Review data	Backfill does not contain contaminants above applicable standards
	Dewatering Discharge	Analytical Laboratory Testing According to Contractor Dewatering Plan	Prior to discharge from 20,000 gallon container	Periodic testing of 20,000 gallon batches of water during dewatering activities	Discharge meets the concentration requirements of less than 10 ppb dissolved arsenic

TABLE 1
SUMMARY OF CQA/QC CONSTRUCTION TESTING AND MONITORING ACTIVITIES
DOVER MUNICIPAL LANDFILL SUPERFUND SITE
DOVER, NEW HAMPSHIRE

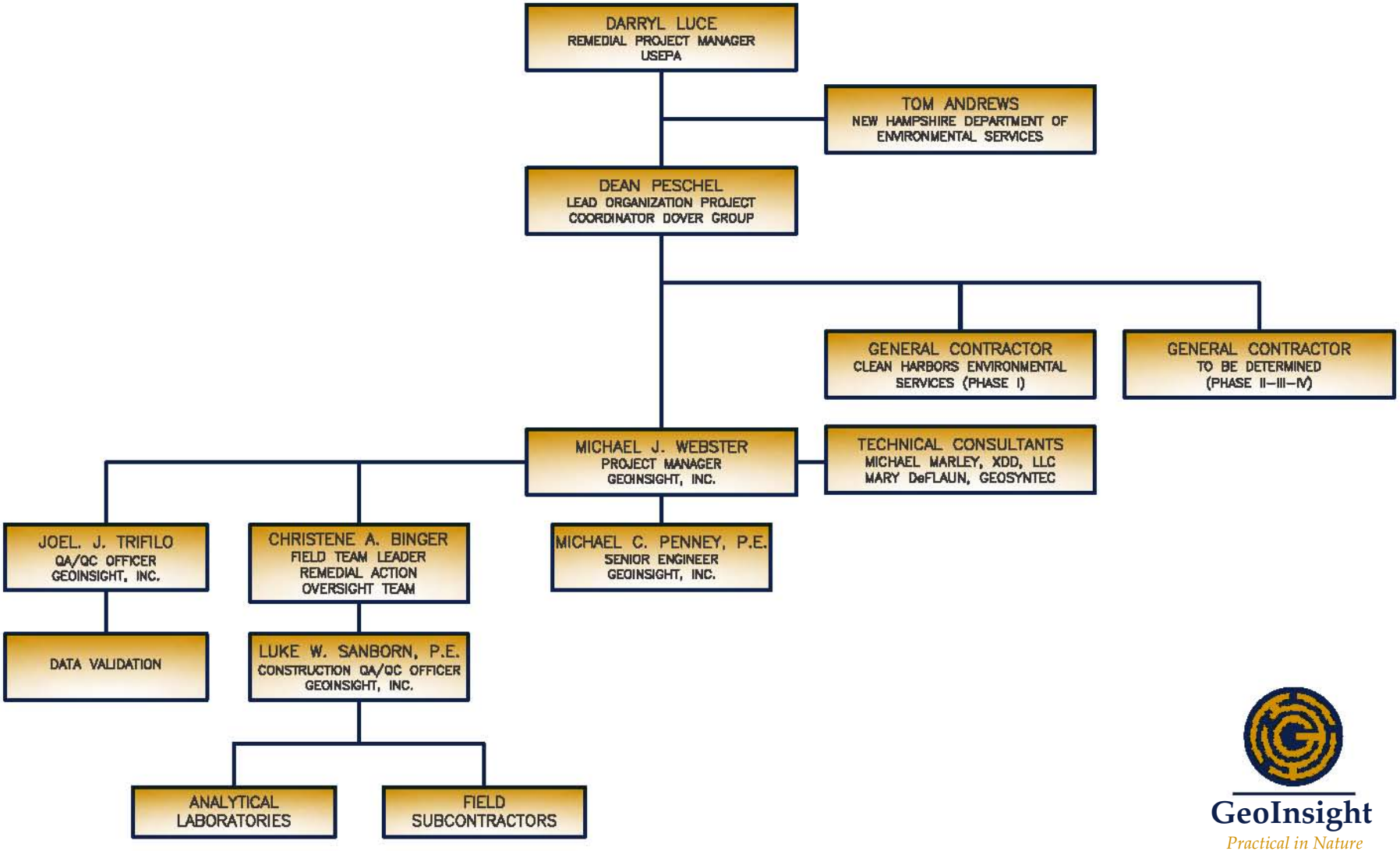
System Element	Measured Property	Means of Quantification	Contractor Testing Frequency	Engineer Audit Frequency	Project Criteria
Construction	Impacted Sediment Stockpile	Visual Inspection	1 per stockpile	Regular visual monitoring	Exposed material stockpiles are covered with at least 10 mils of ballasted polyethylene sheeting
	In-Place Density (Fill)	ASTM D1556, or D2922, D3017	1 per lift, no less than 1 per 40 cy in any one lift	Review data	95% of max. dry unit weight for fill under structures, utilities, and access roads or 90% for other fill areas
	In-Place Density (Trenching and Roadway)	ASTM D1556, or D2922, D3017	1 per 75 feet of trench or roadway	Review data	95% of max. dry unit weight for fill under structures, utilities, and access roads or 90% for other fill areas
	Moisture Content	ASTM D2216 or D3017	1 per lift compaction	Review data	Optimum +/- 2%
	Lift Thickness	Vertical Survey Information	1 per lift	1 per lift	Lift thickness of 12" or less
	Finished Grade	Measurement	Continuous	Regular visual monitoring	Required Elevations +/- 2"
	Common Sand Volume	Survey or 12" Diameter Test Holes	Minimum every 50 linear feet	Regular visual monitoring	As required to fill to within approximately 2.5 feet of final grade
	Road Gravel Depth	Survey or 12" Diameter Test Holes	Minimum every 50 linear feet	Regular visual monitoring	6" layer above common sand for phase 1 access road; Additional 12" minimum layer for final road section sub base
	Recycled Asphalt Pavement (RAP)	Survey or 12" Diameter Test Holes	Minimum every 50 linear feet	Regular visual monitoring	A 6" layer of RAP is placed above the road gravel base
Permeable Soil Cover					
Construction	Exposed Debris Cover Thickness	Measurement	1 per area or 400 square feet, whichever is smaller	Regular visual monitoring	Covered with 6" of bank run gravel, then 6" of permeable soil cover
	Exposed Sand & Gravel Cover Thickness	Measurement	1 per area or 400 square feet, whichever is smaller	Regular visual monitoring	Covered with 3-6" permeable soil cover
	Thin Vegetation Cover Thickness	Measurement	1 per area or 400 square feet, whichever is smaller	Regular visual monitoring	Covered with 3" of permeable soil cover
	Stabilization	Visual Inspection	Continuous	Regular visual monitoring	Tracking only
Geotextile Reinforcing Fabric					
Pre-Qualification	AOS	ASTM D4751	1 per roll	Review data	Minimum of 0.6 mm
	Puncture Strength	ASTM D6241	1 per roll	Review data	Minimum of 180 lbs.
	Permittivity	ASTM D4491	1 per roll	Review data	Minimum of 0.52 sec^{-1}
	Grab Tensile Strength (2%Strain)	ASTM D4632	1 per roll	Review data	Minimum of 400 lbs.
	Trapezoidal Tear Strength	ASTM D4533	1 per roll	Review data	Minimum of 125 lbs.
	Mass per Unit Area	ASTM D5261	1 per roll	Review Data	Minimum of 5 ounces
Construction	Soil Cover	Visual	Continuous	Regular visual monitoring	Minimum depth of 8" of soil is maintained over the geotextile at all times during back dumping and spreading of soil
	Seam Overlap	Visual	Continuous	Regular visual monitoring	Seaming meets overlapping requirements in accordance with manufacturers recommendation
Geotextile Filter Fabric					
Pre-Qualification	AOS	ASTM D4751	1 per roll	Review data	Minimum of 0.2 mm
	Puncture Strength	ASTM D6241	1 per roll	Review data	Minimum of 95 lbs.
	Mass per Unit Area	ASTM D5261	1 per roll	Review data	Minimum of 5 ounces
	Grab Tensile Strength (2%Strain)	ASTM D4632	1 per roll	Review data	Minimum of 160 lbs.
	Trapezoidal Tear Strength	ASTM D4533	1 per roll	Review data	Minimum of 60 lbs.
Construction	Installation	Visual	1 per location	1 per location	Visual Confirmation of Proper Installation

TABLE 1
SUMMARY OF CQA/QC CONSTRUCTION TESTING AND MONITORING ACTIVITIES
DOVER MUNICIPAL LANDFILL SUPERFUND SITE
DOVER, NEW HAMPSHIRE

System Element	Measured Property	Means of Quantification	Contractor Testing Frequency	Engineer Audit Frequency	Project Criteria
Processed Stone					
Pre-Qualification	Gradation (Rip Rap Stone)	ASTM D422	1 per material source	Review data	$D_{85}/D_{50} > 1.6$ and $D_{85}/D_{15} > 3$
DIVISION 33 - UTILITIES					
Site Potable Water Utility and Leachate Conveyance Piping					
Pre-Qualification	Pipe Integrity	Visual Inspection	1 per pipe length prior to	Periodic Inspection	Pipe is not cracked or otherwise damaged
Construction	Pressure and Leakage Tests (Aboveground Piping)	Visual inspection of leaks from pressurized (air or water) pipeline	1 per pipe length between line valves, prior to backfilling or placing concrete	1 visual inspection per contractor test	Pipe has no visible leakage
	Hydrostatic Pressure and Leakage Tests (Pressurized and Gravity Subsurface HDPE)	ASTM F2164	1 per pipe length between line valves, prior to backfilling or placing concrete	Visual inspection and review data	Pipe is free of visual defects/leaks and the makeup water required to restore test pressure does not exceed tabulated values found in Contract Document
Utility Warning Tape					
Construction	Installation	Notify Engineer for field inspection	Upon completion of installation, prior to covering	Visual inspection upon Contractor notification	The tape has been installed according to the manufacturers recommendations
Water Utility and Leachate Conveyance Distribution Valves					
Construction	Installation	Notify Engineer for field inspection	Upon completion of installation, prior to covering	Visual inspection upon Contractor notification	All valves have been installed in accordance with the manufacturers recommendations, the Contract Documents, and are water tight
Flow Metering					
Construction	Meter Operation	Volume Measurement	1 per meter, prior to completion	Visual inspection and review data per meter	Meters are installed as recommended by the manufacturer and the bid specifications and are operating within accuracy specified by manufacturer
Water Meter Pit					
Construction	Installation	Notify Engineer for field inspection	1 per meter pit, prior to completion	Visual inspection upon Contractor notification	Meter pit is installed according to manufacturers specification and in location specified on Contract Drawings
Disinfecting of Potable Water Utility Piping					
Construction	Total Coliform Bacteria, Total and Free Chlorine Residual, and Physical Parameters	ANSI/AWWA C-651-99	1 per pipe section, after disinfection and flushing but prior to placing the water main into active service	Review analytical test results	Test results, with the exception of chlorine, meet the water quality standards designated by NHDES
Ground Water Extraction Wells					
Construction	Well Depth and Diameter	Measurement	1 per well installation	1 diameter and depth to bottom measurement per well installation	Wells are installed to the approximate depths and diameter shown on the Contract Drawings
DIVISION 44 - POLLUTION CONTROL EQUIPMENT					
Sedimentation Tank and Lift Stations					
Post-Construction	Watertight Test	Measurement of liquid loss	1 per tank within 90 days of installation	Review data	The tank has a liquid loss of less than 1% in any 24 hour period

FIGURES

FIGURE 1
PROJECT ORGANIZATION CHART



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PLOT DATE: 3-17-11
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APPENDIX A

CQA/QC CHECKLISTS AND FORMS

EQUIPMENT TESTING AND INSPECTION FORM - EXTRACTION WELL BUILDING

EW- ____

Refer to relevant sections of the Bid Specification text and Figures 6-4 and 6-8.

	INSTALLATION CHECK (initial and date)	APPROVED W/O CONDITIONS (If "No" see Notes)	FIELD TESTING OBSERVED (initial and date)	APPROVED W/O CONDITIONS (If "No" see Notes)	CONDITIONS MET (initial and date)
PUMPS					
PUMP P-1 (US WELL)		☐ Yes ☐ No		☐ Yes ☐ No	
PUMP P-2 (UUI WELL)		☐ Yes ☐ No		☐ Yes ☐ No	
PUMP P-3 (LUI WELL)		☐ Yes ☐ No		☐ Yes ☐ No	
PUMP CONNECTIONS					
US WELL		☐ Yes ☐ No		☐ Yes ☐ No	
UUI WELL		☐ Yes ☐ No		☐ Yes ☐ No	
LUI WELL		☐ Yes ☐ No		☐ Yes ☐ No	
DROP TUBES					
US WELL		☐ Yes ☐ No		☐ Yes ☐ No	
UUI WELL		☐ Yes ☐ No		☐ Yes ☐ No	
LUI WELL		☐ Yes ☐ No		☐ Yes ☐ No	
PIPING					
US WELL		☐ Yes ☐ No		☐ Yes ☐ No	
UUI WELL		☐ Yes ☐ No		☐ Yes ☐ No	
LUI WELL		☐ Yes ☐ No		☐ Yes ☐ No	
MANIFOLD					
TOTALIZERS (3)		☐ Yes ☐ No		☐ Yes ☐ No	
PRESSURE GAUGE (3)		☐ Yes ☐ No		☐ Yes ☐ No	
BALL VALVE (3)		☐ Yes ☐ No		☐ Yes ☐ No	
OTHER (See Notes)		☐ Yes ☐ No		☐ Yes ☐ No	
PRESSURE TRANSDUCERS (3)		☐ Yes ☐ No		☐ Yes ☐ No	
METHANE SENSOR		☐ Yes ☐ No		☐ Yes ☐ No	
HEATER/THERMOSTAT		☐ Yes ☐ No		☐ Yes ☐ No	
EXHAUST FAN		☐ Yes ☐ No		☐ Yes ☐ No	
INTRUSION SENSOR		☐ Yes ☐ No		☐ Yes ☐ No	
LIGHTING		☐ Yes ☐ No			
CONRETE SLAB (including subgrade preparation)		☐ Yes ☐ No			
PRE-FABRICATED STRUCTURE (including roof curbs, footings, insulation, etc.)		☐ Yes ☐ No			

*** NOTES ON REVERSE**

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EQUIPMENT TESTING AND INSPECTION FORM - EXTRACTION WELL BUILDING

EW- ____

NOTES:

FINAL INSPECTION/SHAKEDOWN COMPLETED
(sign/date): _____

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EQUIPMENT TESTING AND INSPECTION FORM - LIFT STATION

LS- ____

Refer to relevant sections of the Bid Specification text and Figure 6-5.

	INSTALLATION CHECK (initial and date)	APPROVED W/O CONDITIONS (If "No" see Notes)	FIELD TESTING OBSERVED (initial and date)	APPROVED W/O CONDITIONS (If "No" see Notes)	CONDITIONS MET (initial and date)
PUMPS					
SUBMERSIBLE PUMP 1		☐ Yes ☐ No		☐ Yes ☐ No	
SUBMERSIBLE PUMP 2		☐ Yes ☐ No		☐ Yes ☐ No	
PUMP LIFT CABLE/LIFT RAIL					
SUBMERSIBLE PUMP 1		☐ Yes ☐ No		☐ Yes ☐ No	
SUBMERSIBLE PUMP 2		☐ Yes ☐ No		☐ Yes ☐ No	
PUMP CONNECTIONS					
SUBMERSIBLE PUMP 1		☐ Yes ☐ No		☐ Yes ☐ No	
SUBMERSIBLE PUMP 2		☐ Yes ☐ No		☐ Yes ☐ No	
PUMP CONTROLS/CONTROL PANEL					
SUBMERSIBLE PUMP 1		☐ Yes ☐ No		☐ Yes ☐ No	
SUBMERSIBLE PUMP 2		☐ Yes ☐ No		☐ Yes ☐ No	
PRESSURE TRANSDUCER		☐ Yes ☐ No		☐ Yes ☐ No	
MANHOLE/MANHOLE COVER		☐ Yes ☐ No			
PIPING					
INFLUENT (Gravity Main)		☐ Yes ☐ No		☐ Yes ☐ No	
INFLUENT (Clean Out Drain)		☐ Yes ☐ No		☐ Yes ☐ No	
EFFLUENT (Force Main)		☐ Yes ☐ No		☐ Yes ☐ No	
PIPE SEALS					
INFLUENT (Gravity Main)		☐ Yes ☐ No		☐ Yes ☐ No	
INFLUENT (Clean Out Drain)		☐ Yes ☐ No		☐ Yes ☐ No	
EFFLUENT (Force Main)		☐ Yes ☐ No		☐ Yes ☐ No	
PRESSURE GAUGE (Force Main)		☐ Yes ☐ No		☐ Yes ☐ No	
VENT PIPE		☐ Yes ☐ No			
STRUCTURE		☐ Yes ☐ No		☐ Yes ☐ No	

(including subgrade preparation, wall thickness, joints/seals, interior water proofing, tightness test, etc.)

NOTES:

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EQUIPMENT TESTING AND INSPECTION FORM - LIFT STATION

LS- ____

NOTES (CONTINUED):

FINAL INSPECTION/SHAKEDOWN COMPLETED
(sign/date): _____

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EQUIPMENT TESTING AND INSPECTION FORM - SEDIMENTATION TANK/VALVE PIT #2

Refer to relevant sections of the Bid Specification text and Figure 6-6.

	INSTALLATION CHECK (initial and date)	APPROVED W/O CONDITIONS (If "No" see Notes)	FIELD TESTING OBSERVED (initial and date)	APPROVED W/O CONDITIONS (If "No" see Notes)	CONDITIONS MET (initial and date)
SEDIMENTATION TANK					
MANHOLES/MANHOLE COVERS		☐ Yes ☐ No			
PIPING/PIPE INSULATION					
INFLUENT (From Valve Pit #3)		☐ Yes ☐ No		☐ Yes ☐ No	
EFFLUENT (High Level Outlet)		☐ Yes ☐ No		☐ Yes ☐ No	
EFFLUENT (Low Level Outlet)		☐ Yes ☐ No		☐ Yes ☐ No	
PIPE SEALS					
INFLUENT (From Valve Pit #3)		☐ Yes ☐ No		☐ Yes ☐ No	
EFFLUENT (High Level Outlet)		☐ Yes ☐ No		☐ Yes ☐ No	
EFFLUENT (Low Level Outlet)		☐ Yes ☐ No		☐ Yes ☐ No	
VENT PIPES		☐ Yes ☐ No			
STRUCTURE		☐ Yes ☐ No		☐ Yes ☐ No	
(including subgrade preparation, wall thickness, joints/seals, interior water proofing, tightness test, etc.)					
VALVE PIT #2					
MANHOLES/MANHOLE COVERS		☐ Yes ☐ No			
PIPING/PIPE INSULATION					
INLET/OULET (High Level)		☐ Yes ☐ No		☐ Yes ☐ No	
INLET/OULET (Low Level)		☐ Yes ☐ No		☐ Yes ☐ No	
HDPE BALL VALVES					
INLET/OULET (High Level)		☐ Yes ☐ No		☐ Yes ☐ No	
INLET/OULET (Low Level)		☐ Yes ☐ No		☐ Yes ☐ No	
STRUCTURE		☐ Yes ☐ No		☐ Yes ☐ No	
(including subgrade preparation, wall thickness, joints/seals, exterior water proofing, etc.)					

NOTES:

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EQUIPMENT TESTING AND INSPECTION FORM - SEDIMENTATION TANK/VALVE PIT #2

NOTES (CONTINUED):

FINAL INSPECTION/SHAKEDOWN COMPLETED
(sign/date): _____

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EQUIPMENT TESTING AND INSPECTION FORM - VALVE PIT #3

Refer to relevant sections of the Bid Specification text and Figure 6-6.

	INSTALLATION CHECK (initial and date)	APPROVED W/O CONDITIONS (If "No" see Notes)	FIELD TESTING OBSERVED (initial and date)	APPROVED W/O CONDITIONS (If "No" see Notes)	CONDITIONS MET (initial and date)
MANHOLES/MANHOLE COVERS		☐ Yes ☐ No			
PIPING					
INFLUENT (From LS-1 Pump 1)		☐ Yes ☐ No		☐ Yes ☐ No	
INFLUENT (From LS-1 Pump 2)		☐ Yes ☐ No		☐ Yes ☐ No	
INFLUENT (From LS-2)		☐ Yes ☐ No		☐ Yes ☐ No	
EFFLUENT (To Sed Tank)		☐ Yes ☐ No		☐ Yes ☐ No	
EFFLUENT (To Sed Tank Bypass)		☐ Yes ☐ No		☐ Yes ☐ No	
PIPING CLEAN OUTS (INFLUENT)					
INFLUENT (From LS-1 Pump 1)		☐ Yes ☐ No		☐ Yes ☐ No	
INFLUENT (From LS-1 Pump 2)		☐ Yes ☐ No		☐ Yes ☐ No	
INFLUENT (From LS-2)		☐ Yes ☐ No		☐ Yes ☐ No	
HDPE BALL VALVES (INFLUENT)					
INFLUENT (From LS-1 Pump 1)		☐ Yes ☐ No		☐ Yes ☐ No	
INFLUENT (From LS-1 Pump 2)		☐ Yes ☐ No		☐ Yes ☐ No	
INFLUENT (From LS-2)		☐ Yes ☐ No		☐ Yes ☐ No	
HDPE FLOW METER					
INFLUENT (LS-1 Pump 1/Pump 2)		☐ Yes ☐ No		☐ Yes ☐ No	
HDPE BALL VALVES (EFLUENT)					
EFFLUENT (To Sed Tank)		☐ Yes ☐ No		☐ Yes ☐ No	
EFFLUENT (To Sed Tank Bypass)		☐ Yes ☐ No		☐ Yes ☐ No	
PIPING CLEAN OUTS (EFLUENT)					
EFFLUENT (To Sed Tank Bypass)		☐ Yes ☐ No		☐ Yes ☐ No	
STRUCTURE		☐ Yes ☐ No			

(including wall thickness, joints/seals, exterior water proofing, etc.)

NOTES:

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EQUIPMENT TESTING AND INSPECTION FORM - VALVE PIT #3

NOTES (CONTINUED):

FINAL INSPECTION/SHAKEDOWN COMPLETED
(sign/date): _____

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EQUIPMENT TESTING AND INSPECTION FORM - VALVE PIT #1 (POTABLE WATER METER)

Refer to relevant sections of the Bid Specification text and Figure 6-7.

	INSTALLATION CHECK (initial and date)	APPROVED W/O CONDITIONS (If "No" see Notes)	FIELD TESTING OBSERVED (initial and date)	APPROVED W/O CONDITIONS (If "No" see Notes)	CONDITIONS MET (initial and date)
MANHOLES/MANHOLE COVERS		☐ Yes ☐ No			
PIPING/PIPE SUPPORTS					
INFLUENT		☐ Yes ☐ No		☐ Yes ☐ No	
EFFLUENT		☐ Yes ☐ No		☐ Yes ☐ No	
PRESSURE GAUGE		☐ Yes ☐ No		☐ Yes ☐ No	
BACKFLOW PREVENTER		☐ Yes ☐ No		☐ Yes ☐ No	
WATER METER		☐ Yes ☐ No		☐ Yes ☐ No	
BALL VALVE		☐ Yes ☐ No		☐ Yes ☐ No	
STRUCTURE		☐ Yes ☐ No			

(including subgrade preparation, wall thickness, joints/seals, exterior water proofing, etc.)

NOTES:

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EQUIPMENT TESTING AND INSPECTION FORM - VALVE PIT #1

NOTES (CONTINUED):

FINAL INSPECTION/SHAKEDOWN COMPLETED
(sign/date): _____

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EQUIPMENT TESTING AND INSPECTION FORM - VALVE PITS #4 AND #5

Refer to relevant sections of the Bid Specification text and Figures 6-5 and 6-7.

	INSTALLATION CHECK (initial and date)	APPROVED W/O CONDITIONS (If "No" see Notes)	FIELD TESTING OBSERVED (initial and date)	APPROVED W/O CONDITIONS (If "No" see Notes)	CONDITIONS MET (initial and date)
VALVE PIT #4					
MANHOLES/MANHOLE COVERS		☐ Yes ☐ No			
PIPING/PIPE SUPPORTS					
INFLUENT		☐ Yes ☐ No		☐ Yes ☐ No	
EFFLUENT		☐ Yes ☐ No		☐ Yes ☐ No	
HDPE BALL VALVE		☐ Yes ☐ No		☐ Yes ☐ No	
RISER ANCHORS		☐ Yes ☐ No		☐ Yes ☐ No	
AIR RELEASE VALVE (Valve Pit # 4)		☐ Yes ☐ No		☐ Yes ☐ No	
STRUCTURE (including subgrade preparation, wall thickness, joints/seals, exterior water proofing, etc.)		☐ Yes ☐ No			
VALVE PIT #5					
MANHOLES/MANHOLE COVERS		☐ Yes ☐ No			
PIPING/PIPE SUPPORTS					
INFLUENT		☐ Yes ☐ No		☐ Yes ☐ No	
EFFLUENT		☐ Yes ☐ No		☐ Yes ☐ No	
HDPE BALL VALVE		☐ Yes ☐ No		☐ Yes ☐ No	
RISER ANCHORS		☐ Yes ☐ No		☐ Yes ☐ No	
STRUCTURE (including subgrade preparation, wall thickness, joints/seals, exterior water proofing, etc.)		☐ Yes ☐ No			

NOTES:

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EQUIPMENT TESTING AND INSPECTION FORM - VALVE PITS #4 AND #5

NOTES (CONTINUED):

FINAL INSPECTION/SHAKEDOWN COMPLETED
(sign/date): _____

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DAILY ACTIVITIES CHECKLIST
DOVER MUNICIPAL LANDFILL SUPERFUND SITE
DOVER, NEW HAMPSHIRE

RECORDED BY: _____ **DATE:** _____

ACTIVITY	Yes	No	N/A	COMMENTS
Erosion controls maintained and functioning properly?				
Activity inside the limits of work?				
Solid waste encountered? If yes, is the solid waste being managed in accordance with the Refuse Management Plan?				
Health and safety meeting participation?				
Work progressing according to plans and specifications?				
Damaged property/structures/grading?				
Non-conformance reported? If yes, see associated Work Problem/Deficiency Form for details.				
Issues communicated to Project Engineer or Quality Control Officer?				

RESULTS OF FIELD INSITU DENSITY TESTS

PROJECT NAME: _____ **DATE:** _____

PROJECT NUMBER: _____ **WEATHER:** _____

STUDY AREA/WORK PLAN: _____ **SITE CONDITIONS:** _____

TESTING CO.: _____ **TESTING PERSONNEL:** _____

TEST NO.	TEST DATE	LOCATION	LEVEL (Elevation)	FIELD DRY DENSITY (pcf)	FIELD WATER CONTENT (%)	MAXIMUM DRY DENSITY (pcf)	OPTIMUM MOISTURE (%)	PERCENT COMPACTION FIELD/REQUIRED	COMMENTS

METHOD: _____

TESTING OBSERVED BY: _____

SIGNATURE: _____

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FIELD INSPECTION REPORT

PROJECT NAME: _____ **DATE:** _____

PROJECT NUMBER: _____ **WEATHER:** _____

FOCUS OF INSPECTION:

_____

_____

PERSONNEL PRESENT FOR INSPECTION:

_____

_____

THE FOLLOWING HAS BEEN NOTED: _____

RECORD COMPLETED BY: _____

SIGNATURE: _____

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WORK PROBLEM/DEFICIENCY AND RESOLUTION FORM

PROJECT NAME: _____

PROJECT NUMBER: _____

DATE: _____

PROBLEM/DEFICIENCY REPORTED BY: _____

PROBLEM/DEFICIENCY REPORTED TO: _____

DESCRIPTION OF DEFICIENCY: _____

DATE PROBLEM/DEFICIENCY IDENTIFIED: _____

CORRECTIVE ACTION TAKEN TO RESOLVE PROBLEM/DEFICIENCY: _____

DATE RESOLVED: _____

INSPECTION COMPLETED BY: _____

SIGNATURE: _____

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CQA/QC AUDIT CHECKLIST
RECORD KEEPING
DOVER MUNICIPAL LANDFILL SUPERFUND SITE
DOVER, NEW HAMPSHIRE

CQA/QC PROCEDURES IN ACCORDANCE WITH CQAPP - RECORD KEEPING		
FIELD PERSONNEL:		
DATES:		
CQAPP AUDIT COMPLETED BY:		
	Record Maintained	Comments
RECORD TYPE		
FIELD QA/QC		
Daily Field Notes maintained for each day of construction oversight (See Field Note Audit Form for details)?	☐ Yes ☐ No ☐ N/A	
Daily Activities Checklist for each day of construction oversight?	☐ Yes ☐ No ☐ N/A	
Construction QC Forms maintained for each day of construction oversight?	☐ Yes ☐ No ☐ N/A	
Equipment Testing and Inspection Forms maintained?	☐ Yes ☐ No ☐ N/A	
In-Situ Field Density Testing logs?	☐ Yes ☐ No ☐ N/A	
OFFICE/ADMINISTRATIVE QA/QC		
Approved Submittals on file for materials being used at site?	☐ Yes ☐ No ☐ N/A	
Work Problem/Resolution - Work Deficiency Forms?	☐ Yes ☐ No ☐ N/A	
Field Inspection Reports?	☐ Yes ☐ No ☐ N/A	
Monthly Construction Progress Reports?	☐ Yes ☐ No ☐ N/A	
OTHER:	☐ Yes ☐ No ☐ N/A	
CONTRACTOR'S QA/QC		
Contractor is supplying QA/QC data to Engineer?	☐ Yes ☐ No ☐ N/A	
OTHER:	☐ Yes ☐ No ☐ N/A	

CQA/QC AUDIT CHECKLIST
DAILY FIELD NOTES
DOVER MUNICIPAL LANDFILL SUPERFUND SITE
DOVER, NEW HAMPSHIRE

CQA/QC PROCEDURES IN ACCORDANCE WITH CQAPP		
FIELD PERSONNEL:	**FIELD ACTIVITY DESCRIPTION:**	
DATE(S):	**CQAPP AUDIT COMPLETED BY:**	
FIELD INVESTIGATION DOCUMENTATION PROCESS	**Personnel Field notes**	
	Recorded	**Comments**
DAILY FIELD NOTES		
Date of work	☐ Yes ☐ No ☐ N/A	
Weather observations	☐ Yes ☐ No ☐ N/A	
Site entry and exit times	☐ Yes ☐ No ☐ N/A	
Contractor personnel and subcontractors on-Site	☐ Yes ☐ No ☐ N/A	
Submittals and materials received and test completed and results referenced or attached	☐ Yes ☐ No ☐ N/A	
Special or unusual events, including failed work and/or corrective actions needed	☐ Yes ☐ No ☐ N/A	
Field observations, including time of observation, daily project progress, the nature of work being performed, and associated QA/QC activities being conducted by the Contractor	☐ Yes ☐ No ☐ N/A	
Samples collected	☐ Yes ☐ No ☐ N/A	
Records of photos and videos taken	☐ Yes ☐ No ☐ N/A	
Site sketches and diagrams	☐ Yes ☐ No ☐ N/A	
Reference to other pertinent notes, such as meeting notes	☐ Yes ☐ No ☐ N/A	
Visitors to the Site	☐ Yes ☐ No ☐ N/A	
Signature of RPR at the end of each day's entries	☐ Yes ☐ No ☐ N/A	

APPENDIX D

PRELIMINARY OPERATIONS, MAINTENANCE, AND MONITORING MANUAL
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OPERATION, MAINTENANCE AND MONITORING MANUAL
SOURCE CONTROL REMEDIAL ACTION
GROUND WATER EXTRACTION SYSTEM
DOVER MUNICIPAL LANDFILL SUPERFUND SITE
DOVER, NEW HAMPSHIRE

Prepared For:

Executive Committee of the Group of Work Settling Defendants
Dover Municipal Landfill Superfund Site

Prepared By:

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Fax: 978-679-1601

March 24, 2011

GeoInsight Project 2009-017

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GEOINSIGHT RESUMES OF KEY PERSONNEL

MICHAEL J. WEBSTER, P.G., L.S.P.

Senior Associate / Senior Geologist

Education:

M.S., Geology, Boston College, 1986

B.S., Geology and Geophysics, Boston College, 1983

Years of Experience:

21 years

Areas of Expertise:

Hydrogeology, MCP/CERCLA Comprehensive Response Actions, Contaminant Fate and Transport Assessment, Litigation Support/Expert Testimony, Remediation, Regulatory Oversight

Professional Registrations:

Massachusetts Licensed Site Professional
Professional Geologist: NH, IN

Mr. Webster is responsible for directing environmental characterization and risk evaluations, remedial investigations, and feasibility studies to determine appropriate remedial actions at contaminated properties. Many of the remedial investigations and feasibility studies are performed in response to releases of hazardous substances at commercial and industrial facilities. Detailed hydrogeologic and remedial investigations undertaken by Mr. Webster have evaluated the extent of contaminants in multiple aquifer systems, the migration of separate-phase product, and the natural degradation of chlorinated and aromatic hydrocarbons in ground water. Mr. Webster is completely familiar with United States Environmental Protection Agency (USEPA) and state protocol for performing all phases of site investigations including risk characterizations, feasibility studies, and the development of remedial action plans, including associated permitting requirements. Mr. Webster also has substantial experience completing environmental due diligence assessments and third party reviews associated with technical and regulatory requirements for impacted properties and portfolios of properties. Mr. Webster has used this experience base to provide expert testimony and litigation support associated with environmental assessment, remediation, and regulatory compliance.

REMEDIAL DESIGN / REMEDIAL ACTION OVERSIGHT CONTRACTOR; DOVER MUNICIPAL LANDFILL SUPERFUND SITE, DOVER, NEW HAMPSHIRE; 1995-2004*; *Project Manager.

Provided independent oversight and technical review of RD/RA activities on behalf of the Potentially Responsible Party (PRP) Group. Included performing a focused feasibility study (FFS) to evaluate the use of *in situ* bioremediation at the Site in place of USEPA selected source control remedy. Evaluation included updating baseline risk assessment to account for current site conditions and performing a FFS to compare USEPA selected remedy with several bioremediation alternatives. Evaluation incorporated the results of a laboratory treatability study and a limited field study.

PREDESIGN INVESTIGATION ACTIVITIES; DOVER MUNICIPAL LANDFILL SUPERFUND SITE, DOVER, NEW HAMPSHIRE; 2004 – Present; Project Coordinator.

Managing ongoing predesign investigation (PDI) activities associated with a plume of leachate associated with the Dover Municipal Landfill Superfund Site. Managed five concurrent PDI programs, including Soil Vapor Intrusion PDI to evaluate possible impacts to residential buildings located downgradient of the landfill; Stage 2 Ecological Risk Assessment to evaluate possible impacts to sediment and surface water in the Cocheco River; Southern Plume PDI to evaluate the extent of ground water impacts between the landfill and the Bellamy Reservoir; North Landfill Hotspot PDI to identify the source for chlorinated volatile organic compounds (VOCs) being discharged to the north perimeter ditch; and a Hydraulic and Fate and Transport Model PDI to refine the three-dimensional computer model developed for the site.

MASSACHUSETTS CONTINGENCY PLAN (MCP) CHARACTERIZATION AND REMEDIAL ACTIVITIES; FORMER MACHINE SHOP – MCP TIER 1C SITE; MEDFIELD, MASSACHUSETTS; 2001-Present; Project Manager/LSP.

Completed independent evaluation of status of a monitored natural attenuation (MNA) remedy and identified a suspected new source area. Completed focused Phase II additional characterization activities of former industrial property and completed a revised Phase III evaluation to address the presence of trichloroethene (TCE) in ground water within a Zone II area. Selected and implemented an air sparge/soil vapor extraction (AS/SVE) remedial system to remove TCE from ground water. Currently operating AS/SVE system under Remedy Operation Status.

MCP COMPREHENSIVE RESPONSE ACTIONS AND REMEDIAL ACTIONS; ELECTROMETALS TIER 1A SITE, CHELMSFORD, MASSACHUSETTS; 1995-Present; Project Manager/LSP.

Conducting ongoing investigation activities at a 5-acre, former industrial manufacturing facility. Releases at the site included direct discharge to the ground surface and a local stream, buried drums and waste materials, and discharges of solvents to a private on-site septic system. Site is located within Zone II areas for several municipal water supply well fields. Historical activities included characterization of the extent of ground water impacts by chlorinated solvents and evaluation of potential for impacts to local sensitive wetland areas and municipal water resources. Ongoing activities include operation and monitoring associated with an *in situ* chemical oxidation (sodium permanganate) remedial system that included the installation and use of a 400-foot-long horizontal injection well.

MCP CHARACTERIZATION AND REMEDIAL ACTIVITIES; TRUCKING TERMINAL – TIER 1C SITE; WOBURN, MASSACHUSETTS; 1998-Present; Project Manager/LSP.

Managed the completion of MCP Phase II through Phase V activities associated with historical releases of petroleum products from underground storage tanks. Property is located within the interim wellhead protection areas (WHPA) for City of Woburn municipal Wells G and H. Remedial actions included excavation and off-site recycling of petroleum-impacted soil and subsequent monitoring of ground water quality. Also submitted Downgradient Property Status associated with the presence of dissolved chlorinated hydrocarbons in ground water.

COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT (CERCLA) REMOVAL ACTION; WELLS G & H SUPERFUND SITE; WOBURN, MASSACHUSETTS; 2002-Present; Project Coordinator.

Managed removal action activities associated with former drum disposal area of 60 Olympia Avenue source area associated with the Wells G & H Superfund Site. Remedial activities included the excavation and off-site disposal of shallow soil that had been impacted by polychlorinated biphenyls (PCBs). Remedial activities also included the installation of the 1/3-acre treatment cell and the completion of several *in situ* chemical oxidation injection events to address dense non-aqueous phase liquid and TCE-impacted soil and ground water. The removal action program has included monitoring ground water quality conditions within the treatment cell and within the Aberjona River floodplain and underlying aquifer.

HYDRAULIC AND CONTAMINANT FATE AND TRANSPORT MODELING; DOVER MUNICIPAL LANDFILL SUPERFUND SITE, DOVER, NEW HAMPSHIRE; 2002-Present; Project Manager.

Managed the development and use of a three dimensional ground water flow model for a 55-acre landfill Superfund Site and surrounding area. MODFLOW was used to develop a model of ground water flow in glacial sediments overlying a marine clay unit and discharge to a local reservoir and river. The model was used as the base for three-dimensional modeling of the fate and transport of

landfill leachate. The model was also used to evaluate hydraulic impacts and cleanup time associated with potential remedial options.

TECHNICAL OVERSIGHT – CITIZENS GROUP; STARMET/NUCLEAR METALS SUPERFUND SITE; CONCORD, MASSACHUSETTS; 2001-Present; Project Manager.
Provided technical, regulatory (MCP and CERCLA), and administrative oversight to a citizens group technical assistance grant associated with the Starmet/Nuclear Metals Superfund Site. Included reviewing and providing comments on historical reports and characterization activities, communicating technical issues to the citizens group, planning project strategy, and interacting with state and federal regulatory agencies. The site includes impacts associated with radioactive materials (depleted uranium) and metals (beryllium and copper) in a residential and environmentally sensitive area (near wetlands, the Assabet River, a bog, and drinking water supplies).

TECHNICAL OVERSIGHT – TOWN OF WILMINGTON; OLIN CHEMICAL SUPERFUND SITE; WILMINGTON, MASSACHUSETTS; 2004-Present; Project Manager.
Provided technical and regulatory (MCP and CERCLA) oversight and review associated with the Olin Chemical Superfund Site. Included detailed evaluation of over 20 years of environmental characterization activities, and an evaluation of the Town's water supply resources associated with the Maple Meadow Brook aquifer. Provide review and comments on behalf of the Town for technical reports submitted by Olin consultants. Participated in ongoing technical and regulatory meetings with state and federal oversight agencies. Site includes impacts to Town aquifer by a complex suite of over 200 organic constituents and includes concentrated plume of dense aqueous phase liquid associated with historical disposal into unlined lagoons.

ENVIRONMENTAL DUE DILIGENCE/THIRD PARTY REVIEW; FORMER DEFENSE CONTRACTOR SITE, WALTHAM, MASSACHUSETTS; 1999-Present; Project Manager.
Completed environmental due diligence and compliance evaluation for an approximately 20-acre industrial facility. The property is a Tier 1A site and has been impacted by historical releases of petroleum products, PCBs, and chlorinated solvents. Reviewed 20 years of environmental assessment and characterization reports, evaluated efficiency of existing ground water extraction and treatment system, and developed a list of outstanding technical and regulatory issues. Have continued to provide oversight to new property owner and liaison with former PRP and remedial contractor.

ENVIRONMENTAL DUE DILIGENCE/THIRD PARTY REVIEW; MULTIPLE COMMERCIAL PROPERTIES, CENTRAL EASTERN COAST, UNITED STATES; 2002-2003; Project Manager.
Completed environmental due diligence associated with a portfolio of approximately 60 commercial and industrial properties located in Virginia, Maryland, and Delaware. Activities included evaluation of historical use, potential receptors, existing reports, and potential costs to address known and suspected environmental impacts. For properties where remedial systems were already operating, evaluated cost and efficiency of systems and time frame to achieve closure.

WETLANDS AND ENVIRONMENTAL PERMITTING – COCHECO RIVER DREDGE PROJECT; DOVER, NEW HAMPSHIRE; 1999-2004; Project Manager.
Managed wetlands and solid waste permitting associated with proposed dredging activities of the lower 3-mile stretch of the Cocheco River. Project included characterization of dredge project and potential impacts to local resources and associated permit document and reports. Made technical presentations (written and verbal) to local, state, and federal agencies. Also reviewed and provided comments on U.S. Corps of Engineers proposed design for upland sediment disposal cell.

REMEDIAL ACTION PROGRAM AND GROUND WATER MANAGEMENT PERMIT; TEICHNER SITE, PLYMOUTH, NEW HAMPSHIRE; 1994-2001; Project Manager.
Developed a Remedial Action Plan (RAP) that included natural attenuation of a plume of dissolved-phase chlorinated VOCs in ground water and institution of a Groundwater Management Permit at a former manufacturing facility. Evaluation included analysis of potential impacts to local surface water resources. Negotiated with the state to accept a natural attenuation-No Further Action outcome. Currently performing long-term monitoring.

TECHNICAL OVERSIGHT – CITIZENS GROUP; W.R. GRACE AND RUSSELL FIELD SITES; CAMBRIDGE, MASSACHUSETTS; 1994-Present; Project Manager.
Provided technical, regulatory, and administrative oversight to a citizens group technical assistance grant associated with the W.R. Grace and Russell Field Sites. Included reviewing and providing comments on historical reports and characterization activities, communicating technical issues to the citizens group, planning project strategy, and interacting with state and federal regulatory agencies. The site includes impacts associated with materials handling and asbestos in shallow soil in a municipal park and sports fields. Project included evaluating potential risks and characterization methods for asbestos in soil.

FEASIBILITY EVALUATION OF FUTURE RESPONSE ACTIONS AND COST ANALYSIS; US WINDPOWER TIER 1A SITE, BURLINGTON, MASSACHUSETTS; 1995; Project Manager.
Performed Phase III Evaluation of comprehensive site assessment and risk characterization to evaluate potential remedial alternatives for MCP Tier 1A site. Nine-acre, former manufacturing site was impacted by releases of tetrachloroethylene (PCE) and TCE to soil and ground water present in shallow bedrock. Site is located within a Zone II area for municipal supply wells. Evaluation included Phase III analysis of proposed ground water remedial actions and analysis of cost for site compliance and closure in accordance with the MCP.

COMPREHENSIVE SITE INVESTIGATION, REMEDIAL ACTION EVALUATION, AND COST ANALYSIS; STAGECOACH WEST TIER 1B SITE, WESTWOOD, MASSACHUSETTS; 1995; Project Manager.
Conducted a detailed subsurface investigation of a release of PCE to overburden and bedrock aquifers at a 1.1-acre commercial site located within the interim WHPA for a municipal water supply well field. Investigation included ground penetrating radar (GPR) and magnetometer survey, test pits, septic system evaluation, soil borings, and fracture trace analysis. The results of the subsurface investigation were used to evaluate likely remedial action scenarios to address the presence of separate-phase PCE in fractured bedrock on-site and off-site migration of dissolved-phase PCE in overburden and fractured bedrock. Developed a conceptual Phase III RAP for use in evaluating long-term costs for site remediation.

REMEDIAL DESIGN/REMEDIAL ACTION; UNION CHEMICAL COMPANY (UCC) SUPERFUND SITE, SOUTH HOPE, MAINE; 1992-1993; Project Hydrogeologist.
Managed aquifer testing program as part of predesign studies for implementation of the Management of Migration (MOM) component of the USEPA's selected remedy for the UCC Superfund site. Aquifer testing included completion of four variable rate (step) discharge tests and two constant rate discharge tests. Constant rate discharge tests lasted 16 days and included monitoring of 22 observation wells and 2 surface water locations. Tests were performed in an unconfined till aquifer under low-discharge conditions (less than 0.2 gallons per minute). Responsible for data reduction and interpretation of test results. The results of the aquifer testing program were used to design a hydraulic control and ground water extraction system.

CONTAMINANT TRANSPORT ASSESSMENT AND MODELING; CLEAN HARBORS KINGSTON FACILITY CORPORATION, KINGSTON, MASSACHUSETTS; 1991-1994; Project Manager.

Performed an off-site migration assessment that included the combination of analytical computer modeling and a focused field investigation. A two-dimensional analytical model was used to estimate the extent of off-site migration of a plume of dissolved-phase chlorinated organic compounds in a glacial outwash unconfined aquifer. The model was calibrated using on-site historical data including ground water sampling results, ground water elevation data, and the results of *in situ* aquifer testing. The final model simulation was used to predict the present off-site configuration of the plume and to select the optimal locations for off-site monitoring. Originally, the state regulatory agency had requested a full-scale field investigation to determine off-site migration of the plume. The analytical modeling approach resulted in a significantly reduced work scope for the off-site characterization.

PRE-DESIGN AND REMEDIAL DESIGN COMPUTER MODELING; UCC SUPERFUND SITE, SOUTH HOPE, MAINE; 1992-1993; Project Hydrogeologist.

Developed three-dimensional numerical model to evaluate multi-layer aquifer system at the UCC Superfund site. Model was used to evaluate effectiveness of source control and MOM alternatives. Model simulations indicated that use of a trench system would be more effective than the ROD MOM remedy (a series of extraction wells).

HYDROGEOLOGICAL INVESTIGATION; IBM CORPORATION, ESSEX JUNCTION, VERMONT; 1988-1992; Project Manager.

Managed and conducted a detailed hydrogeological investigation in support of a Resource Conservation and Recovery Act Corrective Action Plan being developed for a large industrial facility. Activities included a subsurface investigation to evaluate local hydrogeologic conditions, source area characteristics, potential contaminant migration pathways, the magnitude and extent of ground water contamination, and contaminant transport processes. Characterization included overburden and bedrock aquifer contamination by separate-phase chlorinated hydrocarbons. Data obtained during the investigation were used to design interim ground water controls at the site and to implement a source remediation plan. Remedial measures included SVE and ground water extraction and treatment.

LITIGATION SUPPORT; US WINDPOWER MCP SITE, BURLINGTON, MASSACHUSETTS; 1992-1998; Project Manager.

As Project Manager, served as client point of contact and developed project strategies related to hazardous materials handling and litigation issues. As the result of historical releases of solvents and petroleum products to an on-site septic system, litigation was initiated by the current site owner to recover costs for remediation of the facility. The project included extensive engineering, process, and environmental characterization litigation support concerning past site use, including likely waste handling procedures, migration and behavior of contaminants in the environment, and completeness and appropriateness of remedial actions performed at the site.

MCP PHASE II COMPREHENSIVE SITE INVESTIGATION; POWER PLANT, SOUTHEASTERN MASSACHUSETTS; 1990-1992; Project Manager.

As Project Manager, developed the scope of work for the Phase II investigation and coordinated its implementation at the site. The investigation was performed to determine the magnitude and extent of a release of diesel fuel and heating oil from bulk storage containers at a power generating plant and to develop a remedial action plan for recovery of separate-phase product. The site was located in an environmentally sensitive area that included concerns over potential impacts to wetland areas and tidally-influenced surface water. The investigation was complicated by the presence of shallow bedrock at the site, tidal influences to local ground water, and the presence of several non-related historical releases and sources within the study area.

EMERGENCY RESPONSE AND INTERIM MEASURE; POWER PLANT, SOUTHEASTERN MASSACHUSETTS; 1991-1992; Project Manager.
Managed and conducted an investigation to evaluate the source of a release of free-phase gasoline to surface water. Investigation included the characterization of local hydrogeology and contaminant migration. Based upon the results of the investigation, a short-term measure was implemented in accordance with state protocols to stop the continued release to surface water. As part of the investigation, ground water pump and vapor extraction pilot tests were performed. Based upon the results of the pilot tests, a final remediation system was designed and installed.

VAPOR EXTRACTION PILOT TEST; IBM CORPORATION, ESSEX JUNCTION, VERMONT; 1989; Project Manager.
Managed and conducted a vapor extraction pilot study inside an active industrial manufacturing plant. Pilot test was conducted to evaluate the feasibility of *in situ* treatment of contaminated soil beneath the building prior to major building renovations. Project included drilling within confined spaces and most project work was conducted under Level C personal protection. Results of the pilot test were evaluated to determine the time frame necessary to remediate soil to required action levels and to design a full VES system for installation within the building.

AQUIFER TESTING; IBM CORPORATION, ESSEX JUNCTION, VERMONT; 1990-1991; Project Manager.
Managed and conducted a pump test of an unconfined till aquifer. The purpose of the pump test was to evaluate the feasibility of lowering the water table to allow the installation of a vapor extraction remediation system to remove residual contamination of saturated zone soil by chlorinated hydrocarbons. The project included performing a 72-hour pump and recovery test and a 24-hour enhanced vacuum-pumping test. Using data obtained from the pump tests, computer modeling was performed to determine the necessary array of pumping wells that would be needed to depress the water table to allow for vapor extraction of the saturated zone soil.

SPECIAL TRAINING:

OSHA Training Course in Hazardous Waste Site Investigations, 40-Hour Course, Darell Bevis Associates, Inc., Sterling, Virginia
Center for Environmental Management, Tufts University: Hazardous Waste Management, Spring 1987
Environmental Law, Fall 1987
Site Remediation Techniques, April 1989
University of Wisconsin at Madison, Continuing Education: Ground Water Flow and Pump Tests, December 1992

PROFESSIONAL AFFILIATIONS:

American Chemical Society
Licensed Site Professional Association

RESUME

MICHAEL C. PENNEY, P.E., L.S.P.
Senior Associate

EDUCATION:

B.S. University of New Hampshire, 1984, Civil Engineering

PROFESSIONAL CERTIFICATION:

Registered Professional Engineer: New Hampshire, Massachusetts, Connecticut, Maine, and Vermont
Massachusetts Licensed Site Professional
New Hampshire Licensed Subsurface Septic System Designer

PROFESSIONAL HISTORY

1993-Present	GeoInsight, Inc. Senior Associate/Senior Engineer; NH Office Manager
1990-1993	Balsam Environmental Consultants, Inc. Senior Project Engineer
1990-1993	Underground Engineering, PA President
1985-1990	Geotechnical Consultants of Massachusetts, Inc. Project Manager
1984	University of New Hampshire, Thompson School of Applied Science, Teaching Assistant, Surveying Department
1983	Dingman Survey Company Field Technician
1983	University of New Hampshire, Facilities Planning Draftsman

REPRESENTATIVE EXPERIENCE:

Mr. Penney is very familiar with the subsurface geologic characteristics of New England through direct involvement in hundreds of intrusive site investigations performed throughout the region. These investigations were completed for the purposes of foundation and site-work design, development feasibility, environmental site characterization, and remedial investigation and design. Consequently, he has executed an extensive variety of geotechnical and geoenvironmental evaluations, reports, design applications, and litigation support relative to foundations, soil conditions, ground water and surface water, and contaminated soil remediation. By performing a wide range of investigation and compliance services for his clients, Mr. Penney has become knowledgeable in construction codes and hazardous waste, solid waste, and other

environmental regulations pertinent to the New England states.

Mr. Penney has been involved in numerous permitting applications involving sitework, solid waste, ground water and surface water. His site characterization experience was gained through: personally performing oversight of construction and remedial contractor operations; completing designs for shallow and deep foundations and inspecting foundation installations; designing and overseeing geotechnical boring and monitoring well installations; design and implementation of ground water and landfill leachate control and collection systems; slope stability assessment and improvements; geosynthetic design projects and installations; construction surveys; and expert assessment of existing foundations.

His document preparation experience includes proposal writing and work scope development, contract and specification preparation, remedial investigation and feasibility study reports, construction work plans, investigation reports for foundation systems and site development feasibility evaluations, development of remedial and geotechnical design reports for site improvements, risk assessment reports, and remedial and as-built construction summaries.

Mr. Penney's responsibilities include management of numerous large projects, engineering design and report preparation, interaction with clients and regulatory personnel, peer review, staff group management, and business development.

ST. PAUL TRAVELERS INSURANCE, HAMPTON, NEW HAMPSHIRE, 2005.
Provide evaluation and inspection of numerous construction damage claims for residential and commercial buildings in an area of loose sand and organics along the ocean front where new water and sewer lines were being installed. Assessment included reviewing construction sequence and activities, interviewing property owners and evaluating claimed damage, and providing technical opinion reports regarding the claims.

DONOVAN MANAGEMENT, INC., SOUTH BOSTON, MASSACHUSETTS, 2005.
Conducted geotechnical investigation and subsequent report for new six-story residential building with subsurface parking. Provided bearing capacity analysis, lateral earth support design recommendations, settlement analysis, dewatering design, waterproofing recommendations, and general subgrade preparation guidelines.

ROYALSTON DPW, ROYALSTON, MASSACHUSETTS; 2004.
Designed a stabilization system for a steep slope where significant erosion had undermined an adjacent street. The design included geogrid-reinforced, gabion-faced terraces and reuse of existing granite block. Also prepared a bid package for the work including a Request for Proposal, Design Drawings, Bid Form, General Conditions, Contract, and Technical Specifications. After a contractor was hired, recommendations regarding possible value engineering changes were made.

MULTIPLE CLIENTS; BOSTON, MASSACHUSETTS; 1999 TO 2004.
Prepared engineering work plans for numerous Central Artery/Tunnel General Contractors to address soil management, erosion and sediment control, and ground water management associated with large sitework projects.

TOWN OF GOFFSTOWN; GOFFSTOWN, NEW HAMPSHIRE; 2000-2003.
Engineer of Record for closure design and construction oversight for two landfills totaling approximately 18 acres, which included detailed slope stability analyses, design of innovative closure strategies for multiple cap types depending upon slope and location, evaluation of retention structures that function as dams in large storm events, designing for maximized beneficial reuse of the landfill using athletic fields and passive recreational facilities following capping, and preparation of technical specification and bid package for the project with NHDES oversight.

AUBUCHON HARDWARE; WESTMINSTER, MASSACHUSETTS; 2001. Evaluated slope stability for a steep fill embankment at a new store location in Massachusetts. Developed recommendations for stabilizing the slope and prepared a

Beneficial Use Determination to address the embankment fill materials.

HKT ARCHITECTS, INC.; SOMERVILLE, MASSACHUSETTS; 2001.
Conducted a geotechnical evaluation and made recommendations for numerous large additions to the Dighton-Rehoboth Regional High School in Dighton, Massachusetts. Work included preparation of geotechnical investigation report and Earthwork technical specification.

CONFIDENTIAL CLIENT; CONCORD, NEW HAMPSHIRE; 1999. Evaluated claim of hotel building construction change order conditions made by a general contractor through review of contractor's files and site reports. Prepared opinion letter documenting subsurface conditions and industry-accepted approaches for construction that challenged the change order. Provided deposition testimony in support of opinion.

CONFIDENTIAL CLIENT; HANOVER, NEW HAMPSHIRE; 1999. Acted as expert in worker injury claim involving partial failure of coffer dam for bridge abutment foundation construction. Reviewed depositions of other parties involved and NHDOT specifications for project to prepare opinion letter describing an evaluation of the failure. Provided deposition testimony in support of opinion.

TOWN OF FARMINGTON; FARMINGTON, NEW HAMPSHIRE; Ongoing. Developed and initiated strategic approach for phased closure of the 12-acre Farmington municipal landfill. Providing overall management of activities associated with closure activities and preparing closure design documentation that considers impacts to ground water from an adjacent, off-site landfill. Providing design of storm water management and erosion and control systems associated with closure.

HKT ARCHITECTS, INC.; SOMERVILLE, MASSACHUSETTS; 2001. Conducted a geotechnical evaluation and made recommendations for numerous large additions to the Dighton-Rehoboth Regional High School in Dighton, Massachusetts. Work included preparation of geotechnical investigation report and Earthwork technical specification.

STATE FARM INSURANCE; MULTIPLE SITES, SOUTHERN NEW HAMPSHIRE; 1999-2000. Performed site inspections of residential building foundations to evaluate potential damage caused to the foundations from nearby blasting operations. Prepared opinion letters with recommendations for repairs.

SUGERBUSH SKI AREA RETENTION POND FAILURE; WAITSFIELD, VERMONT; 1998. Evaluated 1997 flood of Mad River that caused significant property damage and failure of 12-acre retention pond. Currently assisting in litigation regarding home-owner cost recovery based upon analyses of flood information, design record drawings, and FIRM Map information.

CITY METAL PRODUCTS, INC.; WESTMINSTER, MASSACHUSETTS; 1998. Investigated an existing 900 foot long roadway embankment and assessed its load support potential for new development and installation of underground utilities. Worked with client and Town to demonstrate acceptable integrity of embankment and to develop an acceptable approach to its use as a public road.

TAMBONE CORPORATION; ANDOVER, MASSACHUSETTS; 1998. Conducted combined geotechnical and environmental investigation for 140,000 square foot manufacturing facility. Performed liquefaction evaluation and provided alternative analysis for improving bearing capacity of weak site soils.

AUTO PLACEMENT CENTER, INC.; SALEM, NEW HAMPSHIRE; Ongoing. Evaluated a salvaged auto storage yard with regard to litigation involving off-site impacts to surface water drainage pathways, developed a Storm Water Pollution Prevention Plan, performed geotechnical investigation and provided recommendations for subgrade improvement using geosynthetics, prepared Spill Prevention Control and Countermeasure Plan, and Ground Water Release Detection Permit. Demonstrated pre-existing

debris buried at the site was exempt from NHDES solid waste regulations.

BERGERON DAM FAILURE; ALTON, NEW HAMPSHIRE; 1996. Managed and took part in a geotechnical and regulatory evaluation of the failure of the Bergeron Dam on behalf of a law firm representing the estate of the woman killed by the failure. Work included evaluation of the dam design, forensic observation of post-failure site conditions, evaluation of flood route characteristics, collection of post-failure soil samples for geotechnical laboratory analyses, and development of documentation stating opinions regarding the failure.

ENERGY MANAGEMENT INC.; DIGHTON, MASSACHUSETTS; 1996. Conducted combined geotechnical and environmental investigation for large natural gas-fired power plant facility. Analyses included dynamic loading from large machinery and foundation considerations for towers and exhaust stack.

TOWN OF WESTMINSTER; MASSACHUSETTS; 1993-1995. Performed preliminary investigation and geotechnical assessment of two building sites for a proposed fire station then provided final geotechnical recommendations based on the Town's selection of one of the sites. Performed geotechnical evaluation and report for an addition to the Forbush Memorial Library. Also conducted a foundation feasibility study at the site of a proposed Town salt storage shed.

LASELL COLLEGE; NEWTON, MASSACHUSETTS; 1994. Performed feasibility study and design of two lateral earth support systems including mechanically stabilized earth and soil nailed walls for an excavation associated with a new student recreation center building.

NPL LANDFILL; BROWNING FERRIS INDUSTRIES, INC.; VERMONT; 1993. Responsible for extensive slope stability analysis and portions of the cap design as part of Superfund Accelerated Clean-up Model (SACM) for the closure of a 14-acre landfill. Conducted analyses of storm water runoff to support design of steep downchutes drains.

INTERIM REMEDIAL MEASURE AND CLOSURE DESIGN, PELHAM LANDFILL; BROWNING FERRIS INDUSTRIES, INC.; NEW HAMPSHIRE; 1992-1993. Investigated previously existing landfill cap, designed leachate toe-drain collection system, conducted oversight of toe-drain construction, and was lead engineer for innovative cap design using recycled materials for the cap profile. Conducted as part of the cap design surface water flow analyses of before and after conditions to evaluate and control runoff.

INTERIM REMEDIAL MEASURE; SERVICE CHEMICAL CORPORATION, LAIDLAW NORTHEAST, MASSACHUSETTS; 1992. Performed design of and acted as construction manager for two deep ground water collection trench drains (with geosynthetic and soil filters) installed as a supplemental interim remedial measure to control and collect overburden ground water flow impacted by solvents. Designed multi-stage excavation safety support system to facilitate construction. Design required hydrogeological analysis of trench inflow based upon evaluation of ground water and surface water flow conditions and two-stage excavation support system.

SLUDGE MONOFILL CLOSURE PRELIMINARY DESIGN, WASTEWATER TREATMENT PLANT; PRIME TANNING; MAINE; 1990. Participated in geotechnical analysis of existing wastewater sludge stockpiles to determine in-place stability with regard to their function as retention structures and evaluated consolidation characteristics for proposed capping plan. Evaluated capping designs to accommodate dewatering requirements and proper surface water runoff routing.

HAMMERSMITH VILLAGE DAMS; MELROSE, MASSACHUSETTS; 1988. Prepared stability and hydrologic evaluation of two independent dams retaining a small pond, made recommendations for operation and maintenance, and conducted feasibility study and design to raise pond elevation by three feet.

CRUSADER PAPER; NORTH ANDOVER, MASSACHUSETTS; 1987. Designed large slope

cut for installation of new manufacturing site. Design included slope stability analysis, evaluation of modified runoff conditions and control mechanisms, slope surface treatments using geosynthetics to control seepage, and construction oversight.

FOUNDATION INVESTIGATIONS AND GROUND WATER STUDY; MARINA BAY CORPORATION; MASSACHUSETTS; 1988. Conducted numerous geotechnical investigations for a variety of buildings and made subsequent foundation recommendations for the structures. Site conditions and proposed development required foundations including end bearing piles, caissons, spread footings, and pressure injected footings. Conducted design of breakwater for marina expansion and mooring system for a large ocean vessel. Also designed and implemented a hydrogeological investigation for portions of the 200-acre former military base.

FOUNDATION INVESTIGATION AND OVERSIGHT; HARBOR POINT HOUSING COMPLEX; MASSACHUSETTS; 1985-1988. Designed and oversaw extensive exploration for an extensive housing project located on former Columbia Point in Dorchester, Massachusetts (former landfill). Oversaw pile testing and installations, performed design and oversight of methane gas venting system installations.

SPECIAL TRAINING:

MTBE and Other Fuel Oxygenates: Consideration for Assessment & Remediation, NEIWPCC, 2006.
Ground Water Flow in Fractured Bedrock, LSPA, 2006.
Evaluating Ground Water Flow and Transport Modeling, LSPA, 2005
Activity and Use Limitations, LSPA, 2005.
Data Generation Techniques for Env. Risk Characterizations, LSPA, 2005.
Update on NHDES Wetland Rules, DES, 2005.
MCP Regulatory Interfaces, EBI, 2004.
Brownfields Redevelopment, ACEC, 2004.
Wetland Regulations & the MCP, 2004.
MCP Audit 2003 Case Studies, 2003.
LSP Professional Conduct, LSP Board, 2003.
Environmental Forensics, LSPA, 2003.
Analytical Data Enhancement, LSPA, 2002.
MCP Audit 2002 Case Studies, 2002.
Soil Structure Interaction, BSCE, 2002.
Solid Waste Permitting, and Landfill Closure Post-Closure Use, EnviroExpo, 2002.
Monitored Natural Attenuation, LSPA, 2002.
Addressing Indoor Air Contamination, 2001.
NH Solid Waste Conference, NHDES Waste Management Division, 2001.
Assessment and Management of MTBE-Impacted Sites, 2001.
Indoor Air Contamination, MADEP, 2001.
MADEP EPH, VPH, and APH Methods, 2001.
LSP Board Regulations and Actions, 2000.
Demonstrating Compliance with the MCP through T he Conceptual Model Approach, 2000.
LSP Capping and Containment, 2000.
Interface Friction Evaluation, Geosynthetics >99 Conference, 1999.
Professionalism and Professional Ethics for LSPs, 1999.
Understanding and Using Activity and Use Limitation and Public Involvement Requirements of the MCP, 1998.
Remediation Waste and Remedial Wastewater Management, Massachusetts Department of Environmental Protection, 1997.
Contaminated Sites Corrective Action Seminar, NH Depart. of Environmental Services, 1997.
Using and Understanding Engineering and Construction EJCDC Contract Documents, ASCE/NSPE Seminar, 1996.
Title 5 Regulations Seminar, MADEP, 1995.
Petroleum Remediation and Reimbursement Funds Conference, NHDES, 1994.
Seminar on "Policies and Trends in Environmental Remediation," BSCE, 1994.
Storm Water Management and Erosion and Sediment Control Seminar, NHDES, 1993.
Project Management Seminar, Pryor Resources, Inc., Nashua, NH, 1993.
Excavation Safety Seminar, sponsored by the ASCE, Cambridge, MA, 1992.
Completed graduate level course "Hydrologic Monitoring," UNH, 1992.
Seminar on RCRA Corrective Action and Stabilization Technologies, EPA, 1991.

Specifying and Designing with Geogrids Seminar, Tensar Earth Technologies, 1991.
New England Seismic Design Lecture Series, M.I.T., 1991.
Hydric Soils and Wetland Species Identification Short Course, NHDIA, 1990.
Design, Construction and Performance of Deep Excavations in Urban Areas, Geotechnical Seminar, MIT, 1989.

PUBLICATIONS:

Redding, M.J., and Penney, M.C., “A Model For Landfill Reuse; A Narrative on the Costs and Technical Issues For Redeveloping Landfills,” presented at the New England Environmental Expo, Boston, MA 2002.

Gilbert, J.A. and Penney, M.C., "Multi-Media Investigation of a New Hampshire Mill Site," presented at the New England Environmental Expo, Boston, MA, May, 1995.

PRESENTATIONS:

The Science Behind Landfills, Toxics Action Center, 2005.

Landfill Closure and Post-Closure Uses, Enviro Expo, 2002.

PROFESSIONAL AFFILIATIONS:

American Society of Civil Engineers
North American Geosynthetics Society
American Ground Water Association
International Society of Foundation Engineers

OTHER:

Served on a NHDES workgroup to redevelop template specifications for remedial excavation projects, 2005.

Served as a technical judge for the 2004 Association of Builders and Contractors (ABC) Excellence in Construction Awards.

Served on the Architects, Contractors, and Engineers committee as an ASCE representative for 1996, 1997, and 1998 (Chairman).

LUKE W. SANBORN, P.E.

Senior Project Engineer

Mr. Sanborn's experience includes oversight of earthwork construction activities; oversight of contaminated excavation and in-field impacted soil delineation activities; test pit and test boring explorations; bedrock and overburden extraction well installation; participation in environmental sample collection; and research of hydrogeology to identify potential receptors to migrating impacts in ground water. Mr. Sanborn has composed environmental site assessment reports that identified potential exposure from hazardous wastes to humans, completed Storm Water Pollution Prevention Plans (SWPPPs) and Spill Prevention, Control, and Countermeasure (SPCC) Plans for industrial facilities.

Education:

B.S., Environmental Engineering,
University of New Hampshire, 2003

Years of Experience:

7 years

Areas of Expertise:

Construction Oversight, Landfill Construction Management, Environmental Data Collection and Interpretation, Environmental Permitting and Compliance, Remedial System Implementation and Maintenance, SPCC Planning, Erosion and Sedimentation Control, and Storm Water Management

Professional Registrations:

Professional Engineer: NH
Transportation Worker Identification Credential

DOVER DREDGE SPOILS CELL; DOVER, NEW HAMPSHIRE; 2003-Present; Field Engineer/Staff Engineer.

Served as field engineer for the construction of a 5-acre dredge spoils cell. Project components included earthwork oversight, unsuitable materials separation, compaction testing coordination and record keeping, gas venting system installation, dewatering/underdrain system installation, Quality Assurance/Quality Control inspector for the installation of the high density polyethylene (HDPE) membrane waste containment liner system, SWPPP implementation, erosion and sedimentation control inspections, and construction project management. Also, assisted the City of Dover with management and treatment of accumulated storm water contained within the cell that was discharged to the City's municipal sewer system.

HAZARDOUS MATERIAL MANAGEMENT PLANNING; UNIVERSITY OF NEW HAMPSHIRE; DURHAM, NEW HAMPSHIRE; 2010-Present; Senior Project Engineer.

Working with the University of New Hampshire Office of Environmental Health and Safety to develop a Hazardous Material Management Plan (HMMP). Activities included evaluating chemical purchasing, chemical inventorying, chemical handling and storage, chemical disposal, and chemical minimization procedures in a cross-section of Departments and Laboratories at the University. Data was collected through interviews conducted with University faculty and staff, and results of the evaluation are currently being summarized in the HMMP.

EMERGENCY PLANNING AND COMMUNITY RIGHT-TO-KNOW ACT COMPLIANCE ASSISTANCE; ASPHALT MEMBRANE MANUFACTURING FACILITY; BRENTWOOD, NEW HAMPSHIRE; 2010; Senior Project Engineer.

Assisted the Facility with performing a complete chemical inventory for the purpose of evaluating compliance with the Emergency Planning and Community Right-To-Know Act (EPCRA) Section 312 and Section 313. Following the chemical inventory activities, prepared and submitted Tier II reports to the USEPA, the State Emergency Response Commission, and the Local Emergency Response Commission. In addition, completed TRI reports (EPA Form R) for Section 313 compounds that exceeded the applicable threshold.

ABOVEGROUND STORAGE TANK (AST) COMPLIANCE ASSISTANCE; SPRAGUE ENERGY TERMINALS; NEWINGTON, NEW HAMPSHIRE; 2006-2009; Staff Engineer.
Developed a work plan to evaluate secondary containment options for three bulk petroleum storage facilities. Activities included field permeability tests at various locations within the existing secondary containment berms, soil borings to evaluate existing soil conditions within the existing secondary containment systems, and surveying using a total station to obtain contours to evaluate drainage pathways and for mapping purposes. Following data collection, performed calculations to evaluate the permeability of secondary containment systems for petroleum products stored at the facility for comparison to regulatory standards. Project also involved evaluating the feasibility of, and proposing five lining technologies to upgrade the current secondary containment structure.

COCHECO RIVER BANK STABILIZATION, CITY OF DOVER; DOVER, NEW HAMPSHIRE; 2007-2008; Project Engineer.
This project involved an evaluation of a section of shoreline along the Cocheco River that eroded during a significant storm event in May 2006. The section of eroded shoreline abuts a former municipal landfill and, therefore, stabilization of the shoreline was important to prevent additional erosion and to contain solid waste materials. Performed site reconnaissance of the eroded areas of the river and characterized areas of exposed wastes from the landfill. The information from the site reconnaissance was used to prepare a conceptual design plan set that included an erosion assessment, river bank solid waste analysis, proposed waste removal plan, and river bank restoration plan.

STORM WATER DRAINAGE IMPROVEMENTS; AUTOMOBILE AUCTION FACILITY; SALEM, NEW HAMPSHIRE; 2007-2008; Project Engineer.
This project involved designing drainage improvements for a site that consisted of an approximate 10-acre sand and gravel vehicle storage lot used to support facility operations. Drainage improvements at the site were designed to prevent flooding that historically damaged stored automobiles, and to prevent erosion of the parking lot surface. Analyzed the existing grades with regard to storm water flow and performed a feasibility evaluation to identify several possible improvement alternatives and to assess them with regard to cost, reliability, implementability, and effectiveness. Based upon the results of the feasibility evaluation, most appropriate solution was selected and subsequently prepared engineering plans and construction contract documents.

AST SECONDARY CONTAINMENT DESIGN; PETROLEUM DISTRIBUTION FACILITY; BELMONT, NEW HAMPSHIRE; 2008; Project Engineer.
Evaluated the existing secondary containment structure at the facility and determined compliance with applicable AST regulations. Project activities included performing percolation tests within the secondary containment area, calculating permeability of the secondary containment area using the least viscous petroleum product stored at the facility, design of a geosynthetic clay liner system, and construction management and oversight of secondary containment upgrades.

STORM WATER ANALYSIS, DESIGN, AND MANAGEMENT; LARGE RETAILER; HAVERHILL, NEW HAMPSHIRE; 2007; Project Engineer.
Performed storm water analysis and treatment design of a constructed wetland for a large retail store in Haverhill, New Hampshire. The design addressed treatment of runoff from parking lot and building areas consisting of 16 acres. The treatment was designed to remove metals, petroleum hydrocarbons, and sediment to levels acceptable for infiltrating into an aquifer protection area. The design utilized the “Simple Method” to estimate influent and effluent concentrations.

AIR QUALITY COMPLIANCE ASSISTANCE; MANUFACTURING FACILITY; WEBSTER, MASSACHUSETTS; 2007; Project Engineer.
Evaluated the potential source of odors and a potential cause of periodic "smoking" from facility oven vent stacks. Coordinated and oversaw emissions testing of two oven vent stacks for volatile organic compounds (VOCs), polycyclic aromatic hydrocarbons, and visible emissions and analyzed the results of air emissions testing. Compared to applicable regulatory standards and completed an analysis of the costs of emissions treatment options versus effectiveness. Coordinated air dispersion modeling of the facility emissions and developed modeling scenarios that included existing conditions and several modifications to the vent stacks.

INFILTRATION GALLERY DESIGN; GASOLINE RETAIL/CONVENIENCE STORE; RICHMOND, NEW HAMPSHIRE; 2007; Project Engineer.
Designed an infiltration gallery to receive effluent water from a ground water extraction and treatment system. Performed an existing conditions survey of the site to establish existing ground surface contours and designed the size and layout of the infiltration gallery based upon the proposed pumping rate and upon percolation test data and soil characterization data. Prepared the engineering plans for the infiltration gallery and oversaw and inspected subsequent construction activities.

SPCC PLAN DEVELOPMENT; FOLEY OIL COMPANY; BELMONT, NEW HAMPSHIRE; 2006; Staff Engineer.
Performed a site inspection and used data to prepare a SPCC Plan for a bulk petroleum storage facility. The SPCC Plan included an evaluation of the facility tanks, piping, pumps, alarm systems, secondary containment for the ASTs and appurtenances, storm water management practices at the facility, off-loading and on-loading practices and spill response procedures, and evaluation of potential impacts to surface water and ground water in the event of a release. Provided recommendations for improvements to the loading rack area.

SWPPP AND SPCC PLAN DEVELOPMENT; ALL CYCLE WASTE, INC.; WILLISTON, VERMONT; 2006; Staff Engineer.
Developed a SWPPP and a SPCC Plan for a municipal solid waste transfer station and recycling facility. Activities included an inventory of potential pollutants, evaluation of the storm water collection system at the facility, identification of potential receiving water bodies, development of spill prevention and response procedures, and identification of site-specific Best Management Practices (BMPs) for the facility.

HYDROGEOLOGIC ANALYSIS AND FOUNDATION DRAIN DESIGN; ELMWOOD GARDENS COMMUNITY CENTER; MANCHESTER, NEW HAMPSHIRE; 2006; Staff Engineer.
Performed a hydrogeologic analysis to determine the ground water flow direction and subsurface soil types surrounding a community center that experienced flood damage in 2006. Field activities included test pits, soil boring oversight, piezometer installation and ground water elevation measurements, and existing surface water pumping system analysis. Following the hydrogeologic analysis, a perimeter and sub-slab foundation drain system connected to an upgraded storm water and ground water pumping system was designed to prevent future flooding of the building.

ENVIRONMENTAL SITE ASSESSMENT; SPRAGUE ENERGY TERMINALS; NEWINGTON AND PORTSMOUTH, NEW HAMPSHIRE; 2005; Staff Engineer.
Performed due diligence activities at three bulk fuel terminals located in the New Hampshire Seacoast region that included an inventory of facility processes, materials stored, storm water conveyance pathways, potential receptor survey, and historical review of spills.

WATER TANK GEOTECHNICAL INVESTIGATION; TOWN OF BARRE; BARRE, MASSACHUSETTS; 2005; Staff Engineer.
Performed a geotechnical engineering investigation program and prepared recommendations for the design and construction of a 300,000-gallon concrete municipal water supply storage tank. Project activities included design of the soil boring program, analysis of soil boring data, and preparation of the geotechnical engineering report, including design recommendations for footing bearing capacity and subgrade preparation.

SEPTAGE LAGOON REMEDIATION; PETERBOROUGH, NEW HAMPSHIRE; 2004; Staff Engineer.
Served as Field Engineer for this project, which involved the excavation and off-site disposal of approximately 1,500 tons of soil impacted with various chlorinated VOCs, including trichloroethene and 1,1,1-trichloroethane, that had been historically released to an unlined septage lagoon. Project activities included excavation oversight of contaminated materials, segregation of the materials based upon their relative degree of contamination using field instrumentation, installation of subsurface piping for potential future use of chemical injections for treatment of residual impacts, installation of a clay liner, and reconstruction of surface grade.

SPECIAL TRAINING:

Advanced SWPPP and BMP Planning and Implementation
Design of Geosynthetic Drainage Systems in Landfills
Hydrologic and Hydraulic Design of Culverts
The Ground Water Sampling Field Course
Understanding the Massachusetts Contingency Plan
OSHA 40-Hour Hazardous Waste Training
OSHA 8-Hour Annual Refresher Training

PROFESSIONAL AFFILIATIONS:

American Society of Civil Engineers

JOEL J. TRIFILO, P.G., L.S.P., L.E.P.

Senior Geologist / Corporate Health and Safety Manager

Mr. Trifilo has experience in the environmental industry working with oil and hazardous material impacts of both soil and ground water. He has worked on a wide variety of environmental projects throughout New England. This experience includes regulatory compliance and remedial investigations and cleanups at leaking underground storage tank sites; bulk fuel storage and distribution facilities; historic landfills; and utility, chemical distribution, and industrial manufacturing facilities. He has responded to several emergency situations involving spills of oil or hazardous materials at both residential and industrial properties. He has completed environmental compliance audits at State universities and colleges and prepared Spill Prevention, Control, and Countermeasure Plans for State agencies.

Education:

B.S. Geology, University of Massachusetts, 1986

Years of Experience:

18 years

Areas of Expertise:

Environmental Assessment and Remediation of Soil and Ground Water, Spill Response, Massachusetts Contingency Plan Regulatory Compliance

Professional Registrations:

Professional Geologist: NH
Certified Professional Geologist
Massachusetts Licensed Site Professional
Connecticut Licensed Environmental Professional
Massachusetts Certified Wastewater Treatment Plant Operator (Grade 2-I Full)

FORMER MACHINE SHOP; ESSEX, MASSACHUSETTS; 2002-2004; Senior Geologist/Licensed Site Professional (LSP).

Conducted an investigation of a release of chlorinated solvents to soil, ground water, surface water, and indoor air. Initiated a comprehensive subsurface investigation to delineate the nature and extent of impacts in site media. Applicable components of the Massachusetts Contingency Plan, which applied to the disposal site, included a Release Abatement Measure for the excavation of solvent-impacted soil; an Immediate Response Action Plan for a Condition of Substantial Release Migration; preparation of a Tier Classification Submittal and Tier I Permit; Phase II Comprehensive Site Assessment Report and Phase III Remedial Action Plan; and Phase IV Remedy Implementation Plan and Phase IV Final Inspection Report. A soil vapor extraction system was subsequently installed at the site to remove solvent vapors from beneath the concrete floor of the building and mitigate the presence of constituents in indoor air.

BULK FUEL STORAGE TERMINAL; EAST BOSTON, MASSACHUSETTS; 2002-2003; Senior Geologist/LSP.

Provided LSP services to a major oil corporation to mitigate a release of petroleum into Boston Harbor via a storm drain system. Investigations included a map and field study of Boston Water & Sewer Commission and Massport storm drain systems, dye testing, and preparation of a Tier Classification submittal.

FORMER TANNERY; PEABODY, MASSACHUSETTS; 2002-2003; Senior Geologist.

Supervised the initial site investigation of a former tannery site. The investigation involved a detailed historical review of the former tannery and surrounding properties, followed by an extensive field investigation. Because the site was recently redeveloped into residential apartment units, evidence of past site use was not apparent. A historical review provided critical information regarding previous tannery process areas, petroleum storage areas, and other areas where oil and/or hazardous materials were used or stored. A media sampling and analysis plan was, therefore, biased toward those areas of concern identified during the historical review of the property.

MAINE YANKEE RESOURCE CONSERVATION AND RECOVERY ACT (RCRA) CLOSURE; WISCASSET, MAINE; 2002-2003; Senior Geologist/LSP.

Served as a team leader during the building walkdown phase of the RCRA Facility Investigation (RFI) for the Maine Yankee nuclear power plant located in Wiscasset, Maine. Also served as a senior geologist during the field investigation portion of the RFI. The RFI activities involved the collection of soil, bedrock, ground water, surface water, concrete, biota tissue and fresh water, and offshore sediments for analytical testing. Results of the ongoing RFI will be used to provide a defensible assessment of the Maine Yankee property to ensure that the site closure activities comply with the Maine Department of Environmental Protection and United States Environmental Protection Agency RCRA requirements.

SPECIAL TRAINING:

OSHA 40-Hour Hazardous Waste Training
OSHA 8-Hour Annual Refresher Training
OSHA 8-Hour Supervisory Training

PROFESSIONAL AFFILIATIONS:

Association of Massachusetts Licensed Site Professionals
American Institute of Professional Geologists

CHRISTENE A. BINGER

Senior Hydrogeologist

Education:

M.S., Hydrogeology,
Washington State University, 1997
B.A., Geology, Smith College, 1993

Years of Experience:

10 years

Areas of Expertise:

Hydrogeology, Subsurface Investigations, Underground Storage Tank Management, Remedial System Operation and Maintenance, Regulatory Compliance Reporting, Toxic Substances Control Act - PCB Assessment and Remediation, Plume Delineation with Field Gas Chromatography, Data Analysis and Statistics

Professional Registration:

Massachusetts Certified Wastewater Treatment Plant Operator (Grade 2-I Full)

Ms. Binger has worked on many different environmental projects primarily in Connecticut, Rhode Island, and Massachusetts. Her work has focused on the investigation, assessment, and remediation of petroleum hydrocarbon, chlorinated solvents, and polychlorinated biphenyls (PCBs). This experience includes evaluating plume migration in both surficial and fractured bedrock aquifers. Ms. Binger has managed ground water extraction, soil vapor extraction, and oxygen injection remedial systems, and implemented *in situ* chemical oxidation remedial techniques.

Ms. Binger completed a graduate degree at Washington State University (WSU) focusing on chlorinated solvent interactions with soil. Graduate work included several projects determining sorption values for chlorinated solvents and site-specific materials. Additionally, Ms. Binger completed an internship with the Washington Department of Ecology comparing methods for determining total organic carbon. While at WSU, Ms. Binger taught introductory geology and ground water geology lab classes.

REMEDIAL ACTION PLAN; ASBESTOS DISPOSAL SITE; NASHUA, NEW HAMPSHIRE; 2007-Present; Project Manager.
Evaluated the presence of asbestos-containing materials (ACM) in surface soil and fill material to prepare a Remedial Action Plan (RAP). The RAP included complete removal of surface soil and off-site disposal.

ACTION PLAN FOR FILL MATERIAL; LAWRENCE, MASSACHUSETTS; 2007-Present; Project Manager.
Prepared a Suspect ACM Action Plan for Fill Materials to manage soil potentially impacted with suspect ACM during earthwork activities. The Action Plan presented a practical approach to handling and managing fill material using Best Management Practices.

SUPERFUND PRE-DESIGN INVESTIGATIONS; DOVER MUNICIPAL LANDFILL; 2005-Present; Senior Hydrogeologist/Project Manger.
Coordinated focused assessment activities to evaluate and locate a hot spot within the Landfill and delineated impacts to ground water between the Landfill and a drinking water reservoir. Prepared two Pre-Design Investigation Summary Reports for review by the United States Environmental Protection Agency (USEPA).

SUPERFUND SITE ASSESSMENT AND REMEDIAL EVALUATION; WELLS G & H; WOBURN, MASSACHUSETTS; 2003-Present; Project Hydrogeologist.
Conducted focused site assessment work to build upon information compiled by the USEPA to evaluate the conceptual site model for a plume of chlorinated solvents migrating toward the Aberjona River.

REMEDIAL ACTION PLAN IMPLEMENTATION; ACTIVE INDUSTRIAL FACILITY WITH SOLVENT PLUME IMPACTING PUBLIC WATER SUPPLY; 2002-Present; Project Hydrogeologist.
Implemented a Remedy Implementation Plan (RIP) in accordance with the Massachusetts Contingency Plan (MCP). The RIP included the injection of an oxidant (sodium permanganate) to oxidize residual solvent in soil and ground water.

MCP PHASE II AND REMEDIAL EVALUATION FOR LARGE FORMER DRUM SITE; DARTMOUTH, MASSACHUSETTS; 2002-Present; Project Manager.
Evaluated the vertical and horizontal extent of impacts by chlorinated solvents utilizing a field gas chromatograph (GC). Operated a field GC to obtain real time data to identify source areas and delineate the extent of impacts. Results of fieldwork identified source area and plume shape, focusing the remedial evaluation.

SOURCE EVALUATION AND REMEDIAL SYSTEM DESIGN AND INSTALLATION; MEDFIELD, MASSACHUSETTS; 2002-Present; Project Manager.
Identified contaminant source area not previously evaluated utilizing field GC. Assisted with the design and installation of a soil vapor extraction and air injection system.

SITE ASSESSMENT/SUBSURFACE INVESTIGATION FOR PROPERTY TRANSACTIONS AND DUE DILIGENCE; 2000-Present; Project Hydrogeologist.
Completed American Society for Testing and Materials Phase I Environmental Site Assessments and Phase II Subsurface Investigations to assist clients with evaluating environmental liability. Completed assessments in Massachusetts, New Hampshire, Florida, New York, and Maryland.

SITE EVALUATION USING FIELD GAS CHROMATOGRAPHY; 2000-Present; Project Hydrogeologist.
Evaluated the vertical and horizontal extent of impacts by chlorinated solvents at several commercial properties utilizing a field GC. Operated field GC to obtain real time data to identify source areas and delineate the extent of impacts.

SITE ASSESSMENT/SUBSURFACE INVESTIGATIONS; MULTIPLE MAJOR PETROLEUM COMPANIES; 1998-Present; Project Hydrogeologist.
Completed MCP phased site assessments, remedial evaluations, and implementation of selected remedies, which included Phase I Initial Site Assessments; Phase II Comprehensive Site Assessments; Phase III RAPs; Phase IV RIPs; and Phase V Operation, Maintenance, and Monitoring Reports for multiple projects for major petroleum clients. Investigations included soil boring and monitoring well installation oversight, soil and ground water sampling, and historical property use review to assess sites in accordance with the MCP.

SELF-IMPLEMENTING CLEANUP PLAN (SICP); BURLINGTON, MASSACHUSETTS; 2003-2006; Project Manager.
Conducted large-scale characterization of PCB impacts to former industrial building and exterior soil associated with a former waste treatment system. Data used to prepare three SICP work plans for different phases of the project. Coordinated remediation of PCB-impacted soil and building materials and performed verification sampling to illustrate remediation met project cleanup objectives.

CITIZENS GROUP ASSISTANCE; DEVENS, MASSACHUSETTS; 2003; Project Hydrogeologist.
Assisted the People of Ayer Concerned About the Environment (PACE) with review of ongoing assessment and remediation at the former Fort Devens Military facility. Presented information to the Town of Ayer Administrator and Board of Selectmen regarding an arsenic study of local impacted surface water and water supply well aquifer.

REMEDIAL SYSTEM OPERATION AND MAINTENANCE; NORTH READING, MASSACHUSETTS; 1999-2000; Project Hydrogeologist.
Managed operation and maintenance of a ground water extraction system on behalf of the Massachusetts Department of Environmental Protection. The remedial system extracted ground water from a fractured bedrock aquifer impacted by chlorinated solvents. Worked to maximize system efficiency and monitor performance. Oversaw installation of two new deep recovery wells to enhance ground water recovery and maximize plume migration control.

ENVIRONMENTAL COMPLIANCE AND REMEDIAL SYSTEM OPERATION AND MAINTENANCE; PETROLEUM DISTRIBUTION TERMINAL; BRAINTREE, MASSACHUSETTS; 1999-2000; Project Hydrogeologist.
Managed environmental compliance reporting for large petroleum distribution facility. Completed public involvement requirements in accordance with Public Involvement Plan. Completed Release Abatement Measure to remove tidal flat sediment impacted with lead. Complied with Order of Conditions determined by Braintree Conservation Commission. Managed operation and maintenance of ground water extraction and treatment system. Coordinated comprehensive ground water monitoring across 62-acre terminal property and compared results to applicable ground water standards.

UNDERGROUND STORAGE TANK REMOVAL PROJECT; MASSACHUSETTS HIGHWAY DEPARTMENT; 1998-1999; Project Hydrogeologist.
Oversaw removal and installation of underground storage tanks (USTs) at Massachusetts Highway Department (MassHighway) depots in District II (western Massachusetts). Responsibilities included oversight of UST removals and compilation of UST closure documentation. Performed Immediate Response Actions in response to impacted soil encountered during UST removals at multiple MassHighway depots.

HABITAT ANALYSIS OF MISSISSIPPI DIKE FIELD; 1993; Supervising Project Geologist.
Project was designed to monitor impacts of constructed dike fields on channelization and river sediment distribution. Responsible for all field operations and equipment maintenance. Sampled sediment in the Mississippi River to evaluate grain size distribution relative to dike fields. Field data collection included retrieval of sediment samples, sediment sample locations using a Global Positioning System, river current profiling, and bed elevation profiling.

PROFESSIONAL ASSOCIATIONS:

Licensed Site Professional Association
National Ground Water Association

SPECIAL TRAINING:

Regulatory Expectations and Guidelines for the Vapor Intrusion Pathway, Licensed Site Professional Association (LSPA), MA, November 7, 2007
2006 Massachusetts Contingency Plan Revisions, LSPA, MA, May 10, 2006
Introduction to ArcGIS 9 Workshop, University of New Hampshire Cooperative Extension, Campton, NH, April 19-21, 2006
In-Situ Chemical Oxidation, LSPA, MA, December 13, 2005
Understanding the Massachusetts Contingency Plan, University of Massachusetts, Lowell, 1998
Oceanographic and Maritime Studies, Sea Education Association, Woodshole, MA, 1992
OSHA 40-Hour Health and Safety Training
OSHA 8-Hour Annual Health and Safety Training
CPR and First Aid Certified

PUBLICATIONS AND PRESENTATIONS:

Binger, C.A., Martin, J.P., Allen-King, R.M., Fowler, M., *Variability of Chlorinated-solvent Sorption Associated with Oxidative Weathering of Kerogen*, Journal of Contaminant Hydrology, Vol. 40, pp. 137-158, 1999.

Albanese, C., "Variability of Organic Contaminant Sorption in Aquitards of Different Origin," Master's Thesis, Washington State University, 1997.

Albanese, C., Allen-King, R.M., Roeder, R., "Organic Carbon Sampling and Methodology Project: Yakima Railroad Area," prepared for Department of Ecology, Toxics Cleanup Program, 1997.

Albanese, C., Allen-King, R.M., Fowler, M., "Variability of Organic Contaminant Sorption in the St. Clair City Plain, Sarnia, Ontario," American Geophysical Union, Annual Meeting, presented in Baltimore, MD, 1997.

Albanese, C., Allen-King, R.M., Variability of Organic Contaminant Sorption in Aquitards of Different Origin, Geological Society of America Abstracts with Programs, Vol. 28, No. 7, p. 73, 1996. Presented at Annual Meeting in Denver, CO, 1996.

APPENDIX F

RESPONSE TO COMMENTS

GeoInsight®
Environmental Strategy & Engineering
Practical in Nature

March 24, 2011

GeoInsight Project 2009-017

Darryl Luce
Remedial Project Manager
United States Environmental Protection Agency
5 Post Office Square, Suite 100, OSRR07-1
Boston, MA 02109-3912

RE: Response to Comments on Draft Source Control Remedial Action Work Plan
Dover Municipal Landfill Superfund Site
Dover, New Hampshire

Dear Mr. Luce:

GeoInsight, Inc. (GeoInsight) prepared this letter on behalf of the Work Settling Defendants of the Dover Municipal Landfill Superfund Site (referred to herein as the "Group") to summarize responses to comments that were included in the January 24, 2011 Draft Source Control Remedial Action Work Plan (SCRA-WP) approval letter that was issued by the United States Environmental Protection Agency (USEPA).

Responses to USEPA's comments include references to updated text, tables, and figures for the Final SCRA-WP, as applicable.

1. **Section 1.1, Overview, p.2, 2nd paragraph:** The Operation, Maintenance, and Monitoring (OMM) Manual is a critical component and should be listed in ACRONYMS, page v.

   Response: OMM was added to the acronyms list, as suggested.

2. **General.** The Final Source Control 100% Remedial Design (Section 6.7.7.2, Pump Selection Evaluation, p. 67) states that the results of the hose pump field test in the Southern Plume area will be presented in the SCRAWP. These results were not found. Please indicate where the results can be found or provide them separately as soon as practicable.

   Response: A technical memorandum that summarized the results of the hose pump field test was submitted to USEPA and NHDES on March 16, 2011.

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3. **Section 2.3, Remedial Action Work Area Description, p. 8, 1st paragraph:** The text states that the approximate boundary of the implementation work area is illustrated on Figure 2, but the boundary is either not shown or not labeled. When the SCRAWP is next updated, revise the figure or the text to adequately describe the work area.

   Response: To best represent the approximate boundary of the SCRA Work Area, a new figure was added to the Work Plan. Previous Figures 2 and 3 were modified and combined into a new Figure 2. Figure 2 now provides information associated with the SCRA work area and site features. Figure 3 includes existing ground water monitoring wells and surface water sampling stations.

4. **Section 4.1, Overview…, p.19, 1st paragraph, Section 5, and Table 1**: Prior to referencing Table 1 mention that these requirements are being performed under the 2009 Amended Scope Of Work to the Consent Decree (2009 ASOW). As such there are additional tasks that need to be included further in Section 4, Section 5 and Table 1. Section 6.3.4 of the 2009 ASOW has a requirement for "…biweekly meetings unless otherwise agreed to…." Examine the remainder of Section 6.3 of the 2009 ASOW and incorporate those elements into the revised SCRAWP.

   Response: Section 4.2.2 *Meetings During Construction* was added to Section 4 and includes information regarding the scheduling of meetings, and Table 1 and Section 5 were updated to include additional components described in Section 6.3 of the 2009 ASOW.

5. **Section 4.2, Pre-Construction Meeting, p. 19, 1st paragraph in section:** In accordance with Section 6.3.2 of the 2009 ASOW, EPA and the State should be participants in a pre-construction conference which is to be held within 60 days of EPA approval or modification of the SCRAWP. When the SCRAWP is next updated, please revise the description of the Pre-Construction Meeting, or add another conference/meeting, to accommodate the 2009 ASOW requirements (it is noted that in the CQAPP, the description of the pre-construction meeting states that representatives of State and Federal agencies will be invited).

   Response: Section 4.2 of the SCRA-WP was updated to indicate that USEPA and NHDES will be invited to the pre-construction meeting with the Phase II/III contractor.

6. **Section 4.3.10, Impacted Sediment Disposal, p. 25, and throughout document**: Describe the status of the site preparations and sediment disposal at the time of this document. There are passages where site preparations and sediment appears to be in the future and others where it appears complete or at least partially performed. Please clarify the status of work at the site and keep consistent through the document.

   Response: The draft SCRA-WP was prepared while Phase I activities were initiated and on-going. The final SCRA-WP was updated to reflect completed activities, as requested.

Section 1.3 was added to indicate that Phase I remedial activities were completed at the Landfill in the fall/winter 2010.

7. **Section 4.7, Operational and Functional, p. 29:** The designation of the remedy as "Operational and Functional" that is described in the 2009 ASOW is quite different from that described in this section. When the SCRAWP is next updated, revise this section to be consistent with the requirements of the 2009 ASOW and mention the As-Built Construction Report, assuming that it will meet the requirements of the "Final Construction Report" that is required by the 2009 ASOW as part of the process of designating the remedy Operational and Functional. (It was noted that Table 1, Implementation Time Table, of the SCRAWP is consistent with the 2009 ASOW in both timing and naming of required documents.)

   Response: Section 4.7 was updated to be consistent with Sections 6.3.6 and 6.3.7 of the 2009 ASOW.

8. **Section 4 and 5, and Figure 2, General**: Add a section between *4.3.10 Impacted Sediment Disposal* and *4.3.11 Demobilization Approach*. Title the section "Inspection and Monitoring." Within this section set, and refer to, the schedule of actions to occur in the implementation of the identified actions in Appendix A (Construction Work Plan) and Appendix B (SWPPP). The major tasks identified in these sections need to be referenced in the schedule (especially Section 5). Key areas within these documents should be identified on Figure 2. If Figure 2 is getting cramped, consider a 24" x 36" plan. Also, please review comment #14 and include that work in this section as well.

   Response: Section 4.3.11 was added, titled Inspection and Monitoring. This section includes information regarding the frequency of erosion controls monitoring and wetlands monitoring. Schedule considerations associated with these activities were incorporated into Section 5 and Table 1. Also, a new Figure 2 was prepared for the Final SCRA-WP.

9. **Section 5.1, Project Delivery Strategy, p.30, under sub-heading: GWE System Components – Phase II..., second bullet, install lift station:** Please differentiate between the proposed two on-site 8-foot diameter lift stations and fifteen lift station enclosures over well nests, as noted on the plan titled :proposed conditions overview plan, Figure No.: 2 -1.

   Response: The bulleted list in Section 5.1 was updated to differentiate between the lift stations and the extraction well building enclosures.

10. **Section 6.3.2, Performance Monitoring Well Selection, p.40, 1st paragraph on page:** The MW-107 and the SC-22 well clusters seem to be well-positioned for initial performance monitoring of water levels. Unless these wells were rejected based on screen length or depth or some other criteria, please include them in the quarterly gauging program.

Response: Monitoring wells in clusters MW-107 and SC-22 will be gauged when GWE system performance monitoring activities are performed. However, these wells were not included in the formal performance monitoring well network because review of historical information indicated that this portion of the Landfill is characterized by local conditions that were difficult to simulate using the GMS model (i.e., model calibration in UUI and LUI model layers was poor in these wells). As such, data from these wells is not directly comparable to model simulated hydraulic conditions under active GWE. However, data obtained from these wells will be used to measure the relative change in hydraulic conditions at this portion of the Landfill under active GWE.

11. **Tables 3A and 3B:** The PZ-2, PZ-5, and PZ-8 well clusters could not be located on any of the figures or drawings in the design package. Please indicate where the locations of these well clusters can be found or provide them separately as soon as practicable.

    Response: The locations of the PZ wells were added to Figures 3, 4 and 5. These wells were historically used as part of the Treatment Zone Demonstration project which was located south of the western lobe of the Landfill.

12. **Figure 2:** The labels for the MW-207, -208, and -209 well clusters are printed in light yellow and are very hard to read. Furthermore, the meaning of that color is not identified in the legend. When the SCRAWP is next updated, please revise the figure by using a color that is more visible and is identified in the legend.

    Response: Figure 3 was revised to include Southern Plume monitoring wells which include wells MW-207, MW-208 and MW-209. A different color (dark green) was used to designate Southern Plume wells on Figure 3.

13. **Figure 4, Project Organization Chart:** Please consider including both Christene Binger and Kristin Zeman in the organization chart(s) since they are included as key personnel in GeoInsight's resumes (Appendix E).

    Response: The Project Organization Chart was updated to include Christene Binger. Ms. Zeman's resume was removed because she will no longer be involved with the project.

14. **General:** I could not find where the vegetation monitoring plots asked for in Comment #8 of the September 30, 2010 SCRD Approval letter are contained in the text or on Figure 2. The comment from the September 30th letter:

    > **8. Section 10.3, top of page 93**: The vegetative monitoring plots suggested by the U.S. Fish & Wildlife Service must be established prior to remedial action beginning to provide a baseline. This section should include a statement along the lines of "Selection and monitoring of additional vegetation monitoring plots will occur during construction."

Please identify where the narrative describing this component is, or if omitted, put in the document in the new section identified in Comment #8, above, *Monitoring and Inspection*. Also include the monitoring points on Figure 2.

Response: A new figure (Figure 4) was added to the SCRA-WP to illustrate the locations of the vegetative monitoring plots. In addition, the monitoring approach for the vegetative monitoring plots was added to Section 4.3.11, as suggested.

Please contact us at (978) 679-1600 if you have questions regarding the contents of this letter.

Sincerely,
GEOINSIGHT, INC.

Christene A. Binger
Senior Project Manager/Hydrogeologist

for:
Michael J. Webster, P.G, L.S.P.
Senior Associate/Project Coordinator

Attachments

cc: Dean Peschel, City of Dover
Tom Andrews, NHDES
Warren Diesl, AECOM