October 24, 2018

Richard Hull
US Environmental Protection Agency, Region I
5 Post Office Square, Suite 100
Boston, Massachusetts 02109-3912

Re: Stormwater Investigation Work Plan
Coakley Landfill – North Hampton and Greenland, New Hampshire

Dear Mr. Hull:

On behalf of the Coakley Landfill Group (CLG), CES, Inc. (CES) is hereby submitting a revised Stormwater Investigation Work Plan (Work Plan) that has incorporated United States Environmental Protection Agency (USEPA) comments contained in a September 26, 2018 letter to Peter Britz of the Coakley Landfill Group (CLG).

A summary of responses to comments is provided below:

USEPA

1. **The characterization of the extent of PFAS compounds associated with cap materials and the long-term extent of PFAS contamination in isolated subsurface runoff should be stated as an objective, in addition to the study objectives identified in Section 2.1.**

CLG Response
The study objectives, as outlined in Section 2.1, will be revised to include the characterization of the extent of PFAS compounds associated with cap materials and the long-term extent of PFAS contamination in isolated subsurface runoff.

USEPA

2. **The CLG shall measure the elevation of surface water, leachate seeps, groundwater, retention basin discharges and subsurface discharges at the time of any sample collection. This could be done using survey equipment at the time of sample collection, or pre- surveyed staff gauges could be installed ahead of water quality sampling events.**

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CLG Response

The elevation of surface water, landfill seeps, and stormwater retention basin water will be recorded at the time of sampling using surveyed staff gauges with the elevation of groundwater and subsurface discharges being recorded using surveyed elevations of sampling points and monitoring well measuring point locations (e.g. top of riser). These points will include piezometers installed in support of Comment 5 below.

USEPA

3. **The invert elevations of all outfall and discharge pipes, and retention basin spill ways, should also be verified as part of this investigation.**

CLG Response

Invert elevations will be determined through the implementation of a stormwater investigation survey to be performed on monitoring and sampling locations and be inclusive of invert elevations of all outfall and discharge pipes and stormwater retention basin spill ways.

USEPA

4. **Because the retention basins are unlined, accumulated stormwater will likely infiltrate into the subsurface causing a localized saturated condition. It is possible that variations in backfill material placed during construction of the basins have created preferential pathways for migration of infiltrating surface water, possibly resulting in seeps from the subsurface. This condition could be contributing to the discharge at the L-1 seep location. The CLG shall investigate and describe in more detail the subsurface conditions beneath the retention ponds relative to the landfill liner and the sand drainage layer above the geomembrane liner and underdrain piping discharge system. These conditions are generally depicted in Figure 2 from the August 14, 2018, *Results of Storm Water Sampling at the Coakley Landfill*, but should be investigated and detailed to allow for the interpretation of the extent and transport of infiltration from the basins.**

CLG Response

The stormwater investigation will include the subsurface evaluation of the stormwater retention basins and determine the variations in backfill material, if any, that may result in the formation of preferential pathways for the migration of infiltrating surface water. This evaluation will be performed, in part, with the installation of piezometers as discussed in Comment 5 below.

USEPA

5. **The CLG shall install piezometers through the bottom of each retention basin to allow for the characterization of the extent of groundwater saturation beneath the basins. The piezometers should be surveyed for measuring point elevation, and water elevations in the piezometers should be compared to the surface elevation in the basin. Water quality samples shall be collected from the piezometers and analyzed for at least PFAS and 1,4 dioxane when samples are collected from the surface water drainage discharge locations.**

CLG Response

Piezometers will be installed to facilitate the characterization of the extent of groundwater saturation beneath the stormwater retention basins (SB-1 and SB-2) and be used in the collection of water for analysis of PFAS and 1,4-dioxane. These results will be used in the analysis of samples collected from surface water drainage discharge locations. Note that prior to construction of sediment control basins SB-1 and SB-2, groundwater elevations were monitored using information assessed at locations PZ-1 and MW-1, respectively. Subsequently, the ponds were designed to maintain separation between shallow groundwater and the bottom of the pond. At SB-1, approximately 2.3 feet of separation was maintained between the pond bottom (97 feet AMSL) and shallow groundwater (94.7 feet AMSL). At SB-2, approximately 2.7 feet of separation was maintained between the pond bottom (81 feet AMSL) and shallow groundwater (78.3 feet AMSL).

USEPA

6. **In addition to the sampling location specified in Section 3.2.1, the CLG shall also collect samples from each of the two retention basins when samples are collected from the other locations proposed in Section 3.2.1. The samples shall be analyzed for at least PFAS and 1,4 dioxane.**

CLG Response

The CLG will include the collection of water samples from each of the two retention basins when samples are collected from the other stormwater investigation sampling locations as outlined in Section 3.2.1 and analyzed for PFAS and 1,4-dioxane.

USEPA

7. **The CLG shall modify its long-term environmental monitoring program (LTEMP) so that samples are collected from the L-1 seep during conditions when there is no discharge from the adjacent stormwater retention basin (SB-2) outfall pipe or when the seep is influenced by any other stormwater discharge or surface water. The L-1 seep sample should be isolated to represent only the seep of groundwater to surface water.**

CLG Response

The CLG will modify the existing Sampling and Analysis Plan (SAP) to include requirements for samples from the L-1 seep location to be collected during conditions when there is no discharge from the adjacent stormwater retention basin outfall pipe at location STM-OFP-2 or when the seep (L-1) is not visibly influenced by stormwater discharge or surface water. These conditions are designed to ensure that the sample at L-1 will be representative only of the discharge of groundwater to surface water.

USEPA

8. **The CLG shall conduct the testing of materials as specified in Section 3.3 as part of this study, regardless of results from the stormwater and surface water sampling. The testing shall include the performance of a stormwater leachate procedure test for landfill cap materials.**

CLG Response
The testing of materials will be performed independent of the results from the stormwater and surface water sampling.

USEPA

9. **USEPA again recommends that the CLG analyze the stormwater samples collected as part of this study for an expanded list of PFAS to allow for a broader spectrum of analytes and direct comparison with past and future results in various media. This may allow for distinct characterization between stormwater flow associated with the surface of the landfill and the subsurface collection system, in relation to the groundwater at the Site. Testing for an expanded list of PFAS may provide data that could be attributable to the subsurface collection system and landfill cap materials and any associated PFAS constituents and allow for the distinct segregation between stormwater and groundwater. This may be beneficial for any future characterization of the source of PFAS contamination being discharged to surface waters surrounding the Site.**

CLG Response
The CLG will expand the list of PFAS compounds for analysis of stormwater samples to allow for a broader range of analytes to be used in the direct comparison with past and future results.

USEPA

10. **Section 3.4 shall also specify that the study will not only identify where groundwater may intercept or infiltrate stormwater systems, but also to isolate, quantify and characterize stormwater and subsurface drainage flow from the landfill surface.**

CLG Response
Investigation methodology outlined in Section 3.4 will be revised to include analysis of the interaction between groundwater and stormwater, as well as independently quantifying contributions of surface and subsurface stormwater discharges from the landfill surface.

USEPA

11. **A report detailing the findings of this study shall be submitted to USEPA and the NHDES within 60 days of the collection of the second round of sampling (spring 2018) associated with this study.**

CLG Response
A Draft Stormwater Investigation Report will be submitted to the USEPA and NHDES within 60 days of the Spring 2019 stormwater sampling event.

SENSIBLE SOLUTIONS

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CES INC

STORMWATER INVESTIGATION WORK PLAN COAKLEY LANDFILL SUPERFUND SITE NORTH HAMPTON AND GREENLAND, NEW HAMPSHIRE

FOR

COAKLEY LANDFILL GROUP

1 Junkins Avenue
Portsmouth, New Hampshire

October 2018
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Engineers ◆ Environmental Scientists ◆ Surveyors

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STORMWATER INVESTIGATION WORK PLAN
COAKLEY LANDFILL SUPERFUND SITE
NORTH HAMPTON AND GREENLAND, NEW HAMPSHIRE

1.0 | INTRODUCTION

On behalf the Coakley Landfill Group (CLG), CES, Inc. (CES) has prepared this Stormwater Investigation Work Plan (Work Plan) to provide an approach and protocols for the collection and analysis of stormwater and surface water samples from stormwater management structures at the Coakley Landfill Superfund Site (Site). The intent of this investigation is to better understand the relationship between stormwater discharge, shallow groundwater, and landfill seep discharge from monitoring location L-1. Samples collected as part of this investigation will be analyzed for the presence of per- and polyfluoroalkyl substances (PFAS) and 1,4-dioxane to supplement previously collected data for these contaminants and to assess potential sources.

The sampling and investigation activities are being conducted by the CLG, at the request of the United States Environmental Protection Agency (USEPA) and New Hampshire Department of Environmental Services (NHDES) as outlined in a letter from the USEPA to the CLG dated August 17, 2018. CLG proactively conducted a limited investigation with the results presented in an August 14, 2018 letter report by CES. USEPA's August 17, 2018 letter was generated from a review of that submittal.

2.0 | PROJECT BACKGROUND AND DESCRIPTION

As part of Site remedy design and construction activities implemented in the mid and late 1990s, stormwater runoff from the landfill surface is conveyed to two unlined stormwater retention basins, one near the northeast corner of the landfill (designated as SB-1) and one near the northwest corner of the landfill (designated as SB-2), via a series of perimeter drainage ditches and rip-rap let-down structures on the landfill. Stormwater retained in the basins is subsequently discharged to adjacent wetland areas via an outlet structure in each basin and associated corrugated metal piping.

In addition to surface stormwater runoff, precipitation that infiltrates through the landfill's vegetative layer and cover soil is collected in a sand drainage layer placed immediately above the geomembrane liner of the cap system. Based on an initial review of the 100% Design drawings (Golder, 1996) and a field visit performed by CES on September 4, 2018 in advance of Work Plan development, it appears that water in the sand drainage layer along the east side of the landfill is conveyed via underground perforated piping to stormwater retention basin SB-1, while water along the west side of the landfill is conveyed via similar piping to a rip rap lined discharge swale located west of SB-2 (**Figure 1)**.

Following remedy construction, a seepage area was noted on an embankment adjacent to the northwest stormwater retention basin (SB-2) outfall pipe discharge. This seepage was interpreted to be shallow groundwater discharging to the ground surface at or near the head of a wetland complex west-northwest of the landfill. The seepage location became a sampling point in the Site

monitoring network and is designated as location L-1 on site plans and in annual monitoring reports. It has also previously been referred to as a leachate seep in site-related correspondence. Analytical results for samples collected at L-1 have been reported in monitoring reports since 2000.

During a review of 2017 analytical data for the L-1 seep location, it was noted that concentrations of PFAS in the L-1 sample were significantly higher in the Spring event when discharge was observed from the SB-2 outfall pipe, as compared to the Fall event when little or no discharge was observed in the northwest stormwater retention basin (SB-2) outfall pipe. These results seemed contrary to an assumption that a potentially larger stormwater component would result in a lower PFAS concentration in the L-1 seep sample since stormwater runoff has no direct contact with landfill waste.

To verify the physical relationship between the L-1 seep location and stormwater retention basin outfall piping, a Site visit was conducted by CES on December 7, 2017 to observe Site conditions. During the Site visit, iron-stained soil was observed on the embankment adjacent to the corrugated steel outfall pipe from SB-2. Soil staining appeared to extend to (or above) the bottom elevation of the stormwater outfall pipe, although the inside of the stormwater outfall pipe did not show evidence of iron staining or iron precipitate indicative of impacted groundwater. The heaviest staining and actual water seepage were observed to be in a ponded area (head of wetland) approximately 5-10 feet downslope of the outfall pipe and 1-3 feet lower in elevation than the invert of the outfall pipe.

Water samples were collected from the stormwater management system and L-1 on April 26, 2018 during the Spring 2018 sampling event to further investigate stormwater quality for comparison to historic seep sample results. Results for these samples were provided in a letter report to the CLG dated August 14, 2018 and detailed the additional sampling performed at the perimeter ditch, northwest outfall pipe, and subsurface underdrain piping.

A Site visit was completed on September 4, 2018 by the CLG, CES, USEPA, and NHDES to observe previously sampled stormwater control system components and identify additional sampling locations for inclusion into the additional stormwater and landfill seep investigation detailed below.

2.1 Study Objectives

The overall goal of the sampling and investigation is to gain a better understanding of the relationship and interaction, if any, between stormwater discharge points, shallow groundwater, and seep discharge occurring at monitoring location L-1. In addition, a source for observed PFAS compounds detected in collected stormwater samples will be investigated in conjunction with the characterization of the extent of PFAS compounds associated with the materials used in construction of the landfill cap. Investigation results obtained will aid in evaluating the long-term extent of PFAS contamination in isolated subsurface runoff.

3.0 | SAMPLING AND INVESTIGATION ACTIVITIES

To better understand the interaction between groundwater and source of the seep at sampling location L-1, potential interaction between groundwater and landfill waste, and potential source for detected PFAS compounds in analyzed samples, the stormwater investigation will be comprised of several efforts or phases. These phases, as outlined below, are designed to provide the information necessary to make informed decisions on subsequent investigation activity.

3.1 Verification of Stormwater System

CES will verify the stormwater routing and conveyance system components to differentiate surficial stormwater runoff, sand drainage layer discharge, and other discrete points of contribution to the stormwater retention basins (SB-1/SB-2), if any. This verification will involve both desktop evaluation of 100% Design bid drawings (Golder, 1996), as-built drawings, and field inspection of system components. To aid in this process, a New Hampshire-licensed land surveyor will record invert elevations for portions of the stormwater system (e.g. outfall piping), the location and elevation of surface water and seep sampling locations (SW-5, SW-103, and L-1), and verification of top of riser elevations for groundwater monitoring wells included as part of the investigation. The survey will include the installation and elevation control of staff gauges at the L-1 seep and surface water sampling locations. Recorded elevation information will allow for furthered verification of "as-built" conditions of the stormwater system and aid in the interpretation of hydrologic relationships between surface water, stormwater, and groundwater.

To further evaluate relationships mentioned above, it is proposed to install piezometers within each stormwater retention basin. These piezometers will serve to monitor potential localized water saturation conditions that may result from direct infiltration of stormwater through the unlined basins. The depth of installed piezometers will be based on conditions encountered in the field during installation. These include soil/fill material, depth to water, and spatial relationship to stormwater system components as determined from design drawings and observed field conditions at the time of installation.

Design detail and as-built drawings will be further verified during the logging of materials encountered during the installation of piezometers. Conditions encountered during installation will allow for the characterization of subsurface conditions beneath the retention basins relative to the landfill liner and the sand drainage layer above the geomembrane liner and underdrain piping discharge system. These conditions may include variations in backfill material used in stormwater basin construction and the potential for preferential pathways to exist allowing for the migration of infiltrating surface water.

3.2 Stormwater and Surface Water Sampling

Based on the evaluation of the stormwater routing and conveyance system components, as described above, CES will identify locations where stormwater samples should be collected in addition to those previously sampled during the April 26, 2018 sampling event,

if any. Surface water sampling locations that are part of the routine monitoring program will continue to be monitored during regularly scheduled semiannual sampling events separate from stormwater sampling outlined below, to minimize duplication of sampling. However, efforts will be made to schedule stormwater sampling in conjunction with routine sampling events to allow for more direct correlation of analytical results. A stormwater sampling schedule will be dependent on the occurrence of a rainfall event that generates both surficial and sand drainage layer discharge.

3.2.1 Sampling Locations

The designation "STM" will be used for all stormwater samples. Samples related to the Northeast Stormwater Basin will have the designation of 1 while samples related to the Northwest Stormwater Basin will have the designation of 2. Stormwater samples will be collected from a total of 11 locations as illustrated in **Figure 1** and include:

- Northeast Stormwater Retention Basin (STM-SB-1)
- Northeast Outfall Pipe (STM-OFP-1)
- Northeast Perimeter Ditch (STM-PD-1)
- Northeast Underdrain Piping (STM-UP-1)
- Northeast Toe Drain (STM-TD-1)
- Landfill Seep (L-1)
- Northwest Stormwater Retention Basin (STM-SB-2)
- Northwest Outfall Pipe (STM-OFP-2)
- Northwest Perimeter Ditch (STM-PD-2)
- Northwest Underdrain Piping (STM-UP-2)
- Northwest Toe Drain (STM-TD-2)

Locations L-1, STM-OFP-2, STM-PD-2, and STM-UP-2 were previously sampled during the April 26, 2018 sampling event and designated as L-1, Northwest Outfall Pipe, Perimeter Ditch, and Subsurface Underdrain Piping, respectively. It is anticipated these locations will continue to be sampled for comparison with past and future analytical results. This analytical information may aid in the geochemical evaluation of the landfill seep at L-1. Samples from L-1 will be collected during conditions where there is no discharge from the adjacent SB-2 outfall pipe (STM-OFP-2) or when the seep at L-1 is not visibly influenced by any other monitored stormwater discharge or surface water. These conditions ensure that the samples at L-1 are isolated and representative of only the discharge of groundwater to surface water.

Depth to groundwater measurements from nearby overburden monitoring wells to L-1 (MW-9, MW-10, FPC-5AR, FPC-6A, AE-3A, FPC-7A, FPC-9A, OP-2, and OP-5) will be obtained to monitor the surrounding piezometric surface. Supplemental gauging locations will include piezometers installed within stormwater retention basins as described in **Section 3.1**. The potential exists for some locations (e.g. STM-OFP-1 and STM-OFP-2) to be dry during sampling events, based on the absence or presence of water within the stormwater basins; however, these conditions will be noted and reported accordingly.

Surface water locations, as stated above, will continue to be collected during regularly scheduled groundwater monitoring events. Surface water locations SW-5 and SW-103 are locations in closest proximity to the stormwater control system locations in the northwest portion of the landfill and are approximately 75-ft and 300-ft north of L-1, respectively.

It should be noted that modification to the project sampling and analysis plan (SAP) (CES, 2018) will be made to include the proposed stormwater sampling locations, nomenclature, standard operating procedure (SOP) for stormwater sampling and reporting.

3.2.2 Sampling Schedule

Two stormwater sampling events will be completed as part of this investigation. The first will be scheduled for the Fall of 2018, in conjunction with the Site-wide monitoring event tentatively scheduled to begin on September 24, 2018.

It is anticipated that a second stormwater sampling event will be scheduled during Spring 2019. Stormwater sampling events will be scheduled based on the occurrence of a significant rainfall event during this timeframe. Greater levels of precipitation increase the likelihood that water will be present at proposed stormwater sampling locations.

3.2.3 Laboratory Analysis

Collected stormwater (STM-SB-1, STM-OFP-1, STM-PD-1, STM-UP-1, STM-TD-1, STM-SB-2, STM-OFP-2, STM-PD-2, STM-UP-2, and STM-TD-2), landfill seep (L-1), and surface water (SW-5) samples (**Figure 1**) will be submitted for analysis of PFAS and 1,4 dioxane. Analysis of PFAS compounds will include an expanded list of analytes from those compounds contained in the Quality Assurance Project Plan (QAPP) (CES, 2017), as approved by the USEPA and NHDES, and analyzed in previously completed sampling events at the Site. A list of these compounds is listed in **Appendix A**. Media previously sampled at the Site include groundwater, surface water, sediment, seep, and fish tissue with analysis for PFAS substances including those with established regulatory guidelines.

3.3 Source Material Investigation

An investigation will be performed to identify the materials used in the construction of the Coakley Landfill cap and stormwater collection system by reviewing project records. These materials include, but are not limited to, cap liner and piping, soil, seed, sand, and vegetative layer materials. The investigation will determine if the potential exists for PFAS compounds to have been used in the manufacturing, transport, and/or installation of these structures. Following the stormwater system verification as outlined in **Section 3.1**, a list of landfill cap and stormwater system construction materials will be generated for sample collection and analysis. These materials will be tested for an expanded list of PFAS compounds using an applicable extraction and analysis technique as determined by media type (e.g. soil, geotextile, etc.). Samples will be submitted to Vista Analytical Laboratory via Eastern Analytical, Inc. in accordance with sample preparation, handling, and chain of custody procedures as outlined in the project SAP.

3.4 Stormwater System Infiltration Evaluation

Based on results of tasks listed above, an investigation will be performed to determine locations, if any, where groundwater may intercept and/or infiltrate stormwater system components. These activities will aid in evaluating the integrity of system components and determine if groundwater may be present in samples collected from the stormwater system. The evaluation will be performed, in part, concurrent with the verification of stormwater system components outlined in **Section 3.1**. The evaluation will consist of a review of historic data to include former retention basin piezometers, available well info, development of cross sections, etc., with specific focus on whether groundwater is likely to interact with stormwater and surface water.

In addition to evaluating where groundwater may intercept and/or infiltrate stormwater system components, the investigation will include efforts to isolate, quantify, and characterize stormwater and subsurface drainage flow from the landfill surface. This may include the use of stormwater modelling software (e.g. HydroCAD) to isolate and quantify stormwater flow from the landfill surface with additional modelling (e.g. USGS Hantush stormwater basin model) used to evaluate infiltration to subsurface drainage flow beneath the basins.

4.0 | REPORTING

Data transmittals, memoranda, and/or brief task-specific reports will be generated during the investigation as part of consultation with USEPA and NHDES regarding interpretations of data and subsequent modifications to investigation scope of work or schedule. Upon completion of the scope of work, a stormwater investigation report will be prepared for review by the agencies and submitted within 60 days from the completion of the Spring 2019 stormwater sampling event. The report will include a narrative of activities completed, analytical data collected, interpretation of results, associated tables, figures and appendices, and recommendations for future activities, if any.

5.0 | REFERENCES

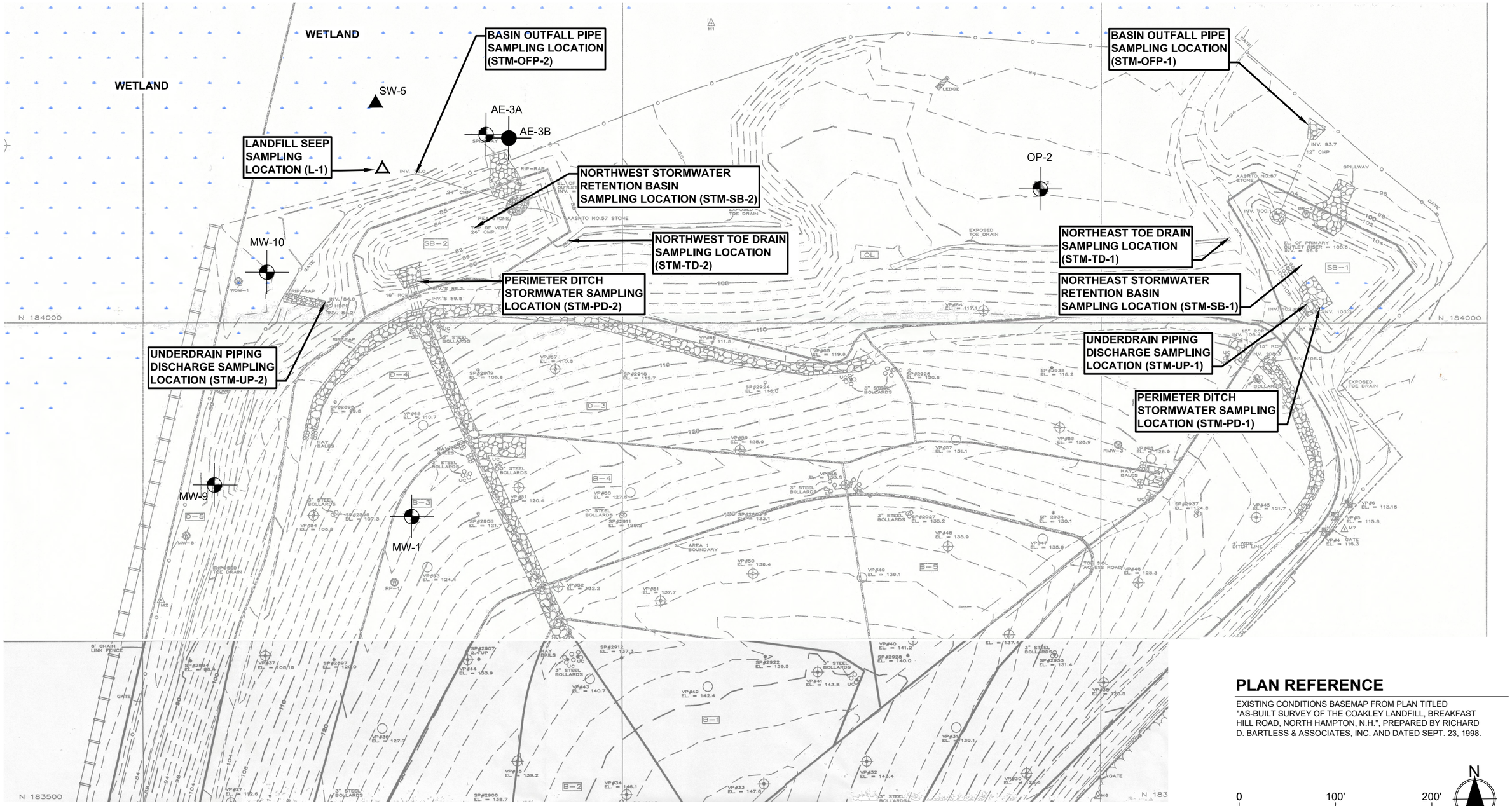
CES, Inc. (2017), Quality Assurance Project Plan (Revision 1), Coakley Landfill Superfund Site, North Hampton and Greenland, New Hampshire (September 2017). Prepared by CES, Inc. for The Coakley Landfill Group

CES, Inc. (2018), Sampling and Analysis Plan, Coakley Landfill Superfund Site, North Hampton and Greenland, New Hampshire (July 2018). Prepared by CES, Inc. for The Coakley Landfill Group

Golder Associates, Inc. (1996), Final (100%) Design Report, Coakley Landfill, North Hampton, New Hampshire (May 1996). Prepared by Golder Associates, Inc. for The Coakley Landfill Group

FIGURE 1

STORMWATER SAMPLING PLAN



PLAN REFERENCE

EXISTING CONDITIONS BASEMAP FROM PLAN TITLED "AS-BUILT SURVEY OF THE COAKLEY LANDFILL, BREAKFAST HILL ROAD, NORTH HAMPTON, N.H.", PREPARED BY RICHARD D. BARTLESS & ASSOCIATES, INC. AND DATED SEPT. 23, 1998.

0 100' 200'

N

PROJECT TITLE: COAKLEY LANDFILL SUPERFUND SITE NORTH HAMPTON & GREENLAND, NEW HAMPSHIRE	DWG: FIGURE 1	BY: BLQ	REV:	DESCRIPTION: FOR REVIEW	CES INC Engineers • Environmental Scientists • Surveyors
SHEET TITLE: STORMWATER INVESTIGATION SAMPLING PLAN	JN: 10424.020	DATE: 2018-09-05	REV DATE: 2018-10-12	DESCRIPTION: NOT FOR CONSTRUCTION	
	SCALE: 1"=100'	APPROVED BY: CB	ISSUE:		
		CHECKED BY: CB	ISSUE DATE:		

APPENDIX A

EXPANDED PFAS ANALYTE LIST

APPENDIX A
EXPANDED PFAS ANALYTE LIST

ANALYTE		CAS No.
PFPeA	Perfluoropentanoic Acid	2706903
PFBS	Perfluorobutane Sulfonic Acid	375735
PFBA	Perfluorobutanoic Acid	375224
PFUnA	Perfluoroundecanoic Acid	2058948
PFTrDA	Perfluorotridecanoate	862374876
PFTeDA	Perfluorotetradecanoic Acid	376067
PFOSA	Perfluorooctane Sulfonamide	754916
PFOS	Perfluorooctane Sulfonate	1763231
PFOA	Pentadecafluorooctanoic Acid	335671
PFNA	Perfluorononanoic Acid	375951
PFHxS	Perfluorohexane Sulfonate	355464
PFHxDA	Perfluorohexadecanoic Acid	67905195
PFHxA	Perfluorohexanoic Acid	307244
PFHpS	Perfluoroheptane Sulfonic Acid	375928
PFHpA	Perfluoroheptanoic Acid	375859
PFDS	Perfluorodecane Sulfonate	67906427
PFDoA	Perfluorododecanoic Acid	307551
PFDA	Perfluorodecanoic Acid	335762
MeFOSE	N-Methyl Perfluorooctane Sulfonamidoethanol	24448097
MeFOSAA	N-Methyl Perfluorooctane Sulfonamidoacetic Acid	2355319
MeFOSA	N-Methyl Perfluorooctane Sulfonamide	31506328
EtFOSE	N-Ethyl Perfluorooctane Sulfonamidoethanol	1691992
EtFOSAA	N-Ethyl Perfluorooctane Sulfonamidoacetic Acid	2991506
EtFOSA	N-Ethyl Perfluorooctane Sulfonamide	4151502
8:2 FTS	8:2 Fluorotelomer Sulfonate	39108344
6:2 FTS	6:2 Fluorotelomer Sulfonic Acid	27619972