

Proposed Plan For Landfill Sites FTMM-02 and FTMM-08 at Fort Monmouth

Oceanport, Monmouth County, New Jersey

July 2025

United States Department of the Army

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- Appendix A Record of Decision For Landfill Sites FTMM-02 and FTMM-09 At Fort Monmouth (October 2017)
- Appendix B Cost Estimate Supporting Documentation

Abbreviations

AR	Administrative Record
ARAR	applicable or relevant and appropriate requirement
bgs	below ground surface
CEA	classification exception area (for groundwater)
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	contaminant of concern
COPC	contaminant of potential concern
COPEC	contaminant of potential ecological concern
DCA	dichloroethane
EPA	U.S. Environmental Protection Agency
FTMM	Fort Monmouth
FS	Feasibility Study
ft	feet
GWQS	groundwater quality standard
IC	institutional control
LUC	land use controls
MCL	maximum contaminant level
MNA	monitored natural attenuation
NCP	National Oil and Hazardous Substance Pollution Contingency Plan
NJDEP	New Jersey Department of Environmental Protection
NFA	No Further Action
O&M	operations and maintenance
PCBs	polychlorinated biphenyls
PCE	tetrachloroethene
PP	Proposed Plan
PRG	preliminary remediation goal
RA	remedial action
RACR	remedial action completion report

RAO	Remedial Action Objective
RI	Remedial Investigation
ROD	Record of Decision
WRA	well restriction area

1.0 Introduction and Statement of Purpose

This Proposed Plan (“PP”) presents the second preferred remedy for a set of landfills which were previously investigated and remediated per the 2017 *Record of Decision (ROD) for Landfill sites FTMM-02 and FTMM-08 at Fort Monmouth, Oceanport, Monmouth County, New Jersey (October 18, 2017)*. This PP is completed in accordance with the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended (CERCLA), 42 U.S.C. § 9601, et seq. and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (“NCP”), 40 C.F.R. Part 300, the Defense Environmental Restoration Program, 10 U.S.C. §2701 et. seq., and U.S. Environmental Protection Agency (EPA) guidance. This PP is being issued by the United States Army (Army), the lead agency for site activities under Executive Order 12580, in consultation with the New Jersey Department of Environmental Protection Agency (NJDEP). The need for additional remedial actions were identified during implementation of the remedy selected per the 2017 ROD. The original remedy selected containment, in accordance EPA guidance on the presumptive remedy for military/municipal landfills. The Army constructed a Resource Conservation and Recovery Act Subtitle D-compliant cap for the landfills, covering all landfill waste without realizing a portion of the cap was placed on property not owned by the Army. This was verified by property surveys performed by the Army following landfill capping. After careful review of the site conditions, in consultation with property owners and the NJDEP, the Army is presenting a second preferred remedy to address the landfill exceedances, on that portion of the landfill waste that is on property not owned by the Army. The preferred alternative for these discrete areas is excavation and off-site disposal (FTMM-02) and placement of deed notice on property not owned by the Army (FTMM-08). After this PP is presented to the public for review and comment, the Army will select the preferred remedy by issuing a ROD Amendment for FTMM-02 and FTMM-08.

The Army is issuing this Proposed Plan, which will select the preferred alternative in a ROD Amendment in accordance with Section 117(a) of CERCLA, 40 CFR300.435(c)(2)(ii) e, and EPA guidance.

This PP will be available for public review and comment. In consultation with the NJDEP, the Army will select a final remedy for landfills FTMM-02 and FTMM-08 after reviewing and considering all comments submitted during the 30-day public comment period. The Army may modify the preferred alternatives or select another remedial action presented in this PP based on new information or public comments. Therefore, the public is encouraged to review and comment on all the alternatives presented in this PP. The final decision document for these two landfill sites will be a ROD Amendment.

The PP provides information on the preferred remedial action alternatives for addressing the landfill overlaps on property not owned by the Army at FTMM-02 and FTMM-08, outlines other remedial alternatives that were considered, and explains the basis for selecting the preferred alternatives. The PP will be placed in the Administrative Record (AR) per NCP 300.825(a)(2). The Administrative Record can be accessed at the Monmouth County Public Library:

Monmouth County Library, Eastern Branch
 1001 Route 35
 Shrewsbury, NJ 07702-4398
 Monday – Thursday, 9:00am – 9:00pm;
 Friday – Saturday, 9:00am – 5:00pm;
 Sunday 1:00pm – 5:00pm* (*closed Sundays in summer – Father’s Day through Labor Day Weekend)

2.0 Site History

2.1 Location and Site Description

Fort Monmouth (FTMM) is located in Monmouth County, New Jersey as shown in Figure 1. FTMM was comprised of the Main Post (MP), the Charles Wood Area (CWA), and the Evans Area (EA). FTMM falls within the Boroughs of Eatontown, Oceanport, and Tinton Falls. The MP is located in Eatontown and Oceanport Boroughs. The CWA is located in the Eatontown and Tinton Falls Boroughs.

The locations of the landfills FTMM-02 and FTMM-08 are shown on **Figure 2**. Summary descriptions of the individual landfill sites are presented in the following subsections. Detailed descriptions of each landfill, as well as a compilation of previous investigations and an evaluation of available analytical data collected from each site, can be found in the individual Remedial Investigation (RI) Reports referenced in Table 1 below and are available in the Administrative Record. At FTMM-08, a Feasibility Study (FS) was conducted since there were unacceptable risks and hazards to human health associated with direct contact with Contaminants of Potential Concern in soil.

Table 1 - FTMM-02 and FTMM-08 Reports

Site	Date
FTMM-02 Final Remedial Investigation	January 2016
FTMM-08 Final Remedial Investigation/Feasibility Study	April 2016
Record of Decision (ROD) for Landfill sites FTMM-02 and FTMM-08 at Fort Monmouth, Oceanport, Monmouth County, New Jersey	October 2017
Remedial Action Completion Report for Sites FTMM-02 and FTMM-08 PCB Hotspot Removal, Fort Monmouth, Oceanport, Monmouth County, New Jersey	2020
Letter, Army to NJDEP, Former Fort Monmouth Landfill (FTMM) Capping Project Summary of Changes to IRP Site FTMM-02 Scope of Work Request for NJDEP Concurrence	September 16, 2021
Memorandum for Record, Subject: Fort Monmouth Landfill Site FTMM-08	August 19, 2021

2.2 Site History

A study was conducted in 1980 (U.S. Army Toxic and Hazardous Materials Agency [USATHAMA], 1980), with a follow-up evaluation completed in 1988 (USATHAMA, 1988), at locations that were considered major landfill areas at Fort Monmouth. During the 1980 study, groundwater and surface water samples were collected and analyzed for compliance with National Primary and Secondary Drinking Water Standards. The study concluded that the targeted chemicals were not found at high enough concentrations to cause degradation to ground or surface water. Following the 1988 evaluation, it was recommended that FTMM submit a landfill registration statement to the NJDEP (USATHAMA, 1988).

The follow-up evaluation was completed in 1988 by USATHAMA to determine if environmental/hazardous waste disposal conditions at FTMM (including the landfills) had changed since the 1980 study. Based on an assessment of available data, USATHAMA did not conduct a site investigation (SI), but the assessment recommended that surface water and groundwater sampling at the landfills continue (USATHAMA, 1988). Numerous additional investigations were conducted at Fort Monmouth including the landfills over the past 30 years. The most recent RI or RI/FS report for each landfill includes a compilation of previous investigations and an evaluation of available analytical data collected from each site.

No enforcement activities have been conducted at the two landfill sites included in this PP.

2.2.1 FTMM-02

FTMM-02 is located in the southwest corner of the MP and is bordered by Mill Creek to the north, former Building 1122 to the east, an open grassed area to the west, and an abandoned railroad track bed to the south (**Figure 2**). FTMM-02 was in operation from approximately 1964 to 1968 and was reportedly used for the general disposal of domestic and industrial wastes. The landfill soil cover material ranges in thickness from 0 to 10 feet below the ground surface (bgs) and averages 2.4 feet thick.

2.2.2 FTMM-08

FTMM-08 is located in the northern portion of the MP and is bounded by Parkers Creek to the north, west, and east, and by Sherrill Avenue to the south (**Figure 2**). FTMM-08 was in use as a landfill between 1962 and 1981 and was reportedly used for the disposal of domestic and industrial waste. The landfill soil cover material ranges in thickness from 0 to 4 feet bgs and averages 2.4 feet thick.

2.2.3 Selected Remedy

The ROD for Landfill Sites FTMM-02 and FTMM-08 At Fort Monmouth Oceanport, Monmouth County, New Jersey, was signed by the Army on October 18, 2017. NJDEP concurred with the remedy described in the ROD on October 25, 2017. The ROD addressed landfills FTMM-02 and FTMM-08 with response actions to protect public health and

welfare and the environment as well as provide safety protection from exposure to solid waste at the landfills for future use and complied with the presumptive remedy of containment to address historic landfills.

Components of the ROD included the following actions:

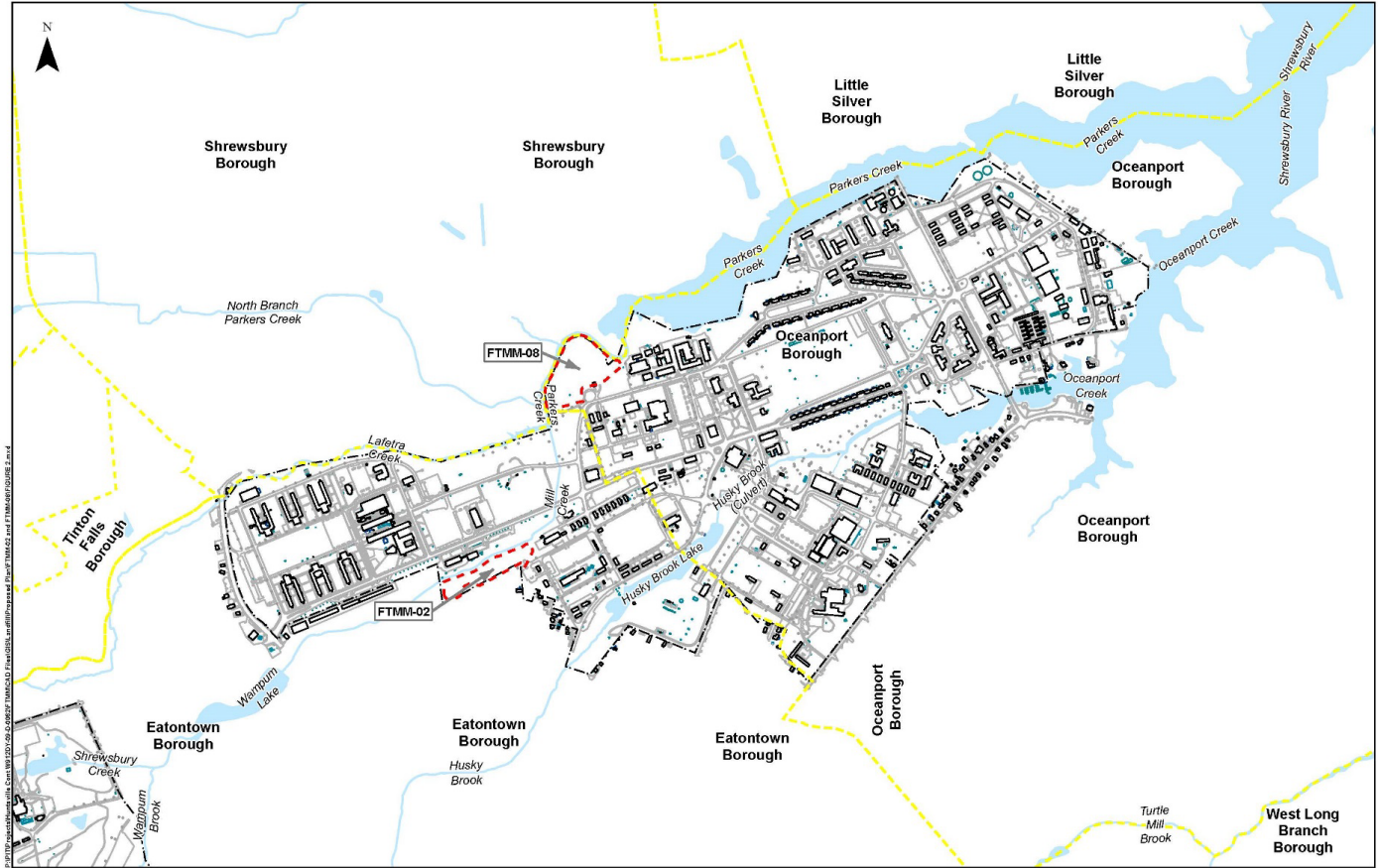
- Limited soil excavations of hot-spot isolated areas with concentrations of polychlorinated biphenyl (PCBs) exceeding 25 milligrams per kilogram (mg/kg)
- Installation of a two-foot vegetated soil cover
- Implementation of land use controls (LUCs), such as deed restrictions, to maintain specific land use.
- Establishing a Classification Exception Area (CEA) and Well Restriction Area (WRA) to prevent groundwater use at FTMM-02 and FTMM-08.

Containment is considered by USEPA to be a highly effective way to remediate historic landfills. USEPA identified containment as a presumptive remedy for historic landfills because it repeatedly has shown to be effective at treating similar wastes at other CERCLA sites. USEPA developed presumptive remedies to streamline the selection of cleanup methods for certain categories of sites by narrowing the consideration of cleanup methods to treatment technologies or remediation approaches that have a proven track record in the Superfund program. The Army, as lead agency, determined that it was appropriate to apply the presumptive remedy of capping for these two landfills based on the soil and contaminant characteristics found at the sites, and the guidance provided in the directive, Presumptive Remedy for CERCLA Municipal Landfill Sites, USEPA OSWER Directive No. 9355.0-49FS (September 1993). Further information on the selection of presumptive remedies for landfills at military installations is presented in the directive, *Application of the CERCLA Municipal Landfill Presumptive Remedy to Military Landfills, USEPA OSWER Directive No. 9355.0-67FS*.

Figure 1 - Location of Fort Monmouth, New Jersey



Figure 2 - Landfill FTMM-02 and FTMM-08 Location



2.3 Remedy Implementation

The following sections describe the implementation of the landfill remedies to date at FTMM-02 and FTMM-08. Landfill FTMM-02 Remedy Implementation To Date

The PCB remedial action (RA) was conducted between July 17, 2018, and October 21, 2019, and is documented in the *Remedial Action Completion Report for Sites FTMM-02 and FTMM-08 PCB Hotspot Removal, Fort Monmouth, Oceanport, Monmouth County, New Jersey* (PCBs RACR) (Parsons Corporation, 2020). As described in the PCBs RACR, the RA for PCBs in soil included excavation of the determined extents, offsite disposal of excavated soil at appropriate facilities, post-excavation sampling, and backfilling of excavations with clean fill. Additional information on this component of the RA for FTMM-02 can be found in the PCBs RACR.

A CEA was established across this landfill in 2000 and was based on the presence of benzene, chlorobenzene, MTBE, TBA, and lead. In 2001, the CEA was modified to apply to only the presence of benzene and chlorobenzene contaminants only. In 2011, the CEA was revised to include the presence of TBA (Parsons Corporation, 2016a). The 2016 Groundwater Report and the ROD (USACE, 2017b) concluded that the 2001 CEA required revision. As stated in the ROD for FTMM-02 and FTMM-08, the concentrations of benzene, MTBE, and TBA in groundwater at FTMM-02 should be monitored until concentrations are reduced below GWQS by natural attenuation. In 2021, groundwater was sampled at FTMM-02. Benzene and MTBE are below criteria. TBA is coming from an off-site source and therefore the CEA will be removed from landfill FTMM-02 as part of the final Remedial Action Report.

After clearing and grubbing of most of landfill FTMM-02, Army and NJDEP conducted a site walk on June 8, 2021, to discuss observations that suggested that the landfill limits previously defined, which extended into and across the wetland and drainage channel, should be further refined. During the site walk, Army presented proposed revisions to the landfill capping extents, which included the following:

- Adjusting the southern limit of landfill to match the JCP&L property line where a utility easement and former rail embankment that predated the landfill are present;
- Adjusting the southeastern limit of landfill to abut but not extend into Alexander Lane, which pre-dated landfilling activities at FTMM-02; and
- Adjusting the western limit of landfill to follow drainage features and wetlands that were present prior to the start of landfill operations.

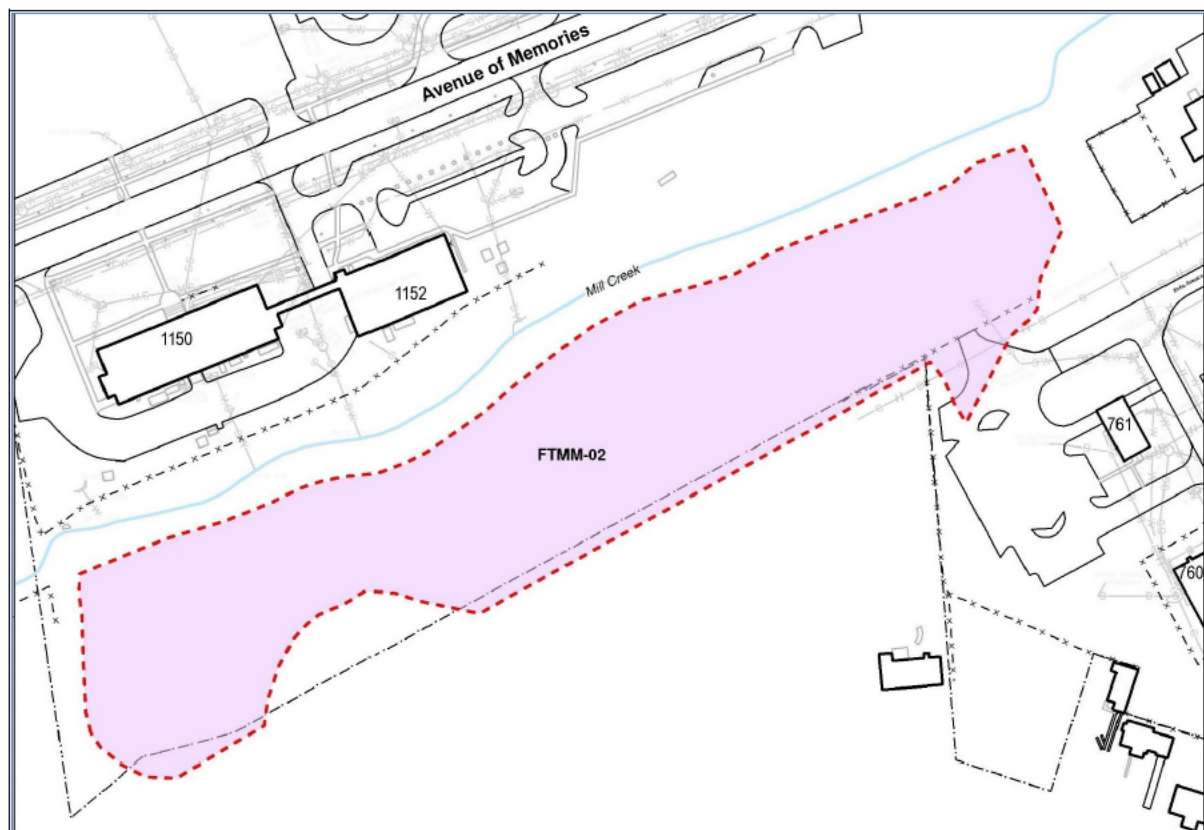
The Army documented these proposed revisions in correspondence to NJDEP dated September 16, 2021 (U.S. Army, 2021a). The NJDEP concurred with the revisions in correspondence to the Army dated November 18, 2021 (NJDEP, 2021d). These changes are reflected in the as-built construction drawings.

Construction activities at FTMM-02 began on July 28, 2021. Initial construction activities included the excavation of a key-in trench around the limit of landfill (LOL) to allow the 2-foot-thick cap to meet surrounding elevations. During subgrade preparation, a passive methane mitigation system consisting of two 100-foot-long trenches with perforated, 4-inch diameter high-density polyethylene

(HDPE) pipes was installed in a bed of washed stone. Perforated piping and washed stone were installed immediately below the 2-foot-thick landfill cap. Vent pipes, constructed from 4-inch diameter, ultraviolet (UV)-resistant, Schedule 80 polyvinyl chloride (PVC) pipe, were installed on 25-foot spacing along the length of the collection trenches. Once the subgrade was prepared, landfill capping construction began. Specifically, delineation fabric (Geotex[®] Orange Nonwoven Printed Demarcation Geotextile) was placed in sections overlapping 1 foot. Approximately 13,675 tons of common fill were imported and placed within the landfill extents. Common fill was placed in three, 8-inch loose lifts and compacted to a thickness of 6-inches, for a total thickness of 18-inches. Each lift was compacted by completing a minimum of three passes of the material with a 10-ton roller compactor. Common fill thickness was confirmed by survey and adjusted as needed. Topsoil was placed in one 6-inch loose lift. Approximately 3,900 (in-place) cubic yards of topsoil were imported and placed within the landfill extents. A walking path was also constructed on top of the 18-inch common fill layer at FTMM-02 consisting of one 6-inch thick, compacted layer of #10 screenings. Following topsoil placement, the landfill's side slopes were stabilized by placing temporary seed mix to prevent erosion before final seeding and restoration. Once the cap was completed it was determined that a portion of the landfill containing waste was located on non-Army property (see Figure 3)

Deed notices for the FTMM-02 landfill will be prepared and submitted as part of the final Remedial Action Report. The land use controls will also be documented in the Fort Monmouth Land Use Control Plan.

Figure 3 - Property Map Landfill FTMM-02



2.3.1 Landfill FTMM-08 Remedy Implementation To Date

As stated in the ROD (USACE, 2017b), the RA included limited soil excavations of hot-spot isolated areas with concentrations of PCBs exceeding 25 mg/kg. As described in the PCBs RAWP, the PCB element of the RA included excavation of the determined extents, offsite disposal of excavated soil at appropriate facilities, post-excavation sampling, and backfilling of the excavations with clean fill. This part of the RA was conducted between July 17, 2018, and August 31, 2019, and is documented in the PCBs RACR (Parsons Corporation, 2020).

After the Army issued the ROD for FTMM-02 and FTMM-08, NJDEP identified FTMM-08 as a foraging habitat for protected species and requested that the Army modify the RA to reduce the foraging habitat affected. The Army revised the remedy in coordination with NJDEP and FMERA and on August 19, 2021, the Army issued the MFR, Subject: *Fort Monmouth Landfill Site FTMM-08* (U.S. Army, 2021a). The MFR presented the following revised RA:

- Construct a continuous cap across the southern 4.2 acres of the landfill as previously proposed;
- Construct an 8-foot-high chain link fence between the northern and southern areas of the landfill; and
- Construct three discrete caps on the 5.3-acre northern portion of the landfill to protect the foraging habitat where there is potential ecological risk. Those three caps for contaminants of potential ecological concern (COPECs) will include a 2-foot soil cover that would taper into the surrounding area to appear as vegetated mounds.

In correspondence to the Army dated August 31, 2021, the NJDEP concurred with the changes described in MFR (NJDEP, 2021b).

Construction activities for the capping in the southern portion of FTMM-08 and the three COPEC capping areas began on November 15, 2021. Initial construction activities included the excavation of a key-in trench around the LOL to allow the 2-foot cap to meet the surrounding elevations. Once the subgrade was prepared, cap construction began. Specifically, delineation fabric was placed in sections overlapping 1-foot. Approximately 20,000 tons of common fill were imported and placed within the southern landfill extents and COPEC areas. Common fill was placed in three 8-inch loose lifts and compacted to a thickness of 6-inches, for a total thickness of 18-inches. Each lift was compacted by completing a minimum of three passes of the material with a 10-ton roller compactor. Common fill thickness was confirmed by survey and adjusted as needed. Topsoil was placed in one 6-inch loose lift. Approximately 4,300 (in-place) cubic yards of topsoil were imported and placed within landfill extents and COPEC areas. Following topsoil placement, the landfill's side slopes were stabilized by placing temporary seed mix and erosion control blankets to prevent erosion before final seeding and restoration. Once the cap was completed it was determined that a portion of the landfill containing waste was located on non-Army property (see Figure 4)

Fence installation around the Two Rivers Water Reclamation Authority (TRWRA) and Eatontown infrastructure and along the northern boundary of the soil cap on FTMM-08 began on September 15, 2022, and was completed on October 7, 2022.

Deed notices for the FTMM-08 landfill will be prepared and submitted as part of the final Remedial Action Report. The land use controls will also be documented in the Fort Monmouth Land Use Control Plan.

Previous groundwater investigations identified PCE, 4,4'-DDD, and lead at concentrations in groundwater at FTMM-08 exceeding the GWQSSs. A CEA will be prepared to address the groundwater contaminants above criteria and will be included with the Remedial Action Report.

Figure 4 - Property Map Landfill FTMM-08



3.0 Rationale for Selecting an Additional Preferred Remedy for FTMM-02 and FTMM-08 at Fort Monmouth

Following the implementation of the vegetative covers for landfills FTMM-02 and FTMM-08 it was determined that certain portions of landfills FTMM-02 and FTMM-08 were located on property that is not owned by the Army. The waste on non-Army property will need to be addressed. For FTMM-02, the Army proposes to excavate the landfill waste on non-Army property

and dispose of it off-site. This will allow the property owner to have unencumbered property. This is a fundamental change to the remedy of leaving waste in place with a vegetative cap as the primary component of the remedy.

As documented in the MFR referenced in Table 1, the remedy at landfill FTMM-08 was changed from providing a vegetative cap over the entire landfill to only capping a portion of the landfill and fencing the remaining portion of the landfill as an engineering control. This change was implemented during the initial remedy implementation to protect foraging habitat for threatened and endangered species. Therefore, documentation of this change is included as part of this ROD Amendment. The portion of the FTMM-08 landfill that is on non-Army property will be described in a deed restriction.

4.0 Scope and Role of the Proposed Alternatives

This Proposed Plan for the second preferred alternative presents remedial alternatives that address:

- Areas of Landfill FTMM-02 that exist on non-Army property will have waste removed and disposed of off-site.
- Area of Landfill FTMM-08 that exists on non-Army property will remain and be subject to Land Use Controls.
- Removal of the CEA at Landfill FTMM-02 as part of the remedy since that is no longer needed.
- Change to remedy at FTMM-08 to allow fencing in place of a vegetative cover for certain portions of the landfill as previously documented in a MFR for FTMM-08.

5.0 Remedial Action Objectives

The remedial action objective (RAO) for the FTMM-08 landfill site addressed in the 2017 ROD is to protect public health by preventing future workers and recreational users' exposure to COCs in soil and potential safety hazards that could pose an excessive carcinogenic risk or non-carcinogenic (non-cancer) hazard; and for FTMM-02 to protect future users from potential safety hazards associated with surficial construction/demolition debris and potential safety concerns associated with methane gas.

5.1 Applicable and or Relevant and Appropriate Requirements

Table 2 presents a detailed summary of the Applicable and or Relevant and Appropriate Requirements.

Table 2 - Summary of Applicable and Relevant or Appropriate Requirements

Media/Action	Requirement	Prerequisite	Citation
<i>Chemical Specific ARARs</i>			
Remediation of Soils as needed once removal of landfill waste is complete to ensure no soil contamination is left in place above the residential standard. Restoration of soils to allow for unrestricted use where landfill waste is removed from non-Army property.	The person responsible for the remediation will comply with all applicable remediation standards in effect at the time the remedial action workplan was approved by the New Jersey Department of Environmental Protection (NJDEP) per 7:26E Technical Requirement for Site Remediation. The person responsible for conducting the remediation shall comply with the remediation standards set forth in NJAC 7:26D	If presence of soil contaminants above Soil Remediation Standards above unrestricted use where landfill waste is removed from non-Army property. Relevant and Appropriate.	Site remediation is covered by 7:26E.5.1(d)4. Soil remediation standards are found in NJAC 7:26D Appendix 1 Table 1 “Soil Remediation Standards for the Ingestion, Dermal Exposure Pathway Residential”.
Remediation of groundwater as needed to meet Groundwater Quality Standards.	Pursuant to N.J.A.C. 7:26E, ground water contaminated above the applicable ground water remediation standards needs to be remediated.	If presence of contaminants in groundwater above Groundwater Quality Standards. Relevant and Appropriate.	Site remediation is covered by 7:26E.5.1(d)4. Groundwater Quality Standards are found in NJAC 7:9C Appendix 1 Table 1.

	In most situations, this requires some form of remedial action (i.e., active or passive (monitored natural attenuation (MNA))); establishment of a CEA.		
<i>Action Specific ARARs</i>			
General remedial action requirements for implementing remedies in New Jersey.	Remedial actions in New Jersey follow 7:26E 5.1 Remedial Action Requirements	Release of contaminants into environmental media. Relevant and Appropriate.	Remedial actions in New Jersey follow 7:26E 5.1 Remedial Action Requirements.
General requirements for transporting and disposal of solid waste in New Jersey	Pursuant to N.J.A.C. 7:26H solid waste in New Jersey shall be handled/transported and disposed properly according to the requirements of 7:26H.	As part of the remedy solid waste at the landfills will be excavated and disposed off site. Relevant and Appropriate	General requirements for solid waste in New Jersey are contained in NJAC 7:26H-1 and transportation specific requirements are contained in NJAC 7:26H-3

Chemical-Specific ARARs

The Soil Remediation Standards (SRS) presented in N.J.A.C. 7:26D (May 17, 2021) are chemical-specific ARARs applicable to this ROD Amendment and only apply to soils in areas where waste is to be removed and disposed offsite.

Action-Specific ARARs

At the landfill sites, the vegetated soil cover and or removal of waste material will be performed consistent with N.J.A.C. 7:26E. Solid waste transportation and disposal will be performed consistently with N.J.A.C. 7:26H.

6.0 Summary of Alternatives

Remedial alternatives were developed to address residual waste material located on non-Army property.

The alternatives to address residual waste material on non-Army property are:

- No Action with institutional controls (ICs).
- Removal of landfill waste material located on non-Army property and disposal offsite.

Each alternative represents a valid conceptual approach to remedial action rather than a specific design. The following sections present a detailed discussion of each alternative and an estimate of cost and timeframe. Costs were prepared as recommended in *A Guide to Developing and Documenting Cost Estimates During the Feasibility Study* (EPA 2000). Costs provided are present worth costs and do not include any annual O&M costs, periodic costs, and closeout costs as if waste is left in place, those annual O&M, period costs and closeout costs are assumed to be addressed with the rest of the landfill that is currently located on Army property and were already considered with the costs of the original remedy.

Alternative 1: No Further Action with ICs

Under this alternative it is assumed that no actions will be taken to remove landfill waste from non-Army property and that a deed notice will not be prepared for the remainder of the landfill(s) on non-Army property.

The estimated costs for Alternative 1 are as follows:

- Initial (capital) cost: \$0
- Annual O&M cost: \$0
- Closeout cost: \$0
- Estimated present worth cost: \$0

Alternative 1 was developed from the NCP provision that requires consideration of a limited or no action response to serve as a baseline for evaluating other remedial alternatives. Alternative 1 is not expected to result in the attainment of unlimited use/unrestricted exposure (UU/UE) for the non-Army property which the landowners are requiring.

Alternative 2: Removal of Landfill Waste from Non-Army Property at FTMM-02

Under this alternative, it is assumed that landfill waste material will be removed from non-Army property and post excavation samples will be collected to verify that underling soils meet the NJDEP Residential Soil Remediation Standards to allow for UU/UE. Once remediation standards are attained, the area will be backfilled with clean soil. Excavated waste material will be disposed offsite at a permitted landfill. This Alternative also includes removing the CEA from the site because current groundwater levels are less than relevant New Jersey Groundwater Quality Standards.

The estimated costs for Alternative 2 are as follows:

- Initial (capital) cost: \$908,424 (Appendix B)
- Annual O&M cost: \$0
- Closeout cost: \$0
- Estimated present worth cost: \$0

The estimated time needed to implement Alternative 2 is estimated to be approximately 6 months.

6.1 Comparative Analysis of Alternatives

To conduct a comprehensive analysis of the remedial alternatives, the NCP requires that each proposed alternative be assessed against the evaluation criteria (40 CFR 300.430(e)(9)). These criteria are separated into three categories: threshold, balancing, and modifying. Threshold criteria relate to the statutory requirements that the alternatives must satisfy. Balancing criteria are technical and are used as the primary basis for evaluation. Modifying criteria relate to state and public acceptance of the alternatives and are assembled formally after the public comment period. The nine criteria are listed in Table 3.

This section uses the results of the detailed evaluation of remedial alternatives to address a comparative analysis of the alternatives to identify the relative advantages and disadvantages of each. The potential remedial alternatives are compared with one another for each of the nine criteria analyzed. The results of the analysis are used to recommend a preferred remedial alternative.

Table 3 - Nine NCP Evaluation Criteria

Criteria Type	Criteria	Description
Threshold	1. Overall protection of human health and the environment	This criterion addresses whether an alternative provides adequate protection of human health and the environment and describes how risks posed through each exposure pathway are eliminated, reduced, or controlled through treatment, engineering control, or ICs.
	2. Compliance with ARARs	This criterion is used to determine how an alternative complies with ARARs.
Balancing	3. Long-term effectiveness and permanence	This criterion addresses the results of a remedial action in terms of the risk remaining after RAOs have been met. The primary focus of the evaluation is to determine the extent and effectiveness of the controls that may be required to manage the risk posed by residual contamination. The factors to be evaluated include the magnitude of risk remaining at the end of the remedial activities and the adequacy and reliability of controls used to manage remaining waste.
	4. Reduction in toxicity, mobility, and volume	This criterion addresses the statutory preference for selecting a remedial action that employs treatment to reduce toxicity, mobility, or volume of the contamination. The factors to be evaluated include the remediation process employed; the amount of hazardous material destroyed or treated; the degree of reduction expected in toxicity, mobility, or volume; and the type and quantity of residuals.
	5. Short-term effectiveness	This criterion addresses the effects of an alternative during the construction and implementation phases until the remedial actions have been completed and the selected level of protection has been achieved. Each alternative is evaluated with respect to its effect on the community and onsite workers, environmental impacts resulting from implementation, and the amount of time until protection is achieved.
	6. Implementability	This criterion addresses the technical and administrative feasibility of implementing an alternative and the availability of various services and materials required during its implementation. Technical feasibility considers construction and operation difficulties, reliability, ease of undertaking additional actions (if required), and the ability to monitor its effectiveness. Administrative feasibility considers activities needed to coordinate with other agencies in regard to obtaining permits or approvals for implementing remedial actions during the construction and implementation phase until the remedial actions have been completed and the selected level of protection has been achieved. Each alternative is evaluated with respect to its effect on the community and onsite workers, environmental impacts resulting from implementation, and the amount of time until protection is achieved.
	7. Cost	This criterion addresses the capital costs, annual operation and maintenance costs, and present worth analysis.
Modifying	8. State acceptance	This criterion evaluates the technical and administrative issue and concerns the NJDEP may have regarding each of the alternatives. This criterion is addressed in the forthcoming ROD and the responsiveness summary.
	9. Community acceptance	This criterion incorporates public concerns into the evaluation of the remedial alternatives. This criterion is addressed in the forthcoming ROD and the responsiveness summary.

6.1.1 Overall Protection of Human Health and the Environment

The goal of this criterion is to either eliminate the potential exposure to waste materials that could pose a physical hazard or in the case of landfill FTMM-08 could pose a health risk due to levels of contaminants in soil and groundwater. Alternative 1 does not include further capping or removal of waste or the implementation of land use controls to eliminate potential exposures and provides only limited protection of human health and the environment. Alternative 2 provides for the removal and disposal of waste material off-site and thus removes the human health and environment pathway for exposure and thus protects human health and the environment.

6.1.2 Compliance with ARARs

Alternative 1 does not comply with ARARs. Alternative 2 would comply with ARARs.

6.1.3 Long-Term Effectiveness

Alternative 1 does not include land use control (for landfill material off Army Property) and therefore, it cannot be confirmed that this alternative would be effective in the long term because it would not be known if receptors would be exposed to waste materials within the portion of landfill on non-Army property. Alternative 2 would achieve long-term effectiveness, primarily by preventing exposure through the removal of waste from non-Army property.

6.1.4 Reduction in Toxicity, Mobility, or Volume Through Treatment

Alternative 1 provides no reduction in toxicity, mobility, or volume of waste material. Alternative 2 would somewhat reduce the on-site volume through removal. Alternative 2 would somewhat reduce mobility by containing a limited amount of the waste off-site in a landfill designed for disposal of this waste.

6.1.5 Short-Term Effectiveness

There are no substantial risks to the community or the environment associated with any of the alternatives.

6.1.6 Implementability

No significant technical implementability issues are associated with any of the Alternatives. There are no action-specific administrative implement ability issues associated with any of the alternatives. Alternative 2 would require the removal of waste materials using standard construction equipment and disposal facilities for the waste to be generated are readily available.

6.1.7 Cost

The estimated present worth costs ranked from lowest to highest are:

1. Alternative 1: No further action (\$0).
2. Alternative 2: The estimated cost for excavation and disposal of waste material from non-Army

property is \$908,424. This estimate is based on a contractor proposal for this work (Appendix B).

6.1.8 State Acceptance

NJDEP has been consulted on the approach of removing waste and disposal off-site from landfills that are not on Army property. The NJDEP has indicated general concurrence with this approach but will have an opportunity to formally comment on this action as part of this Proposed Plan process.

6.1.9 Community Acceptance

The public will have an opportunity to review the preferred alternatives and provide comment to the Army. At the end of the public comment period, a responsiveness summary will be prepared and included with the ROD amendment that summarizes and responds to comments on the preferred alternative.

6.2 Preferred Alternative

Remedial alternatives were developed to address landfill waste existing on non-Army property. Alternative 2 is the preferred alternative. The Army proposes to amend the 2017 Record of Decision for Landfill sites FTMM-02 and FTMM-08 at Fort Monmouth to address the landfill waste located on non-Army property associated with landfill FTMM-02 through the removal and off-site disposal of the waste and backfilling and grading of the non-Army property. The PP documents the changes to the remedy at FTMM-08 whereby a portion of the landfill did not receive a vegetative cover but was addressed with a fence as an engineering control. Lastly this PP documents the removal of the CEA from landfill FTMM-02 as groundwater is no longer above criteria from Army releases.

7.0 Statutory Determinations

Based on available information, the Army believes the preferred alternative (Alternative 2) meets the threshold criteria and provide the best balance of tradeoffs among the other alternatives with respect to the balance and modifying criteria. NJDEP expects the preferred alternatives to satisfy the statutory requirements of CERCLA Section 121(b) 42 USC 9621, as follows:

- Protect human health and the environment
- Comply with ARARs
- Be cost effective
- Utilize permanent solutions to the maximum extent practicable
- Satisfy the preference for treatment as a principal element or explain why the preference for treatment will not be met

8.0 Public Participation

Public participation is an important component of remedy selection. The Army is soliciting input from the community on the preferred alternative identified for these sites. The comment period includes the advertisement of this Proposed Plan and a 30-day public comment period. Written comments will be accepted during this public comment period.

The Army and the NJDEP encourage the public to gain a more comprehensive understanding of the sites and the remedial activities that have been conducted at the sites. A copy of this Proposed Plan can be reviewed in person at the Monmouth County Public Library (address and hours provided in Section 1) or electronically through the website included in the advertisement of this PP. If there is sufficient public interest, the Army will hold a public meeting to explain the Proposed Plan and proposed remedial alternatives, and will extend the public comment period to include the public meeting, if needed.

Send written comments/questions about the Proposed Plan and requests for information to:

U.S. Army Corps of Engineers, New York District
Environmental, InterAgency, and International Services Branch
ATTN: Melissa Abt (melissa.abt@usace.army.mil)
26 Federal Plaza, 17th Floor
Room 17-401
New York, NY 10278

Comments made by the public will be addressed in a Responsiveness Summary. The Responsiveness Summary will be included in the Record of Decision Amendment and will be added to the FTMM Administrative Record file and information repositories.

9.0 References

40 CFR 300.430(f)(2). U.S. Environmental Protection Agency, “Remedial Investigation/Feasibility Study and Selection of Remedy,” *Code of Federal Regulations*.

42 USC 9617. “Public Participation,” *United States Code*.

EPA (U.S. Environmental Protection Agency), 1988. *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA*.

EPA (U.S. Environmental Protection Agency), 2000. *A Guide to Developing and Documenting Cost Estimates During the Feasibility Study*, EPA 540-R-00-002/OSWER 9355.0-75, Office of Emergency and Remedial Response, Washington D.C., July.

NJDEP (New Jersey Department of Environmental Protection), Letter of Concurrence for ROD for FTMM-02 and FTMM-08, October 25, 2017.

Remedial Investigation/Feasibility Study Report for Site FTMM-08, Fort Monmouth, Oceanport, Monmouth County, New Jersey, April 2016

Final Remedial Investigation Report for Site FTMM-02, Fort Monmouth, Oceanport, Monmouth County, New Jersey, January 2016

Letter, Army to NJDEP, Former Fort Monmouth Landfill (FTMM) Capping Project Summary of Changes to IRP Site FTMM-02 Scope of Work Request for NJDEP Concurrence, September 16, 2020

Memorandum For Record, Fort Monmouth Landfill Site FTMM-08, August 19, 2021

Record of Decision (ROD) for Landfill sites FTMM-02 and FTMM-08 at Fort Monmouth, Oceanport, Monmouth County, New Jersey, October 2017

Appendix A

Record of Decision Landfills FTMM-02 and FTMM-08

**RECORD OF DECISION FOR
LANDFILL SITES FTMM-02 and
FTMM-08 AT FORT MONMOUTH**

OCEANPORT, MONMOUTH COUNTY, NEW JERSEY

October 2017



U.S. Corps of Engineers, New York District

and

U.S. Army Engineering and Support Center, Huntsville, Alabama

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LIST OF ACRONYMS

ACRONYM	DEFINITION
µg/kg	micrograms per kilograms
°F	°Fahrenheit
amsl	above mean sea level
BEE	Baseline Ecological Evaluation
ARAR	Applicable or Relevant and Appropriate Requirement
Army	the U.S. Army
ASE	Annual Sampling Event
bgs	below ground surface
BRAC	Base Realignment and Closure
BSE	Baseline Sampling Event
CEA	Classification Exception Area
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
cis-1,2-DCE	cis-1,2-dichloroethene
COC	constituent of concern
COPC	constituent of potential concern
CWA	Charles Wood Area
EA	Evans Area
EC	engineering controls
FFSRA	Federal Facility Site Remediation Agreement
FS	Feasibility Study
FTMM	Fort Monmouth
GWQS	Ground Water Quality Standards
HHRA	human health risk assessment
HRC	Hydrogen Releasing Compound
IC	Institutional control
IGW	Impact to Groundwater
LTM	long-term monitoring
LUC	land use controls
LUCIP	land use control implementation plan
mg/kg	milligram per kilogram
MP	Main Post
NCP	National Contingency Plan
NFA	no further action
N.J.A.C.	New Jersey Administrative Code
NJDEP	New Jersey Department of Environmental Protection
NPW	net present worth
NRDCSRs	Non-Residential Direct Contact Soil Remediation Standard
O&M	operation and maintenance

ACRONYM	DEFINITION
ORC	Oxygen Release Compound
PCB	polychlorinated biphenyl
PCE	tetrachloroethene
PDI	pre-design investigation
RAOs	remedial action objectives
RDCSRS	Residential Direct Contact Soil Remediation Standard
RI	remedial investigation
ROD	Record of Decision
RSL	Regional Screening Level
SI	site investigation
SL	screening level
SVOCs	Semi-volatile organic compounds
SWQS	Surface Water Quality Standard
TCE	trichloroethene
TRSR	Technical Requirements for Site Remediation
TSCA	Toxic Substance Control Act
USACE	U.S. Army Corps of Engineers
USATHAMA	U.S. Army Toxic and Hazardous Materials Agency
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
VOCs	volatile organic compounds

SECTION 1 - DECLARATION

1.1 SITE NAME AND LOCATION

This Record of Decision (ROD) presents the presumptive remedy for two former landfills located at Fort Monmouth (FTMM) in Oceanport, Monmouth County, New Jersey. FTMM was comprised of the Main Post (MP) and Charles Wood Area (CWA) and the Evans Area (EA). FTMM falls within the Boroughs of Eatontown, Oceanport, and Tinton Falls. The MP is located in the Eatontown and Oceanport Boroughs. The CWA is located in the Eatontown and Tinton Falls Boroughs. Landfills FTMM-02 and FTMM-08 are located on the MP.

1.2 STATEMENT OF BASIS AND PURPOSE

The presumptive remedy was selected in accordance with the requirements of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980, as amended by the Superfund Amendments and Reauthorization Act of 1986 (Title 42 United States Code Section § 9601, et seq.) and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), as amended, Title 40 CFR Part 300. The presumptive remedy is consistent with the New Jersey Department of Environmental Protection (NJDEP) regulations (New Jersey Administrative Code [N.J.A.C.] 7:26). FTMM has not been placed on the CERCLA National Priorities List. The Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) identification number for FTMM is NJD980529762.

The U.S. Army (Army) is the lead federal agency under CERCLA and Executive Order 12580, and has selected the presumptive remedy for the two former landfills. The NJDEP is the state support agency under the NCP for FTMM and concurs with the remedy. The decision documented in this ROD is based on and relies on the Administrative Record file for FTMM.

The Army was prepared to present the Proposed Plan for the two former landfills at a public meeting scheduled on April 12, 2017, however no one from the public was in attendance. No public comments on the Proposed Plan for the landfills were submitted or received.

1.3 ASSESSMENT OF THE SITE

The response action selected in this ROD is necessary to protect public health and welfare and will provide safety protection from exposure to solid waste at the landfills for future use and it complies with the presumptive remedy of containment to address historic landfills.

1.4 DESCRIPTION OF THE SELECTED REMEDY

The major components of the presumptive remedy for the two former landfills consist of limited soil excavations of hot-spot isolated areas with concentrations of polychlorinated biphenyl (PCBs) exceeding 25 milligrams per kilogram (mg/kg), followed by the installation of a vegetated soil cover, and implementation of land use controls (LUCs).

Since there are areas where PCBs were detected in soils at both sites, the Army considered both the NJDEP Guidance on Coordination of NJDEP and U.S. Environmental Protection Agency (USEPA) PCB Remediation Policies (NJDEP, 2013) in evaluating the remedial alternatives. The USEPA considers sites to be remediated if PCB concentrations in soil do not exceed 1 mg/kg or if the final remedial levels are greater than 1 mg/kg and less than or equal to 25 mg/kg and the site is covered with an appropriate cap. Therefore, limited soil excavations of isolated areas will be conducted to remove soils with PCB concentrations in excess of the Toxic Substance and Control

Act (TSCA) self-implementing cleanup level of 25 mg/kg. A pre-design investigation (PDI) was conducted at each site in September 2016 to support the limited PCB hot-spot removal and the lateral and vertical extent of PCB concentrations greater than 25 mg/kg were defined.

After removal and off-site disposal of isolated hot-spot soil areas, a vegetated soil cover will be placed over each landfill. At FTMM-02, the soil cover will be installed to provide safety protection for non-residential use from future exposure to solid waste at the landfill. At FTMM-08, the soil cover will be installed to provide public health protection due to potential direct contact with constituents of potential concern (COPC) in soils. The vegetated soil cover will be placed consistent with the NJDEP regulations (N.J.A.C. 7:26E-5.2(d)). Additional soil will be added to the existing soil cover to provide a minimum of two feet of clean soil between the ground surface and landfilled debris. The use of a vegetated soil cover will offer safety protection for future use from exposure to solid waste (e.g.; construction/demolition debris) at the landfills and will also control surface water runoff and erosion. A passive methane mitigation system will be installed to address potential safety concerns at the FTMM-02 landfill. Two 100-foot-long trench systems will be located within the landfill boundary and vented to the surface in 25 foot centers. The location of the venting system will be installed along the south-eastern edge of the landfill to correspond with sampling points M2SG12 and M2SG22. The intent of this passive venting system is in lieu of continued methane monitoring at the landfill after the installation of the vegetative soil cover.

LUCs to maintain the soil cap and prevent residential land use will also be implemented at the landfills. The Army will prepare a Land Use Control Implementation Plan (LUCIP) to set forth the manner in which the institutional controls (ICs) will be implemented, document the location of the engineering controls (EC), and identify the procedural responsibilities including landfill cover inspections, monitoring and reporting, and long-term management requirements.

The Army will be responsible for documenting and implementing the LUCs, which is expected to occur through the filing of a deed notice at the time of property transfer, and would also be responsible to conduct reviews to ensure that the LUCs remain protective of human health and the environment. When the property is transferred out of federal control, the LUCs would be incorporated into the title and the new owner would be responsible for complying with the LUCs. Although the Army may later transfer its procedural responsibilities to another party by contract, property transfer agreement, or through other means, the Army would retain ultimate responsibility for remedy integrity.

In addition, the existing Classification Exception Area (CEA) and a Well Restriction Area (WRA) at FTMM-02 will be revised and a CEA/WRA will be established at FTMM-08 to restrict groundwater use or installation of drinking water wells at FTMM-02 and FTMM-08 landfills. ICs in the form of CEA/WRA which restrict the use of groundwater will be implemented and will remain in place until NJDEP Groundwater Quality Standards (GWQS) for the identified constituents of concern (COCs) are achieved at the sites.

1.5 STATUTORY DETERMINATIONS

The selected remedy provides safety protection from exposure to solid waste at the landfills for future use, complies with Federal and State laws and regulations that are applicable or relevant and appropriate to the remedy, and is cost effective. The remedy uses permanent solutions to the maximum extent practicable. The remedy does not satisfy the statutory preference for treatment.

CERCLA §121 requires 5-year review (statutory reviews) of sites where the remedial action does not achieve concentrations of hazardous substances acceptable for unrestricted use. Five-year reviews will be conducted in compliance with CERCLA § 121(c) and the 40 CFR § 300.430(f)(4)(ii).

1.6 DATA CERTIFICATION CHECKLIST

Table 1 provides the location of key remedy selection information contained in ROD Section II, Decision Summary. Additional information can be found in the FTMM Administrative Record file at the Environmental Restoration Program Information Repository located at the Monmouth County Library, Eastern Branch, 1001 Route 35, Shrewsbury, New Jersey 07702.

Table 1
ROD Certification Checklist

Criterion	Discussion
COPCs and their respective concentrations	Included in Section 2.6.2
Baseline risk represented by the COPCs	Included in Section 2.8
Cleanup levels established for COCs and the basis for these levels	Included in Section 2.9
How source materials constituting principal threats are addressed	Included in Section 2.10
Current and reasonably anticipated future land use assumptions and current and potential future beneficial uses of groundwater used in the risk assessment	Included in Section 2.4
Potential land and groundwater uses that will be available at the site as a result of the Selected Remedy	Included in Section 2.8
Estimated capital, operation and maintenance (O&M), and total net present worth (NPW) costs; discount rate; and number of years over which the remedy costs are projected	Included in Section 2.10.3
Key factors that led to the selection of the remedy	Included in Section 2.10

1.7 AUTHORIZING SIGNATURES

Under Executive Order 12580, the Army is the lead agency responsible for implementation of the selected remedy, with support from the NJDEP. This signature page documents the Army's selected remedy, consisting of limited PCB hot-spot removal in soil, a vegetated soil cover, and implementation of LUCIP. In addition, NJDEP concurrence with the ROD is through their concurrence letter.



Tom Lederle, Chief U.S. Army BRAC Division

18 October 2017

Date

SECTION 2 - DECISION SUMMARY

2.1 SITE NAME, LOCATION, AND DESCRIPTION

FTMM is located in the central-eastern portion of New Jersey in Monmouth County, approximately 45 miles south of New York City, New York, 70 miles northeast of Philadelphia, Pennsylvania, and 40 miles east of Trenton, New Jersey. The Atlantic Ocean is approximately 3 miles to the east. FTMM was comprised of three areas: the MP, the CWA, shown on **Figure 1**, and the EA (not shown). FTMM's MP and CWA were selected for closure by the BRAC Commission in 2005, and officially closed on September 15, 2011. (The EA was closed under BRAC in 1998 and has since been transferred from FTMM.)

This ROD addresses landfills FTMM-02 and FTMM-08. The locations of the landfills are shown on **Figure 2**. Summary descriptions of the individual landfill sites are presented in the following subsections. Detailed descriptions of each landfill, as well as a compilation of previous investigations and an evaluation of available analytical data collected from each site, can be found in the individual Remedial Investigation (RI) Reports (**Table 2**). In addition, at FTMM-08, a Feasibility Study (FS) was conducted since there were unacceptable risk and hazards to human health associated with direct contact with COPCs in soil.

Table 2
Report Submittal Dates

Landfill	Report	Submitted to NJDEP
FTMM-02	Final RI	January 2016
FTMM-08	Final RI/FS	April 2016

2.2 SITE HISTORY AND ENFORCEMENT ACTIVITIES

2.2.1 FTMM Landfill Site Background

A study was conducted in 1980 (U.S. Army Toxic and Hazardous Materials Agency [USATHAMA], 1980), with a follow-up evaluation completed in 1988 (USATHAMA, 1988), at locations that were considered major landfill areas. A timeline of significant events, including the years of operation since FTMM opened nearly 100 years ago is provided on **Figure 3**. During the 1980 study, groundwater and surface water samples were collected and analyzed for compliance with National Primary and Secondary Drinking Water Standards. The study concluded that the targeted chemicals were not found at high enough concentrations to cause degradation to ground or surface water. Following the 1988 evaluation, it was recommended that FTMM submit a landfill registration statement to the NJDEP (USATHAMA, 1988).

The follow-up evaluation was completed in 1988 by USATHAMA to determine if environmental/hazardous waste disposal conditions at FTMM (including the landfills) had changed since the 1980 study. Based on an assessment of available data, it was recommended that USATHAMA not conduct a site investigation (SI), but that surface water and groundwater sampling at the landfills continue (USATHAMA, 1988). Numerous investigations were conducted at FTMM including the landfills over the past 30 years. The most recent RI or RI/FS report for

each landfill includes a compilation of previous investigations and an evaluation of available analytical data collected from each site.

No enforcement activities have been conducted at the two landfill sites included in this ROD.

2.2.2 FTMM-02

FTMM-02 is located in the southwest corner of the MP and is bordered by Mill Creek to the north, former Building 1122 to the east, an open grassed area to the west, and an abandoned railroad track bed to the south (**Figure 4**). FTMM-02 was in operation from approximately 1964 to 1968 and was reportedly used for the general disposal of domestic and industrial wastes. The landfill soil cover material ranges in thickness from 0 to 10 feet below the ground surface (bgs) and averages 2.4 feet thick.

2.2.3 FTMM-08

FTMM-08 is located in the northern portion of the MP and is bounded by Parkers Creek to the north, west, and east, and by Sherrill Avenue to the south (**Figure 5**). FTMM-08 was in use as a landfill between 1962 and 1981, and was reportedly used for the disposal of domestic and industrial waste. The landfill soil cover material ranges in thickness from 0 to 4 feet bgs and averages 2.4 feet thick.

2.3 COMMUNITY PARTICIPATION

A final Proposed Plan for FTMM-02 and FTMM-08 was completed and released to the public in March 2017 at the Eatontown Public Library, 33 Broad Street, Eatontown, New Jersey 07724.

A newspaper notification was posted in the Asbury Park Press on March 29 and 30, 2017 to inform the public of the start of the comment period, to solicit comments from the public, and to announce the public meeting. A public comment period was held from Tuesday, March 28, 2017 to Thursday, April 27, 2017 during which no comments from the public were received. A public meeting was held on Wednesday, April 12, 2017 to present the proposed remedy for the two landfills and seek public comments. At this meeting, representatives from the Army and U.S. Army Corps of Engineers (USACE) were present and prepared to answer questions about the sites and the presumptive remedy under consideration; however, no one from the public was in attendance and therefore no comments were received at the public meeting.

2.4 SCOPE AND ROLE OF REMEDY

This ROD describes the remedy to address safety concerns at two former landfills at FTMM. Results from the RI for FTMM-02 concluded that risks to human health and the environment from soil and groundwater at the landfill are within acceptable ranges for the current and future intended land use which consists of passive open spaces, and therefore, no further action (NFA) is required under CERCLA. Although risks from soil, which included an assessment of PCBs in soil were within acceptable ranges, there are areas at FTMM-02 where PCBs were detected and due to their presence require further consideration based on NJDEP Guidance on Coordination of NJDEP and USEPA PCB Remediation Policies (NJDEP, 2013). Results from the RI for FTMM-08 concluded that there were unacceptable risks and hazards to human health and the environment and therefore a FS was conducted at FTMM-08 associated with direct contact with COCPs in soil.

Since there are areas where PCBs were detected at concentrations greater than 25 mg/kg in soil at both (FTMM -02 and FTMM-08) sites, limited hot-spot removal will be conducted at both

landfills in localized areas where PCB concentrations are in excess of 25 mg/kg. Following hot-spot removal, the selected alternative is to place a vegetated soil cover over the landfills. LUCs to maintain the soil cap and prevent residential land use will be implemented at the landfills. In addition, CEA/WRAs will be in effect until NJDEP GWQS are achieved at the sites.

Containment is considered by USEPA to be a highly effective way to remediate historic landfills in many cases. USEPA has identified containment as a presumptive remedy for historic landfills because it repeatedly has been shown to be effective at treating similar wastes at other CERCLA sites. USEPA developed presumptive remedies to streamline the selection of cleanup methods for certain categories of sites by narrowing the consideration of cleanup methods to treatment technologies or remediation approaches that have a proven track record in the Superfund program. The Army, as lead agency, has determined that it is appropriate to apply the presumptive remedy of capping for these two landfills based on the soil and contaminant characteristics found at the sites, and the guidance provided in the directive, Presumptive Remedy for CERCLA Municipal Landfill Sites, USEPA OSWER Directive No. 9355.0-49FS (September 1993). Further information on the selection of presumptive remedies for landfills at military installations is presented in the directive, *Application of the CERCLA Municipal Landfill Presumptive Remedy to Military Landfills*, USEPA OSWER Directive No. 9355.0-67FS.

2.5 DOCUMENTATION OF SIGNIFICANT CHANGES

The Proposed Plan for the two landfill sites was released for public comment in March 2017. No changes occurred to the proposed remedy following the public comment period.

2.6 SITE CHARACTERISTICS

2.6.1 Physical Characteristics

The following subsections describe the general physical characteristics of the MP at FTMM, as well as the two landfills individually (see Section 2.6.1.7). The RI and RI/FS Reports cited in Table 2.1 include further detailed descriptions of the physiography, topography, vegetation, geology, hydrogeology, and surface water at each of the landfill sites.

2.6.1.1 Physiography, Topography, and Vegetation

The MP is located within New Jersey's Atlantic Coastal Plains Physiographic Province, which is comprised of sedimentary beds that gently dip to the southeast. The Coastal Plains Physiographic Province sedimentary beds are dissected by meandering rivers that drain to the Raritan or Delaware River. The topography at FTMM is relatively flat, and has an elevation of 20 to 25 feet above mean sea level (amsl).

Major vegetation zones at FTMM consist of landscaped areas, estuarine and fresh water wetlands, riparian areas, upland forests, and old field habitats. Much of the upland areas of the MP consist of extensive areas of regularly mowed lawns and landscaped areas.

2.6.1.2 Geology

The MP is situated on New Jersey Coastal Plain deposits that thicken to the southeast. The unconsolidated material in the Coastal Plain deposits date from Cretaceous through the Quaternary Periods and consists of sand, silt, clay, and glauconitic clay. The depth to crystalline bedrock at FTMM is approximately 1,000 feet. The geology of the Long Branch Quadrangle indicates that the Hornerstown, Vincentown, and Tinton Formations are the unconsolidated units that outcrop or

occur close to the ground surface in the area of FTMM and are summarized below.

Hornerstown Formation

The Hornerstown Formation underlies much of the MP, consists of glauconitic (>50%) clay and silty clay. This unstratified formation is approximately 25 to 30 feet thick and is olive, dark green, and black where unweathered; and olive-brown with brown to reddish-brown mottles where weathered.

Vincentown Formation

The Vincentown Formation unconformably overlies the Hornerstown Formation and consists of glauconitic (5-20%), silty, medium-to-coarse, quartz sand; some fine-to-medium sand; and some very coarse sand to very fine pebbles. This formation is yellow, reddish-yellow, olive-yellow, or olive-brown in color and has a total thickness of 180 feet.

Tinton Formation

The Tinton Formation unconformably underlies the Hornerstown Formation and consists of glauconitic (5-30%), silty, medium-to-coarse and fine-to-medium, quartz sand. The color is reddish-brown, reddish-yellow, or yellowish-brown where weathered, and grayish-brown, brown, and olive-brown where unweathered. It is commonly iron-cemented into beds and masses as much as 15 feet thick. The uppermost 4 to 6 feet, just below the contact with the Hornerstown Formation, is a brown to olive-gray, glauconitic, clayey silt to sandy or silty clay.

2.6.1.3 Groundwater

FTMM lies in the Atlantic and Eastern Gulf Coastal Plain groundwater region. This groundwater region is underlain by unconsolidated to semi-consolidated sedimentary deposits. The chemistry of the water near the surface is variable with low dissolved solids and high iron concentrations. The water chemistry in areas underlain by glauconitic sediments (such as Tinton and Hornerstown Sands) is dominated by calcium, magnesium, manganese, aluminum and iron.

The water table aquifer in the MP area is identified as part of the “Navesink-Hornerstown Confining Units,” or minor aquifers. The minor aquifers that underlie FTMM include the Tinton Sand, Hornerstown Sand, and Vincentown Formation.

Groundwater is typically encountered at the MP and in the surrounding areas at shallow depths (2 to 9 feet below ground surface [bgs]); groundwater elevations fluctuate with the tidal action in area creeks. Shallow groundwater in the MP area is locally influenced by the following factors:

- Tides (due to proximity to the Atlantic Ocean);
- Topography;
- Nature of the fill material within the MP area;
- Presence of clay and silt lenses in the natural overburden deposits; and
- Local groundwater recharge areas (e.g., streams, lakes).

N.J.A.C. 7:9-6, GWQS establishes quality criteria for different classes of groundwater. Class II-A, which is defined as all groundwater that is not classified as one of the other special classes, is the appropriate class for groundwater at Fort Monmouth. The primary designated use for Class II-A groundwater is potable water; secondary uses include agricultural and industrial water. However, groundwater at FTMM is not used for potable purposes since a municipal water supply

is currently used at FTMM.

2.6.1.4 Surface Water

The northeastern and southeastern portions of the MP are bordered by Parkers Creek and Oceanport Creek, respectively, and the southern portion of the MP is bordered by Husky Brook Lake. The Shrewsbury River is located within one mile to the east of the MP.

The U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory indicates the presence of wetlands at the MP. Parkers and Oceanport Creeks are classified as estuarine and marine deep water with estuarine and marine wetland areas. Husky Brook Lake is classified as a fresh water pond.

Surface water bodies in the vicinities of the two landfill sites include:

- FTMM-02: Bordered by Mill Creek to the north; and
- FTMM-08: Bounded by Parkers Creek to the north, west, and east.

2.6.1.5 Soils

Per the Monmouth County Soil Survey (U.S. Department of Agriculture [USDA], 2008), much of the MP is covered by urban, developed land with disturbed soils. Surface soils near the MP generally consist of sandy loams ranging in depth from 9 to 12 inches. The surface soils are underlain by sandy loam, sandy clay loam, or loam that may grade to loamy sand at a depth of approximately 5 feet bgs. Some areas at the MP are covered by impermeable surfaces such as roads, parking lots, and buildings.

2.6.1.6 Climate

The climate in the Fort Monmouth area is typically humid subtropical and is impacted by continental and oceanic influences. The proximity to the Atlantic Ocean tends to minimize seasonal temperature fluctuations as compared to interior regions of the state. Based on data obtained from the National Weather Service, the temperature at FTMM ranges from 20 degrees Fahrenheit (°F) to 90°F (average of 57°F), and precipitation averages 42 inches per year. Winter is typically cold with occasional nor'easters (storms that mainly affects the northeastern part of the United States), resulting in rain along the coast; springs are mild, with the average temperature in the 50's and common thunderstorms; summers are hot and humid, with rare hurricanes; and autumns are similar to spring in terms of temperature and precipitation, although unpredictable weather is common.

2.6.1.7 Topography, Geology, and Hydrogeology of the Two Sites

FTMM-02

FTMM-02 is located adjacent to Mill Creek to the north. The ground surface topography is flat, with ground surface elevations of less than 20 feet amsl. The landfill soil cover material ranges in thickness from 0 to 10 feet bgs with an average of 2.4 feet thick. Soil to a depth of at least 8 feet bgs at FTMM-02 is comprised of grey, black, and brown silty clay, tan and grey or brown silty sand with some gravel and clay, or brown and tan sand with some gravel. Shallow soil is comprised of brown silty sand, sometimes underlain by peat. Deeper soil is comprised of silt or silty sand (encountered at approximately 10 to 15 feet bgs) underlain by glauconitic soil (encountered at

approximately 15 to 20 feet bgs). The depth to groundwater typically is approximately 8 feet bgs. Groundwater consistently migrates towards the north-northwest, toward Mill Creek.

FTMM-08

FTMM-08 is located adjacent to Parkers Creek, bounding the site along the north, west, and east. The ground surface topography is flat, with ground surface elevations ranging from 5 to 13.5 feet amsl. The landfill soil cover material ranges in thickness from 0 to 4 feet bgs with an average of 2.4 feet thick. The soil cover is composed primarily of sand and silty sand. Shallow soil to a depth of 16 feet bgs is composed of brown silty sand underlain by gray/brown sandy silt. Deeper soil to a depth of 40 feet bgs is composed of orange/brown to dark green, poorly graded sand with silt. The depth to groundwater at FTMM-08 ranges from 1 to 19 feet bgs. Groundwater migrates northwest, north, and northeast (i.e., toward Parkers Creek).

2.6.2 Summary and Findings of Site Investigations

The following subsections describe environmental investigation activities for soil, groundwater, surface water, and sediments for both landfills covered by this ROD.

2.6.2.1 FTMM-02 Environmental Investigations

Soil

A total of 390 near-surface soil samples were collected from 193 borings from November 1998 to June 1999. The samples were collected between 6 and 12 inches bgs except for the volatile organic compound (VOC) samples, which were collected at approximately 24 inches bgs.

A total of 622 soil samples were collected and analyzed for total PCBs from 73 Geoprobe® borings in the eastern and western portions of FTMM-02 in February 1999 for a focused PCB soil investigation. Samples were collected continuously every six inches from the ground surface to the groundwater table, approximately 8 feet bgs.

A total of 208 soil samples were collected from Geoprobe® borings from March 1999 through January 2000 to delineate VOC (benzene and chlorobenzene) concentrations in the soil and shallow groundwater. Samples were collected continuously from the ground surface (1 foot bgs) to just below the groundwater table to 9 feet bgs.

Concentrations of one VOC, six semi-volatile organic compounds (SVOCs), three pesticides, five PCBs plus total PCBs, and 14 metals exceeded their current NJDEP Residential Direct Contact Soil Remediation Standard (RDCSRS) and/or USEPA Regional Screening Level (RSL) in at least one soil sample. VOCs, SVOCs, metals, pesticides, and PCBs were evaluated as COPCs in soil in the human health risk assessment (HHRA), and none were identified as COCs. However, the presence of PCBs in soil required further consideration based on the NJDEP Guidance on Coordination of NJDEP and USEPA PCB Remediation Policies (NJDEP, 2013).

A total of 37 soil samples were collected from 18 borings in September 2016 for the PDI. Samples were collected in two areas (central-west and central-east) at depths ranging from 3.3 to 8.5 feet bgs depending on historical concentrations and were analyzed for PCBs. Soil samples were collected until PCB concentrations were less than 25 mg/kg to determine the horizontal and vertical extent of the areas to be excavated.

Groundwater

Between 1995 and 2000, 24 groundwater monitoring wells were installed at FTMM-02 to investigate and monitor contaminants in groundwater. Groundwater sampling was conducted quarterly from May 1997 through 2013. Groundwater samples were analyzed for metals, VOCs, pesticides, PCBs, and SVOCs until June 2004 when the groundwater long-term monitoring (LTM) program was reduced to 16 wells and samples were analyzed only for VOCs based upon approval from the NJDEP. The sampling data from the most recent eight quarters (November 2009 to August 2011), the August 2013 Baseline Sampling Event (BSE) (Parsons, 2014), and the 2014 Annual Sampling Event (ASE) were evaluated as being representative of recent conditions. Following the recommendations in the August 2013 BSE report (Parsons, 2014), NJDEP subsequently agreed to the continuation of annual groundwater sampling for VOCs at select monitoring wells (NJDEP, 2014). VOCs and one metal were evaluated as COPCs for groundwater in the HHRA.

Injections of Oxygen Release Compounds (ORC) were performed at six distinct areas in and around FTMM-02 where elevated concentrations of VOCs (benzene and chlorobenzene) were detected in shallow groundwater. The NJDEP approved the implementation of an Enzyme-Enhanced Bioremediation program, supplemented by ORC. Four ORC injections events were performed at the landfill from March 2001 through July 2005 (U.S. Army, 2012).

Surface Water

To determine whether site-related contamination had impacted nearby surface waters, quarterly sampling was performed from October 1996 to September 2010. During the most recent eight quarters of surface water sampling (December 2008 to September 2010), two VOCs (tetrachloroethene [PCE] and trichloroethene [TCE]) were the only VOCs that exceeded NJDEP Surface Water Quality Standard (SWQS). However, it was determined that the PCE and TCE concentrations exceeding the SWQS originated from an offsite source and upstream of FTMM-02. No COPC were identified in the surface water for evaluation in the HHRA.

Sediment

Sediment sampling was conducted in April 2000 along Mill Creek to evaluate PCB-related impacts to stream sediments associated with FTMM-02. No PCBs were detected in the 26 samples above the NJDEP and USEPA criteria. No COPCs were identified in sediment for evaluation in the HHRA.

As part of the 2010 Baseline Ecological Evaluation (BEE) (Shaw, 2012), 12 sediment samples were collected from Mill Creek adjacent to FTMM-02. Samples were analyzed for VOCs, SVOCs, pesticides, PCBs, and metals. The BEE concluded that constituents in sediment at FTMM-02 were unlikely to have a deleterious effect on sensitive ecological receptors or habitats and additional assessments are not warranted or recommended.

2.6.2.2 FTMM-08 Environmental Investigations

Soil

A total of 614 near-surface soil samples were collected from 291 borings from November 1998 through June 1999. Samples collected at approximately 2 feet bgs were analyzed for VOCs, and samples collected between 0.5 and 1 foot bgs were analyzed for metals, SVOCs, pesticides, and PCBs. Concentrations of one VOC, 18 SVOCs, eight pesticides, three PCBs, and 17 metals

exceeded their current NJDEP RDCSRS and/or USEPA Residential Soil RSL in at least one near-surface soil sample (0 to 2 feet bgs). Concentrations of 14 SVOCs, six pesticides, three PCBs, and eight metals exceeded their NJDEP NRDCSRS and/or USEPA Industrial Soil RSL in at least one near-surface soil sample. Concentrations of 11 VOCs, 30 SVOCs, 10 pesticides, four PCBs, and 18 metals exceeded their NJDEP Impact to Groundwater (IGW) Screening Level (SL) and/or USEPA Protection of Groundwater RSL in at least one near-surface soil sample. The maximum-detected concentrations of all the metals targeted for analysis exceeded their maximum background concentrations for the MP. PCB concentrations exceeding NJDEP and USEPA screening criteria were also detected to a depth of 15.5 feet bgs in deeper borings. VOCs, SVOCs, metals, and PCBs were evaluated as COPCs in soil in the HHRA, and 6 SVOCs, one PCB, and one metal were identified as COCs.

Supplemental soil samples were collected from 22 soil borings in August and October 1999 near a well located in the center of the landfill for PCB-impacted soil delineation and to confirm that site soil was the source of PCB groundwater contamination. A total of 293 samples were collected from the surface to 0.5 feet bgs and then at alternating half foot intervals (1 to 1.5 feet, 2 to 2.5 feet, etc.) to depths of 7.5 to 16.5 feet bgs.

A total of 50 soil samples were collected from 27 borings in September 2016 for the PDI. Samples were collected in three areas (northeast, northwest, and central) at depths ranging from 1 to 15.5 feet bgs depending on historical concentrations and were analyzed for PCBs. Soil samples were collected until PCB concentrations were less than 25 mg/kg to determine the horizontal and vertical extent of the areas to be excavated.

Groundwater

In 1994, 1995, 1998, 1999, and in 2010, a total of 16 groundwater monitoring wells were installed at FTMM-08 to investigate and monitor contaminants in groundwater and to determine if leachate from the landfill was impacting groundwater quality. Quarterly groundwater monitoring occurred from June 1997 to August 2011. The sampling data from the most recent eight quarters (December 2009 to August 2011), the August 2013 BSE, and the 2014 ASE were evaluated as being representative of recent conditions. Following the recommendations in the August 2013 BSE report (Parsons, 2014), NJDEP subsequently agreed to the continuation of annual groundwater sampling for VOCs at select monitoring wells (NJDEP, 2014).

Injections of Hydrogen Releasing Compound (HRC[®]) were performed at two areas at FTMM-08 to enhance the degradation of PCE concentrations detected in shallow groundwater at adjacent landfill site FTMM-05 using naturally occurring microorganisms already present in the subsurface. The injections were performed over multiple 3- to 6-month time periods in 2000, 2002, 2003, 2004, and 2005 to facilitate the enhanced anaerobic degradation of PCE in groundwater.

Detected analyte concentrations were compared to Federal and State screening criteria for potable water, as well as MP-specific background concentrations for metals to identify COPCs. During this period, concentrations of 11 VOCs, one pesticide, and 19 metals exceeded their NJDEP GWQS and/or the USEPA Tapwater RSL in at least one sample. Concentrations of 13 of these 19 metals also exceeded the maximum background concentration for the MP. VOCs and one metal were evaluated as COPCs for groundwater in the HHRA.

Surface Water

To determine whether site-related contamination had impacted nearby surface waters, quarterly sampling was performed from October 1996 to September 2010. During the most recent eight quarters of surface water sampling (December 2008 to September 2010), two VOCs (PCE and cis-1,2-dichloroethene [cis-1,2-DCE]) and four metals (arsenic, mercury, thallium, lead) were detected at concentrations exceeding NJDEP SWQS. However, it was determined that PCE, cis-1,2-DCE, arsenic, mercury, and thallium concentrations exceeding the SWQS originated from an offsite source upstream of FTMM-08. The single exceedance of lead in downstream surface water was determined to be an anomaly and unrepresentative. No COPCs were identified in the surface water for evaluation in the HHRA.

Sediment

Sampling was conducted in Parkers Creek in April 2000 to evaluate PCB-related impacts to stream sediments associated with FTMM-08. One PCB (Aroclor 1254) was detected in two of 21 samples at concentrations that exceeded the NJDEP RDCSRS, Non-Residential Direct Contact Soil Remediation Standard (NRDCSRS), and the USEPA Residential and Non-Residential Soil RSL. Although PCBs were detected in near-surface soils at isolated locations at FTMM-08, Aroclor 1254 was not detected in the soil samples. Therefore, it is likely that one or more sources upstream or otherwise outside of FTMM-08 have contributed PCBs to the sediments in Parkers Creek and therefore there are no sediment COPCs.

A total of 10 sediment samples were also collected from Parkers Creek adjacent to FTMM-08 as part of the 2010 BEE (Shaw, 2012). Samples were analyzed for VOCs, SVOCs, pesticides, PCBs and metals. The BEE concluded that constituents in sediment at FTMM-08 were unlikely to have a deleterious effect on sensitive ecological receptors or habitats and additional assessments are not warranted or recommended.

2.7 CURRENT AND POTENTIAL FUTURE LAND AND RESOURCE USES

2.7.1 Current and Potential Land Use

The two sites have been inactive landfills since their respective closure dates (see Figure 3). The anticipated land use for the two landfills is passive open space (EDAW, Inc., 2008). Land planned for use as “open space” is expected to remain undeveloped, with only occasional maintenance activities (e.g., grounds keeping), utility work associated with underground or overhead utilities that may be present within the site boundary, and recreational activity (e.g., hiking and biking on established trails).

2.7.2 Groundwater and Surface Water Uses

Neither groundwater nor surface water are used as a drinking water source by current outdoor workers or indoor workers at FTMM, because municipal water is provided for use. Surface water at FTMM is not currently used for recreational purposes.

2.8 SUMMARY OF SITE RISKS

An HHRA evaluation of the potential risk from human exposure to contaminants in soil, surface water, sediment, and groundwater was conducted as part of the RI at each of the two landfills. The HHRA evaluated exposure of current/future outdoor workers, future utility workers, and future recreational users to COPCs in soil and groundwater through dermal contact, incidental

ingestion, and inhalation of particulates.

No COPCs were identified in surface water or sediment at either of the landfill sites. Therefore, further evaluation of surface water or sediment in the HHRA was not conducted and no unacceptable risks were expected from human exposure to surface water or sediment. Groundwater at FTMM is not used as a drinking water source, because municipal water is provided for use. Therefore, there are no current exposures to groundwater. The following sections summarize the HHRA results for each site.

2.8.1 FTMM-02 Summary of Site Risks

No COPCs were identified for surface water or sediment at FTMM-02; these media were not further evaluated in the HHRA. Site risk based on current and future land use as passive open space for current/future outdoor workers, utility workers, or future recreational users were less than the risk ranges of 1×10^{-4} to 1×10^{-6} for carcinogenic and non-carcinogenic hazard goal of 1 and when above these ranges remedial actions may be required. The results are summarized as follows:

- For outdoor workers exposed to soil at FTMM-02, the cumulative carcinogenic risk of 9×10^{-5} is less than 1×10^{-4} . The cumulative non-carcinogenic hazard is 0.8, which is less than the cumulative hazard goal of 1.
- For utility workers exposed to soil at FTMM-02, the cumulative carcinogenic risk of 1×10^{-6} is less than 1×10^{-4} . The cumulative non-carcinogenic hazard is 0.3, which is less than the cumulative hazard goal of 1.
- For recreational users exposed to soil at FTMM-02, the cumulative carcinogenic risk of 3×10^{-5} is less than 1×10^{-4} . The cumulative non-carcinogenic hazard is 0.1, which is less than the cumulative hazard goal of 1.
- Lead in soil was evaluated separately from the other constituents. The calculated non-carcinogenic hazards are 0.08, 0.05, and 0.02 for outdoor workers, utility workers, and recreational users, respectively. Lead hazards at FTMM-02 are less than the hazard goal of 1.
- For utility workers exposed to groundwater through dermal contact and incidental ingestion, the cumulative carcinogenic risks for all wells is 7×10^{-9} , which is less than 1×10^{-4} . The cumulative non-carcinogenic hazard for all wells is 0.02, which is less than the cumulative hazard goal of 1.

2.8.2 FTMM-08 Summary of Site Risks

No COPCs were identified for surface water or sediment at FTMM-08; these media were not further evaluated in the HHRA. Site risk based on current and future land use as passive open space for current/future outdoor workers, utility workers, or future recreational users were less than the risk ranges of 1×10^{-4} to 1×10^{-6} for the carcinogenic and non-carcinogenic hazard goal of 1 and when above these ranges remedial actions may be required. The results are summarized as follows:

- For outdoor workers exposed to soil at FTMM-08, the cumulative carcinogenic risk of 9×10^{-4} is greater than 1×10^{-4} , which is the cancer risk above which a remedial action

may be required. The cumulative non-carcinogenic hazard index is 2, which is greater than the cumulative hazard goal of 1.

- For utility workers exposed to soil at FTMM-08, the cumulative carcinogenic risk of 1×10^{-5} is less than 1×10^{-4} . The cumulative non-carcinogenic hazard is 0.6, which is less than the cumulative hazard goal of 1.
- For recreational users exposed to soil at FTMM-08, the cumulative carcinogenic risk of 3×10^{-4} is greater than 1×10^{-4} , which is the cancer risk above which a remedial action may be required. The cumulative hazard index is 0.3, which is less than the cumulative hazard goal of 1.
- Lead in soil was evaluated separately from the other constituents. The calculated non-carcinogenic hazards are 0.3, 0.2, and 0.1 for outdoor workers, utility workers, and recreational users, respectively. Lead hazards at FTMM-08 are less than the hazard goal of 1.
- For utility worker exposed to groundwater, the cumulative carcinogenic risks for all wells is 7×10^{-10} , which is less than 1×10^{-4} , which is the cancer risk above which a remedial action may be required. The cumulative non-carcinogenic hazard index for all wells is 0.04, which is less than the hazard goal of 1.

2.8.3 Ecological Risks

A BEE (Shaw, 2012) was performed at the MP and CWA to fulfill requirements set forth in NJDEP's TRSR (N.J.A.C. 7:26E-5.3). The objective of the BEE was to determine whether potential ecological impacts were negligible or whether more site-specific ecological evaluation was warranted. The BEE concluded that exceedances of ecological screening criteria have been sufficiently evaluated and addressed for ecological consideration and that no additional ecological evaluation was necessary. In an August 27, 2012 letter, the NJDEP accepted the 2012 BEE report's recommendations and conclusions and concurred that no further evaluation of ecological risk is required at either of the landfills.

2.9 REMEDIAL ACTION OBJECTIVES

The remedial action objective (RAO) for the FTMM-08 landfill site addressed in this ROD is to protect public health by preventing future workers and recreational users' exposure to COCs in soil and potential safety hazards that could pose an excessive carcinogenic risk or non-carcinogenic (non-cancer) hazard; and for FTMM-02 to protect future users from potential safety hazards associated with surficial construction/demolition debris and potential safety concerns associated with methane gas.

The cleanup levels and basis for the COCs at FTMM-08 are listed in **Table 3**.

Table 3
Cleanup Levels for COCs in Soil at FTMM-08

COC	Cleanup Level	Basis
SVOC		
Benzidine	700 micrograms per kilogram (µg/kg)	NJDEP NRDCSRS
Benzo(a)anthracene; Benzo(b)fluoranthene	2 mg/kg	NJDEP NRDCSRS
Benzo(k)fluoranthene	23 mg/kg	NJDEP NRDCSRS
Benzo(a)pyrene; Dibenz(a,h)anthracene	200 µg/kg	NJDEP NRDCSRS
PCB		
Aroclor 1242	25 mg/kg	TSCA
Metal		
Arsenic	19 mg/kg	NJDEP NRDCSRS

2.10 SELECTED REMEDY

This ROD represents the selected remedy for landfills FTMM-02 and FTMM-08 located at FTMM. A limited hot-spot PCB soil removal will be conducted at localized areas defined at each landfill where the PCB concentrations exceed 25 mg/kg. Following excavation and re-grading, a vegetated soil cover will be placed over the landfills. LUCs to maintain the soil cover and prevent residential land use will be implemented at the landfills. A passive methane mitigation system will be installed at FTMM-02 to address potential safety concerns. Two 100-foot-long trench systems will be located within the landfill boundary and vented to the surface in 25 foot centers. The location of the venting system will be installed along the south-eastern edge of the landfill to correspond with sampling points M2SG12 and M2SG22. The intent of this passive venting system is in lieu of continued methane monitoring at the landfill after the installation of the vegetative soil cover.

Containment is considered by USEPA to be a highly effective way to remediate historic landfills in many cases. USEPA has identified containment as a presumptive remedy for historic landfills because it repeatedly has been shown to be effective at treating similar wastes at other CERCLA sites. USEPA developed presumptive remedies to streamline the selection of cleanup methods for certain categories of sites by narrowing the consideration of cleanup methods to treatment technologies or remediation approaches that have a proven track record in the Superfund program. The Army, as lead agency, has determined that it is appropriate to apply the presumptive remedy of capping for these two landfills based on the soil and contaminant characteristics found at the site, and the guidance provided in the directive, Presumptive Remedy for CERCLA Municipal Landfill Sites, USEPA OSWER Directive No. 9355.0-49FS (September 1993). Further information on the selection of presumptive remedies for landfills at military installations is presented in the directive, *Application of the CERCLA Municipal Landfill Presumptive Remedy to Military Landfills*, EPA OSWER Directive No. 9355.0-67FS.

Restrictions on groundwater use will be placed on the groundwater at FTMM-02 and FTMM-08 to address exceedances of water quality standards at these landfills.

2.10.1 Summary of the Rationale for the Selected Response Action

The limited hot-spot PCB excavation, placement of a vegetative cover, and implementation of LUCs are appropriate responses for these two landfill sites. The USEPA considers sites to be remediated if PCB concentrations in soil do not exceed 1 mg/kg or if the final remedial levels are greater than 1 mg/kg and less than or equal to 25 mg/kg and the site is covered with an appropriate cap. Therefore, soils with PCB concentrations in excess of 25 mg/kg will be excavated from both FTMM-02 and FTMM-08, consistent with the coordination of NJDEP and USEPA PCB Remediation Policies (NJDEP, 2013). Excavated soils containing PCB concentrations less than 25 mg/kg will remain onsite and will be used to backfill the excavated areas at the landfills; and the excavated soils with concentrations greater than 25 mg/kg will be disposed of off-site at an approved TSCA facility.

The RI at FTMM-02 concluded that risks to human health and the environment from soil are within acceptable ranges. Although risks from soil, which included an assessment of PCBs in soil were within acceptable ranges, there are areas at FTMM-02 where PCBs were detected and due to their presence require further consideration based on NJDEP Guidance on Coordination of NJDEP and USEPA PCB Remediation Policies. The response action is to provide safety protection for non-residential use from future exposure to solid waste and potential safety concerns associated with methane gas at the landfill. At FTMM-08, the response action is to prevent chemical exposure and provide public health protection due to potential direct contact with COCs specifically polynuclear aromatic hydrocarbons (PAHs) and arsenic in near surface soils.

2.10.2 Detailed Description of the Implementation of Selected Remedy

A limited hot-spot PCB soil removal will be conducted at localized areas defined at each landfill where the PCB concentrations exceed 25 mg/kg. Excavation will be conducted at FTMM-02 in two areas (central-east and central-west) and at FTMM-08 in three areas (northeast, northwest, and central). A PDI was conducted at each site to determine lateral and vertical extent of PCB concentrations greater than TSCA cleanup level of 25 mg/kg. Based on historical data and the PDI results, areas to be excavated and disposed of off-site have been estimated. At FTMM-02, a total of 210 cubic yards of soil is expected to be excavated and at FTMM-08, a total of 60 cubic yards of soil is to be excavated.

Following excavation and re-grading, a vegetated soil cover will be placed over the landfills. To address safety concerns at FTMM-02 and to prevent chemical exposure at FTMM-08, a vegetated soil cover will be placed over the landfill area after the landfill is regraded. The conceptual design for the vegetated soil cover is shown on **Figure 6**. The vegetated soil cover will be placed consistent with the applicable NJDEP regulations. Additional soil will be added to the existing soil cover to provide a minimum of two feet of clean soil between the ground surface and landfilled debris. The use of a vegetated soil cover will offer safety protection to future users from exposure to landfill debris, to provide public health protection due to potential direct contact with COCs in near surface soils at FTMM-08, and will also control surface water runoff and erosion.

LUCs to maintain the soil cap and prevent residential land use will also be implemented at the landfills. The Army will prepare a LUCIP to set forth the manner in which the ICs will be implemented, document the location of the ECs, and identify the procedural responsibilities including landfill cover inspections, monitoring and reporting, and long-term management requirements.

The Army will be responsible for documenting and implementing the LUCs, which is expected to occur through the filing of a deed notice at the time of property transfer. The Army will also be responsible to conduct reviews to ensure that the LUCs remain protective of human health and the environment. When the property is transferred out of federal control, the LUCs will be incorporated into the title and the new owner will be responsible for complying with the LUCs. Although the Army may later transfer its procedural responsibilities to another party by contract, property transfer agreement, or through other means, the Army retains ultimate responsibility for remedy integrity.

In addition, the CEA/WRA at FTMM-02 will be revised and a CEA/WRA will be established at FTMM-08 to prevent access to and use of the groundwater underlying these landfills. ICs in the form of CEA/WRA will be implemented and will remain in place until NJDEP GWQS are achieved at the sites. CEA/WRA ensures groundwater in the area is restricted until standards are achieved.

2.10.3 Summary of the Estimated Costs for the Selected Remedy

The Army will be responsible for documenting and implementing the LUCs, through the filing of a deed notice and will also be responsible to conduct reviews to ensure that the LUCs remain protective of human health and the environment. When the property is transferred to private ownership, the LUCs will be incorporated into the title and the new owner will be responsible for complying with the LUCs. Although the Army may later transfer its procedural responsibilities to another party by contract, property transfer agreement, or through other means, the Army shall retain ultimate responsibility for remedy integrity.

The costs associated with the limited hot-spot soil removal, installation of the landfill covers, and the implementation and O&M of LUCs and CEA/WRA are summarized in **Table 4**.

2.11 STATUTORY DETERMINATIONS

The selected remedy satisfies the statutory requirements of CERCLA §121 and the NCP, as described below.

2.11.1 Protection of Human Health and the Environment

There were no unacceptable risks to human health and the environment at FTMM-02 but there were at FTMM-08 (specifically PAHs and arsenic), as defined by CERCLA, for the current and reasonably anticipated future use of the landfill sites which is passive open space at FTMM. Although risks from soil, which included an assessment of PCBs in soil were within acceptable ranges, there are areas at FTMM-02 where PCBs were detected and due to their presence required further consideration based on NJDEP Guidance on Coordination of NJDEP and USEPA PCB Remediation Policies. Human exposure to site soils will be controlled by the placement and maintenance of a vegetative soil cap and maintenance of LUCs at the sites. In addition, IC in the form of a CEA/WRA will be implemented for FTMM-02 and FTMM-08 and will remain in place until NJDEP GWQS are achieved at the sites. The RAOs would be achieved and selected remedy is considered protective of human health and the environment.

2.11.2 Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)

The selected remedy complies with the chemical- and action-specific ARARs described below.

Chemical-Specific ARARs

The GWQS (N.J.A.C. 7:9C-1.7(c), Appendix Table 1) are chemical-specific ARARs applicable to this ROD, and only apply to groundwater at FTMM-02 and FTMM-08. Groundwater at these two sites will be monitored biennially until such time it is determined that the following GWQS have been attained through natural attenuation:

Compound	Medium	USEPA Maximum Contaminant Level (µg/L)	NJDEP GWQS (µg/L)
<i>Landfill FTMM-02</i>			
Benzene	Groundwater	5	1
Methyl Tertbutyl Ether	Groundwater	No Level Established (NLE)	70
Tert Butyl Alcohol	Groundwater	NLE	100
<i>Landfill FTMM-08</i>			
Tetrachloroethene	Groundwater	5	1
4,4-DDD	Groundwater	NLE	0.1
Lead	Groundwater	15	5

The New Jersey Soil Remediation Standard (N.J.A.C. 7:26D-4.2) for PCBs is an applicable chemical-specific ARAR for the cleanup of PCBs in soil and, at 1.0 mg/kg for non-residential use, is more stringent than the federal standard of 25 mg/kg. However, where the remediated area will be covered, as the selected remedy for FTMM-02 and FTMM-08 requires, the residual risk from using a higher cleanup standard is addressed. Accordingly, the NJDEP has waived the soil remediation requirement of N.J.A.C 7:26D-4.2 because the soil cover and LUC components of the selected remedy address risk and protect human health and the environment.

Action-Specific ARARs

At the landfill sites, the vegetated soil cover will be placed consistent with N.J.A.C. 7:26E-5.2(d).

2.11.3 Cost-Effectiveness

The selected remedy meets the statutory requirement for a cost-effective remedy. The costs are presented Table 4.

Table 4
Estimated Costs for Selected Remedy

Cost	FTMM-02	FTMM-08
<i>Capital Costs</i>		
Limited PCB Removal	\$386,000	\$159,000
Land Use Controls	\$68,800	\$68,800
• LUC Implementation Plan	\$30,000	\$30,000
• Update Master Planning Maps	\$25,000	\$25,000
• Contingency (25%)	\$13,800	\$13,800
Landfill Cover	\$1,559,900	\$1,549,900
• Design and Construction	\$288,000	\$288,000
• Methane Mitigation System	\$10,000	\$0
• Soil Cover Installation	\$945,500	\$945,500
• Geotechnical Borings	\$6,400	\$6,400
• Contingency (25%)	\$310,000	\$310,000
Total Capital Costs	\$2,014,700	\$1,777,700
<i>Periodic Costs</i>		
Total Present Value Periodic Costs ^{a/}	\$330,000	\$345,000
<i>O&M Costs</i>		
Total Present Value O&M Costs ^{a/}	\$120,000	\$120,000
TOTAL PRESENT VALUE BY SITE ^{b/}	\$2,464,700	\$2,242,700
TOTAL PRESENT VALUE BOTH SITES	\$4,707,400	

^{a/} Discounted rate of 1.90% has not been applied to these values.

^{b/} Discounted rate of 1.90% has been applied; 30-Year, Real Discount Rate from White House Office of Management and Budget, Circular A-94 Appendix C, Revised December 2013

2.11.4 Utilization of Permanent Solutions and Alternative Treatment (or Resource Recovery) Technologies to the Maximum Extent Practicable

Active remediation is required to achieve the safety goals developed for these two sites. The selected remedy does not employ treatment to eliminate contaminants present at the site; however, the selected remedy satisfies the criteria for long-term effectiveness by preventing unacceptable exposures to site soil through maintenance of a vegetative cover. Permanent reduction of constituents will be accomplished through a limited PCB hot-spot soil removal of concentrations in excess of the TSCA self-implementing cleanup level of 25 mg/kg, installation of a vegetated soil cover, and enforcement of LUCs at the sites. The Army will be responsible for documenting

and implementing the LUCs, which is expected to occur through the filing of a deed notice at the time of property transfer, and would also be responsible to conduct reviews to ensure that the LUCs remain protective of human health and the environment. When the property is transferred out of federal control, the LUCs would be incorporated into the title and the new owner would be responsible for complying with the LUCs. Although the Army may later transfer its procedural responsibilities to another party by contract, property transfer agreement, or through other means, the Army would retain ultimate responsibility for remedy integrity.

2.11.5 Preference for Treatment as a Principal Element

The selected remedy does address principal threats posed by the sites through the use of treatment technologies of removal, containment, risk and hazard management whereas a limited PCB hot-spot removal and subsequent vegetated soil cover will be implemented and RAOs will be achieved. The selected response action is protective of human health and the environment. In addition, chemical concentrations of PCBs present in site media will be reduced via excavation and off-site disposal.

2.11.6 Five-Year Review Requirements

Because this response action will result in hazardous substances, pollutants, or contaminants remaining on site above levels that allow for unrestricted exposure, statutory reviews will be conducted every five years after initiation of the remedy to ensure it is, or will be, protective of human health and the environment, until such time it may be determined that the sites qualify for unrestricted use. Five-year reviews will be conducted in compliance with CERCLA §121(c) and the NCP §300.430(f)(5)(iii).

SECTION 3 - RESPONSIVENESS SUMMARY

3.1 PUBLIC ISSUES AND LEAD AGENCY RESPONSES

The final component of the ROD is the Responsiveness Summary. The purpose of the Responsiveness Summary is to provide a summary of the stakeholders' comments, concerns, and questions about the selected response action for the two sites and the Army's responses to these concerns.

Based on the lack of public comments, the community appears to be in support of the selected response action.

A newspaper notification inviting public comment on the Proposed Plan appeared in the Asbury Park Press on March 29 and 30, 2017. The public notice summarized the Proposed Plan and the preferred alternative. The notice also identified the time and location of the public meeting and specified a public comment period as well as the address to which written comments could be sent. Public comments were accepted from March 28, 2017 to April 27, 2017. The newspaper notification identified the Monmouth County Library, Eastern Branch, 1001 Route 35, Shrewsbury, New Jersey 07702 as the location of the FTMM Environmental Restoration Public Information Repository. The public notice and Proposed Plan were also posted on the FTMM Environmental Restoration website.

The public meeting was held on April 12, 2017 at Eatontown Public Library, 33 Broad Street, Eatontown, New Jersey. At this meeting, representatives from FTMM and the USACE were present with the Proposed Plan and were available to answer questions concerning the two landfills and the preferred remedy. There was no one in attendance from the public. The newspaper notification is included in Attachment 2.

3.1.1 Summary of Comments Received During the Public Meeting on the Proposed Plan and Agency Responses

There were no comments received during the public meeting, as there was no one present from the public.

3.1.2 Summary of Comments Received During the Public Comment Period on the Proposed Plan and Agency Responses

No written comments were received during the public comment period.

SECTION 4 - REFERENCES

- EDAW, 2008. Fort Monmouth Reuse and Redevelopment Plan. Prepared for Fort Monmouth Economic Revitalization Planning Authority, September.
- NJDEP. 2013. Coordination of NJDEP and USEPA PCB Remediation Policies. March 22, 2013. Available at: <http://www.nj.gov/dep/srp/guidance/pcbremediation/>
- NJDEP. 2014. Final Baseline Groundwater Sampling Report (August 2013) Remedial Investigation/Feasibility Study/Decision Documents. July 3.
- NJDEP. 2015. Letter Re: November 26, 2014 Response to Comments on the Final Baseline Ground Water Sampling Report (August 2013). February 5.
- NJDEP. 2010. Groundwater Quality Standards. New Jersey Administrative Code Title 7 Chapter 9C. July 22.
- Parsons. 2014. Final August 2013 Baseline Groundwater Sampling Report, Fort Monmouth, Oceanport, Monmouth County, New Jersey. Prepared for the U.S. Army Engineering and Support Center, Huntsville, Alabama. March.
- Parsons. 2016. Final Remedial Investigation Report for Site FTMM-02, Fort Monmouth, Oceanport, Monmouth County, New Jersey. Prepared for the U.S. Army Engineering and Support Center, Huntsville, Alabama. January.
- Parsons. 2016. Final Remedial Investigation / Feasibility Study Report for Site FTMM-08, Fort Monmouth, Oceanport, Monmouth County, New Jersey. Prepared for the U.S. Army Engineering and Support Center, Huntsville, Alabama. April.
- Shaw. 2012. Final Baseline Ecological Evaluation, Fort Monmouth Main Post & Charles Wood Area. Monmouth County, New Jersey. May.
- U.S. Army Office of the Assistant Chief of Staff for Installation Management (U.S. Army). 2012. M-2 Landfill (FTMM-02) Remedial Action Progress Report, U.S. Army Garrison Fort Monmouth, Main Post, Fort Monmouth, New Jersey. March.
- U.S. Army Toxic and Hazardous Materials Agency (USATHAMA). 1980. Installation Assessment of Fort Monmouth, Report No. 171. U.S. Army Toxic and Hazardous Material Agency. May.
- USATHAMA. 1988. Update of the Initial Installation Assessment of Fort Monmouth and Subinstallations: Charles Wood Area and Evans Area. Prepared by J.D. Bonds, J.K. Sherwood, and K.A. Decker, Environmental Science and Engineering, Inc, prepared for U.S. Army Communications-Electronics Command, Fort Monmouth, NJ, and U.S. Army Toxic and Hazardous Material Agency, Aberdeen Proving Ground, MD. June.
- U.S. Department of Agriculture (USDA). 2008. Soil Survey of Monmouth County, New Jersey. Soil Conservation Service. April.
- USEPA. 1996. Application of the CERCLA Municipal Landfill Presumptive Remedy to Military Landfills, USEPA OSWER Directive No. 9355.0-67FS. Office of Solid Waste and Emergency Management. December.

Attachment 1

Figure 1 – Fort Monmouth Location.....	A 1-1
Figure 2 – Main Post Landfill Locations.....	A 1-2
Figure 3 – Timeline of Significant Events.....	A 1-3
Figure 4 – FTMM-02 Site Boundary and Layout.....	A 1-4
Figure 5 – FTMM-08 Site Boundary and Layout.....	A 1-5
Figure 6 – Landfill Cover System Design.....	A 1-6



Figure 1 – Fort Monmouth Location

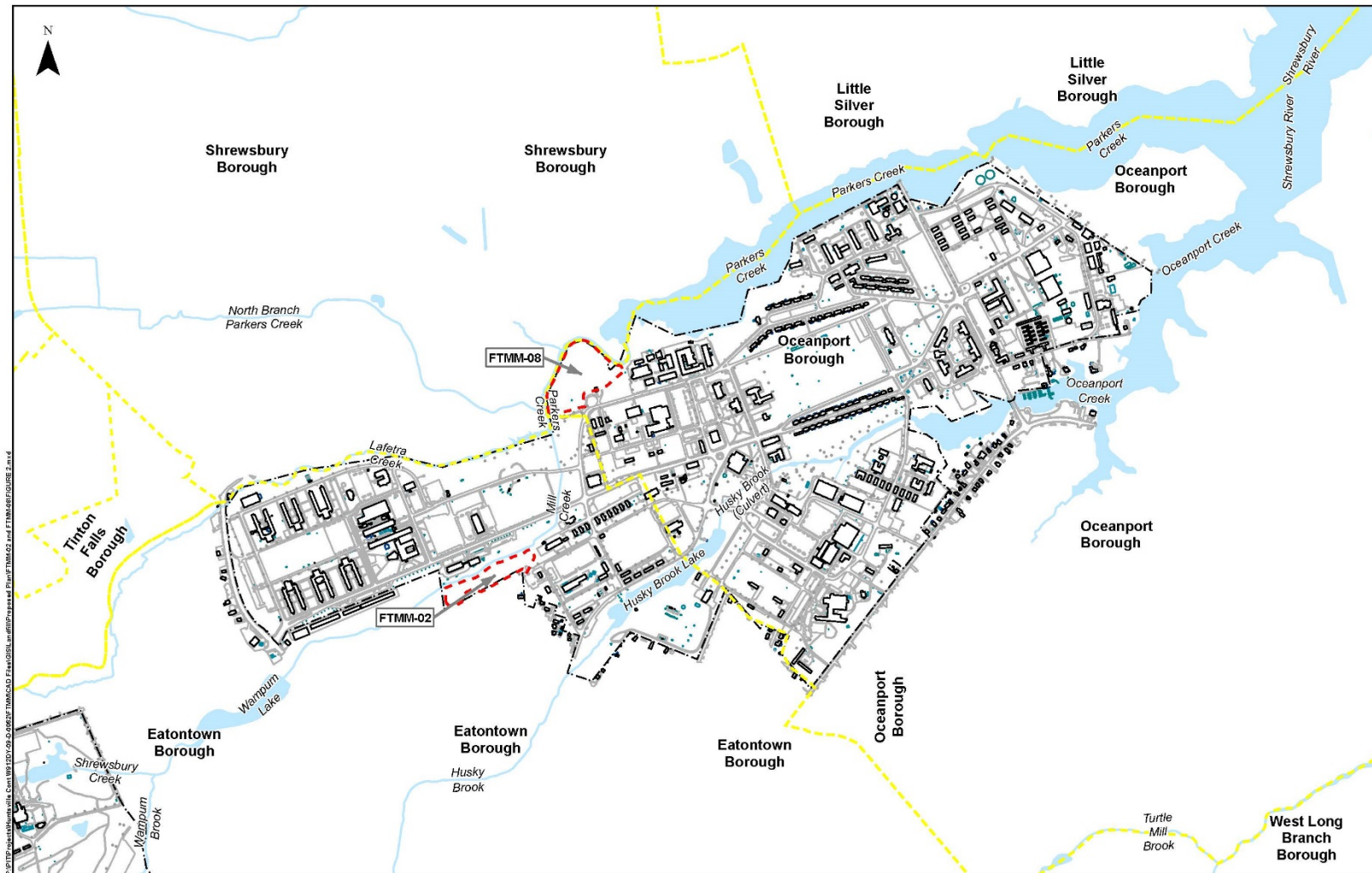
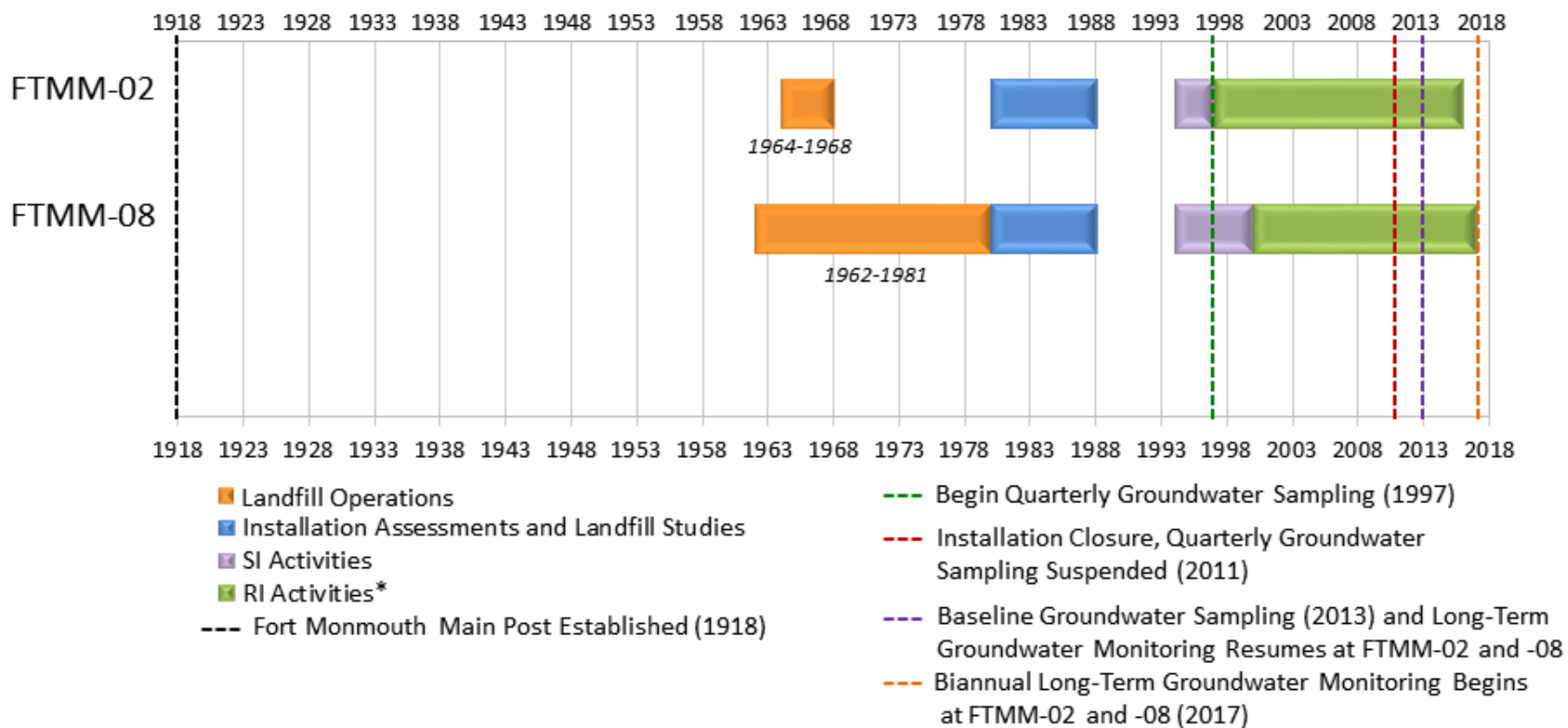


Figure 2 – Main Post Landfill Locations



*End date denotes NJDEP acceptance or anticipated acceptance of Final RI Report for FTMM-02 and Final RI/FS Report for FTMM-08.

Figure 3 – Timeline of Significant Events

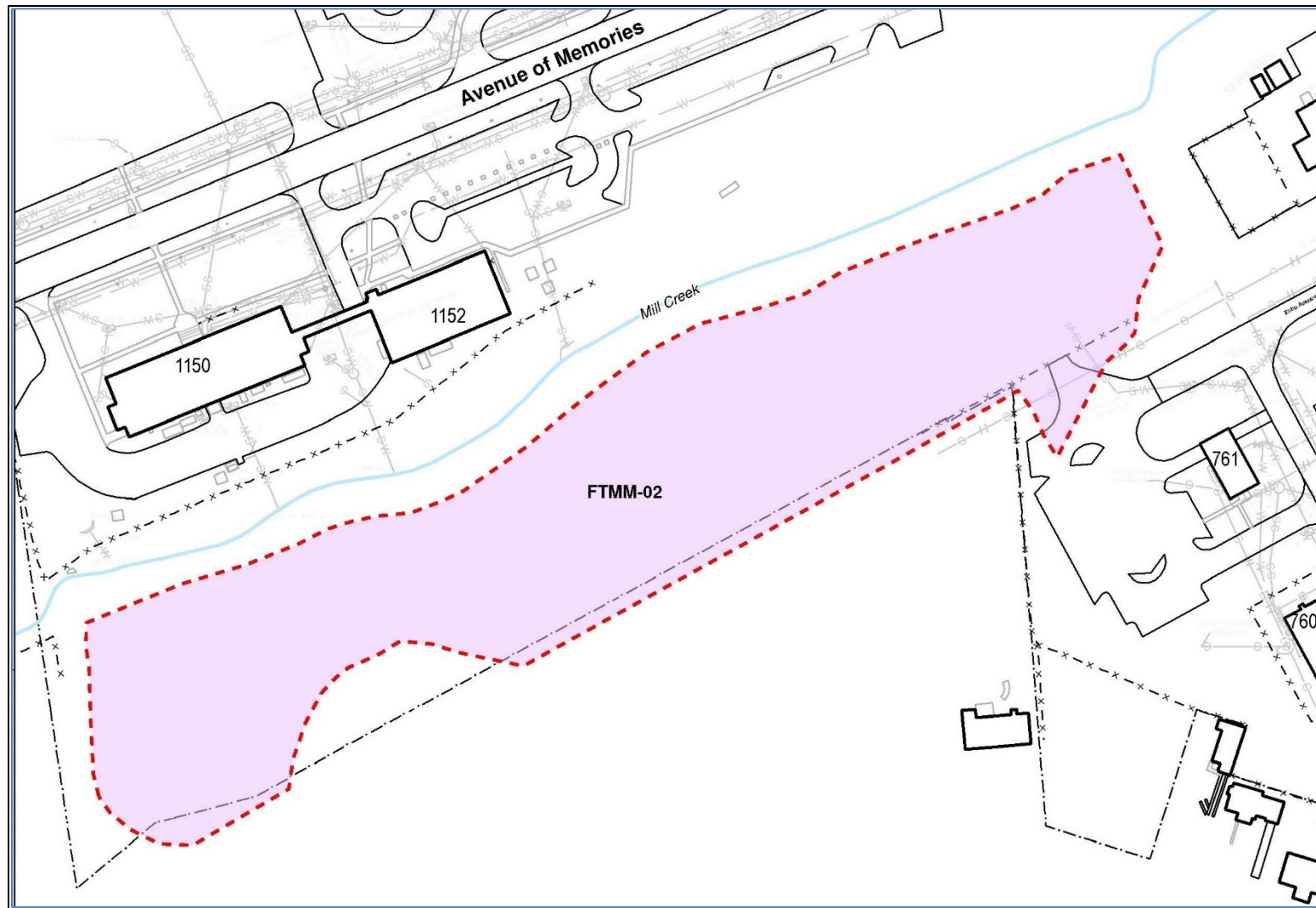


Figure 4 – FTMM-02 Site Boundary and Layout

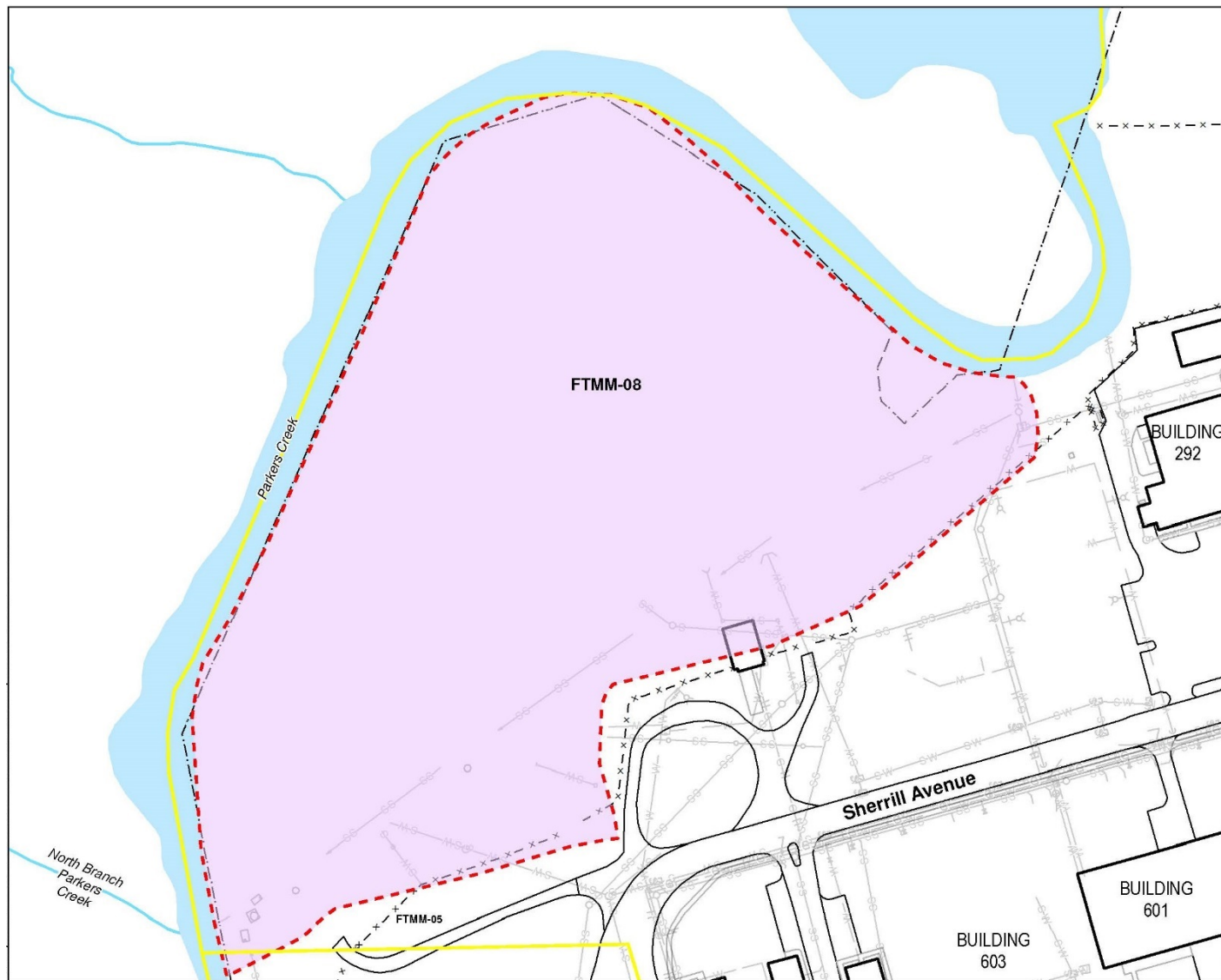


Figure 5 – FTMM-08 Site Boundary and Layout

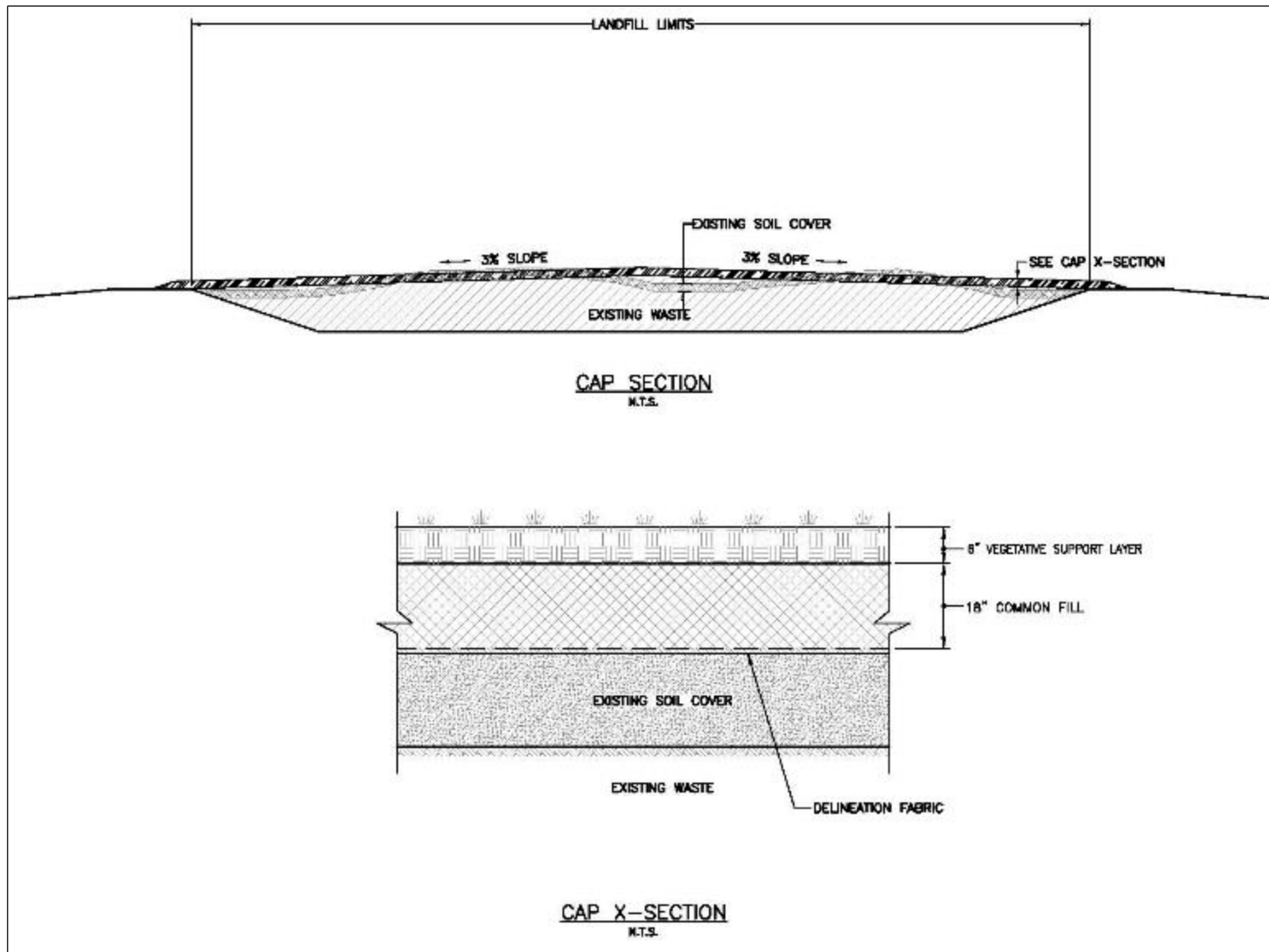


Figure 6 – Landfill Cover System Design

Attachment 2

Certificate of Publication for Public Notice and Public Meeting Record

Appendix B

Cost Support Information

US Army Engineering and Support Center, Huntsville Payment Milestone Schedule - Fort

CLIN	Task No.	Task Budget	Task Name	Milestone Description	Milestone Payment	Milestone Payment/5	Landfill 02	LF 03 AECOM RACR = \$37,371.33	Landfill 04	Landfill 05	LF 08 AECOM RACR = \$37,371.33	LF 12 AECOM RACR = \$37,371.33	Landfill 14	LF 18 AECOM RACR = \$37,371.33	Landfill 25
0001	1	\$ 308,833.00	Project Management Plan (PMP)	Final PMP	\$ 7,818.21	\$1,563.64	\$1,563.64		\$1,563.64	\$1,563.64			\$1,563.64		1,563.64
				Final Meeting Minutes - Kickoff Meeting	\$ 18,230.63	\$3,646.13	\$3,646.13		\$3,646.13	\$3,646.13			\$3,646.13		\$3,646.13
				Bi-Weekly Progress Teleconferences and Monthly Status Reporting1	\$ 282,584.16	\$56,516.83	\$56,516.83		\$56,516.83	\$56,516.83			\$56,516.83		\$56,516.83
0001	2	\$ 61,075.00	Systematic Project Planning	Final Meeting Minutes - In-Person Meeting #1	\$ 10,181.20	\$2,036.24	\$2,036.24		\$2,036.24	\$2,036.24			\$2,036.24		\$2,036.24
				Final Meeting Minutes - In-Person Meeting #2	\$ 10,181.20	\$2,036.24	\$2,036.24		\$2,036.24	\$2,036.24			\$2,036.24		\$2,036.24
				Final Meeting Minutes - In-Person Meeting #3	\$ 10,181.20	\$2,036.24	\$2,036.24		\$2,036.24	\$2,036.24			\$2,036.24		\$2,036.24
				Final Meeting Minutes - In-Person Meeting #4	\$ 10,175.10	\$2,035.02	\$2,035.02		\$2,035.02	\$2,035.02			\$2,035.02		\$2,035.02
				Final Meeting Minutes -Webinar Meeting #1	\$ 10,181.20	\$2,036.24	\$2,036.24		\$2,036.24	\$2,036.24			\$2,036.24		\$2,036.24
				Final Meeting Minutes -Webinar Meeting #2	\$ 10,175.10	\$2,035.02	\$2,035.02		\$2,035.02	\$2,035.02			\$2,035.02		\$2,035.02
0001	3	\$ 56,745.00	UFP-QAPP (Including APP and QASP)2	Draft UFP-QAPP	\$ 42,558.75	\$8,511.75	\$8,511.75		\$8,511.75	\$8,511.75			\$8,511.75		\$8,511.75
				Draft-Final UFP-QAPP	\$ 8,511.75	\$1,702.35	\$1,702.35		\$1,702.35	\$1,702.35			\$1,702.35		\$1,702.35
0001	4	\$ 8,656.00	Geospatial Data	Final UFP-QAPP	\$ 5,674.50	\$1,134.90	\$1,134.90		\$1,134.90	\$1,134.90			\$1,134.90		\$1,134.90
				Final Geospatial Data	\$ 8,656.00	\$1,731.20	\$1,731.20		\$1,731.20	\$1,731.20			\$1,731.20		\$1,731.20
0001	5	\$ 1,835,082.00	Remedial Action Field Activities	Last Daily Report - Landfill 2	\$ 458,770.50		\$458,770.50								
				Last Daily Report - Landfill 4	\$ 458,770.50				\$ 102,764.59						
				Last Daily Report - Landfill 5	\$ 458,770.50										
				Last Daily Report - Landfill 25 (TMB)	\$ 458,770.50	\$114,692.63	\$114,692.63		\$25,691.15				\$25,691.15		
0001	6	\$ 266,402.00	RACR with Deed Notice2	Draft RACR and Deed Notice - Landfill 2	\$ 49,950.37		\$ 49,950.37								
				Draft-Final RACR and Deed Notice - Landfill 2	\$ 9,990.08		\$ 9,990.08								
				Final RACR and Deed Notice - Landfill 2	\$ 6,660.05		\$ 6,660.05								
				Draft RACR and Deed Notice - Landfill 4	\$ 49,950.37				\$ 99,900.74						
				Draft-Final RACR and Deed Notice - Landfill 4	\$ 9,990.08				\$ 19,980.16						
				Final RACR and Deed Notice - Landfill 4	\$ 6,660.05				\$ 13,320.10						
				Draft RACR and Deed Notice - Landfill 5	\$ 49,950.37				\$ 49,950.37						
				Draft-Final RACR and Deed Notice - Landfill 5	\$ 9,990.08				\$ 9,990.08						
				Final RACR and Deed Notice - Landfill 5	\$ 6,660.05				\$ 6,660.05						
				Draft RACR and Deed Notice - Landfill 25 (TMB)	\$ 49,950.37										\$ 49,950.37
				Draft-Final RACR and Deed Notice - Landfill 25 (TMB)	\$ 9,990.08										\$ 9,990.08
				Final RACR and Deed Notice - Landfill 25 (TMB)	\$ 6,660.05										\$ 6,660.05
				Draft CEA - Landfill 5	\$ 6,464.25					\$ 6,464.25					

US Army Engineering and Support Center, Huntsville Payment Milestone Schedule - Fort

CLIN	Task No.	Task Budget	Task Name	Milestone Description	Milestone Payment	Milestone Payment/5	Landfill 02	LF 03 AECOM RACR = \$37,371.33	Landfill 04	Landfill 05	LF 08 AECOM RACR = \$37,371.33	LF 12 AECOM RACR = \$37,371.33	Landfill 14	LF 18 AECOM RACR = \$37,371.33	Landfill 25
0007	5b	\$ 868,192.00	Removal of Overlap at Landfill 12 (5,383, 3,607, and 1,916 SF)	Draft RACR and Deed Notice	\$ 26,045.76										
				Draft-Final RACR and Deed Notice	\$ 17,363.84										
				Final RACR and Deed Notice	\$ 8,681.92										
0008	5c	\$ 870,884.00	Removal of Overlap at Landfill 14 (9,504 SF)	Last Daily Report - Landfill 14	\$ 818,630.96								\$ 818,630.96		
				Draft RACR and Deed Notice	\$ 26,126.52								\$ 26,126.52		
				Draft-Final RACR and Deed Notice	\$ 17,417.68								\$ 17,417.68		
				Final RACR and Deed Notice	\$ 8,708.84								\$ 8,708.84		
					\$ 870,884.00	CLIN 0008							\$ 870,884.00		
0009	5d	\$ 225,466.00	Removal of Overlap at Landfill 25 (RWJ) (1,733 SF)	Last Daily Report - Landfill 25 (RWJ)	\$ 202,919.40										
				Draft RACR and Deed Notice	\$ 11,273.30										
				Draft-Final RACR and Deed Notice	\$ 6,763.98										
				Final RACR and Deed Notice	\$ 4,509.32										
0010	5e	\$ 134,818.00	Remove Overlap Materials in excess of expected amount	Last Daily Report	\$ 67,409.00	\$13,481.80	\$13,481.80		\$13,481.80	\$13,481.80			\$13,481.80		\$13,481.80
				Last Daily Report	\$ 67,409.00	\$13,481.80	\$13,481.80		\$13,481.80	\$13,481.80			\$13,481.80		\$13,481.80
					\$ 134,818.00	CLIN 0010	\$26,963.60		\$26,963.60	\$26,963.60			\$26,963.60		\$26,963.60
0011	5e	\$ 202,227.00	Remove Overlap Materials in excess of expected amount	Last Daily Report	\$ 67,409.00	\$13,481.80	\$13,481.80		\$13,481.80	\$13,481.80			\$13,481.80		\$13,481.80
				Last Daily Report	\$ 67,409.00	\$13,481.80	\$13,481.80		\$13,481.80	\$13,481.80			\$13,481.80		\$13,481.80
				Last Daily Report	\$ 67,409.00	\$13,481.80	\$13,481.80		\$13,481.80	\$13,481.80			\$13,481.80		\$13,481.80
					\$ 202,227.00	CLIN 0011	\$40,445.40		\$40,445.40	\$40,445.40			\$40,445.40		\$40,445.40
0012	7a	\$ 25,857.00	Establish a CEA for a Landfill at Monmouth	Draft CEA TBD	\$ 19,392.75				\$40,445.40	\$40,445.40					
				Draft-Final CEA - TBD	\$ 3,878.55	Landfill Cost from AECOM Contract Mod									
				Final CEA - TBD	\$ 2,585.70	\$0.00	\$58,658.00	\$0.00	\$0.00	\$79,097.00	\$58,658.00			\$79,097.00	\$21,287.00
0013	8a	\$ 25,857.00	Remove a CEA for a Landfill at Monmouth	CEA Removal - TBD	\$ 8,619.00										
				CEA Removal - TBD	\$ 8,619.00										
				CEA Removal - TBD	\$ 8,619.00										
				CEA Removal - TBD	\$ 8,619.00										
Delivery Order Total:					\$ 5,085,881.00										

	Landfill 02	Landfill 03	Landfill 04	Landfill 05	Landfill 08	Landfill 12	Landfill 14	Landfill 18	Landfill 25
Total Costs Per Landfill	\$ 829,326.85	\$ 58,658.00	\$ 442,150.96	\$ 255,713.72	\$ 79,097.00	\$ 58,658.00	\$ 1,077,069.37	\$ 79,097.00	\$ 268,381.72
Proposed Plan Cost for Landfills 02 and 08	\$908,423.85								
Proposed Plan Cost for Landfills 03, 04, 05, 12, 14, 18, and 25	\$2,239,728.77								

AECOM Contract for Modification to RAR Reports

	W912DY-17-D-0002/W912DY18F0632		9/7/2023				
CLIN	Description	CLIN Funded Amount	MOD 04	MOD 05	Funded Amount	Amount Remaining	Total Paid
1	Task 1, Kick Off, PMP, Schedule	\$ 90,425.31			\$ 90,425.31	\$ -	\$ 90,425.31
1AA	Task 1, Kick Off, PMP, Schedule	\$ 12,280.68			\$ 12,280.68	\$ -	\$ 12,280.68
2	Task 2, QAPP/QASP	\$ 319,491.94			\$ 319,491.94	\$ -	\$ 319,491.94
3AA	Task 3A FTMM-02 (Landfill M2) 5.22 Acres Funding Line 1 of 4	\$ 138,805.80			\$ 138,805.80	\$ -	\$ 138,805.80
3AB	Task 3A FTMM-02 (Landfill M2) 5.22 Acres Funding Line 2 of 4	\$ 145,128.81			\$ 145,128.81	\$ -	\$ 145,128.81
3AC	Task 3A FTMM-02 (Landfill M2) 5.22 Acres Funding Line 3 of 4	\$ 156,094.48			\$ 156,094.48	\$ -	\$ 156,094.48
3AD	Task 3A FTMM-02 (Landfill M2) 5.22 Acres Funding Line 4 of 4	\$ 1,070,227.79			\$ 1,070,227.79	\$ -	\$ 1,070,227.79
3BA	Task 3B FTMM-03 (Landfill M3) 7.6 Acres	\$ 1,201,705.29			\$ 1,201,705.29	\$ -	\$ 1,201,705.29
3CA	Task 3C FTMM-04 (Landfill M4) 2.05 Acres	\$ 478,984.67			\$ 478,984.67	\$ -	\$ 478,984.67
3DA	Task 3D FTMM-05 (Landfill M5) 3.96 Acres Funding Line 1 of 2	\$ 607,015.33			\$ 607,015.33	\$ -	\$ 607,015.33
3DB	Task 3D FTMM-05 (Landfill M5) 3.96 Acres Funding Line 2 of 2	\$ 145,828.85			\$ 145,828.85	\$ -	\$ 145,828.85
3EA	Task 3E FTMM-08 (Landfill M8) 9.09 Acres	\$ 31,434.30			\$ 31,434.30	\$ -	\$ 31,434.30
3FA	Task 3F FTMM-12 (Landfill M8) 6.08 Acres	\$ 1,224,769.31			\$ 1,224,769.31	\$ -	\$ 1,224,769.31
3GA	Task 3G FTMM-14 (Landfill M14) 4.87 Acres Funding Line 1 of 3	\$ 278,173.24			\$ 278,173.24	\$ -	\$ 278,173.24
3GB	Task 3G FTMM-14 (Landfill M14) 4.87 Acres Funding Line 2 of 3	\$ 20,000.00			\$ 20,000.00	\$ -	\$ 20,000.00
3GC	Task 3G FTMM-14 (Landfill M14) 4.87 Acres Funding Line 3 of 3	\$ 1,404,656.50			\$ 1,404,656.50	\$ 2,556.99	\$ 1,402,099.51
3HA	Task 3H FTMM-18 (Former Training Area) Landfill 1.18 Acres Funding Line 1 of 2	\$ 54,389.32			\$ 54,389.32	\$ -	\$ 54,389.32
3HB	Task 3H FTMM-18 (Former Training Area) Landfill 1.18 Acres Funding Line 2 of 2	\$ 340,442.93			\$ 340,442.93	\$ -	\$ 340,442.93
3JA	Task 23I FTMM-25 (Landfill CW-3A) 1.56 Acres	\$ 504,805.02			\$ 504,805.02	\$ -	\$ 504,805.02
3KA	Installation of Walking Bridge Between Landfill Caps M3 & M5 Funding Line 1 of 2	\$ 73,807.79			\$ 73,807.79	\$ -	\$ 73,807.79
3KB	Installation of Walking Bridge Between Landfill Caps M3 & M5 Funding Line 1 of 2	\$ 77,438.97	\$ (2,556.99)		\$ 74,881.98	\$ (2,556.99)	\$ 77,438.97
4	Remedial Action Report	\$ 204,667.00	\$ (40,933.40)		\$ 163,733.60	\$ -	\$ 163,733.60
5	Community Relations Support	\$ 75,529.13	\$ (75,227.01)		\$ 302.12	\$ 0.00	\$ 302.12
7	Mod #1 PMP	\$ 5,050.00			\$ 5,050.00	\$ 5,050.00	\$ -
8	Mod #1 UFP-QAPP/QASP/RAWP/SOC	\$ 107,934.00			\$ 107,934.00	\$ -	\$ 107,934.00
9	Mod #1 TASK 3A: FTMM-02	\$ 84,741.00			\$ 84,741.00	\$ -	\$ 84,741.00
10	Mod #1 TASK 3B: FTMM-03	\$ 81,261.00			\$ 81,261.00	\$ -	\$ 81,261.00
11	Mod #1 TASK 3b: FTMM-03 (Optional)	\$ 170,338.00			\$ 170,338.00	\$ 170,338.00	\$ -
12	Mod #1 TASK 3C: FTMM-04	\$ 78,438.00			\$ 78,438.00	\$ -	\$ 78,438.00
13	Mod #1 TASK 3D: FTMM-05	\$ 85,754.00			\$ 85,754.00	\$ -	\$ 85,754.00
14	Mod #1 TASK 3D: FTMM-05 (Optional)	\$ 130,156.00			\$ 130,156.00	\$ 130,156.00	\$ -
15	Mod #1 TASK 3E: FTMM-08	\$ 82,340.00			\$ 82,340.00	\$ -	\$ 82,340.00
16	Mod #1 TASK 3F: FTMM-12	\$ 78,402.00			\$ 78,402.00	\$ -	\$ 78,402.00
17	Mod #1 TASK 3F: FTMM-12 (Optional)	\$ 292,662.00			\$ 292,662.00	\$ 292,662.00	\$ -
18	Mod #1 TASK 3G: FTMM-14	\$ 46,949.00			\$ 46,949.00	\$ -	\$ 46,949.00
19AA	Mod #1 TASK 3H: FTMM-18	\$ 4,991.78			\$ 4,991.78	\$ -	\$ 4,991.78
19AB	Mod #1 TASK 3H: FTMM-18	\$ 13,178.09			\$ 13,178.09	\$ -	\$ 13,178.09
19AC	Mod #1 TASK 3H: FTMM-18	\$ 36,285.13			\$ 36,285.13	\$ -	\$ 36,285.13
19AD	Mod #1 TASK 3H: FTMM-18	\$ 12,274.00			\$ 12,274.00	\$ -	\$ 12,274.00
19AE	Mod #1 TASK 3H: FTMM-18	\$ 774.00			\$ 774.00	\$ -	\$ 774.00
20	Mod #1 TASK 3I: FTMM-25	\$ 36,472.00			\$ 36,472.00	\$ -	\$ 36,472.00
21	Mod #1 TASK 3I: FTMM-25 (Optional)	\$ 43,537.00			\$ 43,537.00	\$ 43,537.00	\$ -

