

Proposed Plan for Landfill Sites FTMM-03, FTMM-04, FTMM-05, FTMM-12, FTMM-14, FTMM-18 and FTMM-25 at Fort Monmouth

Monmouth County, New Jersey

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United States Department of the Army

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Abbreviations and Acronyms

AR	Administrative Record
ARAR	applicable or relevant and appropriate requirement
Army	United States Army
bgs	below ground surface
CEA	classification exception area
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CWA	Charles Wood Area
COC	contaminant of concern
COPC	contaminant of potential concern
COPEC	contaminant of potential ecological concern
DCA	dichloroethane
DCE	dichloroethene
EPA	U.S. Environmental Protection Agency
FTMM	Fort Monmouth
FS	Feasibility Study
ft	feet
GWQS	groundwater quality standard
IC	institutional control
LOL	limit of landfill
LUC	land use control
MP	Main Post
MCL	maximum contaminant level
NFA	no further action
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
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
SOC	Statement of Compliance
TCE	trichloroethene
UU/UE	unlimited use/unrestricted exposure
USATHAMA	U.S. Army Toxic and Hazardous Materials Agency
VC	vinyl chloride
VOC	volatile organic hydrocarbon
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-03, FTMM-04, FTMM-05, FTMM-12, FTMM-14, FTMM-18 and FTMM-25 at Fort Monmouth, Oceanport, Monmouth County, New Jersey (July 17, 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 with 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 some of the caps were 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 (a portion FTMM-04 and FTMM-14) and placement of deed notice on property not owned by the Army (a portion of FTMM-04, FTMM-12 and FTMM-25). Landfill caps at FTMM-03, FTMM-05 and FTMM-18 were constructed all within Army property and followed the remedy identified in the original ROD (July 2017). 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 the *Record of Decision (ROD) for Landfill sites FTMM-03, FTMM-04, FTMM-05, FTMM-12, FTMM-14, FTMM-18 and FTMM-25 at Fort Monmouth, Oceanport, Monmouth County, New Jersey (July 17, 2017)*.

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-03, FTMM-04, FTMM-05, FTMM-12, FTMM-14, FTMM-18 and FTMM-25 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 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-04, FTMM-12, FTMM-14 and FTMM-25, 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-03, FTMM-04, FTMM-05, FTMM-12, FTMM-14 and FTMM-18 are shown on **Figure 2**. The location of landfill FTMM-25 is shown on **Figure 3**. 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.

Table 1 - FTMM-03, FTMM-04, FTMM-05, FTMM-12, FTMM-14, FTMM-18 and FTMM-25 Reports

Site	Date
FTMM-03 Final Remedial Investigation Report	February 2016
FTMM-04 Final Remedial Investigation/Feasibility Study	July 2014
FTMM-05 Final Remedial Investigation Report	October 2015
FTMM-12 Final Remedial Investigation Report	August 2015
FTMM-14 Final Remedial Investigation Report	July 2015
FTMM-18 Final Remedial Investigation Report	October 2015
FTMM-25 Final Remedial Investigation Report	August 2016
Record of Decision (ROD) for Landfill sites FTMM-03, FTMM-04, FTMM-05, FTMM-12, FTMM-14, FTMM-18 and FTMM-25 at Fort Monmouth, Oceanport, Monmouth County, New Jersey	July 2017

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 seven landfill sites included in this PP.

2.2.1 FTMM-03

FTMM-03 landfill located in the western portion of the MP, is bordered by Parker's Creek Branch to the north, Mill Creek Wampum Brook to the east, North Drive to the south and west (**Figure 2**). FTMM-03 was in operation from approximately 1959 to 1964 and was reportedly used for the general disposal of domestic and industrial wastes. The landfill soil cover material ranges in thickness from 0 to 48 inches below ground surface (bgs) and averages 20 inches in thickness.

2.2.2 FTMM-04

FTMM-04 is located on the MP and is bounded by North Drive to the north, Avenue of Memories to the south, and Wilson Avenue to the east (**Figure 2**). Mill Creek bisects the west-central portion of the landfill. FTMM-04 was in use as a landfill between 1955 and 1956 and was reportedly used for the disposal of building demolition debris. The landfill soil cover material ranges in thickness from 6 to 46 inches bgs and averages 32 inches in thickness.

2.2.3 FTMM-05

FTMM-05 located in the western portion of the MP, north of FTMM-04 and south of the FTMM-08 landfill site (not included in this ROD) (**Figure 2**). FTMM-05 is bounded to the south by North Drive, to the north by an unpaved road, Wilson Avenue to the east and Mill Creek and Parkers Creek to the west. A portion of Mill Creek is adjacent to the bounds of the western side of the site. FTMM-05 was in use as a landfill between 1952 and 1959, and was reportedly used for domestic and industrial wastes. The landfill soil cover material at FTMM-05 ranges in thickness from 0 to 72 inches bgs and averages 24 inches in thickness.

2.2.4 FTMM-12

FTMM-12 is located in the central portion of the MP and is bordered by Husky Brook to the north, Murphy Drive to the east, multiple buildings to the south, and Todd Avenue to the west (**Figure 2**). FTMM-12 was in use as a landfill between 1950 and 1966, and was reportedly used

for the disposal of automobiles and domestic and industrial wastes. The landfill soil cover material ranges in thickness from 0 to 48 inches bgs and averages 24 inches in thickness.

2.2.5 FTMM-14

FTMM-14 is located on the MP and is bordered by houses along Gosselin Avenue to the north, by Husky Brook to the south, and by Murphy Drive to the east (**Figure 2**). FTMM-14 was in use as a landfill between 1965 and 1966 and was reportedly used as a general-purpose disposal area for building rubble and was later covered with dredged material from Husky Brook Lake. The landfill soil cover material ranges in thickness from 6 to 78 inches bgs and averages 30.6 inches in thickness.

2.2.6 FTMM-18

FTMM-18 is located on the northern part of the MP, between Parkers Creek to the north and multiple buildings and Sherrill Avenue to the south (**Figure 2**). The period of operation for FTMM-18 is unknown; however past use of the site reportedly consisted of both landfill and nonlandfill-related components. A building demolition debris disposal area is located in the southern portion of FTMM-18, just north of Building 293. The landfill soil cover material ranges in thickness from 0 to 60 inches bgs and averages 28 inches in thickness.

2.2.7 FTMM-25

FTMM-25 is located at the CWA. It is bounded by Pearl Harbor Avenue to the west, Shrewsbury Creek to the north, a wooded area to the east and the Pulse Power Facility Building to the south (**Figure 3**). FTMM-25 currently consists of a partially wooded lot with tall grass in the center and trees to the north, east and west. FTMM-25 was in use as a landfill between 1955 and 1956 and was reportedly used for the disposal of debris from the demolition of buildings at CWA. The landfill soil cover material ranges in thickness from 1 to 30 inches bgs and averages 20 inches in thickness.

2.2.8 Selected Remedy

The ROD for Landfill Sites FTMM-03, FTMM-04, FTMM-05, FTMM-12, FTMM-14, FTMM-18 and FTMM-25 at Fort Monmouth Oceanport, Monmouth County, New Jersey, was signed by the Army on July 17, 2017. NJDEP concurred with the remedy described in the ROD on June 13, 2017. The ROD addressed landfills FTMM-03, FTMM-04, FTMM-05, FTMM-12, FTMM-14, FTMM-18 and FTMM-25 with response actions to protect public health and welfare and the environment and 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:

- 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-05 and FTMM-18.

Containment is considered by EPA 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. EPA 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, in consultation with NJDEP determined that it was appropriate to apply the presumptive remedy of capping for these 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 - Landfills FTMM-03, FTMM-04, FTMM-05, FTMM-12, FTMM-14, and FTMM-18

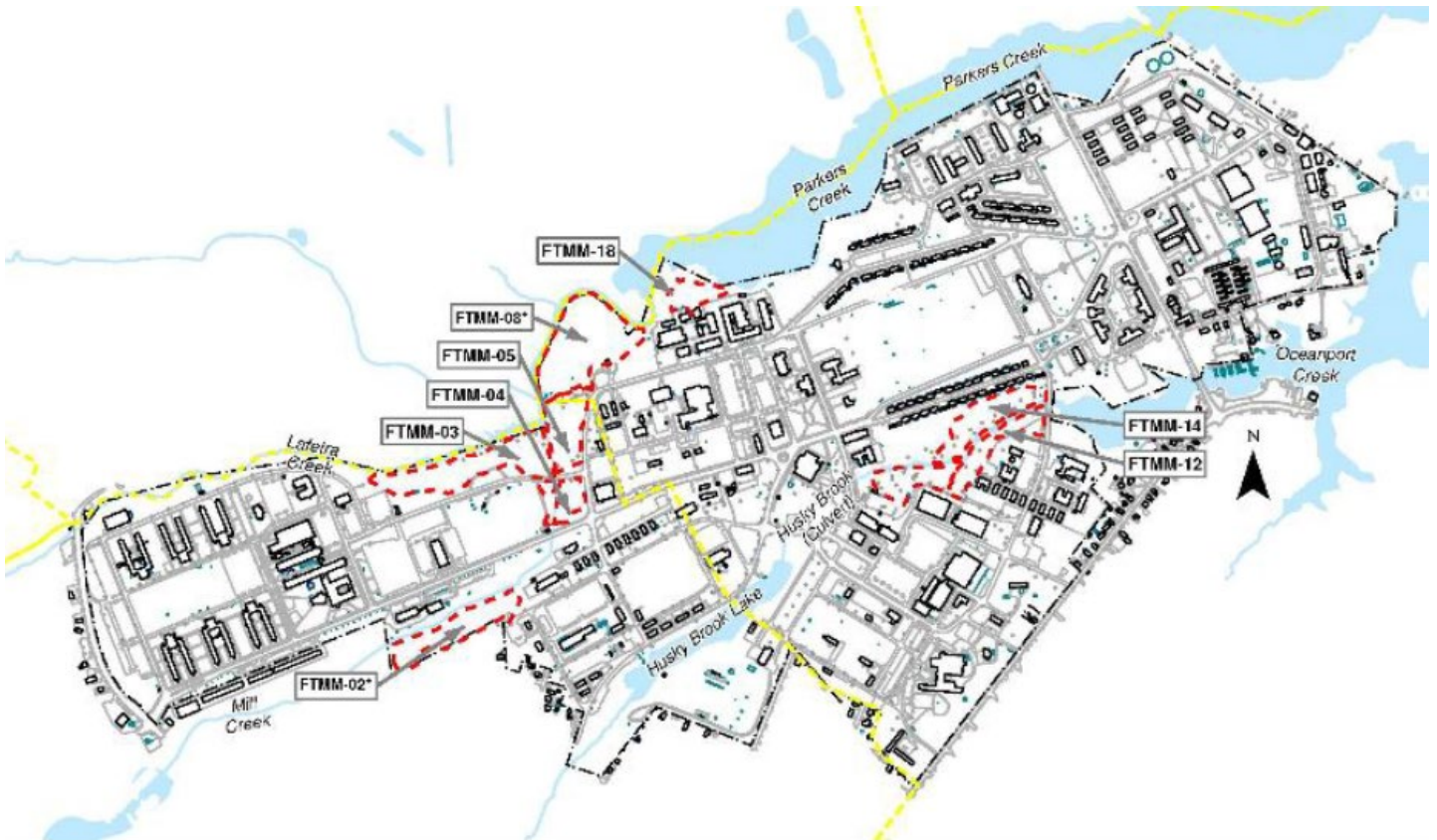
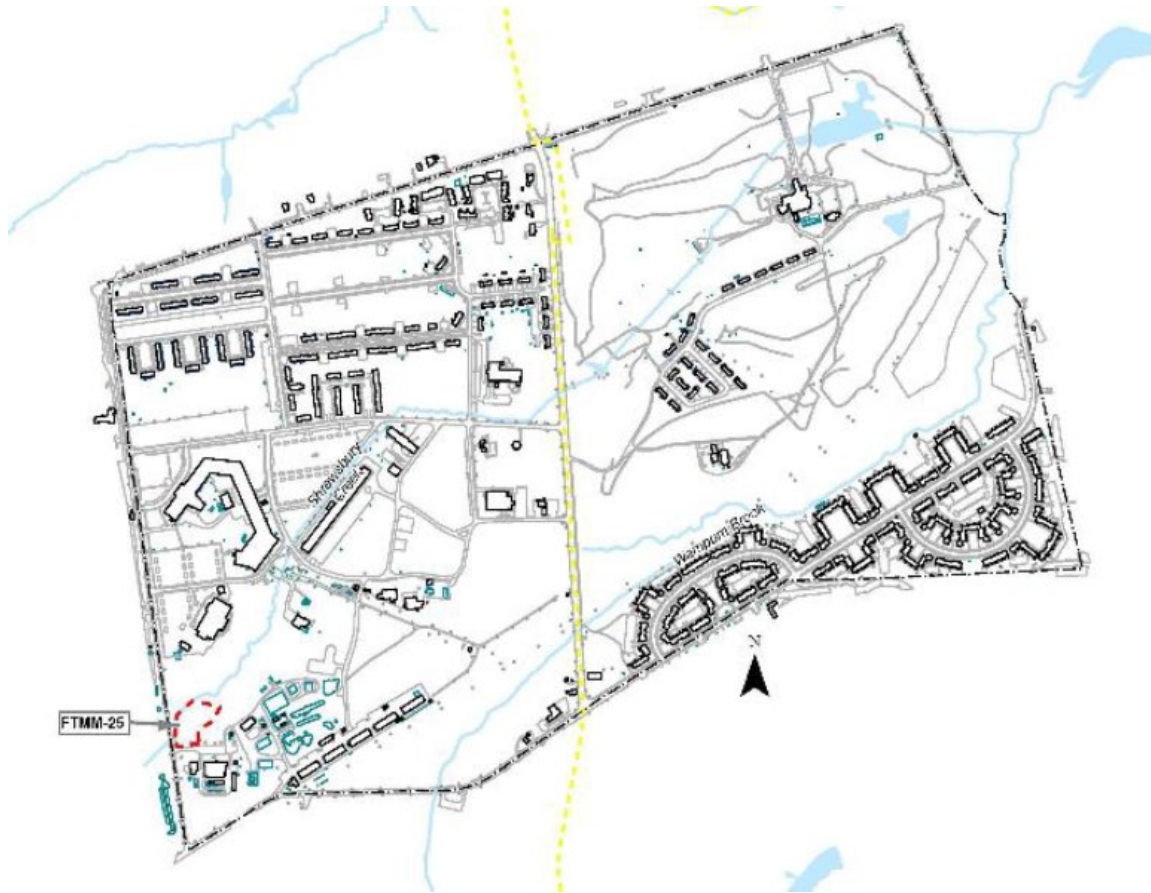


Figure 3 - Landfill FTMM-25 Location



2.3 Remedy Implementation

The following sections describe the implementation of the landfill remedies to date at FTMM-03, FTMM-04, FTMM-05, FTMM-12, FTMM-14 and FTMM-18 and FTMM-25.

2.3.1 Landfill FTMM-03 Remedy Implementation To Date

Construction activities at FTMM-03 began on September 17, 2020. 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 the surrounding elevations. Subgrade preparation within the LOL consisted of regrading to ensure positive drainage with slopes generally between 3 and 6%, to the extent possible, in accordance with NJDEP Solid Waste Regulations, N.J.A.C. 7:26 Subchapter 2A.

On October 5, 2020, during subgrade preparation, AECOM encountered a hand-dug well beneath a concrete slab. The well was constructed of red brick, approximately three feet in diameter, and 11.5-feet deep. Prior to installation of the landfill cap, the hand-dug well was decommissioned in accordance with N.J.A.C. 7:9D, *Well Construction and Maintenance*;

Sealing of Abandoned Wells (NJDEP, 2021h). On January 25, 2021, a licensed driller from East Coasting Drilling, Inc. oversaw the backfilling of the well with soil visually free of landfill material or debris to one foot below the top of the well casing. The backfill was tamped with an excavator bucket. The remaining foot of the well's annulus was filled as part of the installation of the common fill component of the landfill cap.

Once subgrade was prepared, landfill capping construction began. Specifically, delineation fabric (Geotex® Orange Nonwoven Printed Demarcation) was placed in sections overlapping 1 foot. Approximately 34,500 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 six 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 5,600 (in-place) cubic yards of topsoil were imported and placed within landfill extents. A walking path was also constructed on top of the 18-inch common fill layer at FTMM-03 consisting of one 6-inch thick, compacted layer of #10 placed on top of a non-woven geotextile. 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.

Seed mixtures were applied at the planting rates specified in the Soil Erosion and Sediment Control Plan (SESCP). Hydroseeding was used to plant the appropriate seed mixtures in both the riparian zone and upland area within the landfill's extents. The Statement of Compliance (SOC) identifies native herbaceous species and the native species were included in the selected pollinator seed mixture for the riparian zone. In accordance with the SOC, a pollinator seed mix resulting in native herbaceous vegetation of equal or greater ecological function was applied to the riparian zone within the extent of the landfill.

A Deed notice for the FTMM-03 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.

NJDEP approved the No Further Action (NFA) request for groundwater on June 2, 2017 (NJDEP, 2017d).

2.3.2 Landfill FTMM-04 Remedy Implementation To Date

Construction activities at FTMM-04 began on November 2, 2020. 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. Subgrade preparation within the LOL consisted of regrading to ensure positive drainage with slopes generally between 3 and 6%, to the extent possible, in accordance with NJDEP Solid Waste Regulations, N.J.A.C. 7:26 Subchapter 2A. The subgrade at each landfill was then compacted with a vibratory compactor to 90% of the subgrade's maximum dry density (determined using ASTM D698), based on field measurements using a soil density gauge (Troxler E-Gauge Model 4590). No suspected hazardous wastes or suspected asbestos containing-materials were observed in the landfill material and pre-existing cover during regrading. Concurrent with the beginning of construction, excavation of isolated landfill material

west of FTMM-04 was conducted. Excavation of the isolated landfill material east of Wampum Brook was conducted from November 17 through November 18, 2020. Three excavations were completed: encompassing M4TP23 and M4TP4; M4TP6; and M4TP5. The proposed extents of the excavation were staked and the as-built extents of the excavation were surveyed by an AECOM licensed surveyor. Survey results confirmed that the excavation depths were one foot beyond the landfill material observed during test pitting. No landfill material was observed in the completed excavation bottoms of sidewalls. Excavated material was loaded into a dump truck, transported and spread within the FTMM-04 landfill capping extents during subgrade preparation. The excavations were then backfilled with common fill. Due to the sequencing of landfill cap construction, landfill cap construction beyond the extents presented in the ROD along the northern and southern boundaries of the landfill, and in the vicinity of a buried manhole, occurred after landfill capping material was already partially placed. To achieve the grading necessary to complete landfill cap construction, surface soil (preexisting landfill cover material) was relocated to other landfills. Once subgrade was prepared, landfill capping construction began. Specifically, delineation fabric (Geotex[®] Orange Nonwoven Printed Demarcation Geotextile) was placed in sections overlapping 1 foot. Approximately 10,400 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 2,000 (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-04 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 and erosion control blankets to prevent erosion before final seeding and restoration. Seed mixtures were applied at the planting rates specified in the SESCO. Hydroseeding was used to plant the appropriate seed mixtures in both the riparian zone and upland area within the landfill's extents. The SOC identifies native herbaceous species and the native species were included in the selected pollinator seed mixture for the riparian zone. Seed mixtures for the riparian zone and upland areas. In accordance with the SOC, a pollinator seed mix resulting in native herbaceous vegetation of equal or greater ecological function was applied to the riparian zone within the extent of the landfill.

A Deed notice for the FTMM-04 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.

NJDEP concurred that no further sampling activities were required for groundwater at FTMM-04. An NFA was issued on May 15, 2017 (NJDEP, 2017b).

2.3.3 Landfill FTMM-05 Remedy Implementation To Date

Construction activities at FTMM-05 began on November 12, 2020. Initial construction activities included the excavation of a key-in trench around the LOL to allow the 2-foot cap to meet surrounding elevations. Subgrade preparation within the LOL consisted of regrading to ensure

positive drainage with slopes generally between 3 and 6%, to the extent possible, in accordance with NJDEP Solid Waste Regulations, N.J.A.C. 7:26 Subchapter 2A. The subgrade at each landfill was then compacted with a vibratory compactor to 90% of the subgrade's maximum dry density (determined using ASTM D698), based on field measurements using a soil density gauge (Troxler E-Gauge Model 4590). No suspected hazardous wastes or suspected asbestos-containing materials were observed in the landfill material and pre-existing cover during regrading. Stockpiled soil from previous access road construction was relocated to within FTMM-05's extents between December 1, 2020, and December 4, 2020. Stockpiled soil was loaded into a track-mounted carrier, transported to FTMM-05, placed within the landfill capping extents south of the access road, and spread with the subgrade preparation activities. 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 17,500 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. Observations along the stream bank beside the southwestern side of FTMM-05, which has a shallower slope and a lower top of bank elevation, indicated frequent flooding of the southern portion of FTMM-05; this impacted the ability to complete construction of the approved cap. Due to the condition of the stream bank in this area, riprap was placed on the stream bank which adjusted its slope and raised the top of bank elevation approximately two feet; this protected the landfill cap from erosion and created a suitable tie-in for the top of cap at the landfill limit. Topsoil was placed in one 6-inch loose lift. Approximately 3,400 (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-05 consisting of one 6-inch thick, compacted layer of #10 screenings placed on top of a non-woven geotextile. 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. Seed mixtures were applied at the planting rates specified in the SESCO. Hydroseeding was used to plant the appropriate seed mixtures in both the riparian zone and upland area within the landfill's extents. The SOC identifies native herbaceous species and the native species were included in the selected pollinator seed mixture for the riparian zone. In accordance with the SOC, a pollinator seed mix resulting in native herbaceous vegetation of equal or greater ecological function was applied to the riparian zone within the extent of the landfill.

A Deed notice for the FTMM-05 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 the chlorinated solvent-related VOCs PCE, TCE, VC, and cis-1,2 DCE at concentrations in groundwater near FTMM-05 exceeding the GWQSSs. In general, at FTMM-05, groundwater is encountered at an average of 4.1 ft amsl and groundwater flow is to the northwest toward Parker's Creek. Groundwater contour maps and results figures have been presented in previous reports and are not included in this document. It appears that chlorinated solvent impacts to groundwater appear to originate from a location upgradient of the landfill. Further investigations related to chlorinated solvent contaminants in groundwater will be conducted. The NJDEP has concurred on placing a CEA for VOCs on the

landfill footprint with an indeterminate time frame can be placed while the full delineation of the extent of VOC exceedance is determined.

2.3.4 Landfill FTMM-12 Remedy Implementation To Date

Construction activities at FTMM-12 began on June 23, 2021. Initial construction activities included the excavation of a key-in trench around the LOL to allow the 2-foot cap to meet surrounding elevations. Subgrade preparation within the LOL consisted of regrading to ensure positive drainage with slopes generally between 3 and 6%, to the extent possible, in accordance with NJDEP Solid Waste Regulations, N.J.A.C. 7:26 Subchapter 2A. The subgrade at each landfill was then compacted with a vibratory compactor to 90% of the subgrade's maximum dry density (determined using ASTM D698), based on field measurements using a soil density gauge (Troxler E-Gauge Model 4590). No suspected hazardous wastes or suspected asbestos-containing materials were observed in the landfill material and pre-existing cover during regrading. Excavations of the isolated soil west of FTMM-12 with concentrations of arsenic and lead exceeding NJDEP standards was conducted on August 5, August 6, and August 31, 2021. A total of 304 cubic yards of soil was removed from two separate excavations. Excavated soil was placed within the cap area for FTMM-12. One excavation of 14 cubic yards centered at sample location MW-22B, where a previous sample at 5.0-5.5-foot bgs slightly exceeded the arsenic SRS (19.22 mg/kg). One post excavation soil sample was collected at this location to confirm removal. Further, arsenic concentrations in samples collected at 4.0-4.5 feet bgs (14.3 mg/kg) and 5.5-6.0 feet bgs (8.9 mg/kg) can be used to document that average concentrations of arsenic are less than the Soil Remediation Standard (SRS). A second 290 cubic yard excavation centered around sample locations MW22-C, -D, -E, and -F. Post excavation soil samples were collected on September 30, 2022. Soil analytical data reported on Table 8 and shown on Drawing C-12-02B document that lead and arsenic impacts in soil within this area were removed. While one post-excavation soil sample (SWW-1.0-1.5) exceeded the SRS for arsenic, compliance is achieved using simple arithmetic mean in accordance with NJDEP's 2021 *Technical Guidance for the Attainment of Remediation Standards and Site-Specific Criteria*. To complete delineation of the excavation footprint, contingency sample SWW2-1.0-15 was analyzed for arsenic after arsenic was detected above the SRS in sample SWW-1.0-1.5. Multiple large trees are located on the western portion of FTMM-12 and in the vicinity of overhead power lines. Because removal of these trees would pose a risk of damaging the power lines, the trees were left in place and an alternative cap consisting of geotextile and riprap was constructed within the trees' driplines. During subgrade preparation activities at FTMM-12, AECOM observed that FTMM-12 received stormwater from the surrounding areas and, if implemented without additional erosion control measures, planned capping would likely result in poor drainage on upgradient land and erosion of the cap. To mitigate potential erosion, three swales were constructed where concentrated stormwater flow was anticipated. The swales, which are a component of the landfill cap, were constructed from demarcating geotextile, 1 foot of common fill, an additional geotextile, and 1 foot of riprap. Culverts were also placed where the swale crossed the alignment of the walking path. 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 24,500 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. Topsoil was placed in one 6-inch loose lift. Approximately 4,900 (in-place) cubic yards of topsoil were imported and placed within landfill

extents. A walking path was also constructed on top of the 18-inch common fill layer at FTMM-12 consisting of one 6-inch-thick, compacted layer of #10 screenings placed on top of a non-woven geotextile. 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. Seed mixtures were applied at the planting rates specified in the SESCO. Hydroseeding was used to plant the appropriate seed mixtures in both the riparian zone and upland area within the landfill's extents. The SOC identifies native herbaceous species, and the native species were included in the selected pollinator seed mixture for the riparian zone. In accordance with the SOC, a pollinator seed mix resulting in native herbaceous vegetation of equal or greater ecological function was applied to the riparian zone within the extent of the landfill.

A Deed notice for the FTMM-12 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.

NJDEP concurred that no further sampling activities were required at FTMM-12. An NFA was issued on May 15, 2017 (NJDEP, 2017a).

2.3.5 Landfill FTMM-14 Remedy Implementation To Date

Construction activities at FTMM-14 began on July 13, 2021. Initial construction activities included the excavation of a key-in trench around the LOL to allow the 2-foot cap to meet surrounding elevations. Subgrade preparation within the LOL consisted of regrading to ensure positive drainage with slopes generally between 3 and 6%, to the extent possible, in accordance with NJDEP Solid Waste Regulations, N.J.A.C. 7:26 Subchapter 2A. The subgrade at the landfill was then compacted with a vibratory compactor to 90% of the subgrade's maximum dry density (determined using ASTM D698), based on field measurements using a soil density gauge (Troxler E-Gauge Model 4590). No suspected hazardous wastes or suspected asbestos-containing materials were observed in the landfill material and pre-existing cover during regrading. During subgrade preparation, a passive methane mitigation system consisting of two 100-foot-long trenches with perforated, 4-inch diameter 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, UV-resistant, Schedule 80 PVC, were installed on 25-foot spacing along the length of the collection trenches. Once subgrade was prepared, landfill capping construction began. Specifically, delineation fabric (Geotex® Orange Nonwoven Printed Demarcation Geotextile) was placed in sections overlapping 1 foot. Approximately 15,700 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. In the vicinity of an existing degraded stormwater culvert, the end section of the eroded culvert pipe was replaced with corrugated HDPE pipe and riprap was placed around the outfall. In the vicinity of the single large tree located within the landfill's footprint the tree's dripline extents were capped with geotextile fabric and a 1-foot-thick layer of riprap. 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-14 consisting of one 6-inch thick, compacted layer of #10 screenings placed on top of a non-woven geotextile. 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.

Seed mixtures were applied at the planting rates specified in the SESCO. Hydroseeding was used to plant the appropriate seed mixtures in both the riparian zone and upland area within the landfill's extents. The SOC identifies native herbaceous species, and the native species were included in the selected pollinator seed mixture for the riparian zone. In accordance with the SOC, a pollinator seed mix resulting in native herbaceous vegetation of equal or greater ecological function was applied to the riparian zone within the extent of the landfill.

A Deed notice for the FTMM-14 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.

NJDEP concurred that no further groundwater sampling activities were required at FTMM-14. An NFA was issued on May 15, 2017 (NJDEP, 2017c).

2.3.6 Landfill FTMM-18 Remedy Implementation To Date

Construction activities at FTMM-18 began on January 11, 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. Subgrade preparation within the LOL consisted of regrading to ensure positive drainage with slopes generally between 3 and 6%, to the extent possible, in accordance with NJDEP Solid Waste Regulations, N.J.A.C. 7:26 Subchapter 2A. The subgrade at each landfill was then compacted with a vibratory compactor to 90% of the subgrade's maximum dry density (determined using ASTM D698), based on field measurements using a soil density gauge (Troxler E-Gauge Model 4590). No suspected hazardous wastes or suspected asbestos-containing materials were observed in the landfill material and pre-existing cover during regrading. Small quantities of surficial waste outside the southeastern LOL were consolidated within FTMM-18's extents under the landfill cap. No surficial waste was observed north of the LOL. Additionally, the swale was observed to be eroded in the vicinity of a culvert near the southernmost point of FTMM-18. To prevent further erosion and to protect the southern edge of the landfill cap, riprap was placed in the swale in the vicinity of the culvert. During preparation and compaction of the FTMM-18 subgrade, it was identified that certain portions of FTMM-18 are tidally influenced and are submerged during high tide. Because these conditions prevent compaction of the subgrade and the placement and compaction of common fill within the landfill's extents, an alternative cap consisting of demarcation fabric and 3-inch to 5-inch diameter stone was constructed. Excavation of the isolated ash, coal, and asphalt identified in test pit M18TP10 was conducted on July 28, 2021. A trench was excavated to remove the isolated material and measured approximately 4-ft wide, 8-ft long, and 7-ft deep, which is 1 foot beyond M18TP10's original extents in each direction. No landfill material was observed in the excavation's bottom or sidewalls. The excavation extents were confirmed in the field with manual measurements. Due to the sequence of landfill cap construction, material excavated from M18TP10's location was loaded into a dump truck and transported to FTMM-12. The material was spread within the landfill capping extents and graded to promote positive drainage; it was not used as a component of the landfill cap. Investigations at FTMM-12 have identified ash, coal, and asphalt already present within the landfill capping extents. Additionally, nearby soil

borings installed at FTMM-18 did not contain any constituents at concentrations exceeding the maximum concentrations already present at FTMM-12. Therefore, the excavated material from M18TP10 meets the definition of alternative fill that can be placed without prior NJDEP approval in accordance with N.J.A.C. 7:26E-5.2(b). 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 3,700 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. Topsoil was placed in one 6-inch loose lift. Approximately 5,600 (in-place) cubic yards of topsoil were imported and placed within landfill extents. A walking path was also constructed on top of the 18-inch common fill layer at FTMM-18 consisting of one 6-inch thick, compacted layer of #10 screenings placed on top of a non-woven geotextile. 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. Seed mixtures were applied at the planting rates specified in the SSCP. Hydroseeding was used to plant the appropriate seed mixtures in both the riparian zone and upland area within the landfill's extents. The SOC identifies native herbaceous species and the native species were included in the selected pollinator seed mixture for the riparian zone. In accordance with the SOC, a pollinator seed mix resulting in native herbaceous vegetation of equal or greater ecological function was applied to the riparian zone within the extent of the landfill.

A Deed notice for the FTMM-18 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.

Historical data reported that concentrations of benzene at M18MW22, M18MW23, and 296MW06 exceeded the GWQS. Previous recommendations and the ROD have indicated that a CEA is to be established at FTMM-18 for benzene present in groundwater detected in monitoring wells. Monitoring well 296MW06 has consistently reported benzene exceedances of the GWQS, associated with a gasoline spill during military field exercise conducted at the landfill. Concentrations of cis-1,2 DCE and carbon tetrachloride at M18MW22 and M18MW23 were recently identified in a 2021 sampling event and are not believed to be associated with FTMM-18.

In general, groundwater is encountered at an average of 3.0 ft bgs and groundwater flow is to the north toward Parker's Creek. Groundwater contour maps and results figures have been presented in previous reports and are not reincluded in this document.

A CEA has been prepared for benzene impacts associated with monitoring well 296MW06 at the FTMM-18 landfill. Based on NJDEP's *Guidance on the Final Designation of Classification Exception Areas* (1998), analytical solution (Option C) was used to calculate the length and duration of the proposed CEA (NJDEP, 1998). The half-life/degradation rate of benzene concentrations in monitoring well 296MW06 was determined by analysis of concentrations at 296MW06 where benzene analytical results were available from 2008 through 2021. As shown on the CEA worksheet an initial (C_0) concentration was established at the maximum concentration of 75.98 µg/L, reported in 2011. Based on the data, calculated and graphical degradation rates were

determined to be 0.0017 and 0.0006, respectively. For comparison purposes, a range of literature degradation values for benzene were also assessed, but ultimately were not supported by the data. Published benzene degradation rates were sourced from *Approximation of Biodegradation Rate Constants for Monoaromatic Hydrocarbon (BTEX) in Ground Water* (Wiedemeier, et al., 1996). Using the more conservative graphical degradation rate value of 0.0006 mg/kg, the proposed CEA duration was determined to be 6.08 years from the date of the last sample collected in December 2021.

2.3.7 Landfill FTMM-25 Remedy Implementation To Date

Construction activities at FTMM-25 began on November 9, 2020. Initial construction activities included the excavation of a key-in trench around the LOL to allow the 2-foot-thick cap to meet the surrounding elevations. Subgrade preparation within the LOL consisted of regrading to ensure positive drainage with slopes generally between 3 and 6%, to the extent possible, in accordance with NJDEP Solid Waste Regulations, N.J.A.C. 7:26 Subchapter 2A. Once subgrade was prepared, landfill capping construction began. Specifically, delineation fabric (Geotex® Orange Nonwoven Printed Demarcation Geotextile) was placed in sections overlapping 1 foot. Approximately 3,418 cubic yards (6,835 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 six 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 1,200 (in-place) cubic yards of topsoil were imported and placed within landfill extents. 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.

Seed mixtures were applied at the planting rates specified in the SESCO. Hydroseeding was used to plant the appropriate seed mixtures in both the riparian zone and upland area within the landfill's extents. The SOC identifies native herbaceous species and the native species were included in the selected pollinator seed mixture for the riparian zone. In accordance with the SOC, a pollinator seed mix resulting in native herbaceous vegetation of equal or greater ecological function was applied to the riparian zone within the extent of the landfill.

A Remedial Action Report (RAR) was submitted on December 16, 2022 and documented the completion of the capping of the landfill. The RAR was updated with a minor adjustment of the limit of landfill with a revision on 8 of January 2025.

Deed notices for the FTMM-25 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.

NJDEP concurred that no further groundwater sampling activities were required at FTMM-25. A request for n regarding ground water was accepted by NJDEP in 2017 (NJDEP, 2017).

3.0 Rationale for Amending the 2017 Record of Decision for Landfill Sites FTMM-03, FTMM-04, FTMM-05, FTMM-12, FTMM-14, FTMM-18 and FTMM-25 at Fort Monmouth

Following the implementation of the vegetative covers for landfills FTMM-04, FTMM-12, FTMM-14 and FTMM-25 it was determined that certain portions of landfills FTMM-04, FTMM-12, FTMM-14 and FTMM-25 were located on property that is not owned by the Army. The waste on non-Army property will need to be addressed. At landfill FTMM-04 the Army proposes to excavate the landfill waste on non-Army property adjacent to Avenue of Memories and dispose of it offsite. For the portion of landfill FTMM-04 along Wilson Avenue, the owner of the property has agreed to place a deed notice on their property that contains a portion of landfill FTMM-04 (See **Figure 4**). At landfill FTMM-14, the Army proposes to excavate the landfill waste on non-Army property and dispose of it offsite (see **Figure 5**). The work at FTMM-14 will also include the movement of the passive gas vents off non-Army property onto the Army owned portion of the landfill. This will allow the non-Army property owners 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.

For landfills FTMM-12 and FTMM-25 (see **Figures 6 and 7** respectively), the owners of the non-Army property where landfill material remains have agreed to place deed notices on their portions of the property and thus the only change to the original ROD is that there will be multiple deed notices for each of these landfills to address landfill material left on non-Army property.

Landfills FTMM-03, FTMM-05 and FTMM-18 did not have landfill material on non-Army property and therefore the remedies included in the original ROD for these sites does not require amendment.

Figure 4 - FTMM-04 Proposed Revised Remedy

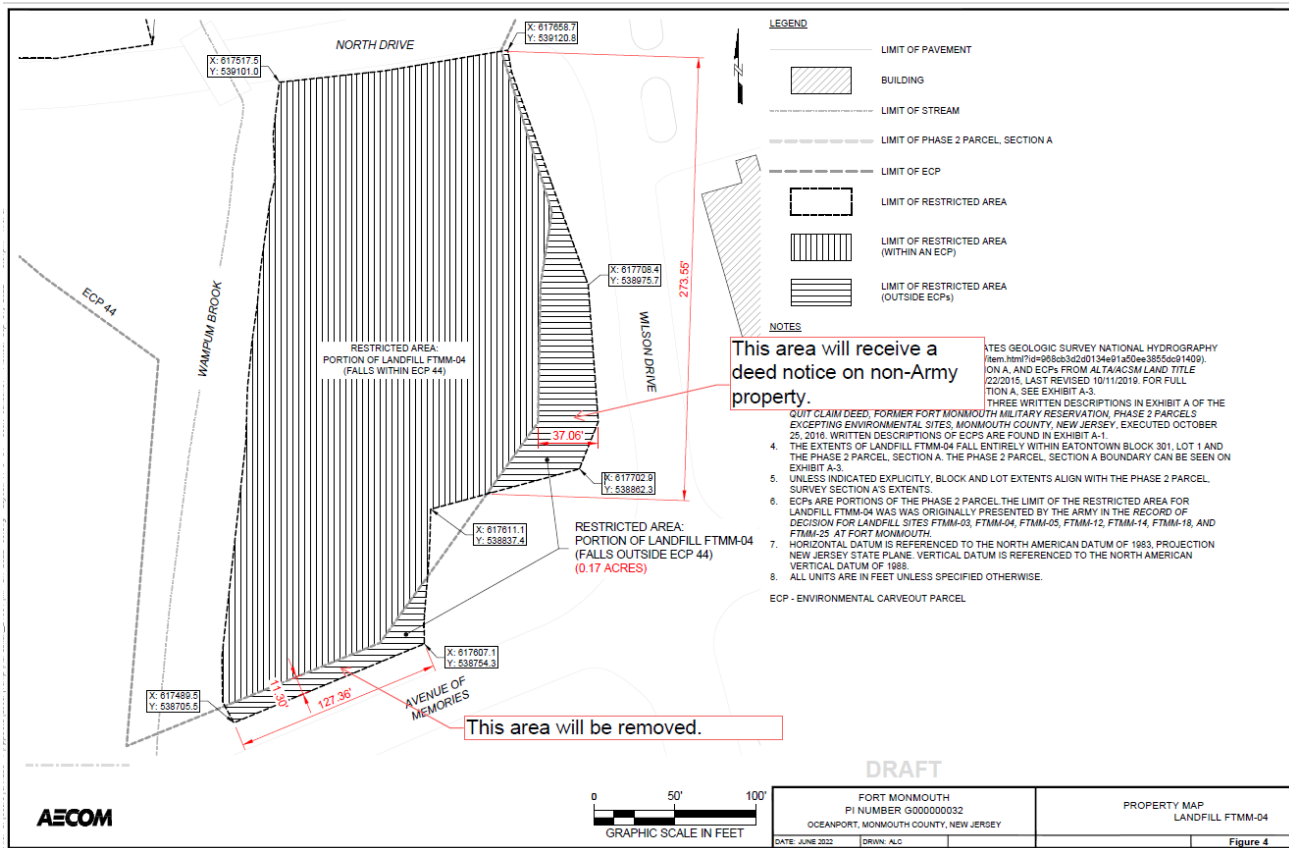


Figure 5 - FTMM-14 Proposed Revised Remedy

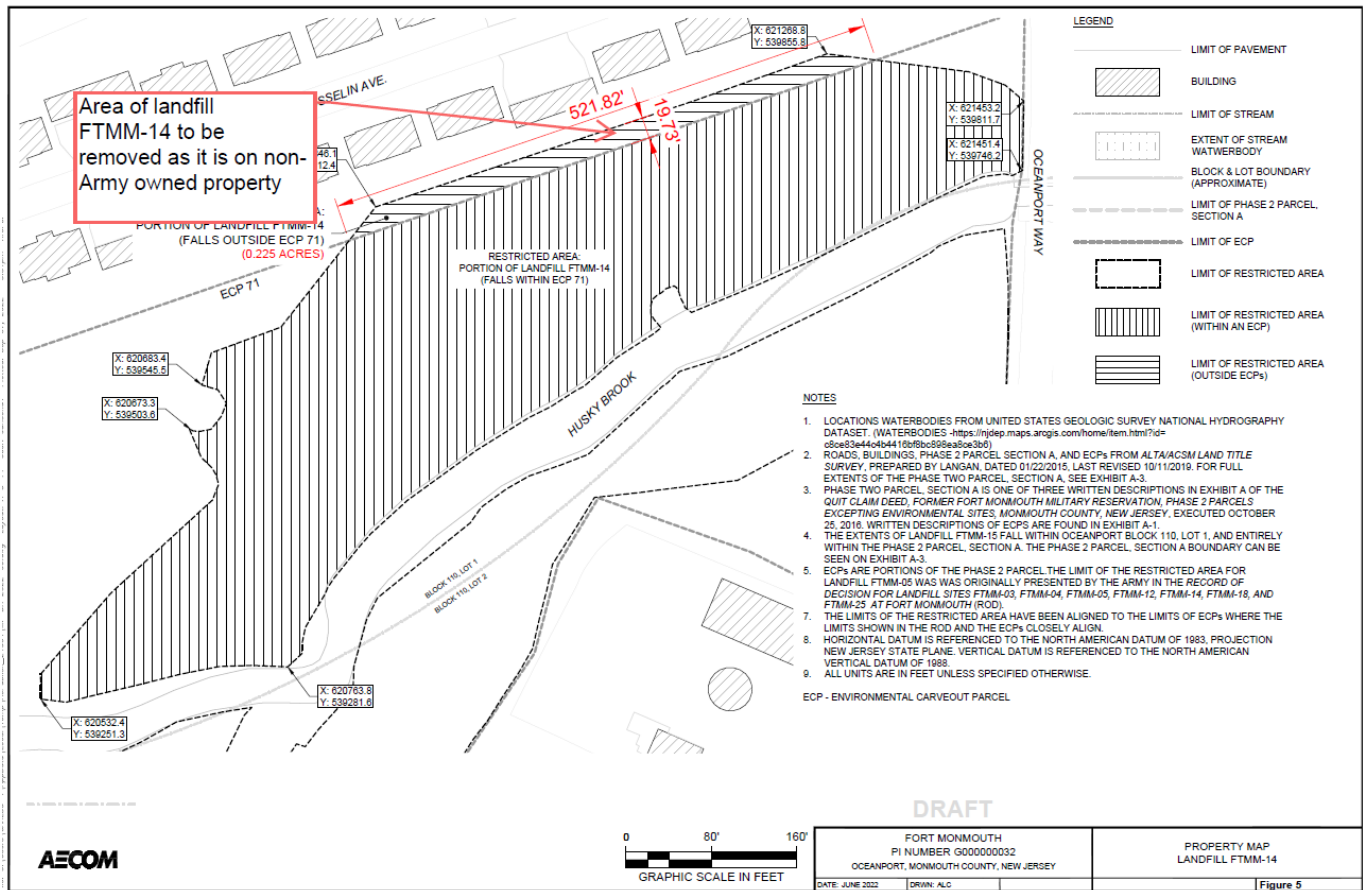


Figure 6 - FTMM-12 Proposed Revised Remedy

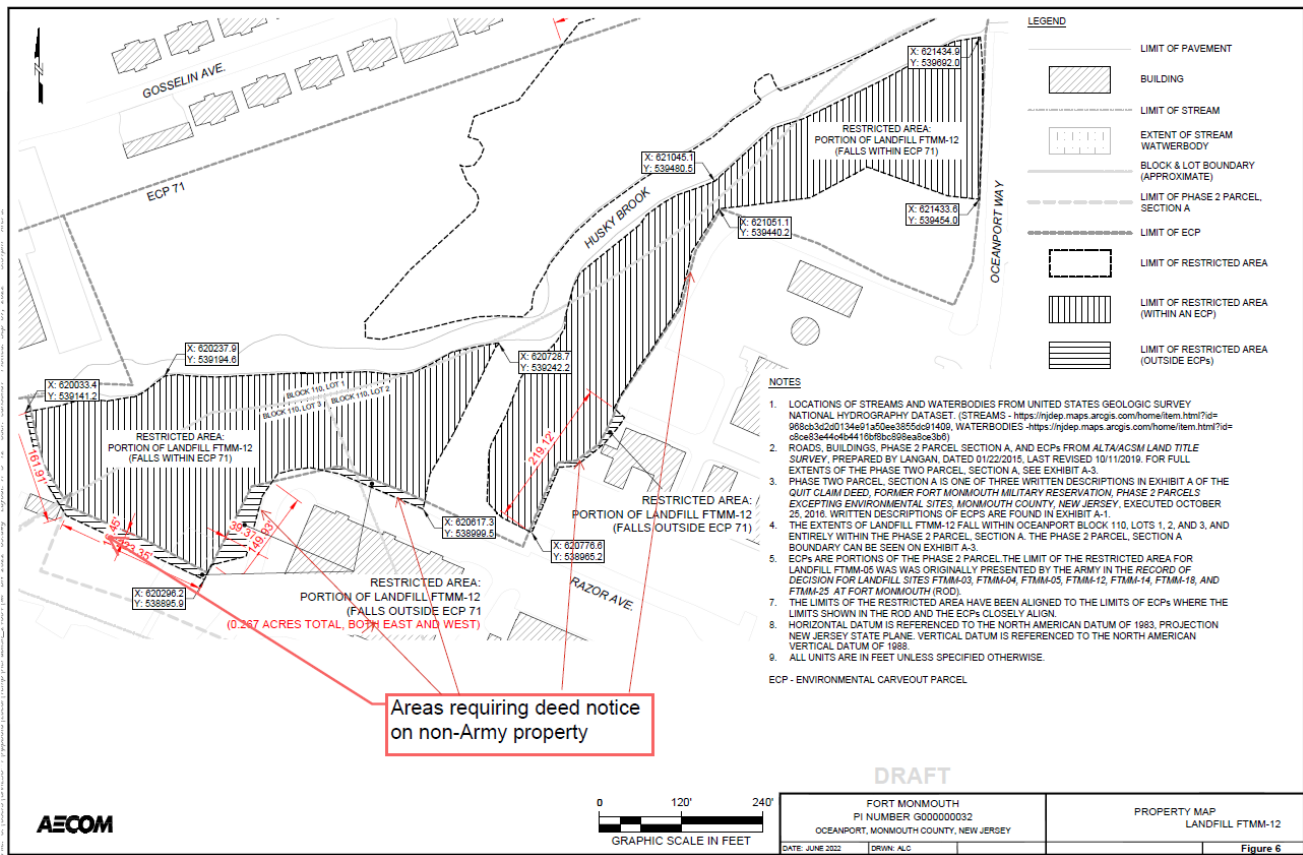
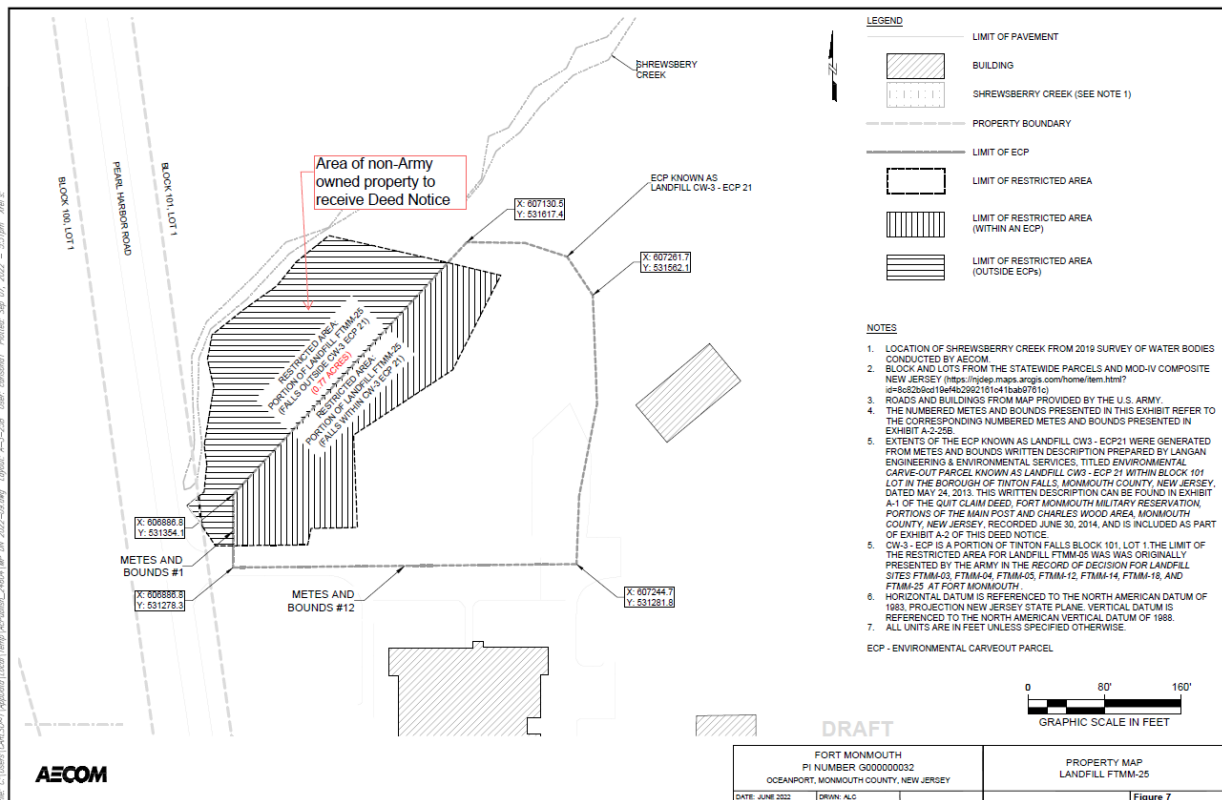


Figure 7 - FTMM-25 Proposed Revised Remedy



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-04 and FTMM-14 that exist on non-Army property will have waste removed and disposed of offsite.
- Area of Landfills FTMM-12 and FTMM-25 that exist on non-Army property will remain and be subject to Land Use Controls.

5.0 Remedial Action Objectives

The remedial action objective (RAO) for the FTMM-04, FTMM-05, FTMM-12, FTMM-14, and FTMM-25 landfill sites 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-14 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 Requirements.

Table 2 - Summary of Applicable or Relevant and Appropriate Requirements

Media/Action	Requirement	Prerequisite	Citation
Chemical Specific ARARs			
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	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".

	person responsible for conducting the remediation shall comply with the remediation standards set forth in NJAC 7:26D		
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. In most situations, this requires some form of remedial action (i.e., active or passive (monitored natural attenuation (MNA)); establishment of a CEA.	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.
Action Specific ARARs			
General remedial action requirements for implementing remedies in New Jersey.	Remedial actions in New Jersey are 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 offsite. 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 consistent 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 ICs.
- Removal of landfill waste material located on Army and 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 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-04 and FTMM-14

Under this alternative, it is assumed that landfill waste material will be removed from non-Army and Army property and post excavation samples will be collected to verify that underlying 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 the movement of passive gas vents from non-Army property (at landfill FTMM-14) onto landfill which is on Army owned property.

The estimated costs for Alternative 2 are as follows:

- Initial (capital) cost: \$2,239,729 (Appendix B)
- Annual O&M cost: \$0
- Closeout cost: \$0
- Estimated present worth cost: \$2,239,729

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 ECP 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 propose a physical hazard or in the case of landfill FTMM-05 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 offsite 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 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

Alternatives 1 provides no reduction in toxicity, mobility, or volume of waste material.

Alternative 2 would somewhat reduce toxicity and mobility by containing waste offsite 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 either of the alternatives.

6.1.6 Implement Ability

No significant technical implement ability issues are associated with either of the Alternatives. There are no action-specific administrative implement ability issues associated with either 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 \$2,707,137. This estimate is based on an existing contract for this work.

6.1.8 State Acceptance

NJDEP has been consulted on the approach of removing waste and disposal offsite 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-03, FTMM-04, FTMM-05, FTMM-12, FTMM-14, FTMM-18 and FTMM-25 at Fort Monmouth to address the landfill waste located on non-Army property associated with landfills. Landfills FTMM-04 and FTMM-14 will be addressed through the removal and off-site disposal of the waste and backfilling and grading of the property as well as deed notice for non-Army property associated with landfill FTMM-04. Landfills FTMM-12 and FTMM-25 will be addressed as covered in the ROD, however deed notices will be placed on the Army owned property as well as non-Army owned property. Landfills FTMM-03, FTMM-05 and FTMM-18 do not require changes to the original remedy selected in the ROD.

7.0 Statutory Determinations

Based on available information, the Army believes the preferred alternative 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 identified in the advertisement for this Proposed Plan. 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-03, Fort Monmouth, Oceanport,

Monmouth County, New Jersey, February 2016

Final Remedial Investigation Report for Site FTMM-04, Fort Monmouth, Oceanport, Monmouth County, New Jersey, July 2014

Remedial Investigation/Feasibility Study Report for Site FTMM-05, Fort Monmouth, Oceanport, Monmouth County, New Jersey, October 2015

Final Remedial Investigation Report for Site FTMM-12, Fort Monmouth, Oceanport, Monmouth County, New Jersey, August 2015

Remedial Investigation/Feasibility Study Report for Site FTMM-14, Fort Monmouth, Oceanport, Monmouth County, New Jersey, July 2015

Final Remedial Investigation Report for Site FTMM-18, Fort Monmouth, Oceanport, Monmouth County, New Jersey, October 2015

Record of Decision (ROD) for Landfill sites FTMM-03, FTMM-04, FTMM-05, FTMM-12, FTMM-14, FTMM-18 and FTMM-25 at Fort Monmouth, Oceanport, Monmouth County, New Jersey, July 2017

Remedial Action Report, Landfill Capping, FTMM-25, Fort Monmouth, Oceanport, Monmouth County, New Jersey (Dec 2022)

Appendix A

**Record of Decision Landfills for Landfill Sites FTMM-03, FTMM-04,
FTMM-05, FTMM-12, FTMM-14, FTMM-18 and FTMM-25 at Fort
Monmouth**

**RECORD OF DECISION FOR
LANDFILL SITES FTMM-03, FTMM-04,
FTMM-05, FTMM-12, FTMM-14,
FTMM-18, AND FTMM-25 AT FORT
MONMOUTH**

OCEANPORT, MONMOUTH COUNTY, NEW JERSEY

June 2017



**U.S. Corps of Engineers, New York District
and**

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



New Jersey Department of Environmental Protection
Site Remediation Program

Report Certifications for RCRA GPRA 2020, CERCLA, and Federal Facility Sites

These certifications are to be used for reports submitted for RCRA GPRA 2020, CERCLA, and Federal Facility Sites. The Department has developed guidance for report certifications for RCRA GPRA 2020, CERCLA, and Federal Facility Sites under traditional oversight. The "Person Responsible for Conducting the Remediation Information and Certification" is required to be submitted with each report. For those sites that are required or opt to use a Licensed Site Remediation Professional (LSRP) the report must also be certified by the LSRP using the "Licensed Site Remediation Professional Information and Statement". For additional guidance regarding the requirement for LSRPs at RCRA GPRA 2020, CERCLA and Federal Facility Sites see http://www.nj.gov/dep/srp/srra/training/matrix/quick_ref/rcra_cercla_fed_facility_sites.pdf.

Document: "Record of Decision for Seven Landfill Sites at FTMM"

PERSON RESPONSIBLE FOR CONDUCTING THE REMEDIATION INFORMATION AND CERTIFICATION

Full Legal Name of the Person Responsible for Conducting the Remediation: William R. Colvin

Representative First Name: William Representative Last Name: Colvin

Title: BRAC Environmental Coordinator

Phone Number: (732) 380-7064

Ext: _____

Fax: _____

Mailing Address: P.O. Box 148

City/Town: Oceanport

State: NJ

Zip Code: 07757

Email Address: william.r.colvin18.civ@mail.mil

This certification shall be signed by the person responsible for conducting the remediation who is submitting this notification in accordance with Administrative Requirements for the Remediation of Contaminated Sites rule at N.J.A.C. 7:26C-1.5(a).

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein, including all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, to the best of my knowledge, I believe that the submitted information is true, accurate and complete. I am aware that there are significant civil penalties for knowingly submitting false, inaccurate or incomplete information and that I am committing a crime of the fourth degree if I make a written false statement which I do not believe to be true. I am also aware that if I knowingly direct or authorize the violation of any statute, I am personally liable for the penalties.

Signature: _____

Date: 07/25/2017

Name/Title: William R. Colvin / BRAC Environmental Coordinator

Completed form should be sent to:

Mr. Ashish Joshi
New Jersey Department of Environmental Protection
Division of Remediation Management & Response
Bureau of Northern Field Operations
7 Ridgedale Avenue (2nd Floor)
Cedar Knolls, New Jersey 07927-1112

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LIST OF ACRONYMS

ACRONYM	DEFINITION
°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
COCs	constituents of concern
COPC	constituents of potential concern
CWA	Charles Wood Area
EA	Evans Area
EC	engineering controls
FFSRA	Federal Facility Site Remediation Agreement
ft/day	feet per day
FTMM	Fort Monmouth
GES	Groundwater & Environmental Services, Inc.
gpm	gallons per minute
GWQS	Ground Water Quality Standard(s)
HHRA	human health risk assessment
LUC	land use controls
LUCIP	land use control implementation plan
LTM	long-term monitoring
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
PAHs	polynuclear aromatic hydrocarbons
PCB	polychlorinated biphenyl
PCE	tetrachloroethene
RAGS	Risk Assessment Guidance for Superfund

ACRONYM	DEFINITION
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
SVOCs	Semi-volatile organic compounds
SWQS	Surface Water Quality Standard
TRSR	Technical Requirements for Site Remediation
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 seven 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-03, FTMM-04, FTMM-05, FTMM-12, FTMM-14, FTMM-18 are located on the MP and FTMM-25 is located on the CWA.

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 for FTMM and has selected the presumptive remedy for the seven 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 presented the Proposed Plan for the seven former landfills at a public meeting on March 2, 2017. Comments on the Proposed Plan for the landfills provided by stakeholders were evaluated and considered in selecting the final remedy. See responses to comments in Section 3 – Responsiveness Summary.

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 seven former landfills consist of a vegetated soil cover and implementation of land use controls (LUCs).

To address safety concerns, a vegetated soil cover will be placed over the landfill area after the landfill is regraded to provide safety protection for future use. The vegetated soil cover will be placed consistent with the NJDEP regulations (N.J.A.C. 7:26). 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 due to the proximity of residential houses to the FTMM-14 landfill. The two 100-foot-long trench systems will be located within the landfill boundary and vented to the surface in 25 foot centers. The intent of this passive venting system is in lieu of continued methane monitoring after the installation of the vegetative soil cover. The location of the venting system shall be installed to correspond with sampling points M14SG10 and M14SG 9 and extend in a northeasterly direction parallel to the residential houses. The location of the venting system may require adjustment during installation due to the existences of high pressure gas main and the individual gas main service connections for each housing unit.

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, Classification Exception Areas (CEAs) will be established at FTMM-05 and FTMM-18 to restrict groundwater use or installation of drinking water wells at the FTMM-05 and FTMM-18 landfills. ICs in the form of CEAs which restrict the use of groundwater will be implemented and will remain in place until NJDEP Groundwater Quality Standards (GWQS) for the identified COCs are achieved at the site.

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. The Environmental Restoration Program Information Repository for FTMM is located at the Monmouth County Library, Eastern Branch, 1001 Route 35, Shrewsbury, New Jersey 07702.

Table 1
ROD Certification Checklist

Criterion	Discussion
Chemicals of concern (COCs) and their respective concentrations	Included in Section 2.6.2
Baseline risk represented by the COCs	Included in Section 2.8
Cleanup levels established for COCs and the basis for these levels	Not applicable
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 a vegetated soil cover, and implementation of LUCIP. In addition, the signatures from the NJDEP document concurrence with the ROD.



Tom Lederle, Chief, U.S. Army BRAC Division

17 July 2017

Date

Mark Pederson, NJDEP Assistant Commissioner

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-03, FTMM-04, FTMM-05, FTMM-12, FTMM-14, FTMM-18, and FTMM-25. The locations of the landfills are shown on **Figure 2**, except for FTMM-25 which is shown on **Figure 3**. 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 RI Reports (**Table 2**).

Table 2
Remedial Investigation Report Submittal Dates

Landfill	Submitted to NJDEP
FTMM-03	February 2016
FTMM-04	July 2014
FTMM-05	October 2015
FTMM-12	August 2015
FTMM-14	July 2015
FTMM-18	October 2015
FTMM-25	August 2016

2.2 SITE HISTORY AND ENFORCEMENT ACTIVITIES

2.2.1 FTMM Landfill Site Background

A study was conducted in 1980, with a follow-up evaluation completed in 1988, at locations that were considered to be major landfill areas. A timeline of significant events, including the years of operation since FTMM opened nearly 100 years ago is provided on **Figure 4**. 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 (U.S. Army Toxic and Hazardous Materials Agency

[USATHAMA], 1988).

A 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 assessment in 1980. 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 Remedial Investigation (RI) report for each landfill is a compilation of previous investigations and an evaluation of available analytical data collected from each site.

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

2.2.2 FTMM-03

FTMM-03 landfill located in the western portion of the MP, is bordered by Lafetra Creek to the north, Mill Creek to the east, and North Drive to the south and west (**Figure 5**). FTMM-03 was in operation from approximately 1959 to 1964 and was reportedly used for the general disposal of domestic and industrial wastes. The landfill soil cover material ranges in thickness from 0 to 48 inches below ground surface (bgs) and averages 20 inches in thickness.

2.2.3 FTMM-04

FTMM-04 is located on the MP and is bounded by North Drive to the north, Avenue of Memories to the south, and Wilson Avenue to the east (**Figure 6**). Mill Creek bisects the west-central portion of the landfill. FTMM-04 was in use as a landfill between 1955 and 1956, and was reportedly used for the disposal of building demolition debris. The landfill soil cover material ranges in thickness from 6 to 46 inches bgs and averages 32 inches in thickness.

2.2.4 FTMM-05

FTMM-05 located in the western portion of the MP, north of FTMM-04 and south of the FTMM-08 landfill site (not included in this ROD) (**Figure 7**). FTMM-05 is bounded to the south by North Drive, to the north by an unpaved road, Wilson Avenue to the east and Mill Creek and Parkers Creek to the west. A portion of Mill Creek is adjacent to the bounds of the western side of the site. FTMM-05 was in use as a landfill between 1952 and 1959, and was reportedly used for domestic and industrial wastes. The landfill soil cover material at FTMM-05 ranges in thickness from 0 to 72 inches bgs and averages 24 inches in thickness.

2.2.5 FTMM-12

FTMM-12 is located in the central portion of the MP and is bordered by Husky Brook to the north, Murphy Drive to the east, multiple buildings to the south, and Todd Avenue to the west (**Figure 8**). FTMM-12 was in use as a landfill between 1950 and 1966, and was reportedly used for the disposal of automobiles and domestic and industrial wastes. The landfill soil cover material ranges in thickness from 0 to 48 inches bgs and averages 24 inches in thickness.

2.2.6 FTMM-14

FTMM-14 is located on the MP and is bordered by houses along Gosselin Avenue to the north, by Husky Brook to the south, and by Murphy Drive to the east (**Figure 9**). FTMM-14 was in use as a landfill between 1965 and 1966 and was reportedly used as a general-purpose disposal area

for building rubble and was later covered with dredged material from Husky Brook Lake. The landfill soil cover material ranges in thickness from 6 to 78 inches bgs and averages 30.6 inches in thickness.

2.2.7 FTMM-18

FTMM-18 is located on the northern part of the MP, between Parkers Creek to the north and multiple buildings and Sherrill Avenue to the south (**Figure 10**). The period of operation for FTMM-18 is unknown; however past use of the site reportedly consisted of both landfill and non-landfill-related components. A building demolition debris disposal area is located in the southern portion of FTMM-18, just north of Building 293. The landfill soil cover material ranges in thickness from 0 to 60 inches bgs and averages 28 inches in thickness. The Final RI Report for FTMM-18 was submitted to NJDEP in October 2015.

2.2.8 FTMM-25

FTMM-25 is located at the CWA. It is bounded by Pearl Harbor Avenue to the west, Shrewsbury Creek to the north, a wooded area to the east and the Pulse Power Facility Building to the south (**Figure 11**). FTMM-25 currently consists of a partially wooded lot with tall grass in the center and trees to the north, east and west. FTMM-25 was in use as a landfill between 1955 and 1956 and was reportedly used for the disposal of debris from the demolition of buildings at CWA. The landfill soil cover material ranges in thickness from 1 to 30 inches bgs and averages 20 inches in thickness. The Final RI Report for FTMM-25 was submitted to NJDEP in August 2016.

2.3 COMMUNITY PARTICIPATION

A final Proposed Plan for FTMM-03, FTMM-04, FTMM-05, FTMM-12, FTMM-14, FTMM-18, and FTMM-25 was completed and released to the public in February 2017 at the Monmouth County Library, Eastern Branch, 1001 Route 35, Shrewsbury, NJ 07702.

A newspaper notification was posted in the Asbury Park Press on February 6 and 7, 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 Wednesday, February 8, 2017 to Thursday, March 9, 2017 during which no comments from the public were received. A public meeting was held on Thursday, March 2, 2017 to present the proposed remedy for the seven landfills and seek public comments. At this meeting, representatives from the Army and U.S. Army Corps of Engineers (USACE) were present to answer questions about the site and the presumptive remedy under consideration. One question was received at the public meeting.

2.4 SCOPE AND ROLE OF REMEDY

This ROD describes the remedy to address safety concerns at seven former landfills at FTMM. RIs performed in 2014 and 2015 concluded that risks to human health and the environment from soil at the landfills 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 there is no CERCLA risk, and therefore no need for a CERCLA action, a vegetated soil cover will be placed over the landfills to address safety concerns for future use, and the soil cap will be placed consistent with the applicable NJDEP regulations. LUCs to maintain the soil cap and prevent residential land use will be implemented at the landfills.

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 seven 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 seven landfill sites was released for public comment in February 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 and CWA at FTMM, as well as those of the seven landfills individually (see Section 2.6.1.7). The RI Reports cited in Table 2.1 include further detailed descriptions of the physiography, topography, vegetation, geology, hydrogeology, and surface water at each of the seven landfill sites.

2.6.1.1 Physiography, Topography, and Vegetation

Both the MP and CWA are 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 and CWA consist of extensive areas of regularly mowed lawns and landscaped areas

2.6.1.2 Geology

The MP and CWA are 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 underlies much of the MP and the northern portion of the CWA, 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 and CWA areas 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 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. The Shrewsbury River is located within one mile to the east of the MP. Wampum Brook is located to the south of the CWA, and Shrewsbury Creek traverses the CWA from west to east. Shrewsbury

Creek and Wampum Brook merge approximately 300 feet east of the CWA to form Mill Creek. No other surface water bodies were identified within one mile of the CWA.

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 and Lafetra Creek are classified predominantly as fresh water riverine, emergent wetland, and forested/shrub wetland. Husky Brook Lake is classified as a fresh water pond. Several CWA wetland areas are identified on the USFWS National Wetland Inventory. Most of Shrewsbury Creek and Wampum Brook are classified as fresh water forested/shrub wetland, and the open water in the golf course in the eastern portion of the CWA is classified as a fresh water pond.

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

- FTMM-03: Bordered by Lafetra Creek to the north and Mill Creek to the east;
- FTMM-04: Mill Creek bisects the west-central portion of the site;
- FTMM-05: Bordered by Mill Creek and Parkers Creek to the west;
- FTMM-12: Bordered by Husky Creek to the north;
- FTMM-14: Bordered by Husky Creek to the south;
- FTMM-18: Adjacent to Parkers Creek to the north; and
- FTMM-25: Bordered by Shrewsbury Creek to the north.

2.6.1.5 Soils

According to 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, whereas the CWA is covered by less urban land complexes than the MP. Surface soils near the MP and CWA 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 and CWA 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 (a storm 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 Seven Sites

FTMM-03

FTMM-03 is located in a floodplain. The ground surface topography is flat, with ground surface elevations of less than 20 feet amsl. The site gently slopes to the north and east, discharging runoff via overland flow to adjacent Lafetra Creek and Mill Creek. The landfill soil cover material ranges in thickness from 0 to 48 inches bgs and averages 20 inches thick. The soil cover is composed primarily of silty sand to sandy silt. Deeper soil to a depth of approximately 10 feet bgs is also composed of silty sand to sandy silt with trace to some gravel, underlain by clay. The depth to groundwater at FTMM-03 ranges from 2 to 12 feet bgs. Groundwater migrates in a north-northwesterly direction toward Lafetra Creek; the calculated average horizontal advective groundwater seepage velocity ranges from 0.08 to 0.48 feet per day (30 to 175 feet per year).

FTMM-04

FTMM-04 is located in the floodplain of Mill Creek. 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 6 to 46 inches bgs and averages 32 inches thick. Soil to a depth of at least 24 feet bgs at FTMM-04 is comprised of brown, fine to coarse sand with fine gravel and root fragments and green/gray/black sandy silt and clay. The depth to groundwater typically ranges from approximately 5 to 10 feet bgs. Groundwater east of Mill Creek migrates toward the west (i.e., toward Mill Creek); the calculated average horizontal advective groundwater seepage velocity is 0.48 foot per day (175 feet per year).

FTMM-05

FTMM-05 is located adjacent to Mill Creek, Lafetra Creek, and Parkers Creek. The ground surface topography is flat, with elevations of less than 20 feet amsl. The landfill soil cover material ranges in thickness from 0 to 72 inches bgs and averages 24 inches thick. The soil cover is composed primarily of topsoil and tan and brown silty sand with root fragments. Deeper soil is composed of greenish, orange, and gray sandy clay with a trace of gravel. The depth to groundwater at FTMM-05 ranges from 6 to 11 feet bgs. Groundwater migrates in a westerly to northwesterly direction toward Mill and Parkers Creeks; the calculated average horizontal advective groundwater seepage velocity is 0.22 ft/day (82 feet per year).

FTMM-12

FTMM-12 is located adjacent to Husky Brook and is bisected by a storm water outfall and drainage ditch that is a tributary to Husky Brook. The ground surface topography is flat, with elevations of less than 20 feet amsl. Landfill cover material thicknesses range from 0 to 48 inches and average 24 inches. The fill material underlying the soil cover is composed of green to brown sand with little silt and clay to a depth of 4 to 10 feet bgs. Native soil encountered below the fill consisted of brown to black fine sand, silt, and clay with organic material. The depth to groundwater at FTMM-12 ranges from 2 to 10 feet bgs. Groundwater migrates in a northern/northwestern direction toward Husky Brook; the calculated average advective horizontal groundwater seepage velocity is 0.51 to 0.62 foot per day (186 to 226 feet per year).

FTMM-14

FTMM-14 is located southeast of Mill and Parker Creek and immediately north and adjacent to Husky Brook. The ground surface topography is flat, with elevations of less than 20 feet amsl. Landfill cover material thickness range from 6 to 78 inches and average 30 inches. The soil cover is composed primarily of greenish-gray, silty, coarse to fine sand with little clay and gravel. Deeper

soil is composed of greenish, orange, and gray sandy clay with a trace of gravel. The depth to groundwater at FTMM-14 ranges from 6 to 8 feet bgs. Groundwater migrates in a southerly direction towards Husky Brook; the calculated average horizontal advective groundwater seepage velocity is 0.02 to 0.06 ft/day (7 to 22 feet per year).

FTMM-18

A tidal marsh adjoins the northern portion of FTMM-18. The ground surface topography is flat with elevations of less than 20 feet amsl. The landfill soil cover material ranges in thickness from 0 to 60 inches and averages 28 inches. The soil cover is composed primarily of topsoil, silty sand, and olive-brown-gray clay. Deeper soil is primarily composed of gray to dark gray, silty sand and green clay. The depth to groundwater at FTMM-18 ranges from 4 to 8 feet bgs. Groundwater beneath the site migrates toward the adjacent Parkers Creek; the calculated average advective horizontal groundwater seepage velocity is 0.16 to 0.19 foot per day (58 to 69 feet per year).

FTMM-25

The ground surface elevation at FTMM-25 located in the southwestern corner of the CWA ranges from 30 to 60 feet amsl. The landfill soil cover material ranges in thicknesses from 1 to 30 inches bgs and averages 20-inches. Deeper soil is composed primarily of sands and silty sands that extend to depths of 5 to 10 feet bgs, and are underlain by silty clay to the total investigated depth of 17 feet bgs. The depth to groundwater at FTMM-25 ranges from 7 to 14 feet bgs. Groundwater on both sides of Shrewsbury Creek is estimated to migrate toward the creek; The calculated average advective horizontal groundwater seepage velocity is 0.11 ft/day (41 feet per year).

2.6.2 Summary and Findings of Site Investigations

The following subsections describe environmental investigation activities for soil, groundwater, surface water, and sediments for each of the seven landfill sites covered by this ROD.

2.6.2.1 FTMM-03 Environmental Investigations

Soil

A total of 425 near-surface soil samples were collected from 205 borings from September to November 1998. The samples were collected between 6 and 12 inches bgs except for the volatile organic compounds (VOCs) samples which were collected at approximately 24 inches bgs. Concentrations of four VOCs, seven semi-volatile organic compounds (SVOCs), six pesticides, one polychlorinated biphenyl (PCB), and 16 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. These compounds were evaluated as constituents of potential concern (COPC) for soil in the human health risk assessment (HHRA).

Groundwater

Between 1995 and 2010, 13 groundwater monitoring wells were installed at FTMM-03 to investigate and monitor contaminants in groundwater. From 1997 through 2004, groundwater samples were analyzed for VOCs, SVOCs, pesticides, PCBs, and metals. In 2005, the NJDEP approved discontinuing analyses for SVOCs, pesticides, PCBs, and metals because contaminant concentrations were consistently below NJDEP GWQS. The wells continued to be sampled quarterly for VOCs between 2005 and 2009, and samples collected thereafter were analyzed for VOCs and metals. The sampling data from the most recent eight quarters (November 2009 to

August 2011), the August 2013 Baseline Sampling Event (BSE), and the 2014 Annual Sampling Event (ASE) were evaluated as being representative of recent conditions. NJDEP subsequently agreed to discontinue the groundwater long-term monitoring (LTM) program since concentrations were below the GWQS. Only VOCs were evaluated as COPC 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), tetrachloroethene (PCE) was the only VOC that exceeded NJDEP Surface Water Quality Standard (SWQS). However, it was determined that the PCE concentrations exceeding the SWQS originated from an offsite source and upstream of FTMM-03. No COPC were identified in the surface water for evaluation in the HHRA.

Sediment

Sediment sampling was conducted in April 2000 in Lafetra Creek to evaluate PCB-related impacts to stream sediments associated with FTMM-03. No PCBs were detected in the 25 samples above the NJDEP and USEPA criteria. No COPC were identified in sediment for evaluation in the HHRA.

2.6.2.2 FTMM-04 Environmental Investigations

Soil

A total of 66 near-surface soil samples were collected from 63 borings in March 1998. The samples were collected between 6 and 12 inches bgs except for the VOCs samples, which were collected at approximately 24 inches bgs. No VOCs exceeded NJDEP RDCSRs or USEPA RSLs. Concentrations of seven SVOCs, nine metals, and two pesticides exceeded their current NJDEP RDCSRs and/or USEPA RSL in at least one soil of 66 samples. SVOCs, metals, and pesticides were evaluated as COPC in soil in the HHRA.

Groundwater

Between 1994 and 1999, four groundwater monitoring wells were installed at FTMM-04 to investigate and monitor contaminants in groundwater. From 1997 through 2004, groundwater samples were analyzed for VOCs, SVOCs, pesticides, PCBs, and metals. Upon approval from the NJDEP, analyses for VOCs, SVOCs, pesticides, and PCBs was discontinued beginning in 2005 because contaminant concentrations were consistently below NJDEP GWQS. The wells continued to be sampled quarterly for metals between 2005 and 2011. The sampling data from the most recent eight quarters (November 2009 to August 2011) and August 2013 BSE supported the conclusion that detected concentrations of metals are representative of background conditions despite exceedances of NJDEP and/or USEPA Tapwater RSL. Following the recommendations in the August 2013 BSE results, NJDEP subsequently agreed to discontinue the groundwater LTM program since groundwater concentrations were below GWQS. No COPC were identified in the groundwater for evaluation 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 (March 2007 to September 2010), PCE was the only VOC that exceeded NJDEP SWQS. However, it was determined that PCE concentrations exceeding the SWQS originated from an offsite source and upstream of FTMM-04. No COPC were identified in the surface water for evaluation in the HHRA.

Sediment

Sediment samples collected from Mill Creek, adjacent to FTMM-04 in 2000 and 2010, and analyzed for PCBs and VOCs, SVOCs, pesticides, PCBs, and metals resulted in no detections above the NJDEP RDCSRS. No COPC were identified in the sediment for evaluation in the HHRA.

2.6.2.3 FTMM-05 Environmental Investigations

Soil

A total of 296 near-surface soil samples were collected from 254 borings during April-December 1998. The samples were collected between 6 and 12 inches bgs except for the VOCs samples, which were collected at approximately 24 inches bgs. Concentrations of two VOCs, eight SVOCs (all of which are PAHs), seven pesticides, one PCB, and 15 metals exceeded their current NJDEP RDCSRS and/or USEPA RSL in at least 1 of 183 samples. Concentrations of five PAHs, two pesticides, one PCB, and eight metals exceeded their NJDEP NRDCSRS and/or USEPA Industrial RSL in at least one soil sample. These compounds were evaluated as COPCs in the HHRA.

Groundwater

Between 1994 and 1998, four groundwater monitoring wells were installed at FTMM-05 to characterize and monitor contaminants in groundwater. Nine additional monitoring wells were installed at the site in 1999. From 1997 through 2004, groundwater samples were analyzed for VOCs, SVOCs, pesticides, PCBs, and metals. Upon approval from the NJDEP, analyses for SVOCs, pesticides, and PCBs was discontinued in 2003 because contaminant concentrations were consistently below NJDEP GWQS. The wells continued to be sampled quarterly for VOCs and metals between 2005 and 2011. Additional groundwater sampling occurred in August 2013 and December 2014. The sampling data from the most recent eight quarters (November 2009 to August 2011), the August 2013 BSE, and the 2014 ASE were evaluated as being representative of recent conditions. During this period, concentrations of six VOCs and 17 metals exceeded the NJDEP GWQS and/or USEPA Tapwater RSL in at least one sample. Metals were not considered a COPC based on the small number of background exceedances. Only VOCs were evaluated as a COPC for groundwater in the HHRA. Based on the recommendations in the August 2013 BSE Report, NJDEP agreed only select wells should be sampled for VOC analyses on an annual basis.

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 exceeded either the NJDEP SWQS or the USEPA human health criteria. However, it was determined that VOCs originated from an offsite source and upstream of FTMM-05. No COPC were identified in the surface water for evaluation in the HHRA.

Sediment

Sediment samples were collected from Mill Creek, adjacent to FTMM-05 in 2000 to evaluate PCB-related impacts to stream sediments associated with FTMM-05. One PCB was detected in one sample below the NJDEP RDCSRS and the USEPA Residential RSL. No COPC were identified in sediment for evaluation in the HHRA.

2.6.2.4 FTMM-12 Environmental Investigations

Soil

A total of 193 near-surface soil samples were collected from 143 borings from March 1998 to September 1999 and analyzed for VOCs, metals, SVOCs, pesticides, and PCBs. Concentrations of two VOCs, six SVOCs (all of which are polynuclear aromatic hydrocarbons [PAHs]), two pesticides, and 13 metals exceeded their current NJDEP RDCSRS and/or USEPA RSL in at least 1 of 193 soil samples. Concentrations of five PAHs and four metals exceeded their NJDEP NRDCSRS and/or USEPA Industrial RSL in at least one soil sample. These compounds were evaluated as COPC for soil in the HHRA.

Groundwater

Quarterly groundwater monitoring was performed from 1997 to 2011 from a network of up to 16 wells and were analyzed for VOCs, SVOCs, pesticides/PCBs, and metals through August 2004. As agreed to by the NJDEP in November 2004, select wells were analyzed for metals and pesticides and PCBs; and VOCs and SVOCs were eliminated from the sampling program starting in February 2005. In March 2009, the groundwater monitoring wells were only sampled for metals. Additional groundwater sampling occurred in August 2013. Historic exceedances of metals except for lead are attributed to background water quality. The August 2013 sampling was conducted for lead analysis only, and lead was not detected. Following the recommendations in the August 2013 BSE Report, NJDEP agreed to discontinue the groundwater LTM program since concentrations were below the GWQS. No COPC were identified in the groundwater for evaluation in the HHRA.

Surface Water

Quarterly surface water sampling was conducted at four locations in Husky Brook adjacent to FTMM-12 from October 1996 through September 2010. The most recent eight quarters of surface water monitoring data were determined to be representative of recent conditions. Concentrations of VOCs and metals detected upstream of FTMM-12 were similar to concentrations detected downstream of the site. This comparison indicated that FTMM-12 is not significantly impacting VOC or metal concentrations in Husky Brook. No COPCs were identified in the surface water for evaluation in the HHRA.

Sediment

One PCB was detected in 1 of 25 sediment samples collected for the FTMM-12 in April 2000 at a concentration slightly above than the NJDEP RDCSRS and the USEPA Residential RSL for soil. The detected PCB concentration did not exceed the NJDEP NRDCSRS or USEPA Industrial RSL for soil. The PCB detection occurred upstream of FTMM-12, and is not associated with this site. No COPC were identified in the sediment for evaluation in the HHRA.

2.6.2.5 FTMM-14 Environmental Investigations

Soil

A total of 124 near-surface soil samples were collected from 119 borings during December

1998 to January 1999. Samples were analyzed for VOCs, metals, SVOCs, pesticides, and PCBs. Concentrations of seven SVOCs (all of which were PAHs), one pesticide, and seven metals exceeded their NJDEP RDCSRS and/or USEPA Residential RSL in at least 1 of 124 soil samples. These compounds were evaluated as COPC for soil in the HHRA.

Groundwater

Quarterly groundwater sampling was performed from June 1997 to August 2011 from a network of up to nine monitoring wells. Concentrations of one VOC (1,4-dichlorobenzene) and 18 metals exceeded their NJDEP GWQS and/or the USEPA Tapwater RSL in at least one sample collected between November 2009 and August 2011. Groundwater samples were also collected in August 2013 for VOC analyses; no VOCs exceeded the GWQS. Following the recommendations based on the August 2013 BSE results, NJDEP subsequently agreed to discontinue the groundwater LTM program since concentrations were below the GWQS. No COPCs were identified in the groundwater for evaluation in the HHRA.

Surface Water

Quarterly surface water sampling was conducted at four locations in Husky Brook associated with FTMM-14 from October 1996 through September 2010. The most recent eight quarters of surface water monitoring data were evaluated as being representative of recent conditions. Concentrations of VOCs and metals detected upstream of FTMM-14 were similar to concentrations detected downstream of the landfill in Husky Brook. This comparison indicated that FTMM-14 is not significantly impacting VOC or metal concentrations in Husky Brook. No COPC were identified in the surface water for evaluation in the HHRA.

Sediment

One PCB was detected in 1 of 25 sediment samples collected for the FTMM-14 in April 2000 at a concentration slightly above than the NJDEP RDCSRS and the USEPA Residential RSL for soil. The detected PCB concentration did not exceed the NJDEP NRDCSRS or USEPA Industrial RSL for soil. The PCB detection occurred upstream of FTMM-14, and is not associated with this site. No COPCs were identified in the sediment for evaluation in the HHRA.

2.6.2.6 FTMM-18 Environmental Investigations

Soil

Soil samples collected in 1999 were analyzed for VOCs, metals, SVOCs, pesticides, and PCBs. Concentrations of six SVOCs (all of which are PAHs) and six metals exceeded their NJDEP RDCSRS and/or USEPA RSL in at least 1 of 65 soil samples. Concentrations of four PAHs, and one metal exceeded their NJDEP NRDCSRS and/or USEPA Industrial RSL in at least one soil sample. PAHs and metals were evaluated as COPC for soil in the HHRA.

Groundwater

Quarterly groundwater sampling was performed from June 1997 to August 2011 and in August 2013, using a network of up to 10 monitoring wells. Concentrations of six VOCs and 17 metals exceeded the NJDEP GWQS and/or the USEPA Tapwater RSL in at least one sample. Following the recommendations in the August 2013 BSE Report, NJDEP agreed that sampling should be limited to four select wells for VOCs on an annual basis. Two VOCs and one metal were evaluated as COPCs for groundwater in the HHRA. The other VOCs and metals which exceeded

groundwater comparison criteria were not considered to be COPCs because the detections were either isolated and anomalous, or they did not exceed their groundwater comparison criteria during the most recent sampling events.

Surface Water

Quarterly surface water samples were collected upstream, adjacent to, and downstream of FTMM-18 from October 1996 to September 2010. PCE concentrations that exceeded the NJDEP SWQS were detected upstream of FTMM-18 and were determined not to be site-related. 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-18. One PCB (Aroclor 1254) was detected in two of eight samples. The concentration in one sample was slightly above the NJDEP RDCSRS for total PCBs and the USEPA Residential RSL for Aroclor 1254. The PCB concentration in the other sample was below comparison criteria. There are multiple storm sewer outlets at Parkers Creek upstream of the two sample locations that may be a source of PCBs. However, the detection could not be definitively attributed to upstream sources and therefore was considered a sediment COPC that was potentially site-related and was evaluated in the HHRA.

2.6.2.7 FTMM-25 Environmental Investigations

Soil

Soil samples collected in 1998 were analyzed for VOCs, metals, SVOCs, pesticides, and PCBs. Concentrations of six SVOCs (all of which are PAHs), two pesticides, two PCBs, and 10 metals exceeded their NJDEP RDCSRS and/or USEPA RSL in at least one soil sample. Concentrations of four PAHs and two metals exceeded their NJDEP NRDCSRS and/or USEPA Industrial RSL in at least one soil sample. COPCs in soil that were evaluated in the HHRA included six PAHs, two PCBs, and five metals.

Groundwater

Groundwater monitoring was performed at FTMM-25 from December 1997 to July 2011 using a network of up to four monitoring wells; additional baseline monitoring was performed in August 2013. Eleven metals were detected at concentrations exceeding their NJDEP GWQS and/or the USEPA Tapwater RSL. Following the recommendations in the August 2013 BSE Report, NJDEP agreed that the groundwater LTM program should be discontinued since groundwater concentrations were below GWQS. Two metals were evaluated as COPCs in the groundwater for the HHRA. The other metals which exceeded groundwater comparison criteria were not considered to be COPCs because the detections were either isolated and anomalous, or they did not exceed their groundwater comparison criteria during the most recent sampling events.

Surface Water

A surface water sampling event conducted at Shrewsbury Creek was performed in June 2010. The PAHs detected were likely not related to the landfill and detected metal concentrations were similar to those found in background samples. No COPCs were identified in the surface water for evaluation in the HHRA.

Sediment

Sampling was conducted in April 2000 in Shrewsbury Creek to evaluate potential PCB-related impacts to sediments. No PCBs were detected in the samples collected at and downstream of FTMM-25. No COPCs were identified in the sediment for evaluation in the HHRA.

2.7 CURRENT AND POTENTIAL FUTURE LAND AND RESOURCE USES

2.7.1 Current and Potential Land Use of the Seven Sites

The seven sites have been inactive landfills since their respective closure dates (see Figure 4). The anticipated land use for the seven 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 seven landfill sites. The HHRA evaluated exposure of current/future outdoor workers, future utility workers, and future recreational users to COPCs in soil, groundwater, and sediment through dermal contact, incidental ingestion, and inhalation of particulates.

No COPCs were identified in surface water at any of the seven landfill sites. Therefore, further evaluation of surface water in the HHRA was not conducted and no unacceptable risks were expected from human exposure to surface water. 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-03 Summary of Site Risks

No COPCs were identified for surface water or sediment at FTMM-03; 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-03, the cumulative carcinogenic risk of 7×10^{-5} is less than 1×10^{-4} to 1×10^{-6} . The cumulative non-carcinogenic hazard is 0.5, which is less than the cumulative hazard goal of 1.
- For utility workers exposed to soil at FTMM-03, the cumulative carcinogenic risk of 8×10^{-7} is less than 1×10^{-4} . The cumulative non-carcinogenic hazard is 0.2, which is less than the cumulative hazard goal of 1.

- For recreational users exposed to soil at FTMM-03, the cumulative carcinogenic risk of 2×10^{-5} is less than 1×10^{-4} to 1×10^{-6} . The cumulative non-carcinogenic hazard is 0.08, 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 0.1, 0.08, and 0.04 for outdoor workers, utility workers, and recreational users, respectively. Lead hazards at FTMM-03 are less than the hazard goal of 1.
- For utility workers exposed to groundwater through dermal contact and incidental ingestion, the cumulative carcinogenic risk for all wells is 2×10^{-10} , which is less than 1×10^{-4} . The cumulative non-carcinogenic hazard for all wells is 0.05, which is less than the cumulative hazard goal of 1.

2.8.2 FTMM-04 Summary of Site Risks

No COPCs were identified for groundwater, surface water, or sediment at FTMM-04; 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. When above these ranges remedial actions may be required. The results are summarized as follows:

- For outdoor workers exposed to soil at FTMM-04, the cumulative carcinogenic risk of 4×10^{-5} is less than 1×10^{-4} . The cumulative non-carcinogenic hazard for outdoor workers was initially calculated as 25, which is above the cumulative hazard goal of 1. The non-carcinogenic hazard consisted almost entirely of the hazard associated with exposure to thallium in soil. The hazard associated with the other non-carcinogens in soil was 1 for outdoor workers if thallium was not included in the cumulative risk. Based on qualitative evaluation of the thallium present at the site, the cumulative hazard of 1 is expected to be more representative of expected site conditions and therefore thallium was not identified as a COC in soil at FTMM-04.
- For recreational users exposed to soil at FTMM-04, the cumulative carcinogenic risk of 8×10^{-6} is less than 1×10^{-4} . The cumulative non-carcinogenic hazard for recreational users was initially calculated as 4, which is above the cumulative hazard goal of 1. The non-carcinogenic hazard consisted almost entirely of the hazard associated with exposure to thallium in soil. The hazard associated with the other non-carcinogens in soil was 0.1 for recreational users if thallium was not included in the cumulative risk. Based on qualitative evaluation of the thallium present at the site, the cumulative hazard of 1 is expected to be more representative of expected site conditions and therefore thallium was not identified as a COC in soil at FTMM-04.

2.8.3 FTMM-05 Summary of Site Risks

No COPCs were identified for surface water or sediment at FTMM-05; 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-05, the cumulative carcinogenic risk of 4×10^{-5} is within the cumulative risk goal of 1×10^{-4} to 1×10^{-6} . The cumulative non-carcinogenic hazard is 0.9, which is less than the cumulative hazard goal of 1.
- For utility workers exposed to soil at FTMM-05, the cumulative carcinogenic risk of 6×10^{-7} is less than the cumulative risk goal of 1×10^{-4} to 1×10^{-6} . 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-05, the cumulative carcinogenic risk of 1×10^{-5} is within the cumulative risk goal of 1×10^{-4} to 1×10^{-6} . 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 0.4, 0.2, and 0.1 for outdoor workers, utility workers, and recreational users, respectively. Lead hazards at FTMM-05 are less than the hazard goal of 1.
- For utility workers exposed to groundwater, the cumulative carcinogenic risks for all wells is 8×10^{-9} , which is less than the cumulative risk goal of 1×10^{-4} to 1×10^{-6} . The cumulative non-carcinogenic hazard for all wells is 0.04, which is less than the cumulative hazard goal of 1.

2.8.4 FTMM-12 Summary of Site Risks

No COPCs were identified for groundwater, surface water, or sediment at FTMM-12; these media were not further evaluated in the HHRA for FTMM-12. 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. When above these ranges remedial actions may be required. The results are summarized as follows:

- For outdoor workers exposed to soil at FTMM-12, the cumulative carcinogenic risk of 3×10^{-5} is within the cumulative risk goal of 1×10^{-4} to 10^{-6} for soil. The cumulative non-carcinogenic hazard is 0.4, less than the cumulative hazard goal of 1.
- For utility workers exposed to soil at FTMM-12, the cumulative carcinogenic risk of 3×10^{-7} is less than the cumulative risk goal of 1×10^{-4} to 10^{-6} for soil. The cumulative non-carcinogenic hazard is 0.1, less than the cumulative hazard goal of 1.
- For recreational users exposed to soil at FTMM-12, the cumulative carcinogenic risk of 8×10^{-6} is within the cumulative risk goal of 1×10^{-4} to 10^{-6} for soil. The cumulative non-carcinogenic hazard is 0.06, which is less than the cumulative hazard goal of 1.
- Lead was evaluated separately from the other constituents. The calculated non-carcinogenic hazards are 0.09, 0.05, and 0.03 for outdoor workers, utility workers, and recreational users, respectively. Lead hazards at FTMM-12 are less than the hazard goal of 1.

2.8.5 FTMM-14 Summary of Site Risks

No COPCs were identified for groundwater, surface water, or sediment at FTMM-04; these

media were not further evaluated in the HHRA for FTMM-14. 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-14, the cumulative carcinogenic risk of 4×10^{-5} is within the cumulative risk goal of 1×10^{-4} to 10^{-6} for soil. The cumulative non-carcinogenic hazard is 0.3, less than the cumulative hazard goal of 1.
- For utility workers exposed to soil at FTMM-14, the cumulative carcinogenic risk of 5×10^{-7} is less than the cumulative risk goal of 1×10^{-4} to 10^{-6} for soil. The cumulative non-carcinogenic hazard is 0.09, less than the cumulative hazard goal of 1.
- For recreational users exposed to soil at FTMM-14, the cumulative carcinogenic risk of 1×10^{-5} is within the cumulative risk goal of 1×10^{-4} to 10^{-6} for soil. The cumulative non-carcinogenic hazard is 0.04, which is less than the cumulative hazard goal of 1.

2.8.6 FTMM-18 Summary of Site Risks

No COPCs were identified for surface water at FTMM-18; surface water was not further evaluated in the HHRA for FTMM-18. 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. When above these ranges remedial actions may be required. The results are summarized as follows:

- For outdoor workers exposed to soil at FTMM-18, the cumulative carcinogenic risk of 2×10^{-5} is within the cumulative risk goal of 1×10^{-4} to 1×10^{-6} for soil. The cumulative non-carcinogenic hazard is 0.1, which is less than the cumulative hazard goal of 1.
- For utility workers exposed to soil at FTMM-18, the cumulative carcinogenic risk of 3×10^{-7} is less than the cumulative risk goal of 1×10^{-4} to 1×10^{-6} for soil. The cumulative non-carcinogenic hazard is 0.04, which is less than the cumulative hazard goal of 1.
- For recreational users exposed to soil at FTMM-18, the cumulative carcinogenic risk of 7×10^{-6} is within the cumulative risk goal of 1×10^{-4} to 1×10^{-6} for soil. The cumulative non-carcinogenic hazard is 0.02, which is less than the cumulative hazard goal of 1.
- For utility workers exposed to groundwater, the cumulative carcinogenic risks for all wells of 2×10^{-7} is less than the cumulative risk goal of 1×10^{-4} to 1×10^{-6} for groundwater. The cumulative non-carcinogenic hazard for all wells is 0.09, which is less than the cumulative hazard goal of 1.
- For outdoor workers exposed to sediment, the cumulative carcinogenic risk of 2×10^{-7} is below the cumulative risk goal of 1×10^{-4} to 1×10^{-6} for sediment. The cumulative non-carcinogenic hazard is 0.01, which is less than the cumulative hazard goal of 1.
- For recreational users exposed to sediment, the cumulative carcinogenic risk of 3×10^{-8} is below the cumulative risk goal of 1×10^{-4} to 1×10^{-6} for sediment. The

cumulative non-carcinogenic hazard of 0.002 does not exceed the cumulative hazard goal of 1.

2.8.7 FTMM-25 Summary of Site Risks

No COPCs were identified for surface water or sediment at FTMM-25; these media were not further evaluated in the HHRA for FTMM-25. 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. When above these ranges remedial actions may be required. The results are summarized as follows:

- For outdoor workers exposed to soil at FTMM-25, the cumulative carcinogenic risk of 3×10^{-5} 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 utility workers exposed to soil at FTMM-25, the cumulative carcinogenic risk of 3×10^{-7} is less than 1×10^{-4} . The cumulative non-carcinogenic hazard is 0.1, which is less than the cumulative hazard goal of 1.
- For recreational users exposed to soil at FTMM-25, the cumulative carcinogenic risk of 1×10^{-5} is less than 1×10^{-4} . The cumulative non-carcinogenic hazard is 0.04, 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 0.6, 0.3, and 0.2 for outdoor workers, utility workers, and recreational users, respectively. Lead hazards at FTMM-25 are less than the hazard goal of 1.
- For utility workers exposed to groundwater, no carcinogenic analytes were identified as COPCs in groundwater. The cumulative non-carcinogenic hazard for any wells is 0.01, which is less than the hazard goal of 1.

2.8.8 Ecological Risks

A Baseline Ecological Evaluation ([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 any of the seven landfills.

2.9 REMEDIAL ACTION OBJECTIVES

The remedial action objective (RAO) for the landfill sites addressed in this ROD is not to mitigate chemical exposures but rather to protect future users from potential safety hazards associated with surficial construction/demolition debris.

2.10 SELECTED REMEDY

This ROD represents the selected remedy for landfill sites FTMM-03, FTMM-04, FTMM-05, FTMM-12, FTMM-14, FTMM-18, and FTMM-25 located at FTMM. Although there is no CERCLA risk, and therefore no need for a CERCLA action, a vegetated soil cover will be placed over the landfills to address safety concerns for future use, and the soil cap will be placed consistent with the applicable NJDEP regulations. 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 to address potential safety concerns due to the proximity of residential houses to the FTMM-14 landfill. The two 100-foot-long trench systems will be located within the landfill boundary and vented to the surface in 25 foot centers. The intent of this passive venting system is in lieu of continued methane monitoring after the installation of the vegetative soil cover. The location of the venting system shall be installed to correspond with sampling points M14SG10 and M14SG 9 and extend in a northeasterly direction parallel to the residential houses. The location of the venting system may require adjustment during installation due to the existences of high pressure gas main and the individual gas main service connections for each housing unit.

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 seven 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-05 and FTMM-18 to address exceedances of water quality standards at these landfills.

2.10.1 Summary of the Rationale for the Selected Response Action

The placement of a vegetative cover and implementation of LUCs are appropriate responses for these seven landfill sites. Since no risk to human health or the environment is present at the sites, the response action is not necessary to prevent chemical exposures, but rather to provide safety protection from future exposure to solid waste at the landfills for future use.

2.10.2 Detailed Description of the Implementation of Selected Remedy

To address safety concerns, 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 12**. 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 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 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. 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 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, CEAs will be established at FTMM-05 and FTMM-18 to prevent access to and use of the groundwater underlying these landfills. ICs in the form of CEAs will be implemented and will remain in place until NJDEP GWQS are achieved at the site. CEA 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, which is expected to occur 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 installation of the landfill covers and the implementation and O&M of LUCs are summarized in **Table 3**.

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, as defined by the CERCLA, for the current and reasonably anticipated future use of the seven landfill sites which is passive open space at FTMM. 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 will be established and implemented for FTMM-05 and FTMM18 and will remain in place until NJDEP GWQS are achieved at the sites.

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 the only chemical-specific ARARs applicable to this ROD, and only apply to groundwater at FTMM-05 and FTMM-18. Groundwater at these two sites will be monitored bi-annually 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)
Landfill FTMM-05			
Tetrachloroethene	Groundwater	5	1
Trichloroethene	Groundwater	5	1
Landfill FTMM-18			
Benzene	Groundwater	5	1

Action-Specific ARARs

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

TABLE 3
ESTIMATED COSTS FOR SELECTED REMEDY

<u>CAPITAL COSTS</u>	FTMM-03	FTMM-04	FTMM-05	FTMM-12	FTMM-14	FTMM-18	FTMM-25
➤ Land Use Controls	\$63,000	\$62,000	\$63,000	\$63,000	\$63,000	\$69,000	\$31,000
• LUC Implementation Plan	\$25,000	\$25,000	\$25,000	\$25,000	\$25,000	\$30,000	\$25,000
• Update Master Planning Maps	\$25,000	\$25,000	\$25,000	\$25,000	\$25,000	\$25,000	\$0
• Contingency (25%)	\$13,000	\$12,000	\$13,000	\$13,000	\$13,000	\$14,000	\$6,000
➤ Landfill Cover	\$1,537,000	\$374,000	\$741,000	\$1,470,000	\$1,438,000	\$882,000	\$460,000
• Design and Construction	\$26,000	\$113,000	\$180,000	\$270,000	\$270,000	\$180,000	\$126,000
• Soil Cover Installation	\$1,505,000	\$180,000	\$407,000	\$900,000	\$870,000	\$520,000	\$236,000
• Geotechnical Borings	\$6,000	\$6,000	\$6,000	\$6,000	\$6,000	\$6,000	\$6,000
• Contingency (25%)	\$385,000	\$75,000	\$148,000	\$294,000	\$290,000	\$176,000	\$92,000
TOTAL CAPITOL COSTS	\$1,922,000	\$436,000	\$804,000	\$1,530,000	\$1,501,000	\$951,000	\$491,000
<u>PERIODIC COSTS</u>							
TOTAL PRESENT VALUE PERIODIC COSTS ^{a/}	\$0	\$0	\$237,000	\$0	\$0	\$217,000	\$119,000
<u>O&M COSTS</u>							
TOTAL PRESENT VALUE O&M COSTS ^{a/}	\$90,000	\$90,000	\$90,000	\$90,000	\$90,000	\$90,000	\$90,000
TOTAL PRESENT VALUE BY SITE ^{a/}	\$2,075,000	\$526,000	\$1,131,000	\$1,620,000	\$1,591,000	\$1,258,000	\$700,000
TOTAL PRESENT VALUE ALL SITES							\$8,901,000

^{a/} Discounted rate of 1.90% applied to these values. 30-Year, Real Discount Rate from White House Office of Management and Budget, Circular A-94 Appendix C, Revised December 2013

2.11.3 Cost-Effectiveness

The selected remedy meets the statutory requirement for a cost-effective remedy. The costs are presented Table 3.

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

As determined by the project stakeholders, active remediation is not required to achieve the safety goals developed for these seven sites. Consequently, the selected remedy does not employ treatment to eliminate contaminants present at the site. The selected remedy satisfies the criteria for long-term effectiveness by preventing unacceptable exposures to site soils through maintenance of a vegetative cover. Permanent reduction of risks will be accomplished through 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 not address principal threats posed by the sites through the use of treatment technologies because there are no principal threats at these seven sites. It was determined that active remediation is not needed at the sites to achieve the RAOs. The selected response action is protective of human health and the environment. In addition, chemical concentrations present in site media do not warrant treatment.

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 seven 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. All comments and concerns summarized below have been considered by the Army and NJDEP in selecting the final remedy for the seven landfills.

A newspaper notification inviting public comment on the Proposed Plan appeared in the Asbury Park Press on February 6, 2017 and February 7, 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 February 8, 2017 to March 9, 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 Program Information Repository. The public notice and Proposed Plan were also posted on the FTMM Environmental Restoration website.

The public meeting was held on March 2, 2017 from 7:30 p.m. to 9:00 p. m. at Building 455 at Fort Monmouth, Oceanport Ave, Oceanport, New Jersey. At this meeting, representatives from FTMM and the USACE presented the Proposed Plan and were available to answer questions concerning the seven landfills and the preferred remedy. The complete attendance list and newspaper notification are included in Attachment 2.

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

One comment specific to the selected remedy for the seven landfills was received during the public meeting held on March 2, 2017. Transcripts from the public meeting were completed and submitted into the FTMM Environmental Restoration Program Information Repository for the site. The comment received on the selected remedy is summarized as follows:

Comment 1: When is the proposed construction going to start and how long do you anticipate it to take for all the landfills?

Reply: The Army is going to start construction on the landfill covers next fall and anticipates that construction will be completed on all landfills in one year.

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

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ATTACHMENT 1

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Figure 1 – Fort Monmouth Location

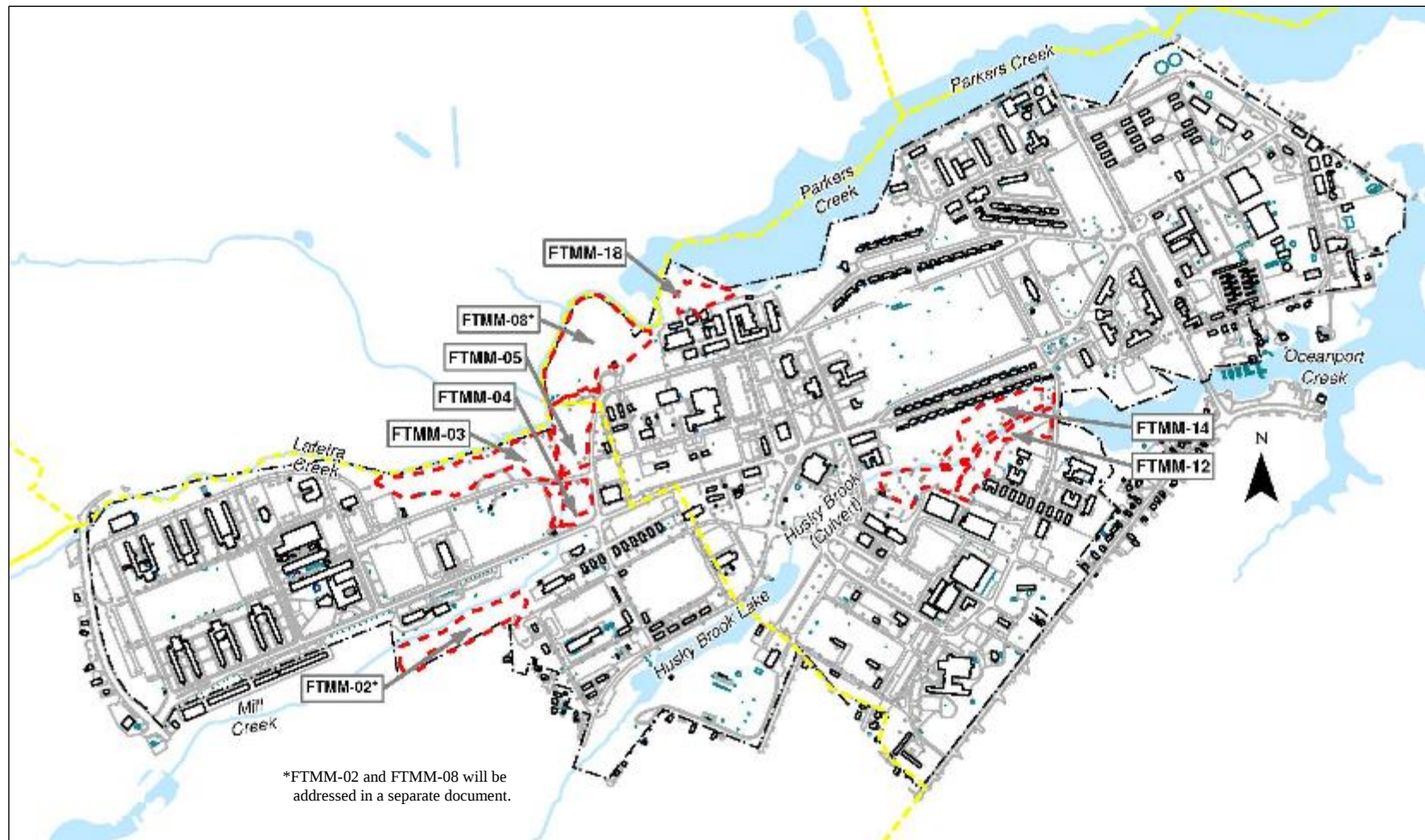


Figure 2 – Main Post Landfill Locations

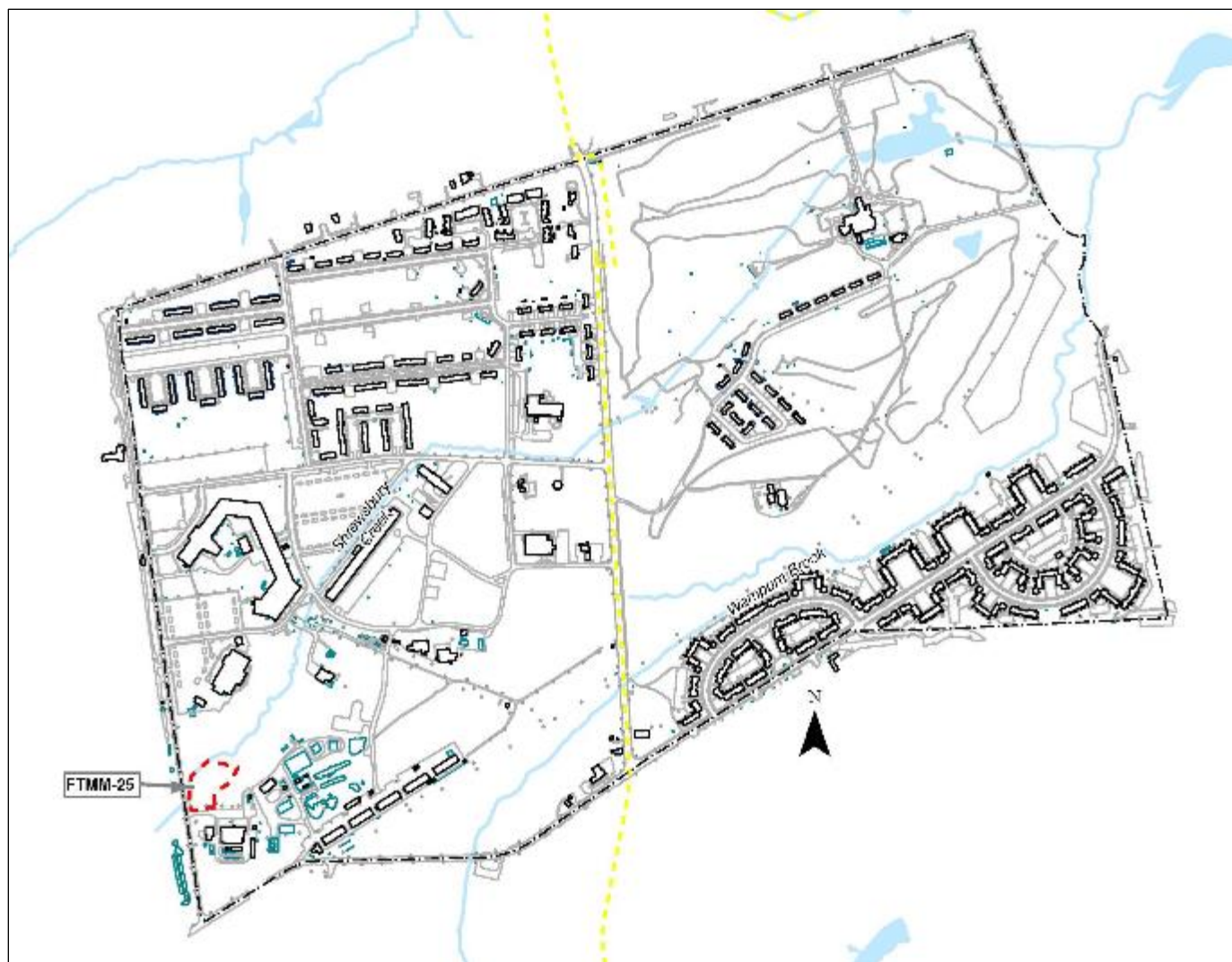


Figure 3 – Charles Wood Area Landfill Location

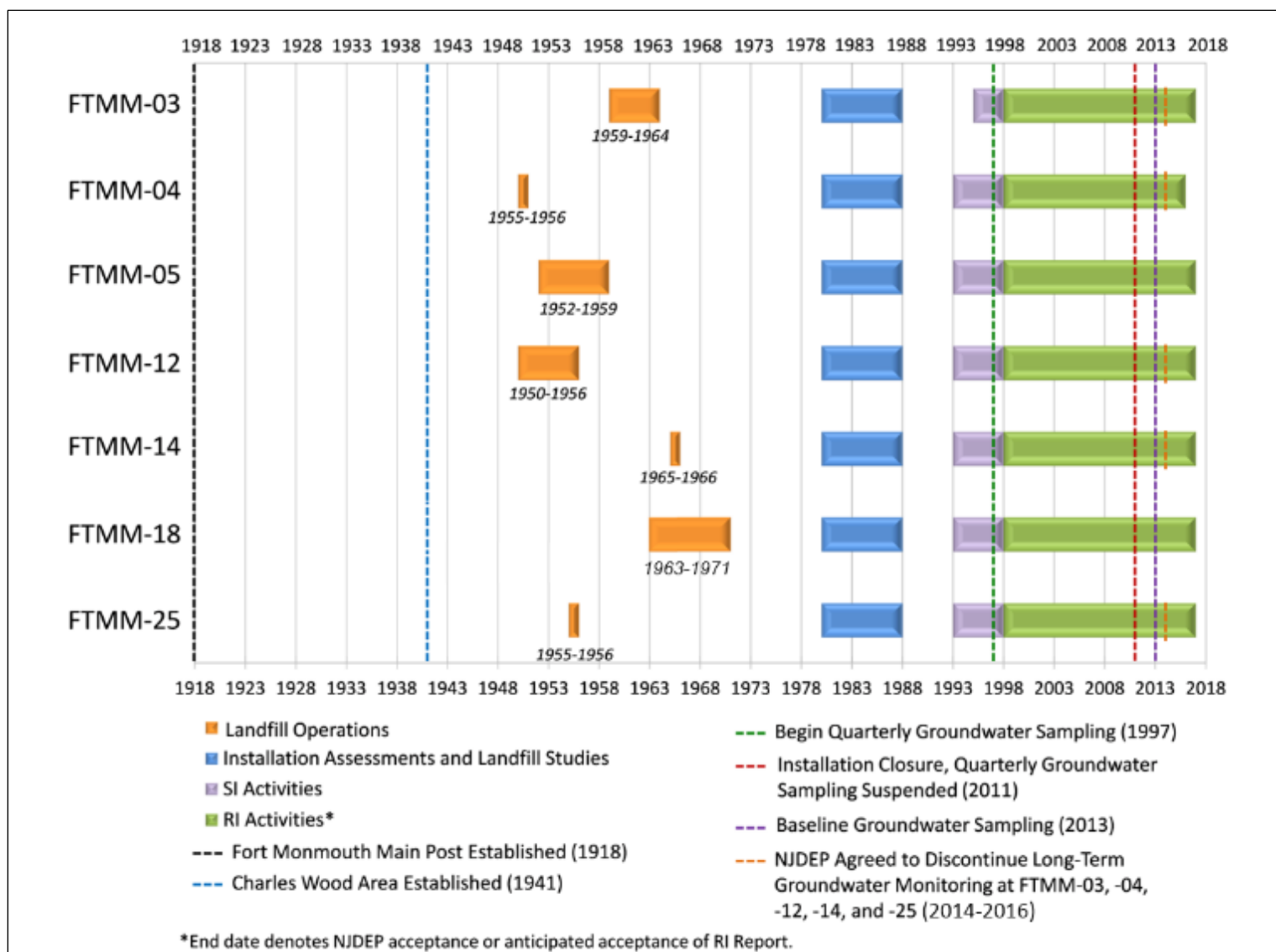


Figure 4 – Timeline of Significant Events

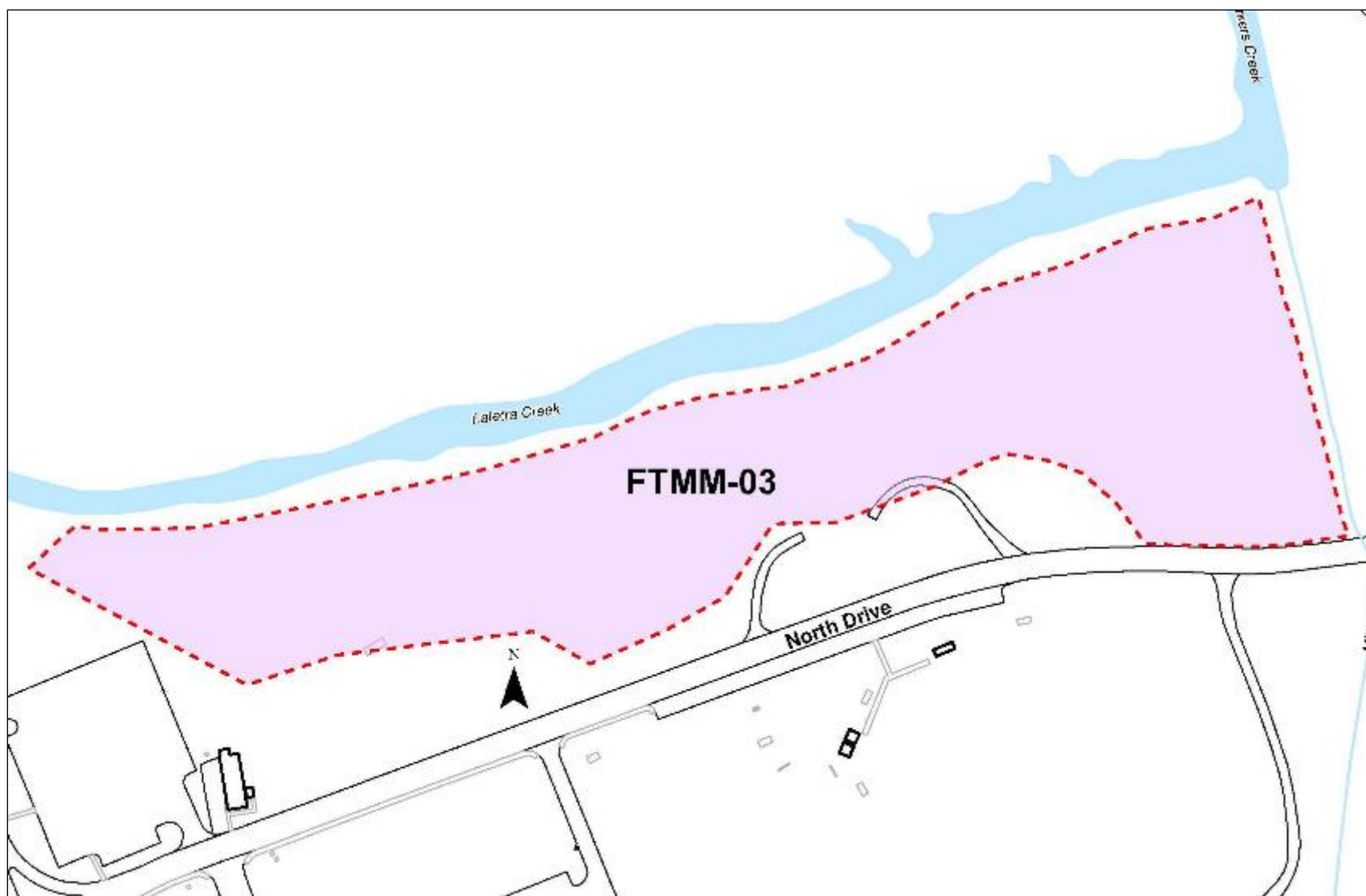


Figure 5 – FTMM-03 Site Boundary and Layout

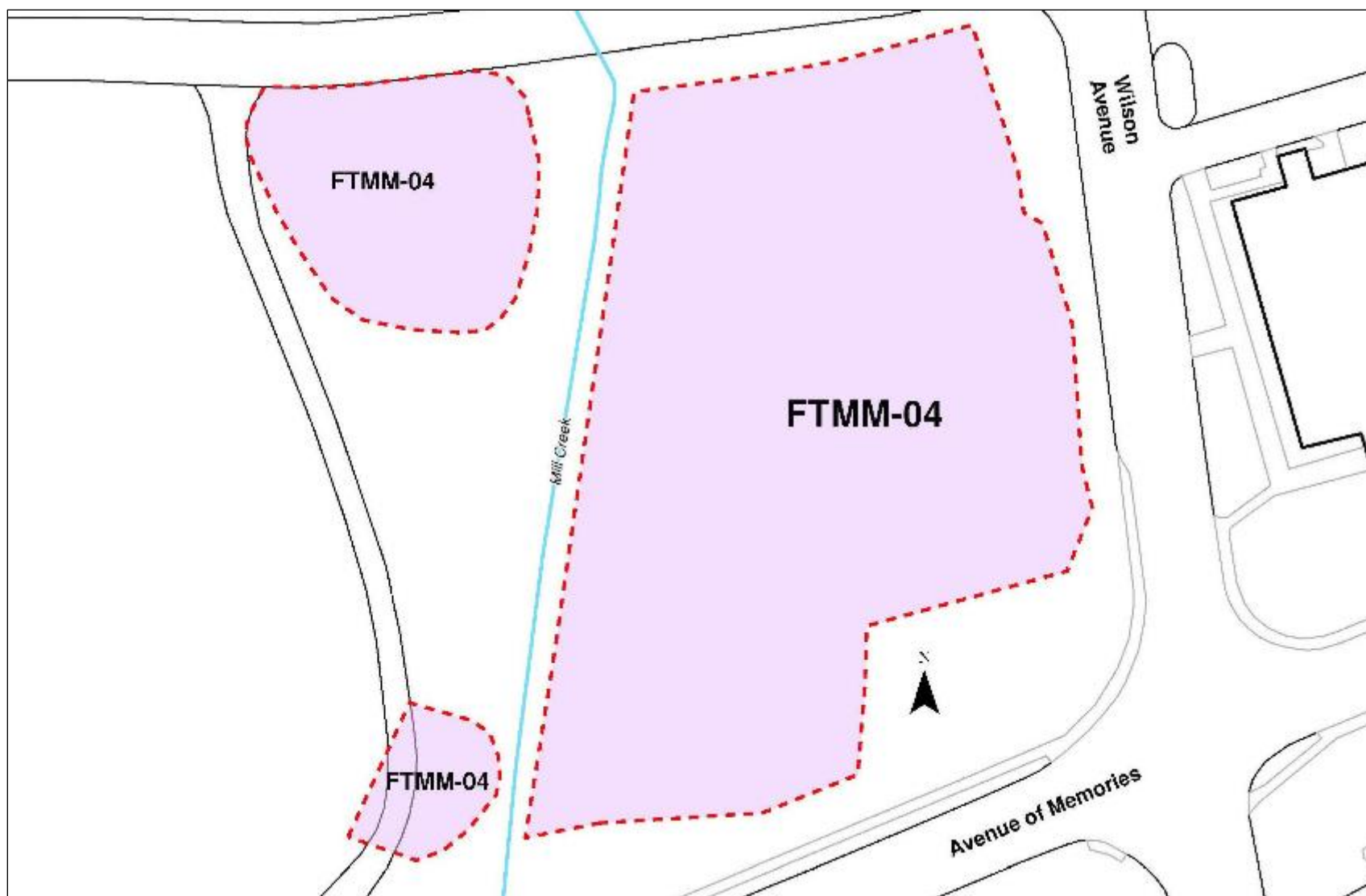


Figure 6 – FTMM-04 Site Boundary and Layout

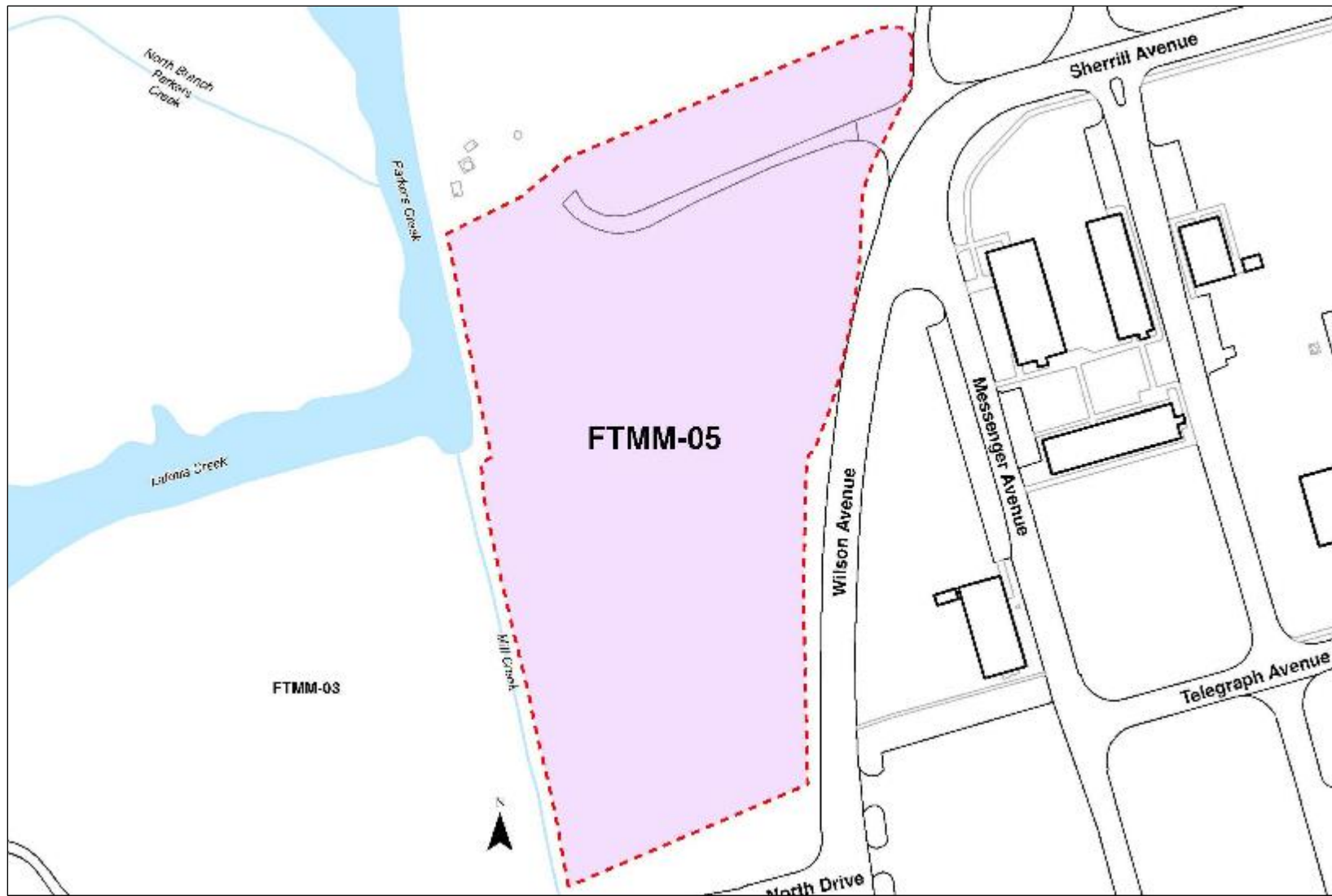


Figure 7 – FTMM-05 Site Boundary and Layout

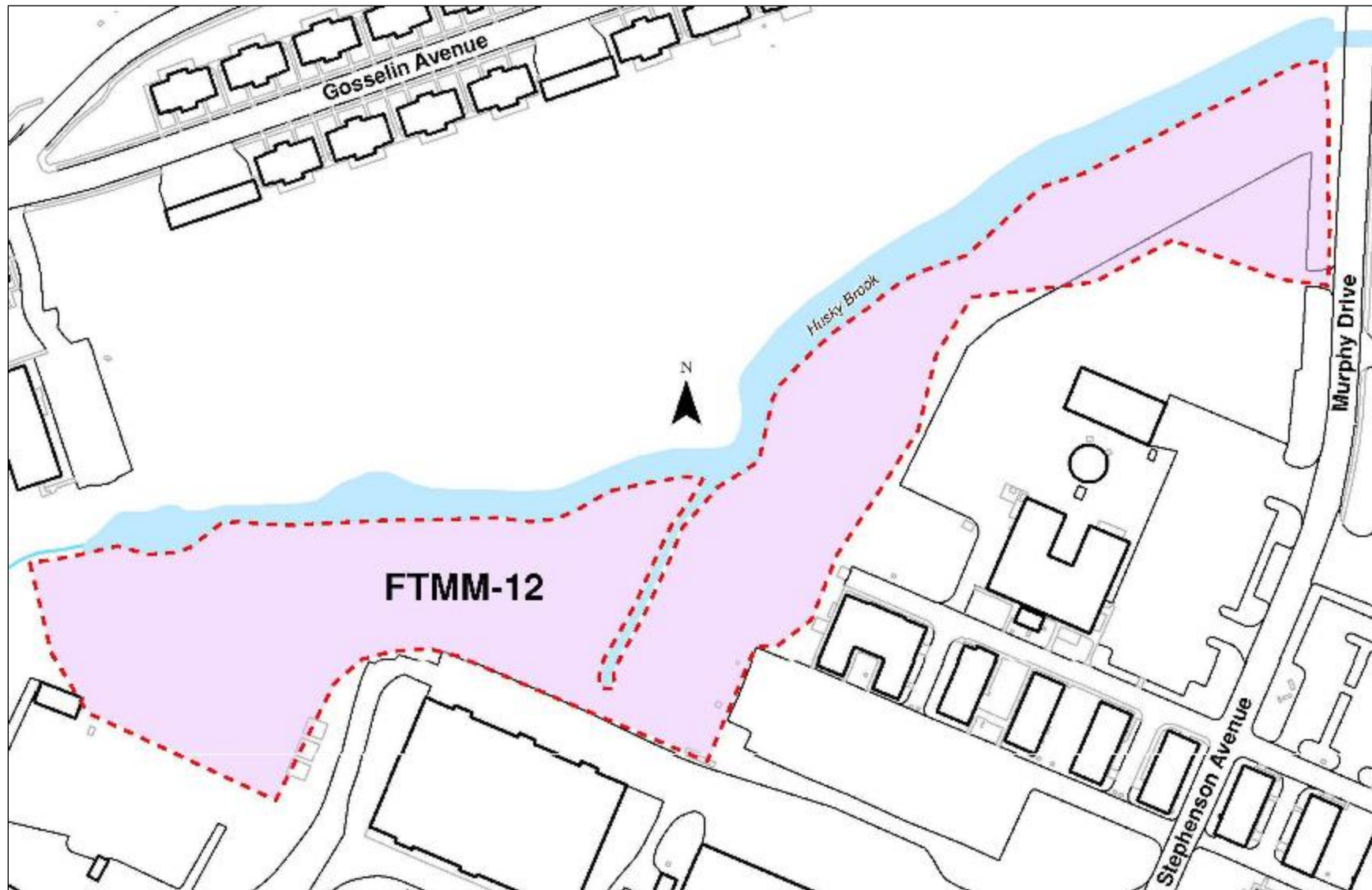


Figure 8 – FTMM-12 Site Boundary and Layout

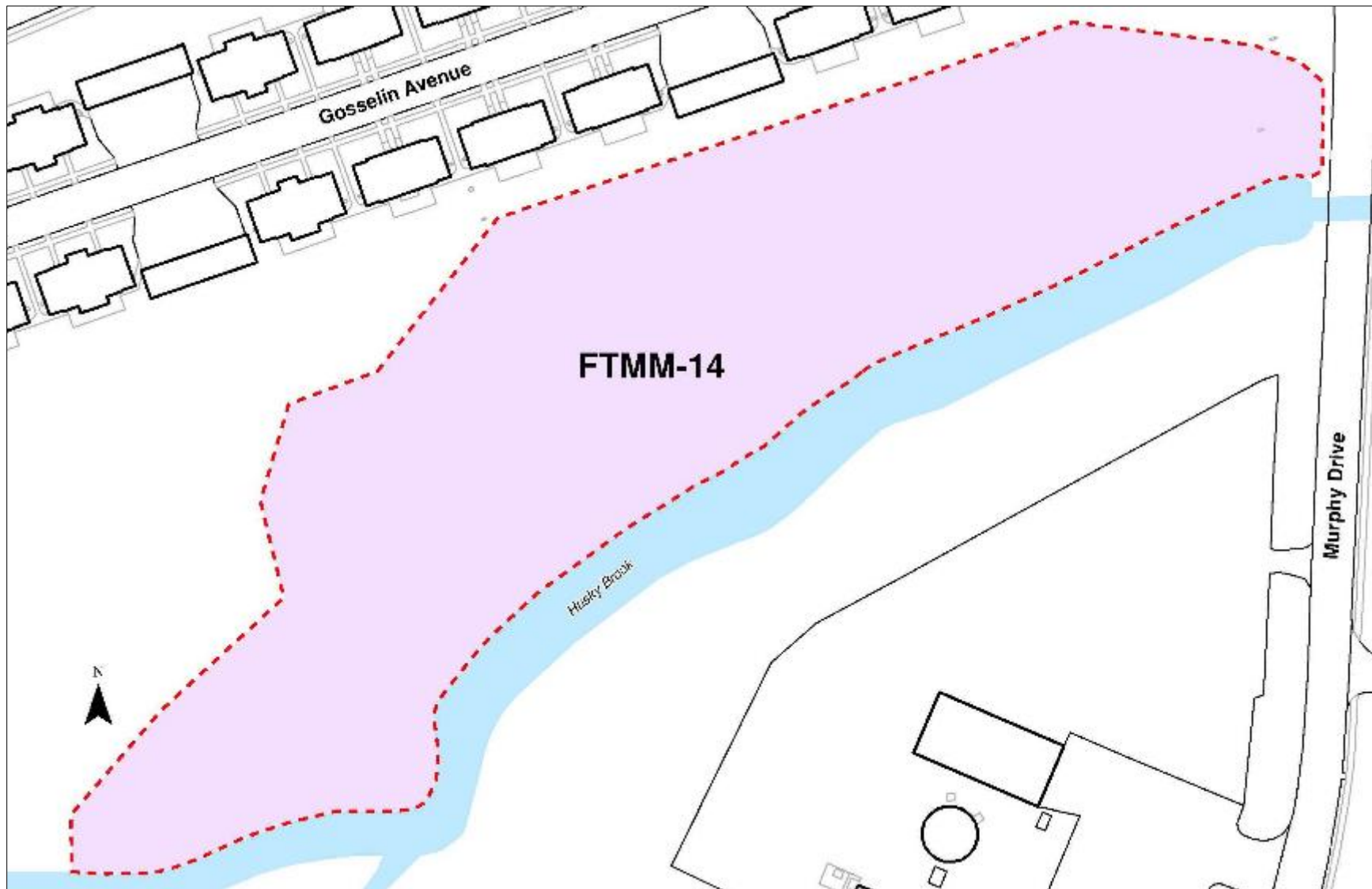


Figure 9 – FTMM-14 Site Boundary and Layout

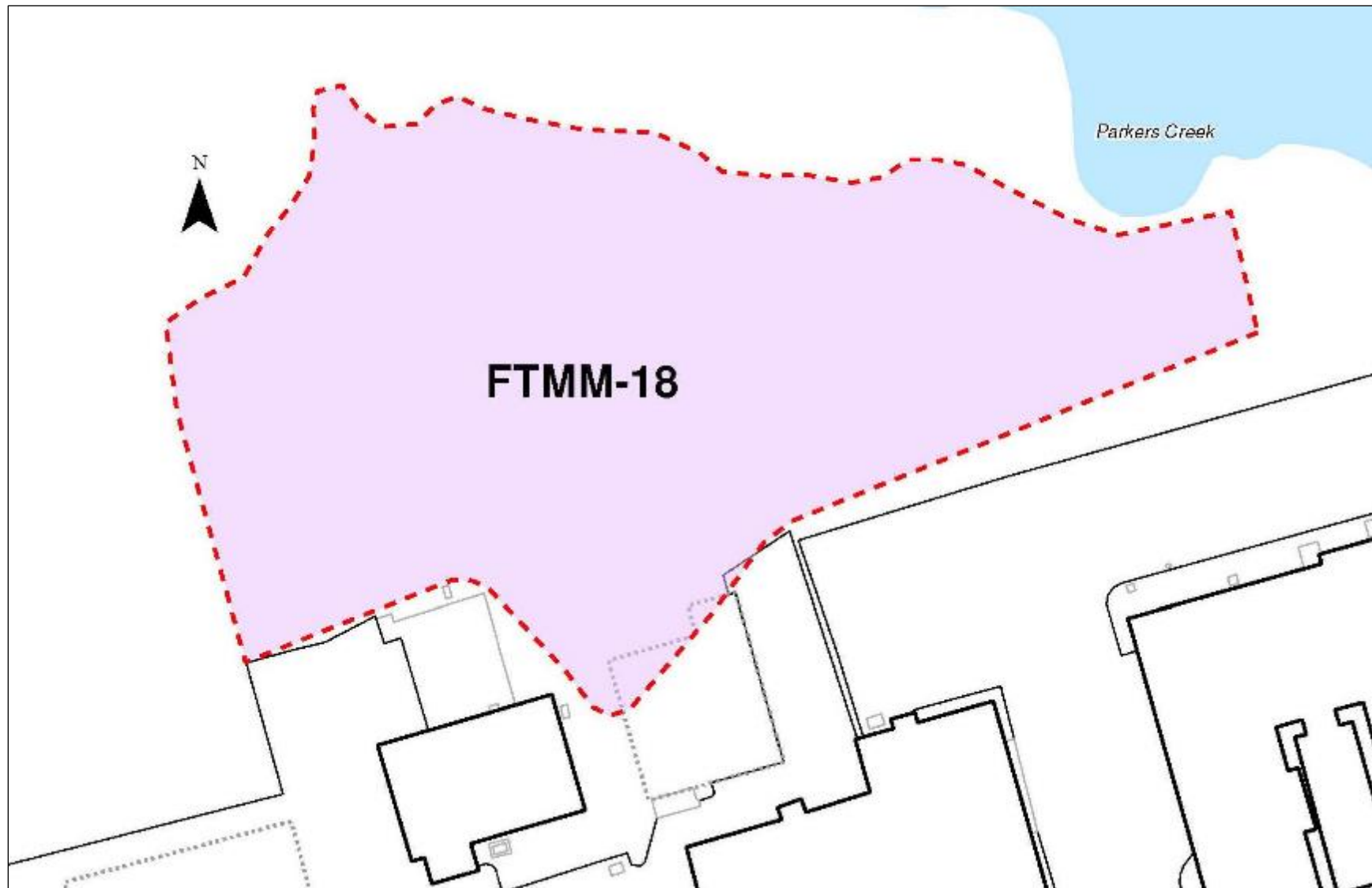


Figure 10 – FTMM-18 Site Boundary and Layout

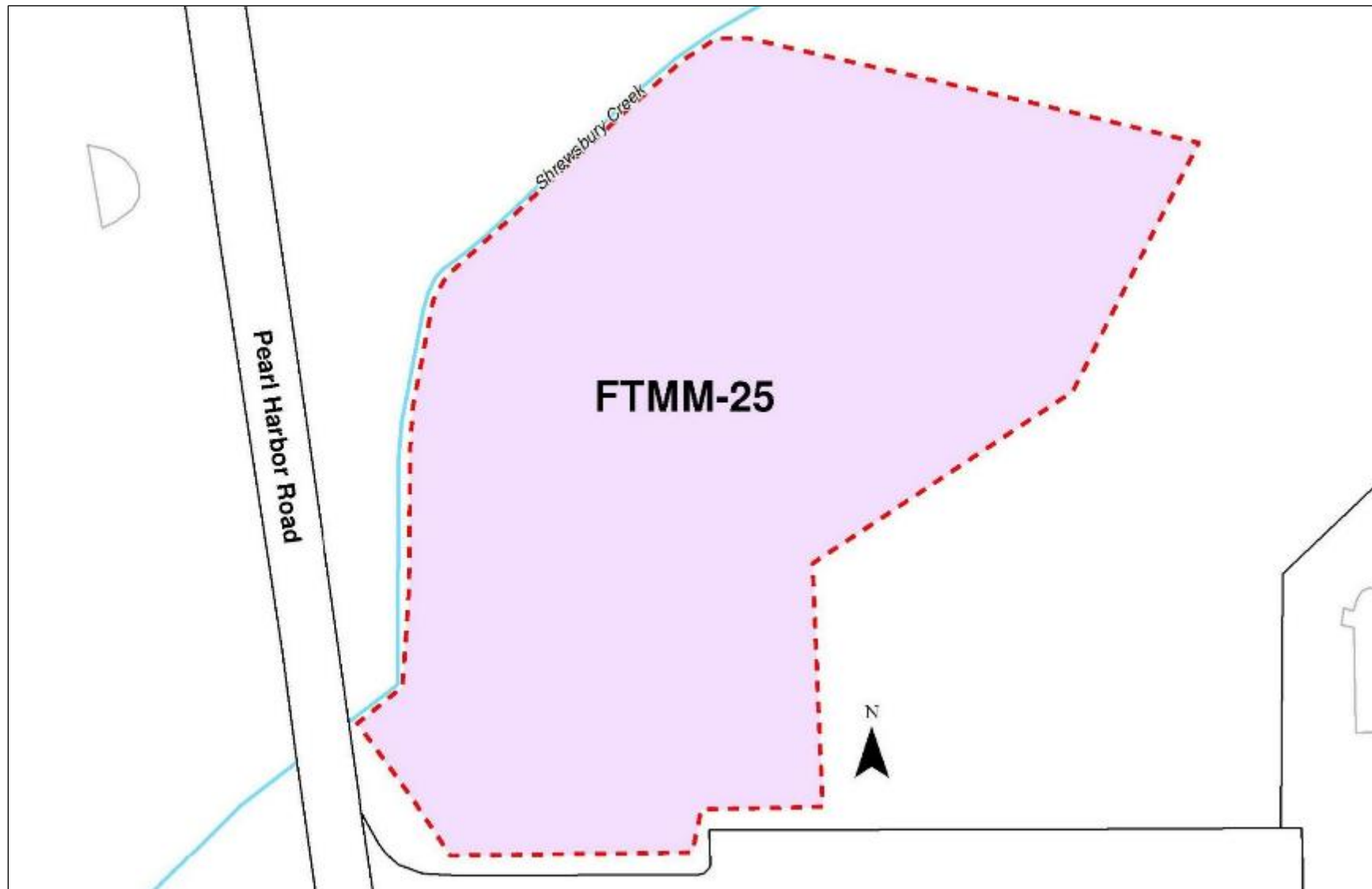


Figure 11 – FTMM-25 Site Boundary and Layout

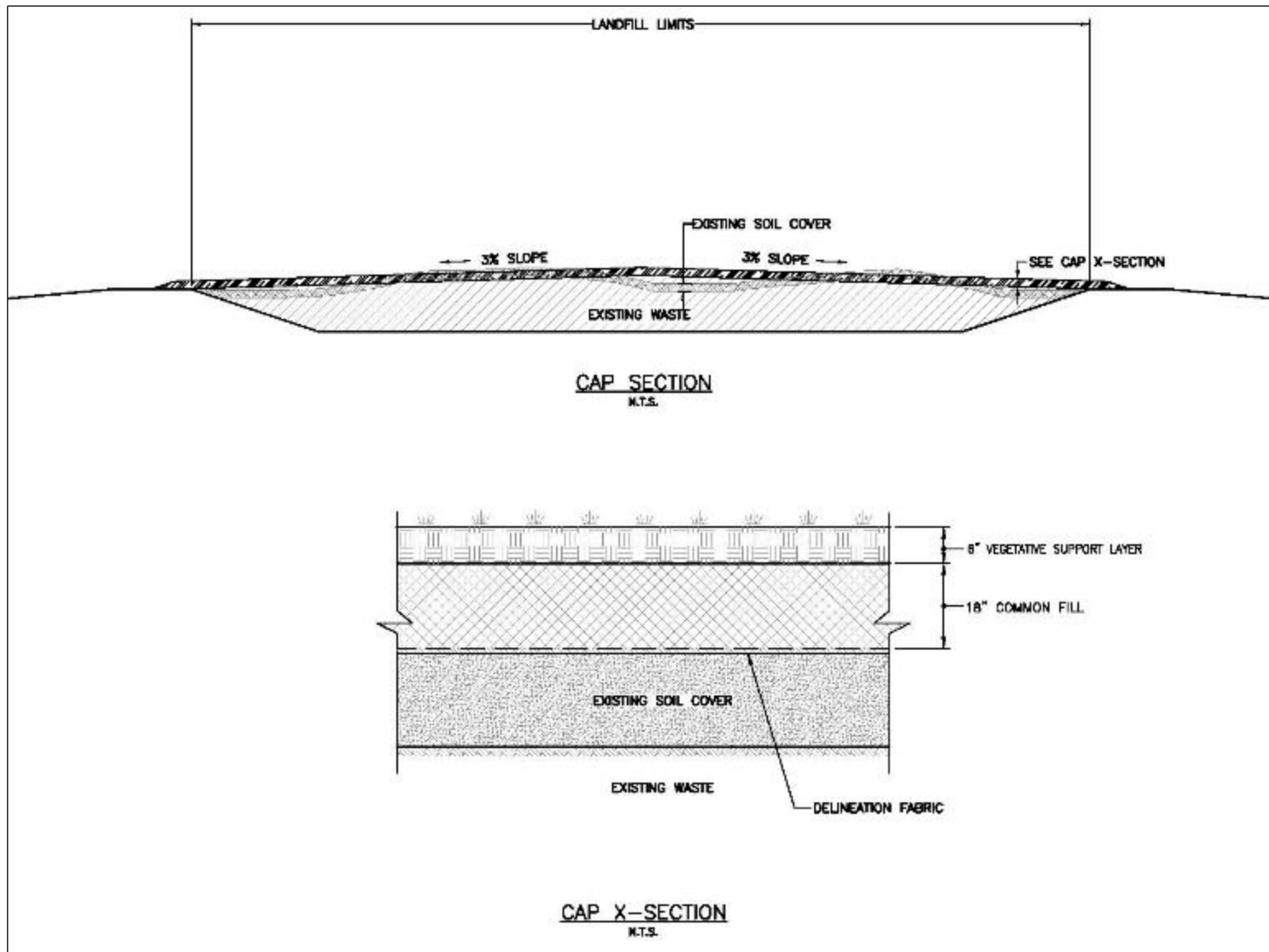


Figure 12 – Landfill Cover System Design

ATTACHMENT 2

Certificate of Publication for Public Notice and Public Meeting Record

AFFIDAVIT OF PUBLICATION

Publisher's Fee \$112.20 Affidavit \$35.00

State of New Jersey } SS.
Monmouth/Ocean Counties

Personally appeared

Denise Gorney

Of the **Asbury Park Press**, a newspaper printed in Freehold, New Jersey and published in Neptune, in said County and State, and of general circulation in said county, who being duly sworn, depose and saith that the advertisement of which the annexed is a true copy, has been published in the said newspaper 2 times, once in each issue as follows:

02/06/17, 02/07/17 A.D 2017

Denise Gorney

Melanie Galtz
Sworn and subscribed before me, this 7 day of February, 2017

Ad Number: 0001907830



OTHER HEADINGS

PUBLIC NOTICE

U.S. Army Corps of Engineers, NY District, Releases Proposed Plan for Landfill Sites FTMM-03, FTMM-04, FTMM-05, FTMM-12, FTMM-14, FTMM-18, and FTMM-25

The U.S. Army Corps of Engineers New York District and the U.S. Army Engineering and Support Center, Huntsville (USAESCH), has prepared a Proposed Plan for seven former landfills at Fort Monmouth (FTMM) in Oceanport, Monmouth County, New Jersey. The U.S. Army is the lead agency for FTMM in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and Executive Order 12580. New Jersey Department of Environmental Protection (NJDEP) is the state support agency under the National Contingency Plan for FTMM.

The Proposed Plan describes the preferred alternative of a vegetated two-foot soil cover which will be installed to provide safety protection from future exposure to solid waste at the landfills for future non-residential users, and provides the rationale for this preference.

Remedial investigations performed in 2014 and 2015 concluded that risks to human health and the environment from soil at the landfills are within acceptable ranges for the current and future intended land use which consists of passive open spaces. Although there is no CERCLA risk, and therefore no need for a CERCLA action, the vegetated soil cover will be placed over the landfills to address safety concerns for future non-residential use, consistent with the NJDEP Solid Waste requirements. Institutional Controls to maintain the soil cap and prevent residential land use will be established on each landfill.

The Proposed Plan, the Remedial Investigation reports that support it, and the full public record for the Site, are available for review at the Monmouth County Library, Eastern Branch, 1001 Route 35, Shrewsbury NJ 07702. The Proposed Plan is also posted on the FTMM Environmental Restoration Program website (<http://www.pic.a.army.mil/ftmonmouth/>)

The New York District invites public comment on the Proposed Plan. Written comments will be accepted during a 30-day comment period starting February 8, 2017 and ending March 9, 2017. All comments must be postmarked by March 9 and mailed to the address below (or emailed by March 9 to william.r.colvin18.civ@mail.mil):

BRAC Environmental Coordinator
OACSIM - U.S. Army Fort Monmouth
Attn: Mr. William Colvin
P.O. Box 148, Oceanport, NJ 08641
(732) 380-7064

A public meeting on the Proposed Plan will be held on March 2, 2017 at 7 p.m. Building 455 at Fort Monmouth, Oceanport Ave, Oceanport, NJ. The public is invited to attend and provide oral comments on the Proposed Plan at that time.
(\$112.20)

0001907830-01

U.S. ARMY FORT MONMOUTH

IN RE:

PROPOSED PLAN FOR SEVEN
LANDFILL SITES

)
)
) TRANSCRIPT OF:
) PROCEEDINGS
)
)
)

Thursday, March 2, 2017
U.S. Army Fort Monmouth
Wade Avenue, Building 455
Oceanport, New Jersey
7:30 p.m.

P R E S E N T:

WILLIAM COLVIN - BRAC Environmental Coordinator

CRIS GRILL - Parsons

FRANK ACCORSI - Parsons

JAMES T. MOORE - U.S. Army Corps of Engineers

Job No. NJ2544808

1 MR. COLVIN: All right. It's about 7:30
2 on the -- for the public meeting we're having for the
3 seven landfills at Fort Monmouth. We have Cris Grill
4 of Parsons, Frank Accorsi of Parsons, Jim Moore of
5 the Corps of Engineers, and I'm Bill Colvin, the
6 environmental coordinator for Fort Monmouth.

7 The public has arrived. We have one
8 person here right now. We're going to begin the
9 presentation. I guess I can call you by your first
10 name.

11 MR. BLANAR: Dr. Blanar to you.
12 (Laughter.)

13 MR. COLVIN: Well, good evening, and
14 welcome to our public meeting. I'm Bill Colvin, the
15 environmental coordinator for the Army at Fort
16 Monmouth. Tonight we're presenting the proposed plan
17 for seven landfills. Restoration work is being done
18 by the Corps of Engineers, and we'd ask that you save
19 your questions and comments until the presentation is
20 completed. Following the presentation, you will have
21 the opportunity to provide comments and ask questions
22 on the proposed plan for the landfills. That's the
23 purpose of the meeting.

24 Cris Grill, the senior project manager
25 with Parsons, one of the contractors the Corps has

1 contracted for the Fort Monmouth Restoration Program
2 will present the work performed to date and the work
3 plan for the landfills. Cris.

4 MS. GRILL: Thanks, Bill. Tonight's
5 agenda -- some of the items we're gonna cover is the
6 proposed plan and project team overview, site
7 background, remedial investigation results, summary
8 of risks at the seven landfills, preferred remedial
9 alternatives for the seven landfills, components of
10 the remedial measures for selected landfills may
11 include public participation and questions and public
12 comments.

13 So the proposed plan presents the
14 preferred alternative for seven former landfills at
15 Fort Monmouth, and they include FTMM-03, -04, -05,
16 -12, -14, -18, and -25. The U.S. Army Corps is the
17 lead agency under CERCLA, and the NJDEP is the state
18 support agency for Fort Monmouth.

19 This figure shows six of the seven
20 landfills are located on the Main Post area, and they
21 include M-03, M-04, M-05, M-12, M-14, and M-18. The
22 seventh landfill is located on the Charles Wood area,
23 and that is FTMM-25.

24 Remedial investigations have been
25 conducted in 2014 and '15 for each of the landfills

1 and it consisted of review of previous investigations
2 and sampling results, comparison of concentrations to
3 the NJDEP criteria for the soil, groundwater, surface
4 water and sediment, and conducting a human health
5 risk assessment.

6 The risk assessment is evaluation of the
7 potential adverse health effects caused by exposure
8 to contaminants in the soil, groundwater, surface
9 water and sediment.

10 Overall, the risk assessment showed no
11 unacceptable risk to human health in the environment
12 was found at the landfills for the current and future
13 intended use, which is passive open space.

14 Although there is no CERCLA risk and no
15 need to take an action, a vegetated soil cover will
16 be installed on each landfill to provide safety
17 protection from potential exposure to solid waste for
18 future nonresidential users.

19 Land use controls to maintain the soil
20 cover and prevent residential land use will be
21 implemented through A LUCIP.

22 Site Background: This figure shows
23 background information for each of the landfills,
24 including landfill operations, which are shown by the
25 orange box, it also includes the various

1 investigations conducted for each landfill and the
2 associated dates, and the various investigations
3 include Landfill Assessment and Studies, which is the
4 blue box, Site Investigation Activities, which is the
5 purple box, and RI Activities, which is the green
6 box.

7 The bluish-green dashed line is the
8 Corlies groundwater sampling which was started in
9 about 1997 for all the landfills. Corlies sampling
10 continued all the way up through 2011 and was
11 temporarily suspended when the base closed. Sampling
12 resumed in 2013, and each dashed line on the
13 landfills, which is an orange dashed line indicates
14 those are the landfills that the DEP agreed to
15 discontinue long-term monitoring of the groundwater
16 at.

17 The next slide is a table that shows the
18 sample collection history for soil, groundwater,
19 surface water and sediment collected at each landfill
20 and it includes the number of samples collected and
21 the date sampled.

22 Remedial Investigation Results: The
23 next seven slides are a summary of the RI results for
24 the seven landfills. So the first one is FTMM-03 and
25 it began operation from 1959 to 1964. The final RI

1 report was submitted to the DEP in February of 2016.
2 For soil: Four VOCs, seven SVOCs, one PCB, and 16
3 metals were evaluated in the risk assessment. For
4 groundwater: The last eight sampling rounds were
5 evaluated as representative of recent conditions in
6 the risk assessment and included three VOCs; NJDEP
7 agreed to discontinue long-term monitoring of the
8 groundwater in 2016 since concentrations were below
9 criteria. For surface water: No contamination was
10 originating from the landfill. And sediment: No
11 PCBs were detected in the samples above the NJDEP
12 criteria.

13 FTMM-04 operated from 1955 to 1956. The
14 final RI report was submitted to the DEP in July of
15 2016. For soil: Seven SVOCs, nine metals and two
16 pesticides were evaluated in the risk assessment.
17 For groundwater: The last eight sampling rounds were
18 evaluated as representative of recent conditions for
19 the risk assessment; however, no compounds were
20 evaluated in the risk assessment; the NJDEP agreed
21 that metal concentrations are representative of
22 background and to discontinue long-term monitoring in
23 2014. Surface water: No contamination originating
24 from the landfill. And sediment: No VOCs, SVOCs,
25 pesticides, PCBs or metals were detected in the

1 samples above the NJDEP criteria.

2 FTMM-05 operated from 1952 to 1959. The
3 final RI report was submitted to the DEP in August of
4 2015. For soil: Two VOCs, six SVOCs, two pesticides
5 and 13 metals were evaluated in the risk assessment.
6 For groundwater: Most recent sampling data indicates
7 VOCs are present above the NJDEP criteria and
8 sampling at select wells for VOCs will continue
9 annually. Surface water: No contamination
10 originating from FTMM-05 were found. And sediment:
11 No PCBs detected in samples above the NJDEP criteria.

12 FTMM-12 operated from 1950 to 1956. The
13 RI report was submitted to the DEP in August of 2015.
14 For soil: Two VOCs, eight SVOCs, seven pesticides,
15 one PCB and 15 metals evaluated in the risk
16 assessment. For groundwater: The last eight
17 sampling rounds evaluated as representative of recent
18 conditions for the risk assessment; no compounds
19 evaluated in the risk assessment; and the NJDEP
20 agreed to discontinue groundwater sampling in 2014
21 since the concentrations are below the criteria.
22 Surface water: No contamination originating from
23 FTMM-12. And for sediment: One PCB detected above
24 the NJDEP criteria, but it was located upstream and
25 not associated with the landfill.

1 FTMM-14 is located across from M-12
2 landfill. FTMM-14 operated from 1965 to 1966. The
3 RI report was submitted to the DEP in July of 2015.
4 Soil: Seven SVOCs, one pesticide, and seven metals
5 evaluated in the risk assessment. Groundwater: Last
6 eight sampling rounds evaluated is representative of
7 recent conditions for the risk assessment; no
8 compounds evaluated in the risk assessment; NJDEP
9 agreed to discontinue monitoring in 2014 since
10 concentrations were below the criteria. Surface
11 water: No contamination originating from FTMM-14.
12 Sediment: One PCB detected above the NJDEP criteria
13 was located upstream but was not related to FTMM-14.

14 FTMM-18 operated from 1963 to 1971. The
15 report was submitted to the NJDEP in October of 2015.
16 Soil: Six SVOCs, two PCBs, and five metals were
17 evaluated in the risk assessment. Groundwater: Most
18 recent sampling data indicates VOCs are present above
19 the New Jersey criteria; sampling for VOCs at select
20 wells will continue annually. Surface water: No
21 contamination originating from the landfill.
22 Sediment: One PCB detected slightly above the
23 criteria at two locations and was evaluated in the
24 risk assessment.

25 FTMM-25 operated from 1955 to 1956. The

1 final RI report was submitted to the DEP in August of
2 2016. Soil: Six SVOCs and five metals were
3 evaluated in the risk assessment. For groundwater:
4 The last eight sampling rounds evaluated as
5 representative of recent conditions for the risk
6 assessment; NJDEP agreed that metal concentrations
7 are representative background and agreed to
8 discontinue monitoring in 2014. Surface water: No
9 contamination originating from FTMM-25 was found.
10 And sediment: No PCBs detected in the samples above
11 the NJDEP criteria.

12 Summary of Risks at the Seven Landfills:
13 The risk assessment evaluated risks from human
14 exposure to contaminants in the soil, groundwater,
15 surface, and sediment at each of the landfills.

16 The USEPA regional screening levels for
17 soil and groundwater were used for comparison
18 purposes because the Army was assigned to perform a
19 CERCLA-compliant remedial investigation in human
20 health risk assessment. The RSLs were used to
21 identify those contaminants that are contaminants of
22 potential concern.

23 These COPCs were evaluated in the risk
24 assessment. No COPCs were determined to be
25 contaminants of concern at any of the landfills; no

1 COPCs were identified in the surface water; the risk
2 assessment evaluated exposure of current/future
3 outdoor workers, future utility workers, and future
4 recreational users to the COPCs in soil, groundwater,
5 and sediment through dermal contact, incidental
6 ingestion, and/or inhalation of particulates.

7 Groundwater at Fort Monmouth is not used as a source
8 of drinking water since municipal water is provided.

9 The risk assessment found no
10 unacceptable potential risk to: Current/future
11 outdoor workers or utility workers or future
12 recreational users from exposure to soil;
13 current/future utility workers from exposure to
14 groundwater; and current/future outdoor workers or
15 recreational users from exposure to sediment.

16 Overall, the risk to human health in the
17 environmental from the soil, groundwater, and
18 sediment are within the CERCLA ranges for the current
19 and future intended land use, which is passive open
20 space.

21 A baseline ecological evaluation was
22 conducted at Fort Monmouth to assess whether the
23 presence of constituents of concern in the sediment,
24 surface water, soil and groundwater has the potential
25 for adverse effects to the wildlife. It was

1 concluded that constituents at Fort Monmouth are
2 unlikely to have adverse effects on the wildlife or
3 their habitats and additional ecological assessment
4 was not warranted. In August of 2012, the DEP
5 accepted the baseline ecological risk assessment
6 report and recommendations and conclusions and
7 concurred that no additional evaluation of ecological
8 risk was required.

9 Preferred Remedy Alternative for the
10 Seven Landfills: A vegetated soil cover will be
11 placed over each area consistent with the NJDEP solid
12 waste regulations. Additional soil will be added to
13 the existing soil cover to have a minimum of two feet
14 of soil between the ground surface and the landfill
15 debris. The vegetated soil cover will offer safety
16 protection to nonresidents from potential future
17 exposure to solid waste at the landfill, and also
18 control surface water runoff and erosion.

19 The next slide shows the landfill cover
20 system design. The first figure shows the landfill
21 will be graded with a 3 percent slope to promote
22 positive surface water runoff.

23 The second slide is a cross-section of
24 the cover, and it includes a delineation fabric
25 placed over the existing soil cover followed by 18

1 inches of certified clean fill, followed by six
2 inches of certified clean topsoil that's seeded.

3 In addition to the soil cover, a LUCIP
4 will be prepared to implement the LUCs, which are
5 maintaining the soil cover and prevent residential
6 land use; document the location of the engineering
7 control, which is the soil cover; and it will also
8 identify procedural responsibilities, including cover
9 inspections and maintenance, monitoring and reporting
10 and long-term management requirement.

11 The Army will be responsible for
12 documenting and implementing the LUCs through filing
13 of a deed notice at the time of the property
14 transfer. The new owner will be responsible for
15 complying with the LUCs; however, the Army will
16 retain ultimate responsibility for the remedy
17 integrity of the landfills.

18 Components of the remedial measures for
19 select landfills may include institutional controls
20 in the form of a CEA will be established for
21 groundwater at FTMM-05 and FTMM-18 and will remain in
22 place until the groundwater quality standards are
23 achieved. Methane gas mitigation systems, walking
24 paths, access roads, parking areas, and maintenance
25 inspections of landfill caps may also be included.

1 MR. COLVIN: All right. Thanks, Chris.

2 Any part of selected remedy is public
3 participation, so it's great that you turned out
4 tonight, and I thank you for that.

5 We have posted the preferred -- the
6 proposed plan on the Fort Monmouth website. We
7 placed it in the Fort Monmouth Environmental
8 Restoration Program information repository, and
9 that's in the Monmouth County Library here in
10 Shrewsbury. We also having copies of the proposed
11 plan and tonight's presentation on the table in the
12 back of the of room if you'd like to have one for
13 reference.

14 Comments and questions from the public
15 and the Army's responses will be placed in the
16 decision document which will be added to the public
17 information repository, and comments will be accepted
18 through next Thursday. That's March 9th.

19 At this time, we'll open the meeting to
20 public questions and comments on the proposed plan
21 for seven landfills. Each person will have five
22 minutes for their questions and comments. Before you
23 ask your questions or provide your comments we'd ask
24 that you please state your name and your town of
25 residence.

1 After you've asked your questions and
2 made your comments, we'll respond to them. We will
3 also respond to written comments we receive tonight.
4 Forms are available in the back of the room with the
5 rest of the information. And tonight's comments,
6 questions, and responses pertaining to the proposed
7 plan will be included in the decision document along
8 with written responses that are mailed and emailed to
9 us.

10 Is there anybody from the public that
11 wishes to ask a question, make a comment?

12 Yes, sir. Go right ahead. You can
13 stand up at the....

14 MR. BLANAR: Thank you. Ed Blanar, from
15 Monmouth Junction, New Jersey, B-l-a-n-a-r.

16 When is proposed construction going to
17 start and how long do you anticipate it to take for
18 all the landfills?

19 MR. COLVIN: We're going to start next
20 fall and we plan for a year to have the construction
21 completed at the landfills.

22 MR. BLANAR: I also want to say thank
23 you all for your hard work. It looks like you've
24 done a lot of work here to get this far and I
25 appreciate that you all took the time to come and

1 present this to the public. Thank you.

2 MR. COLVIN: We certainly appreciate
3 your interest and attendance tonight.

4 That concludes our presentation, and
5 thank you very much. It's about quarter to eight.

6 (Proceedings concluded at 7:45 p.m.)
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CERTIFICATE

I, LYDIA F. McDONNELL, a Certified
Shorthand Reporter and Notary Public of the State of
New Jersey, do hereby certify that the foregoing is a
true and accurate transcript of the proceedings as
taken stenographically by and before me at the time,
place and on the date hereinbefore set forth.

I DO FURTHER CERTIFY that I am neither a
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of the parties to this action, and that I am neither
a relative nor employee of such attorney or counsel,
and that I am not financially interested in the
action.



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My Commission expires June 30, 2018

Dated: March 23, 2017

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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	\$ 308,633.00	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										
				Last Daily Report - Landfill 14	\$ 818,630.96						\$ 818,630.96				
0008	5c	\$ 870,884.00	Removal of Overlap at Landfill 14 (9,504 SF)	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										
				Draft-Final CEA - TBD	\$ 3,878.55										
				Final CEA - TBD	\$ 2,585.70										
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	\$ -

