



**Proposed Plan  
Former Raritan Arsenal  
Middlesex County College Property  
Edison and Woodbridge, New Jersey**

**The Proposed Plan**

This Proposed Plan was prepared by the U.S. Army Corps of Engineers (the Corps), New England and New York Districts, to present the proposed response to soil contamination at the Middlesex County College Property at the former Raritan Arsenal in Edison and Woodbridge Townships, New Jersey. This plan summarizes the Corps' rationale for recommending No Further Action for soil at the Middlesex County College Property.

**Introduction**

This Proposed Plan provides information to the public on the Corps' recommended response for soil contamination at the Middlesex County College (MCC) Property (the Site) at the former Raritan Arsenal in Edison and Woodbridge Townships, New Jersey. This Proposed Plan presents the Corps' rationale for the preferred approach for the MCC Property area, and is a tool to encourage and facilitate community participation.

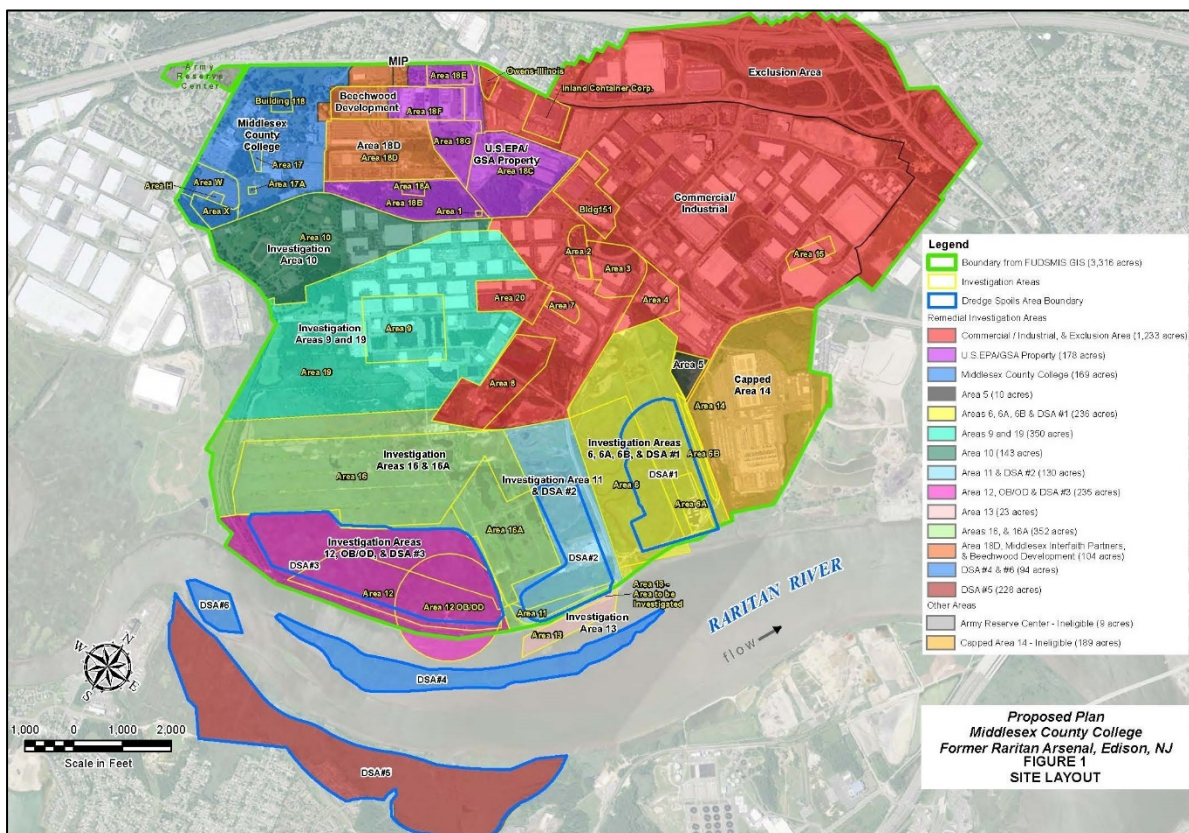
The former Raritan Arsenal has been divided into several areas of investigation, referred to as Remedial Investigation (RI) Areas, for soil based on a combination of property ownership, land use, and historical Investigation Area boundaries. Site-wide groundwater and vapor intrusion concerns are evaluated as a separate project. This No Further Action Proposed Plan is for the MCC Property area and focuses on the identified hazardous and toxic waste (HTW) soil

contamination associated with the MCC Property. Figure 1 presents a Site Layout of the former Raritan Arsenal.

While not specific to this Proposed Plan, it bears mentioning that there are no vapor intrusion (VI) concerns associated with the MCC Property from volatile compound contamination in soil or groundwater. All buildings that could possibly be affected by the VI pathway have been evaluated and/or sampled. Results indicate there are no vapor intrusion issues.

Another component of the ongoing investigations at the former Raritan Arsenal is concern about munitions and explosives of concern (MEC) that may remain buried in soil. To address this concern, the Corps intends to complete a RI specifically for MEC that will include a Hazard Assessment (HA) for the entire MCC Property to evaluate the likelihood of encountering MEC in the future. The results of the MEC RI will be used to complete a Feasibility Study (FS) for MEC (if necessary). A separate Proposed Plan and Decision Document specifically for MEC at the MCC Property will be prepared.

Federal and state environmental laws govern characterization and response activities at federal facilities. The investigation and environmental restoration of the former Raritan Arsenal has been conducted under the Defense Environmental Restoration Program – Formerly Used Defense Sites (DERP-FUDS).



The overall goal under the DERP-FUDS is to achieve environmental restoration of the former Raritan Arsenal and to address potential human health and environmental risks associated with past Department of Defense (DOD) activities. The federal statute, the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), establishes procedures for site investigation, evaluation, and remediation. The Corps has followed the CERCLA process to identify the scope of the problem and appropriate remedial response. The New Jersey Department of Environmental Protection (NJDEP) is the lead regulator for this Site. The Corps has also been conferring with local stakeholders since 1990 about community concerns regarding the Site.

As the lead agency for implementing the environmental response program for the former Raritan Arsenal, the Corps has prepared

this Proposed Plan in accordance with CERCLA Section 117(a) and Section 300.430(f)(2) of the National Contingency Plan (NCP) to continue its community awareness efforts and to encourage public participation. After the public has the opportunity to review and comment on this Proposed Plan, the Corps will summarize and respond to the comments received during the public comment period and at a public meeting. Information on the times and places for public comment and the public meeting are shown in the box below.

The Corps will carefully consider all comments received from the public and provide responses which will be compiled into a Responsiveness Summary. The decision on which action is appropriate for MCC will be detailed in a Decision Document, which will include the Responsiveness Summary.



This Proposed Plan highlights key information from previous investigations including the baseline human health risk assessment that was documented in the *Final Remedial Investigations and Remedial Actions Summary Report* (June 2014) and the results of a focused, supplemental RI that was completed for a small, localized area within MCC Property (April 2018).

The 2014 RI, the 2018 RI Addendum, and this Proposed Plan are available for review through the Corps' website for the former Raritan Arsenal:

<http://www.nan.usace.army.mil/Raritan>

To access the 2014 RI, the 2018 RI Addendum, and the Proposed Plan, click on the 'Public Documents' link in the webpage above. Other documents related to the MCC Property can be obtained directly from Mr. Matthew Creamer via email (Matthew.T.Creamer@usace.army.mil) or phone (917-790-8335).

### Site Background

#### *Where is the former Raritan Arsenal?*

The former Raritan Arsenal lies along the north bank of the Raritan River, mostly in Edison Township with a portion of the site located in Woodbridge Township, approximately 20 miles southwest of lower Manhattan. It is bordered to the north and northwest by Woodbridge Avenue (Route 514), to the southwest by Mill Road and the Industrial Land Reclamation (ILR) Landfill, and to the east by vacant and industrial properties. Figure 2 presents the former Raritan Arsenal location.

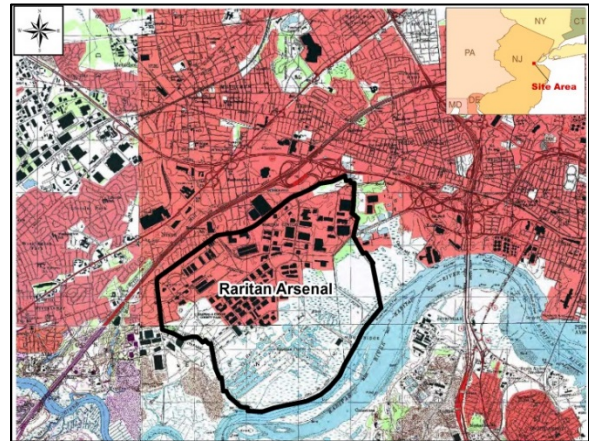


Figure 2 - Map showing the location of the former Raritan Arsenal site in Edison and Woodbridge Townships.

### Public Comments Are Requested

#### PUBLIC COMMENT PERIOD

February 11, 2019 – March 20, 2019

Written comments on this Proposed Plan can be submitted to the Corps during this comment period. Comment letters must be postmarked no later than March 20, 2019 and can be sent to Mr. Matthew Creamer, Project Manager, U.S. Army Corps of Engineers, Jacob K. Javits Federal Building 26 Federal Plaza, Room 1811. New York, NY 10278. Comments can also be sent by email to: Matthew.T.Creamer@usace.army.mil.

#### PUBLIC MEETING

March 6, 2019

The Corps will host an information session from 7:00 to 8:00 PM at the Middlesex County College, Gabriel Hall – Brunswick Room to provide information and answer questions in an informal setting. This meeting will include a brief introduction and summary by the Corps and an opportunity to submit public comments – whether verbally or in writing.





#### *What was the former Raritan Arsenal used for?*

The former Raritan Arsenal was used by the U.S. Army from 1917 to 1963. Operations at the arsenal included the receipt, storage, shipment, and decommissioning of ordnance, arms, and machinery. Some waste material, including ordnance and chemical agents, were reportedly buried on site. It has also been reported that explosive materials were routinely destroyed by surface burning or burning in chambers or pits. Accidental explosions in magazine buildings and outdoor storage areas reportedly scattered materials over large areas, and drove ordnance fragments into the ground. Site operations were phased out between 1961 and 1963.

Today much of the northern portion of the former Raritan Arsenal is developed by private landowners which have built Raritan Center, a major industrial park complex; United States Environmental Protection Agency (USEPA); and Middlesex County, which owns Thomas A. Edison County Park and MCC. The southern portion of the Site has remained primarily tidal marsh with limited development since the closing of the former Raritan Arsenal in 1963.

#### *What is the history of the MCC Property?*

MCC occupies approximately 169 acres in the northwest corner of the former Raritan Arsenal. A few buildings previously constructed by the Army remain and are used by MCC for various administrative purposes. All other structures and roads, fields, parking lots, etc. were constructed by MCC during the 1960's and 1970's. There are a number of athletic fields present in this area.

A 1918 site plan indicated that the MCC Property area was used by the Army as a cantonment (living) area and also contained a hospital complex. During the period between 1918 and 1934, most of the barracks were demolished as they were no longer necessary

following World War I (WWI). Construction activities that occurred between 1918 and 1934 included: construction of brick buildings to house non-commissioned officers, development of a 9-hole golf course, building of a swimming pool, and construction of a new hospital building.

Between 1934 and 1943, the remaining WWI barracks were demolished. Buildings constructed during this time period included new barracks, a school building, and other miscellaneous buildings. An area identified as "Future Salvage Yard" was noted on a 1943 site plan.

Few changes occurred within the MCC Property between 1943 and 1961. The Future Salvage Yard noted on the 1943 site plan was not included on a 1954 site plan. However, an area identified as "Burning Ground" was noted on the 1954 site plan. The Burning Ground area is located near the location of the Future Salvage Yard noted on the 1943 site plan.

Based on what is known about historic uses of the MCC Property, the following soil Investigation Areas have been identified on MCC Property (see Figure 3).

- Area 17 and Area 17A – Former Burning, Salvage, and Property Disposal Area.
- Building 118 – Adapter Booster Disposal and Underground Storage Tank (UST) Area.
- Areas X, H, and W – Former Administrative and Barracks Area.
- Additional areas such as the High Traffic Area, UST removal areas, and the PCB Transformers Areas.







*What was the contamination problem and where did it come from?*

Historical contaminants at the MCC Property area consisted of volatile organic compounds (VOCs), polynuclear aromatic hydrocarbons (PAHs), pesticides, polychlorinated biphenyls (PCBs), and metals in surface and subsurface soils and VOCs and metals in groundwater. The source of soil contamination was the presence of buried ordnance, drums, and associated debris discovered in Area 17A, Building 118, Area W, various USTs and transformers, and non DOD-related diffuse anthropogenic sources (i.e., PAHs and historical pesticide use). The source of VOC concentrations in the groundwater was leaking buried drums and debris discovered in Area W. Interim response actions have been performed at Area 17 and 17A, Area W, and Building 118, thereby removing the contaminant source areas and mitigating risk to human health and the environment.

The highest remaining soil contaminant concentrations were found in several High Traffic Area surface soil samples and in an Area W test pit subsurface soil sample and were evaluated in the baseline human health risk assessment (BHHRA). Individuals that could be exposed to soil include groundskeepers, construction/utility workers, student recreational users, indoor workers, and daycare children. Additionally, the BHHRA looked at risks to hypothetical future residents to provide information on remediation to unlimited use and unrestricted exposure levels (UU/UE). These receptors have the potential to be exposed to surface and/or subsurface soil via incidental ingestion, dermal contact, inhalation of dust emissions, and inhalation of VOCs released from soil. The indoor worker has no direct contact with soil and therefore, the

dermal contact pathway was not evaluated for this receptor.

There is currently no use of groundwater on site. All buildings, including MCC buildings, are connected to municipal water. Groundwater is not expected to be used in the future because new buildings will connect to municipal water. Therefore, there is no contact with the groundwater. The only portion of the MCC Property affected by groundwater contamination is the AOC 10 plume, which includes Area 17A and parts of Area X, H, and W. As noted previously, the site-wide groundwater and vapor intrusion concerns are being evaluated as a separate project. As a brief synopsis for groundwater AOC 10, evaluation of the vapor intrusion pathway for the one building located over AOC 10 plume concluded there is no risk from vapor intrusion. Any future buildings constructed in this area will need to be designed with consideration given to the potential for the vapor intrusion pathway.

A site wide screening level ecological risk assessment (SLERA) was completed in March 2004. As a follow-up to the SLERA, a baseline ecological risk assessment (BERA) was completed in 2008. The MCC Property was considered in both investigations but potential ecological risk was not evaluated because of a lack of suitable ecological habitat in the majority of the area.

**Site Characterization**

*What has the Corps done to investigate the site?*

Various studies conducted by the Army including multiple RIs have been performed to investigate the contamination issues at the MCC Property since the closing of the Raritan Arsenal. The report titled *Final Remedial Investigations and Remedial Actions Summary Report* (June 2014) summarizes all of the



previous studies and interim removal/remedial actions performed at the MCC Property and presents a human health risk assessment. The 2018 RI Addendum for Area W presents the results of a focused, supplemental RI that was completed to investigate elevated VOC levels that were historically observed in subsurface soil.

The RIs used a variety of characterization tools that are highlighted (see the Characterization Tools highlight box). The RIs evaluated all identified potential contamination at the MCC Property area and in certain cases resulted in the large-scale interim response actions of contaminated soils at Investigation Area 17/17A, Building 118, and Investigation Area W.

#### RI Characterization Tools

- Archival searches
- Geophysical surveys
- MEC surveys
- Test pit investigations
- Soil gas surveys
- Soil samples
- Groundwater monitoring well installation and sampling

The first investigation performed was a report prepared in 1963 by the Letterkenny Army Depot that discussed the results of a decontamination (explosive residue only) effort performed by the Army during the closure of the former Raritan Arsenal. Numerous follow-on investigations and response actions have included:

- Archival searches to identify areas of potential contamination including MEC based on historical operations.

- Geophysical surveys across a large portion of the MCC Property area to identify subsurface anomalies including discarded military munitions (DMM), munition debris (MD), and possibly unexploded ordnance (UXO).
- DMM removal and a geophysical survey at Building 118.
- UST removals.
- PCB transformer removals.
- Soil and groundwater investigations that delineated and characterized the levels of contamination throughout the MCC Property Area including areas known to experience high use (i.e., the High Traffic Areas).
- Interim response actions at the ball fields and tennis courts associated with Investigation Area 17/17A and at Investigation Area W to mitigate risk to human health and the environment as well as source area removal.
- Follow-on studies at Investigation Area W including a focused RI for residual subsurface VOC contamination.
- A time-critical removal action of MEC identified on the eastern portion of the MCC Property area to eliminate risk to human health and the environment.
- Ongoing monitoring of the Groundwater Area of Concern 10 plume supporting the selected Monitored Natural Attenuation remedy for groundwater.
- A baseline HHRA that evaluated the degree of soil exposure within MCC using health-protective assumptions on the current and future uses of MCC Property.

#### *What did the RI and HHRA conclude?*

The RIs performed at the MCC Property focused on all areas known or suspected to be contaminated and thoroughly investigated the



nature and extent of the contamination. Environmental sampling at the MCC Property began in the early 1990s. Soil samples have been analyzed for over 150 chemical compounds, including VOCs, semivolatile organic compounds (SVOCs), PAHs, pesticides, herbicides, PCBs, explosives, and metals. The results of the soil samples were used to guide the need for interim actions where soil excavations were performed to remove the highest levels of contamination. Figure 3 presents the locations of the soil samples and the interim response actions.

As part of the 2014 RI, a BHHRA was conducted to estimate the current and future effects of soil contaminants on human health. The BHHRA evaluated all soil data that were not removed during the various interim response actions that were historically conducted within the MCC Property. The contaminants of potential concern (COPCs) that were evaluated in the BHHRA were selected by comparing the maximum detected concentration of each analyte in soil with available risk-based screening levels. The selected COPCs included PAHs, various pesticides, two VOCs, and metals.

Risks calculated in the BHHRA were evaluated to determine the need for a remedial action. For cancer effects, a “cancer risk” was calculated. As an example, a cancer risk of  $5 \times 10^{-6}$  means a five in one million excess cancer risk for an individual exposed to site COPCs under the conditions assumed in the BHHRA. For noncancer health effects, a “hazard index” (HI) was calculated. The key concept for a noncancer HI is that a “threshold” (measured as an HI of less than or equal to one) exists below which noncancer health hazards are not expected to occur. Because it represents a threshold, a greater HI is not a reliable measure of a greater effect.

COPCs that exceed a  $1 \times 10^{-4}$  cancer risk or an HI of one typically require a remedial action at the site. If remediation were required, the remediation goals would be set with consideration of the CERCLA acceptable cancer risk limit of  $1 \times 10^{-4}$  to  $1 \times 10^{-6}$  which corresponds to a one in ten thousand to a one in a million excess cancer risk, and an HI of one for noncancer effects.

The BHHRA calculated risks for a wide range of individuals that currently work at or spend time at MCC including groundskeepers, construction/utility workers, student recreational users, indoor workers, and daycare children. The BHHRA assumed that these individuals would also contact the soil in the future. Additionally, the BHHRA evaluated risks to hypothetical future residents to determine the ‘worst-case’ risks as soil contact associated with residential exposure traditionally results in the high risks at a site.

The BHHRA concluded that, even with the inclusion of the hypothetical future residents, the potential exposure and consequent risks to adults and children using or potentially using MCC, both currently and in the future, are not a concern for restricted or unrestricted uses. That is, the site cancer risks were less than  $1 \times 10^{-4}$  and the noncancer hazards were less than one. This conclusion is based on all chemical data available to define the nature and extent of contamination within the MCC Property. Therefore, No Further Action is proposed for soil contamination associated with the MCC Property.

An ecological risk assessment was not conducted for the MCC Property due to the highly developed nature of the MCC Property and the consequent lack of suitable wildlife habitat.





## Technology Evaluation

### *What is a Feasibility Study (FS)?*

A Feasibility Study is an engineering study of the potential cleanup remedies for a site. Based on the result of the BHHRA which concluded that risks to exposed individuals are not a concern for restricted or unrestricted use, CERCLA guidance does not require an FS for the residual soil contamination at the MCC Property.

### Next Steps

#### *What happens next?*

The Corps will conduct a public meeting on March 6, 2019 at the Middlesex County College, Cabriel Hall – Brunswick Room. Once the community has reviewed this Proposed Plan, the Corps will consider all comments received

from the public. The Corps will provide written responses to all substantive comments and combine them into a Responsiveness Summary, which will be included in the Decision Document for the MCC Property. The Decision Document will describe the No Further Action determination and summarize community participation in the selection process. The Corps anticipates that the Decision Document will be finalized and signed before the end of 2019, at which time it will be made available to the public at MCC and on the Corps' webpage for the former Raritan Arsenal:

<http://www.nan.usace.army.mil/Raritan>

None of the CERCLA § 121 statutory determinations are necessary because no remedy is being selected.



## Glossary of Terms

**Comprehensive Environmental Response, Compensation and Liability Act (CERCLA):** A federal law passed in 1980 and amended in 1986 by the Superfund Amendments and Reauthorization Act (SARA), commonly known as Superfund. The Corps' characterization and remediation at DERP FUDS sites is conducted under the framework of CERCLA/SARA, while funded by the Defense Environmental Restoration Program (DERP).

**Corps of Engineers (the Corps):** The U.S. Army Corps of Engineers provides comprehensive environmental restoration services for the Army, Department of Defense (DOD), Environmental Protection Agency (EPA), Department of Energy (DOE), and other federal agencies. The DOD has designated the Corps to oversee the environmental program at the Site, under the Formerly Used Defense Site (FUDS) program.

**Decision Document:** A legal, technical and public document that explains the rationale and remedy decision for a given site. It also summarizes the public's involvement in the decision process.

**Feasibility Study (FS):** An engineering study of the potential remedies for a site.

**Baseline Human Health Risk Assessment (BHHRA):** An analysis of the potential adverse human health effects caused by hazardous-substance exposure in the absence of any actions to control or mitigate these exposures under current and future site uses.

**Remedial Investigation (RI):** The collection of data and information necessary to characterize the nature and extent of contamination at a site. The RI also includes information as to whether or not the contamination poses

significant risk to human health and/or the environment.



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#### Information Repositories

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<http://www.nan.usace.army.mil/Raritan>