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PROPOSED PLAN FOR SITE 2 WORLD WAR II LANDFILL NCBC GULFPORT MS

11/1/2014

NAVAL CONSTRUCTION BATTALION CENTER GULFPORT MS

PROPOSED PLAN FOR SITE 2 – WORLD WAR II LANDFILL
NAVAL CONSTRUCTION BATTALION CENTER GULFPORT
GULFPORT, MISSISSIPPI
November 2014

NAVY ANNOUNCES PROPOSED PLAN

This Proposed Plan presents the Navy's proposed remedy (***preferred alternative****) to address contaminants detected in ***soils*** and ***groundwater*** at Site 2, the World War II Landfill, at the Naval Construction Battalion Center (NCBC) Gulfport. Figures 1, 2 and 3 show the features and location of the site. The ***preferred alternative*** is Alternative 2, which consists of limited regrading and fill placement within the existing soil cover, establishing and maintaining a vegetative cover, ***land use controls (LUCs)***, and ***long-term monitoring (LTM)*** of ***groundwater***.

This Proposed Plan was developed by the Navy as lead agency under the ***Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA)*** and the ***National Oil and Hazardous Substances Pollution Contingency Plan (NCP).*** The Navy consulted with and obtained the concurrence of the Mississippi Department of Environmental Quality (MDEQ) for this remedy proposal as a designated supporting agency under ***CERCLA***.

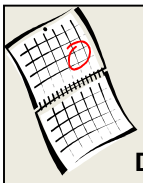
This document provides environmental information about the site, summarizes the remedial alternatives that were evaluated, explains the rationale used to support the ***preferred alternative*** for the cleanup of Site 2, and summarizes information found in detail in the Navy's previous ***Remedial Investigation (RI)*** and ***Feasibility Study (FS)*** Reports for Site 2 at NCBC Gulfport.

The Navy is issuing this Proposed Plan as part of its public participation responsibilities under Section 117(a) of ***CERCLA*** and Section 300.430(f)(2) of the ***NCP*** to assist and involve the community in the decision-making process.

The public is invited to comment on this Proposed Plan during the Public Comment Period beginning on December 2, 2014, and ending on January 5, 2015. The Proposed Plan and other site documents are available for review at the NCBC Gulfport ***Information Repository***, which is located in the Gulfport Public Library (see the box at right for more information). Public comments will be considered in the selection of the final remedy and will be addressed in the Site 2 Decision Document.

*Words in ***italicized boldface*** are defined in the Glossary on Page 13.

Figure 1: *Site 2 is mainly a grass covered area in the western portion of NCBC Gulfport. The photo was taken from the west, looking towards the northeast.*



MARK YOUR CALENDAR

PUBLIC COMMENT PERIOD
December 2, 2014, to January 5, 2015

The Navy will accept written comments on the Proposed Plan during the Public Comment Period.

PUBLIC MEETING
December 2, 2014
2:00 – 4:00 pm

The Navy will hold a public meeting to explain the Proposed Plan and the alternatives evaluated in the ***FS***. Written comments will also be accepted during the meeting, which will be held at the Gulfport Public Library, 1708 25th Avenue, Gulfport, Mississippi.

INFORMATION REPOSITORY

All the technical and public information publications prepared to date for the site are available at the following location:

Gulfport Public Library
1708 25th Avenue
Gulfport, MS 39501
Telephone: (228) 871-7171

For more information about this plan, please call Mr. Gordon Crane, NCBC Gulfport at (228) 229-0446.

SITE BACKGROUND

NCBC Gulfport is a Navy base located in the western portion of Gulfport, Mississippi in southeastern Harrison County about 1.2 miles north of the Gulf of Mexico. The installation is approximately 1,100 acres in size and currently consists of military housing, training, and support facilities.

Site 2 is a former landfill facility located on approximately 8 acres north of 8th Street and east of Colby Avenue. Site 2 was operated from 1942 to 1948 as the primary disposal area for general refuse collected in dumpsters at the installation. The majority of the waste disposed at Site 2 was general refuse and inert material such as paper, cardboard, wood, and garbage. Limited volumes of liquid wastes such as paints, paint thinners, solvents, oils, and fuels were reportedly disposed of at the site. Because much of the waste was burned at the site, flammable liquids and materials disposed of at the site were probably incinerated.

The disposal operation at Site 2 consisted of burning combustible materials in a structure located at the northern end of the site. The ash, along with the non-combustible material, was then pushed to the southern end of the site and buried in trenches. Wastes were placed in the unlined trenches at or near the groundwater table (approximately 8 feet deep), and buried. The waste disposal area was covered with soil when disposal activities ceased in 1948. Additional fill was added to much of Site 2 as part of the construction of the Pine Bayou Golf Course, which closed in 2011. The site is currently being used as a training area.

SITE 2 CHARACTERISTICS

Figure 2 shows the location of Site 2 in the western section of NCBC Gulfport. Site 2 is a former landfill located on approximately 11 acres north of 8th Street and east of Colby Avenue (see Figure 3). The site is relatively flat, and a pond is located on the eastern side of Site 2. The pond was created during the golf course construction activities. It reportedly was a source of fill to build up the fairways, which are located on Sites 2 and 7.

The 1987 Confirmation Study found evidence of low levels of chromium and lead in ***sediment*** and low levels of chlorinated ***volatile organic compounds (VOCs)*** in ***groundwater***. A ***geophysical survey*** was also conducted during the Confirmation Study. The magnetometer detected variations in the total magnetic field indicating that metal objects were present at Site 2.

In 1994, a basewide ***groundwater*** investigation found ***dioxin*** north of Site 2 and near Site 7. The variety of ***dioxin*** found was associated with Herbicide Orange. ***VOCs*** and herbicides were not detected in any of the ***groundwater*** samples during this sampling event. The

Figure 2: *Site 2 is located to the north in the western section of NCBC Gulfport.*

Figure 3: *Site 2 boundary.*

recommendations from this study included resampling at Site 7 due to the ***dioxin*** detection.

In 1999, a basewide ***groundwater*** investigation was conducted to determine the extent of ***dioxin***. None of the newly installed monitoring wells at Site 2 contained ***dioxins*** during this sampling event.

Prior to the preparation of the ***RI*** Work Plan in 2009, it was determined that a ***Presumptive Remedy*** for Site 2 was the best course of action based on the characteristics of the materials in the landfill and low concentrations of contaminants in the ***groundwater***. The ***Presumptive Remedy*** for landfills includes a streamlined approach to site characterization and, therefore, expedites cleanup. (See the highlight box on Page 3 for more information about ***Presumptive Remedies***.)

In 2011, the Navy began the ***RI*** fieldwork to further investigate Site 2. The ***RI*** fieldwork included a ***geophysical*** and ***soil gas survey,*** and ***surface water, sediment***, ***soils***, and **groundwater** sampling. The investigations found low concentrations of ***polynuclear aromatic hydrocarbons (PAHs),*** herbicides, and metals in ***soils*** and ***groundwater*** exceeding MDEQ

Tier 1 TRGs. No landfill gas was detected. This is anticipated due to the age of the landfill and the waste disposal practices used. ***Surface water*** and ***sediment*** contained similar contaminants. As a result, the Site 2 boundary was extended to the east to include the entire area of the pond.

The ***RI*** Report also included ***Human Health*** and ***Ecological Risk Assessments*** and identified ***contaminants of concern (COCs)*** for Site 2. ***COCs*** are contaminants that might pose a risk for human health or the environment.

In 2012, additional ***RI*** fieldwork was conducted to fully characterize the existing soil cover and verify the depth of landfill wastes. Results for this field event were evaluated and are presented in the ***FS***. One soil sample, located north of Site 2 (near Site 7), contained ***dioxin*** at a concentration that could potentially pose a risk to site workers and future human residents. Because of the location of this sample and the similarity to other Site 7 detections, this finding will be addressed along with remedy for Site 7.

The results of the soil analytical program (low level contaminants and municipal wastes) are consistent with the application of the containment strategy of the ***Presumptive Remedy***. No principal threat wastes (liquids in drums, highly mobile contaminants, or highly toxic source materials) were found in the landfill. The direct observation of the field samples and waste profiling confirmed the waste disposal area defined by the geophysical investigation.

SCOPE AND ROLE OF THE ACTION

Site 2 is being addressed under the Navy's ***Environmental Restoration Program***. Although the base has not been placed on United States Environmental Protection Agency's (USEPA's) ***National Priorities List,*** the Navy is conducting investigations and cleanup activities following ***CERCLA*** and, to the extent practicable, the ***NCP*** in consultation with MDEQ as a supporting agency under ***CERCLA***. The overall strategy for the ***Environmental Restoration Program*** at the installation is to perform cleanup on a site-by-site basis to ensure protection of human health and the environment, and to support base operations and overall Department of Defense mission accomplishment.

Implementation of the ***preferred alternative*** described in this Proposed Plan would allow the future land use at Site 2 to remain a training area. The remedy is intended to be the only remedial action at Site 2 and addresses the risks involved with potential exposure to soil and landfilled waste. Additionally, **groundwater** will be monitored to evaluate potential leaching from the landfill. The remedial action proposed will address the source area and reduce current risks posed to human health and/or the environment, in light of the current and reasonably anticipated future land uses.

PRESUMPTIVE REMEDY FOR MILITARY LANDFILLS

In early 1990, the USEPA began looking at various ways to streamline environmental cleanup. One approach was to use standardized proven technologies to cleanup similar sites such as municipal landfills. These standardized technologies for specific categories of sites are called "***Presumptive Remedies***". Use of ***Presumptive Remedies*** has been shown to ensure consistency in remedy selection and to reduce the cost and time required for investigation and remediation of sites with similar characteristics.

The USEPA published guidance documents that specifically encourage source containment for military landfills with characteristics similar to municipal landfills. The application of waste containment as the ***Presumptive Remedy*** most often requires the design and installation of some form of landfill surface cover designed to meet the following three goals:

- Minimize infiltration of water that could dissolve contaminants in the landfill.
- Prevent direct contact with the landfill wastes and prevent movement of the waste by wind or water.
- Prevent exposure to landfill gas.

Site 2 fits the criteria for consideration as a military landfill as mentioned in the USEPA guidance based upon the following:

- Risks are low level except for hotspots.
- Waste types are generally household, commercial, non-hazardous sludge, and industrial solid wastes.
- Lesser quantities of hazardous wastes are present as compared to municipal-type wastes, if any.
- No military-specific wastes (such as unexploded ordnance, radioactive waste, or biological/ chemical warfare agents) are present.

According to the USEPA ***Presumptive Remedy*** guidance and based on the characteristics of the site, containment that prevents direct contact with the waste would be considered adequate to address contamination at Site 2. Since the waste is in constant contact with the ***groundwater***, minimizing the passage of storm water through the landfill is unnecessary. Additionally, management of landfill gas is unnecessary since testing did not indicate a need associated with Site 2.

SUMMARY OF SITE RISKS

A summarized explanation of the evaluation and results of the ***Human Health Risk Assessment*** and ***Ecological Risk Assessment*** is presented below. Detailed results and in-depth information can be found in the ***RI***. The ***FS*** and other documents pertaining to Site 2 can be found at the ***Information Repository***.

Human Health Risk Assessment

A ***Human Health Risk Assessment*** estimates the likelihood of health problems occurring if no cleanup action were taken at the site. The following four-step process is used to calculate the baseline risk:

- **Data evaluation** – This first step looks at the concentrations of contaminants found at a site and compares the data to risk-based numbers to determine which contaminants are most likely to pose the greatest threat to human health. Data evaluated for Site 2 included ***soils***, ***groundwater***, ***surface water***, and ***sediment*** collected during the ***RI***.

- **Identification of exposure pathways** – In Step 2, consideration is given to the various types of people who could potentially be exposed to the contaminants identified in the previous step (referred to as potential ***receptors***), the concentrations to which people might be exposed, and the potential frequency and duration of exposure. The Site 2 exposure assessment evaluated possible site workers (construction, maintenance and industrial workers), recreational users and trespassers, and the most sensitive ***receptors***, adult or child residents (in the event that people would ever be allowed to live at the site).

- **Assess potential health dangers (also called toxicity assessment)** – In Step 3, the information from Step 2 is combined with information on the toxicity of each chemical to assess potential health risks. Two types of risks, cancer risks and non-cancer risks, are considered. The likelihood of any kind of cancer resulting from a site is generally expressed as an upper bound probability (for example, a "1 in 1,000,000 chances"). In other words, for every 1,000,000 people that could be exposed, one extra cancer case may occur because of exposure to site contaminants. An extra cancer case means that one more person could get cancer than would normally be expected to occur from all other causes. The MDEQ considers any risk above one in one million unacceptable. For non-cancer health effects, a hazard index is calculated. The hazard index is a threshold level below which non-cancer health effects are no longer predicted. The MDEQ considers a hazard index of 1 or less as acceptable.

- **Estimation of potential risks** – In Step 4, it is determined whether site risks are great enough to cause health problems for people at or near the site. The results of the three previous steps are combined, evaluated, and summarized.

In 2012 through 2014, a Landfill Cover Assessment to evaluate the nature of the existing soil cover was conducted in the waste disposal area. Additional risk calculations and further evaluation eliminated chemicals that were assumed to present minimal risks to potential human ***receptors***. This evaluation and results of the Landfill Cover Assessment are summarized in the ***FS***.

The human health risks are summarized in the following table:

Summary of Human Health Risks		
Potential Receptor	**Media**	**Potential COC**
Construction Worker	Surface Soil	***PAHs***
	Subsurface Soil	***PAHs***
Future Child and Adult Resident and Future Lifelong Resident	Surface Soil	***PAHs***
	Subsurface Soil	***PAHs***
	Groundwater	***PAHs***, Arsenic, Iron

Based on discussions between the Navy and MDEQ, it was agreed that remediation goals for the project would be based upon the State of Mississippi Target Remediation Goals for ***soils*** and ***groundwater***. As a result, the MDEQ Target Remediation Goals will serve as the basis for remedial action. The ***FS*** identified the proposed remediation goals for the following primary risk drivers for Site 2:

Proposed Remediation Goals	
Surface Soil	
PAHs	87.5 µg/kg
Subsurface Soil	
PAHs	87.5 µg/kg
Groundwater	
PAHs	0.2 µg/L
Arsenic	10 µg/L
Iron	11,000 µg/L
Sediment	None
Surface Water	None

Screening-Level Ecological Risk Assessment

Ecological risks were evaluated for ***sediment*** and ***surface water*** collected from ditches adjacent to the site and the pond on the eastern side of the site. The pond is pictured in Figure 4. A smaller ditch on the western side has a concrete bottom lining (see Figure 1) and the larger ditch (not pictured) on the southern side receive storm water runoff from the central part of the installation. Based on the distribution of contaminants and the small area and general unsuitability of the habitat, the risk to benthic ***receptors*** at Site 2 was considered to be minimal.

Figure 4: *The golf course pond is located on the eastern portion of Site 2. The photo was taken from the north, looking towards the southeast***.**

Overall Assessment

Inherent risks are associated with potential exposure to landfill materials remaining at the site.

In addition, the following potential risks to human health and the environment were identified:

- ***PAHs*** were identified as a human health risk in surface soil and subsurface soil.
- ***PAHs***, arsenic, and iron were identified as potential human health risks in ***groundwater***.

The Site 2 Conceptual Site Model developed during the preparation of the ***FS*** (see Figure 5) illustrates the Navy's current understanding of Site 2 conditions. It is the Navy's judgment that the ***preferred alternative*** identified in this Proposed Plan is necessary to protect public health or welfare or the environment from actual or threatened releases of pollutants or contaminants from this site, which may present an imminent and substantial endangerment to public health or welfare.

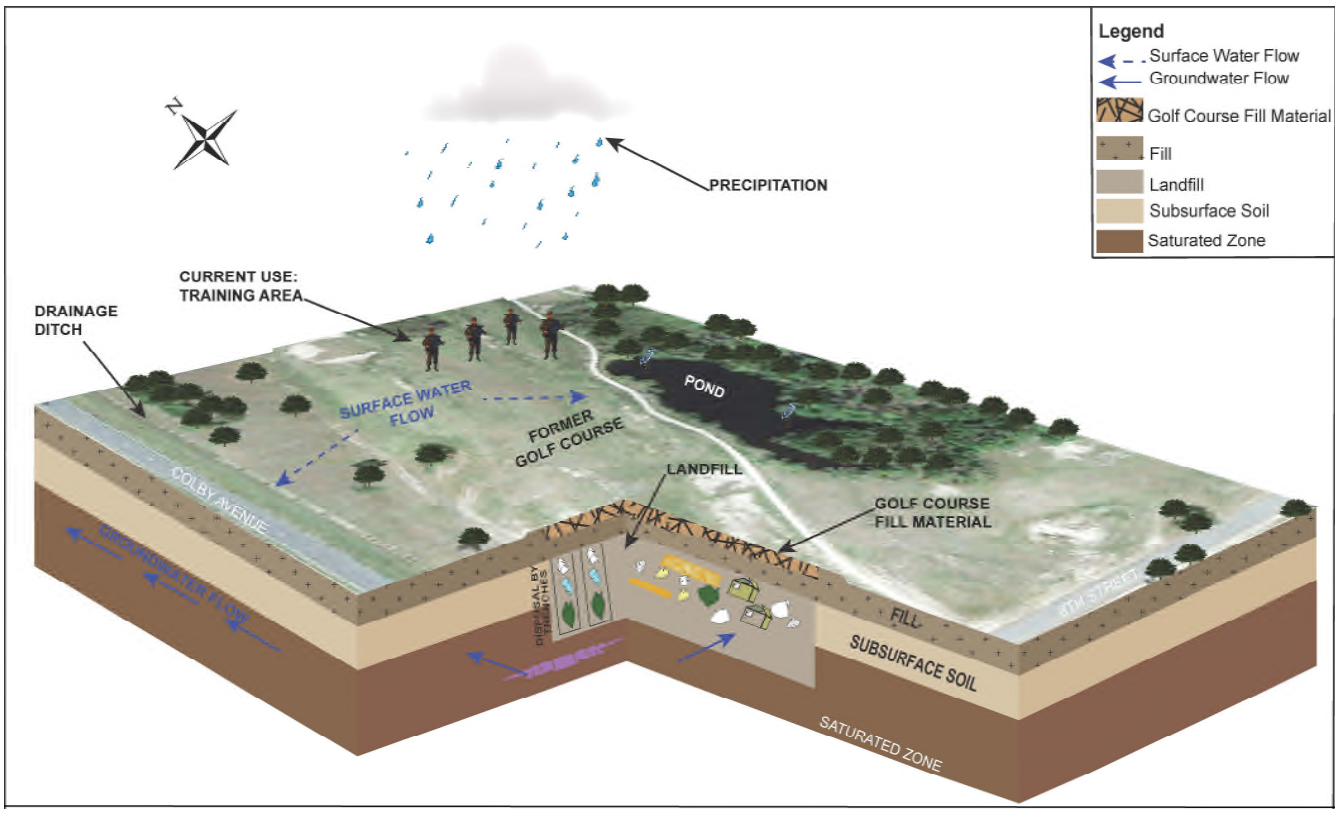


Figure 5. *The Conceptual Site Model illustrates current understanding of site conditions.*

REMEDIAL ACTION OBJECTIVES

Remedial Action Objectives (RAOs) are the goals that a cleanup plan should achieve. They are established to protect human health and the environment and to comply with all qualifying federal and state ***Applicable or Relevant and Appropriate Requirements*** (***ARARs)***. The following ***RAOs*** were developed for Site 2 based on its current and reasonably anticipated future site uses:

RAO 1: Prevent direct contact with landfill contents and exposure to ***COCs*** in surrounding contaminated soil.

RAO 2: Prevent direct contact with contaminated surface soils.

RAO 3: Prevent direct exposure routes for human ***receptors*** for ***COCs*** in ***groundwater***.

Because use of a ***Presumptive Remedy*** is proposed for this site, the evaluation of alternatives was streamlined and only three remedial alternatives were analyzed. Figure 6 presents the remedy components.

Figure 6: *Site 2 boundary and the approximate extent of contaminated surface soil. Additional delineation may reduce the area of contamination.*

SUMMARY OF REMEDIAL ALTERNATIVES

The following section summarizes the remedial alternatives developed for Site 2:

Alternative 1: No Action

A "No Action" alternative is always used as a baseline for comparison. This alternative assumes that no changes would be made to the existing conditions at the site.

Alternative 2: Landfill Cover and Waste Containment with LUCs and LTM

This alternative consists of the following components: 1) filling the golf course pond with clean fill material with limited regrading of the existing surface soil to prevent ponding and promote drainage and site reuse, 2) containing the landfill using a minimum soil cover thickness of 2 feet, 3) establishing and maintaining a vegetative cover, 4) establishing and maintaining ***LUCs***, and 5) conducting ***LTM*** of ***groundwater***. After implementation of this focused action, the site would be available for both current and reasonably anticipated future site uses.

The golf course pond to the east will be drained as necessary to aid in construction and filled with clean fill material to a similar grade as the landfill. This cover will adequately cover waste that has been detected beneath the golf course pond.

Limited regrading of the existing surface soil west of the golf course pond would be conducted to prevent ponding and promote drainage and site reuse. Additionally, the PAH-contaminated surface soil will be isolated during site preparation and placed beneath the cover. A minimum soil cover thickness of 2 feet over the portion of the landfill area that has either contaminated surface soil or less than 2 feet of clean soil cover would be installed. Containment of the landfill would preclude direct contact with buried waste and eliminate migration of impacted ***soils***. A vegetative cover consisting of native grass or other shallow-rooted vegetation suitable to minimize soil erosion where needed would be established and maintained.

LUCs to be applied at the site would consist of the following:

- Prohibit future residential and agricultural uses of the site.
- Prohibit excavation of soil or other intrusive activities that may compromise the integrity of the soil cover.
- Prohibit the withdrawal of ***groundwater*** from beneath the site.

Annual ***LUC*** compliance inspections would be conducted to ensure that these implemented ***LUCs*** are being maintained.

LTM of ***groundwater*** would consist of periodically collecting ***groundwater*** samples from the perimeter monitoring (see Figure 3) wells to evaluate if contaminants are moving from the site.

Alternative 3: Treatment and Capping

This alternative consists of the following components: 1) waste containment (via soil cover/soil cap), 2) chemical in situ treatment injected barrier at 5-year intervals to treat iron and arsenic in groundwater, 3) implement and maintain ***LUCs,*** 4) landfill gas management/monitoring and, 5) ***LTM*** of ***groundwater***. As with Alternative 2, after implementation of this alternative, the site would be available for both current and reasonably anticipated future land uses.

Under this alternative, a landfill "cap" would be constructed as a surface cover consistent with MDEQ solid waste regulations. The constructed cap would consist of four layers: a topsoil layer to prevent surface erosion, an underlying low permeability layer (2 feet of clean fill) to enhance prevention of rainwater infiltration into the landfill, a gas venting layer that would collect landfill gas, and common fill placed 6 inches below the gas-venting layer. However, due to the high water table in this area, landfill wastes are buried at and below the water table, and it is unlikely that infiltration of rain water would cause additional adverse effects. A chemical treatment injection barrier[1] would be used reduce the mobility of arsenic and iron in the shallow aquifer at the edge of the landfill. An oxygen releasing material injected into the shallow aquifer will change the aquifer conditions to convert the metal contaminants to insoluble forms that would adhere to the soil matrix and not be transported by the groundwater. This treatment is also anticipated to improve attenuation conditions for the PAHs to reduce the concentrations to acceptable levels.

This alternative would also include a gas-venting layer to manage any potential landfill gas. Additionally for Site 2, the ***PAH***-contaminated surface soil would be isolated during site preparation and placed beneath the cap prior to construction. Prior to installing the final cover, the site would be regraded to promote runoff from the site.

LUCs similar to those proposed under Alternative 2 would be implemented and maintained to prevent future residential development, the withdrawal of ***groundwater*** or any soil excavations, or other intrusive activities that could result in exposure to impacted subsurface soil or landfill wastes. Periodic inspections would similarly be conducted to ensure that the implemented ***LUCs*** are being maintained, the site (e.g., cap) has not been damaged, and to determine if maintenance to the surface is required.

Landfill gas would be managed to prevent the excess accumulation of methane gas below the cap. Methane gas is created when the waste within the landfill degrades. During ***Landfill Gas Surveys***, methane concentrations would be measured at landfill vents and from probes installed during the remedial action.

LTM of ***groundwater*** would consist of periodically collecting ***groundwater*** samples from selected wells to assess the effectiveness of the landfill cap and groundwater treatment at the site.

EVALUATION OF ALTERNATIVES

The remedial alternatives were compared to each other using the nine criteria established by the ***NCP*** (see "Summary of Evaluation of Alternatives Using the Nine Criteria" on the following page). Please consult the Site 2 ***FS*** Report for more detailed information. The following is a summary of these comparisons.

1. Overall Protection of Human Health and the Environment

Alternative 1 would not be protective of human health and the environment because there would be nothing to prevent exposure to contaminants in ***soils*** and ***groundwater***. Alternative 1 would not meet the ***RAOs***.

Alternative 2 would be protective of human health and the environment because the soil cover would ensure that future potential site users would be protected from exposure to buried waste or unacceptable levels of contaminants associated with the landfill contents. ***LUCs*** would preclude residential uses of the site and prevent potential exposure to the remaining landfill materials and unacceptable levels of contaminants in ***soils*** and ***groundwater***. **LTM** will ensure no undetected contaminant concentrations increase or migration is occurring. A vegetative cover would be established to

[1] The active groundwater treatment portion of the remedy was added after the FS was completed to address Navy comments.

minimize soil erosion and stabilize the soil cover. All of the ***RAOs*** would be met under this alternative.

Alternative 3 would be protective of human health and the environment because soil cover/cap over the area of contamination would ensure that future potential site users would be protected from exposure to unacceptable levels of contaminants. Groundwater treatment would reduce contaminant concentrations in groundwater and prevent migration away from the site. ***LUCs*** would restrict residential and commercial/ industrial uses of the site and prevent potential exposure to the remaining landfill materials and unacceptable levels of contaminants in ***soils*** and ***groundwater***. The site would be suitable for revegetation. All of the ***RAOs*** would be met under this alternative.

2. Compliance with ARARs

Alternative 1 would not comply with ***ARARs*** because unacceptable levels of contaminants would remain at the site and exposure to the contaminants would not be controlled.

Alternative 2 would comply with ***ARARs*** because exposure to ***media*** with contaminant concentrations greater than regulatory criteria would be prevented by the landfill soil cover and application of ***LUCs***.

Alternative 3 would comply with ***ARARs*** because exposure to contaminant concentrations greater than regulatory criteria would be prevented by the landfill cover/cap and application of ***LUCs***.

3. Long-term Effectiveness and Permanence

Alternative 1 would have no long-term effectiveness or permanence because waste would remain on site, and there would be no ***LUCs*** to prevent human exposure and no monitoring to detect potential contaminant movement away from the site.

Alternative 2 would be effective long-term and permanent because the soil cover would provide a barrier that would prevent human ***receptors*** from unacceptable exposure to contaminants at the site, and **LTM** and ***LUCs*** would provide further protection against exposure to contaminants/ wastes below the surface.

Alternative 3 would be effective long-term and permanent because the soil cover/cap and groundwater treatment would likewise provide a barrier that would prevent human ***receptors*** from unacceptable exposure to contaminants at the site, and ***LUCs*** would provide further protection against exposure to contaminants in the subsurface.

4. Reduction of Toxicity, Mobility, or Volume through Treatment

Alternative 1 would not be effective in the short term because accessible contaminated soils and groundwater would remain in place without a complete cover.

Alternative 2 would not reduce toxicity, mobility, and volume of contaminants through treatment. However, it would help to minimize future movement of contaminants within the landfill, and the regrading of surface soil and soil cover would reduce the overall exposure risk of known site contaminants.

Alternative 3 would reduce the mobility of arsenic and iron in the shallow aquifer at the edge of the landfill by changing the aquifer conditions to convert these contaminants to insoluble forms that would adhere to the soil matrix and not be transported by the groundwater. This alternative would not reduce toxicity, mobility, and volume of contaminants in soil through treatment. Like Alternative 2, it would reduce the future potential movement of contaminants within the landfill and landfill gas venting would prevent the accumulation of methane gas below the cap. It.

5. Short-term Effectiveness

Alternative 1 would not result in risks to site workers or result in short-term adverse impact to the surrounding community or environment because no remedial activities would be performed.

Both Alternatives 2 and 3 would be effective in the short-term by reducing potential risks to humans during implementation through the use of dust suppression and control measures to minimize exposure to contaminated soil particulates during on-site activities such as regrading. Erosion control measures would minimize the potential migration of soil into the adjacent ditches. Additionally for Alternative 3, groundwater treatment involves chemicals which also posed limited risk to workers handling the material. On-site workers would be adequately protected using established health and safety equipment and procedures.

What are Applicable or Relevant and Appropriate Requirements (ARARs)?

ARARs stands for "Applicable or Relevant and Appropriate Requirements". The following types of legal requirements are addressed in a cleanup action:

- Chemical-specific ***ARARs*** address concentrations of contaminants that the cleanup must meet. The MDEQ Target Remediation Goals are chemical-specific ***ARAR***s for Site 2.
- Action-specific ***ARARs*** regulate how a cleanup remedy is implemented and define how contaminants are managed.
- Location-specific ***ARARs*** address legal issues for special location such as wetlands and tribal lands. There are no location-specific ***ARARs*** for Site 2.

6. Implementability

Alternative 1 would be readily implemented because no action would occur.

Alternative 2 would be implementable because of the following:

- It would use typical construction industry equipment for regrading and earthmoving.
- Off-site locations for clean soil have been identified and are available.

LUCs have been successfully developed by the Navy with concurrence by the MDEQ at other sites on this installation.

Alternative 3 would be implementable because of the following:

- It would use typical construction industry equipment for regrading and earthmoving.
- Injection equipment and chemicals for the chemical oxidation injected barrier are a mature technology in environmental remediation and are readily available.
- Off-site locations for clean soil have been identified and are available.

LUCs have been successfully developed by the Navy with concurrence by the MDEQ and at other sites on this installation.

7. Cost

The capital and ***O&M*** costs of Alternative 1 is $0 since no work would be performed. For Alternative 2, the capital cost was estimated to be $1,166,000. The ***net present worth (NPW)*** of Alternative 2 including the capital and long-term costs is estimated at $1,812,000. For Alternative 3, the capital cost was estimated to be $4,719,000. The ***NPW*** of Alternative 3 including the capital and long-term costs is estimated at $5,319,000. The costs have been rounded to the nearest $1,000 to reflect the preliminary nature of these estimates.

8. State Acceptance

Based on ongoing discussions, MDEQ concurrence with Alternative 1 would not be expected. State concurrence would be expected for Alternatives 2 or 3.

9. Community Acceptance

Community acceptance of the preferred remedy will be assessed based on comments received during the Public Comment Period (December 2, 2014, to January 5, 2015) for the Site 2 Proposed Plan.

SUMMARY OF EVALUATION OF ALTERNATIVES USING THE NINE CRITERIA PAGE 1 OF 2			
Evaluation Criteria	**Alternative 1: No Action**	**Alternative 2: Landfill Cover and Waste Containment with LUCs and LTM**	**Alternative 3: Treatment and Capping**
1. Overall Protectiveness of Human Health and the Environment determines whether an alternative eliminates, reduces, or controls threats to public health and the environment through ***LUCs*** or treatment	Would not reduce toxicity, mobility, or volume of waste through treatment because current site conditions would not change.	Soil cover would eliminate potential exposure to landfill waste and prevent migration of contaminants via erosion. The pond will be drained and filled with clean fill material to support the cover. LTM would ensure no contaminant concentration increases or undetected contaminant migration. ***LUCs*** would prevent exposure to buried waste, and contaminants in ***soils*** and ***groundwater***.	Capping of the landfill would eliminate potential exposure to landfill waste, prevent migration of contaminants via erosion, and prevent percolation of rain from leaching contaminants from landfill material to the water table. The pond will be drained and filled with clean fill material to support the cap. Groundwater treatment and **LTM** would help prevent contaminant concentration increases or undetected contaminant migration. ***LUCs*** would prevent exposure to buried waste and contaminants in ***soils*** and ***groundwater***.
2. Compliance with *ARARs* evaluates whether the alternative meets federal and state environmental statutes, regulations, and other requirements that pertain to the site.	Would not meet any ***ARARs***.	Would meet the threshold criteria for compliance with ***ARARs***.	
3. Long-term Effectiveness and Permanence considers the ability of an alternative to maintain protection of human health and the environment over time.	Would not have long-term effectiveness or permanence.	Would be effective for the long-term in protecting human health and the environment by keeping contaminant migration pathways from being completed. ***LUCs*** would provide for routine inspection, maintenance, and monitoring.	Would be effective for the long-term in protecting human health and the environment by keeping contaminant migration pathways from being completed. Groundwater treatment would reduce select COCs to acceptable levels and help prevent migration. ***LUCs*** would provide for routine inspection, maintenance, and monitoring.
4. Reduction of Toxicity, Mobility, or Volume of Contaminants through Treatment evaluates an alternative's use of treatment to reduce the harmful effects of principal contaminants, their ability to move in the environment, and the amount of contamination present.	Would not provide a reduction of toxicity, mobility, or volume of contaminants through treatment	Would not provide a reduction of toxicity, mobility, or volume of contaminants through treatment.	Alternative 3 would utilize direct treatment of groundwater to reduce the toxicity, mobility, or volume of hazardous substances.

SUMMARY OF EVALUATION OF ALTERNATIVES USING THE NINE CRITERIA PAGE 2 OF 2			
Evaluation Criteria	**Alternative 1: No Action**	**Alternative 2: Landfill Cover and Waste Containment with LUCs and LTM**	**Alternative 3: Treatment and Capping**
5. Short-term Effectiveness considers the length of time needed to implement an alternative and the risk the alternative poses to workers, residents, and the environment during implementation.	Would not pose any risks to on-site workers or result in short-term adverse impact to the local community and the environment.	Regrading and handling of impacted ***soils*** would pose short-term risks because on-site activities would involve a greater opportunity for exposure of remediation workers to contaminated ***soils***. The use of personal protective equipment, monitoring equipment, and observance of Occupational Safety and Health Administration guidelines would address these concerns.	Regrading and handling of impacted ***soils*** would pose short-term risks because on-site activities would involve a greater opportunity for exposure of remediation workers to contaminated ***soils***. Groundwater treatment involves chemicals which also posed limited risk to workers handling the material. The use of personal protective equipment, monitoring equipment, and observance of Occupational Safety and Health Administration guidelines would address these concerns.
6. **Implementability** considers the technical and administrative feasibility of implementing the alternative, including factors such as the relative availability of goods and services.	Would be readily implemented because it would not involve remediation activities.	Would be implementable. Regrading and earthmoving equipment considered under this alternative are typical in the construction industry and readily available from several local sources. Off-site borrow locations for clean soil can be identified. Establishment of ***LUCs*** would require negotiation and agreement on the specifics of the procedures between the Navy and regulatory agencies.	Would be implementable. Regrading and earthmoving equipment considered under this alternative are typical in the construction industry and readily available from several local sources. Off-site borrow locations for clean soil can be identified. The proposed groundwater treatment methodology is readily available an easily implementable. Establishment of ***LUCs*** would require negotiation and agreement on the specifics of the procedures between the Navy and regulatory agencies.
7. **Cost** includes estimated capital and annual ***operation and maintenance (O&M)*** costs, as well as present worth cost.	$0	$1,812,000	$5,319,000
8. **State/Support Agency Acceptance** considers whether the state agrees with the Navy's analyses and recommendations, as detailed in the ***RI, FS***, and Proposed Plan.	MDEQ would not accept this remedy.	Based on ongoing discussions with MDEQ, State concurrence with this alternative is anticipated.	Not selected as the ***preferred alternative***.
9. Community Acceptance considers whether the local community agrees with the Navy's analyses and ***preferred alternative***. Comments received on the Proposed Plan are an important indicator of community acceptance.	Not selected as the ***preferred alternative***.	To be determined during the Public Comment Period.	Not selected as the ***preferred alternative***.

Contaminants of Concern at Site 2

COCs are substances detected at concentrations and/or in locations where they could have an adverse effect on human health and the environment. For Site 2, ***COCs*** include the following:

Polycyclic Aromatic Hydrocarbons (PAHs): ***PAHs*** are frequently released to the environment through emissions from the incineration of municipal and chemical wastes and in exhaust from internal combustible engines. The ***PAHs*** detected at Site 2 may be a by-product of wastes burned at Site 2. ***PAH*** compounds in soil generally do not migrate vertically to a great extent and are more likely to adhere to soil particles and be removed from the Site via surface runoff and erosional processes.

Arsenic: Arsenic concentrations in environmental ***media*** at Site 2 may be attributed more to naturally occurring conditions. Evaluations of arsenic concentrations in soil have been conducted in Mississippi and reported data with detections of arsenic from locations in the Coastal Flatwoods in Jackson County and Hancock County. The arsenic levels at Site 2 were in the lower range of background levels reported in the Coastal Flatwoods in Jackson County.

Iron: Iron occurs naturally as a mineral from ***sediment*** and rocks or from mining, industrial waste, and corroding metal. Metals released to the environment generally adsorb to the soil matrix (compared to being part of the soil structure) and bioaccumulate. Because metals are frequently incorporated into the soil matrix and remain bound to particulate matter, they migrate from source areas via bulk movement processes (erosion). Iron imparts a bitter astringent taste to water and a brownish color to laundered clothing and plumbing.

PREFERRED ALTERNATIVE

The ***preferred alternative*** for cleaning up Site 2 is Alternative 2: Cover and LUC/LTM, which includes 1) filling the golf course pond with clean fill material, 2) limited regrading of the existing surface soil to prevent ponding, ensure proper cover and promote drainage, and site reuse, 3) containment of the landfill using a minimum soil cover thickness of 2 feet, 4) establish and maintain a vegetative cover, 5) establish and maintain ***LUCs***; and 6) conducting ***LTM*** of ***groundwater***.

Since landfill trenches are located within or near a flood plain, a low permeable cover and gas venting system would not be necessary. A minimum 2-foot of soil with a vegetative cover would sufficiently prevent human exposure and would not result in landfill gas accumulation, thus negating the need for landfill gas monitoring.

Because waste will remain in place with contaminants in excess of levels that allow for unlimited exposure or unrestricted use, the Navy would review the remedial action every 5 years after initiation of the remedial action [per ***CERCLA*** Section 121(c) and the ***NCP*** at 40 Code of Federal Regulations 300.430(f)(4)(ii)]. If the results of any 5-year reviews show that remedy integrity is compromised and that protection of human health is insufficient, additional remedial actions would be evaluated and may be implemented by the Navy.

Based on the information currently available, the Navy believes that the ***preferred alternative*** meets the threshold criteria and complies with the modifying criteria (see "Nine Evaluation Criteria"). The Navy expects the ***preferred alternative*** to satisfy the following statutory requirements of ***CERCLA*** Section 121(b): 1) be protective of human health and the environment, 2) comply with ***ARARs***, 3) be cost-effective, and 4) utilize permanent solutions to the maximum extent practical, and satisfy the preference for treatment as a principal element of the remedy. The Navy, in conjunction with the MDEQ, will not select a final alternative until public comments have been considered.

COMMUNITY PARTICIPATION

The public is encouraged to participate in the decision-making process for the cleanup of Site 2 by reviewing and commenting on this Proposed Plan during the Public Comment Period.

Additional information on this site can be found in the ***RI*** and ***FS*** Reports and other Site 2 documents. These documents are maintained at the NCBC Gulfport ***Information Repository***, which is located at the Gulfport Public Library, 1708 25th Avenue, Gulfport, Mississippi, 39501.

A public meeting to present this Proposed Plan will be held on December 2, 2014. The date, location, and time of the public meeting, as well as the dates for the Public Comment Period and the location of the ***Information Repository***, are provided on Page 1.

Glossary

This glossary defines the bolded, italicized terms used in the Proposed Plan. The definitions in this glossary apply specifically to this Proposed Plan and may have other meanings when used in different circumstances.

Applicable or Relevant and Appropriate Requirements (ARARs): The federal, state, and local environmental rules, regulations, and criteria that must be met by the selected remedy under ***CERCLA***.

Contaminant of Concern (COC): A substance detected at a concentration and/or in a location where it could have an adverse effect on human health and the environment.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA): A federal law also known as "Superfund". This law was passed in 1980 and modified in 1986 by the Superfund Amendments and Reauthorization Act. The Department of Defense complies with ***CERCLA*** requirements via their ***Environmental Restoration Program***.

Dioxins: ***Dioxins*** are a class of chemical contaminants that are formed during combustion processes such as waste incineration, forest fires, and backyard trash burning, as well as during some industrial processes such as paper pulp bleaching and herbicide manufacturing. The most toxic chemical in the class is 2,3,7,8-tetrachlorodibenzo-para-dioxin (TCDD). The highest environmental concentrations of ***dioxin*** are usually found in soil and ***sediment***, with much lower levels found in air and water.

Ecological Risk Assessment: A study that evaluates the potential risk to ecological ***receptors*** (various types of plants and animals) from contaminants at a site.

Environmental Restoration Program: The Department of Defense Program established to comply with ***CERCLA*** regulations and the ***National Contingency Plan***.

Feasibility Study (FS): A report that presents the development, analysis, and comparison of cleanup alternatives for a site that has undergone an ***RI***.

Geophysical Survey: As a component of a Remedial Investigation field study, the ***geophysical survey*** uses electromagnetic and/or magnetic detectors to identify subsurface features at a site.

Groundwater: The supply of fresh water found beneath the Earth's surface that supply wells and springs.

Human Health Risk Assessment: A study that evaluates the potential risk to human ***receptors*** (such as site workers and residents) from contaminants at a site.

Information Repository: The public collection of documents related to the investigations and cleanup actions for the site.

Landfill Gas Survey: A survey to assess whether landfill gas (methane) is being generated and if it is accumulating under and within structures on the site.

Land Use Controls (LUCs): Engineered and non-engineered measures formulated and enforced to regulate current and future land use options. Engineered measures include fencing and posting. Non-engineered measures typically consist of administrative deed restrictions that prohibit residential development and/or ***groundwater*** use.

Long-term Monitoring (LTM): A program used to verify the site status, which typically involves ***groundwater*** sampling. The intent is to ensure that site conditions do not change in a way that might adversely affect the environment or public.

Media (environmental): All of the non-living components of the natural environment. In environmental studies ***media*** typically refers to soil, water, and air.

National Contingency Plan (NCP): Formally known as the National Oil and Hazardous Substances Pollution Contingency Plan, is the federal government's blueprint for responding to both oil spills and hazardous substance releases.

National Priorities List: USEPA's list of the most serious uncontrolled or abandoned hazardous waste sites identified for possible long-term remedial action under Superfund.

Net Present Worth (NPW): A costing technique that expresses the total of initial capital cost and long-term ***O&M*** costs in terms of present day dollars

Operation and Maintenance (O&M): Activities conducted after a site action is completed to ensure that the action is effective.

Polynuclear Aromatic Hydrocarbons (PAHs): A subgroup of semivolatile organic compounds that are lighter in molecular weight and are more water soluble or environmentally mobile. ***PAHs*** detected at Site 2 may be a by-product of wastes burned from the site.

Preferred Alternative: The remedy recommended by the Navy for cleaning up a site. The remedy may be modified or changed based on comments received during the Public Comment Period.

Presumptive Remedy: A standardized proven technology to cleanup a specific type of site such as a municipal landfill. ***Presumptive Remedies*** have been shown to ensure consistency in remedy selection and reduce the cost and time required for investigation and remediation of similar types of sites.

Receptor (Ecological Risk Assessment): Ecological ***receptors*** includes any living organisms other than humans, the habitat which supports such organisms, or natural resources which could be adversely affected by environmental contaminations resulting by a release at or migration from a site.

Receptor (Human Health Risk Assessment): Any human individual or population that are presently or will potentially be exposed to, and adversely affected by, the release or migration of contaminants.

Remedial Action Objective (RAO): A cleanup objective agreed on by the Navy, and MDEQ. One or more ***RAOs*** are typically formulated for each environmental site.

Remedial Investigation (RI): A report that describes the site, documents the type and distribution of environmental contaminants detected, and presents the results of the ***human health*** and ***ecological risk assessments***.

Sediment: Solid material deposited in ***surface water*** bodies such as ditches, streams, or lakes.

Soil Gas Survey: An investigative technique to measure air that is present in the void spaces of the soil above the ***groundwater*** table.

Soils: Soils include surface soil, which is **s**oil from 0 to 2 feet below land surface, and subsurface soil, which is soil 2 feet below land surface and deeper.

Surface Water: Water bodies that are on land surface such as lakes, river, streams, and ditches. The ***surface water*** bodies at Site 1 are the ditches to the east and west site boundaries, not within site boundaries.

Volatile Organic Compounds (VOCs): Organic compounds that can be isolated from the water phase of a sample by purging the water sample with inert gas. Many ***VOCs*** are human-made chemicals that are used and produced in the manufacture of paints, adhesives, petroleum products, pharmaceuticals, and refrigerants. They often are compounds of fuels, solvents, hydraulic fluids, paint thinners, and dry-cleaning agents commonly used in urban settings.

USE THIS SPACE TO WRITE YOUR COMMENTS

Your input on the Proposed Plan for Site 2 – World War II Landfill, is important to the Navy. Comments provided by the public are valuable in helping the Navy select a final cleanup remedy for the site.

You may use the space below to write your comments then fold and mail. Comments must be postmarked by January 5, 2015. If you have any questions about the comment period, please contact Gordon Crane, NCBC Gulfport, at (228) 229-0446. Those with electronic capabilities may submit their written comments to the Navy at the following e-mail address: gordon.crane@navy.mil.

Name: _____

Address: _____

City: _____

State: _____ **Zip:** _____

Fold, staple, stamp, and mail ----------

Place
Stamp
Here

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