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NCBC GULFPORT
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PUBLIC NOTICE REGARDING PERIOD TO COMMENT ON PROPOSED PLAN SITE 4 NCBC
GULFPORT MS
12/1/2009
NCBC GULFPORT

PROPOSED PLAN FOR SITE 4 - GOLF COURSE LANDFILL NAVAL CONSTRUCTION BATTALION CENTER GULFPORT GULFPORT, MISSISSIPPI

December 2009

NAVY ANNOUNCES PROPOSED PLAN

This Proposed Plan presents the Navy's recommendation to address contaminants detected in **surface water**, subsurface soil, **sediment**, and **groundwater** at Site 4 - Golf Course Landfill, at Naval Construction Battalion Center (NCBC) Gulfport, shown on Figure 1. This Proposed Plan was developed by the Navy, as the lead agency, following United States Environmental Protection Agency (USEPA) and Mississippi Department of Environmental Quality (MDEQ) policies and procedures.

This Proposed Plan provides environmental information about the site, summarizes the remedial alternatives that were evaluated, provides the rationale that supports the **Preferred Alternative** for cleaning up Site 4, and summarizes information found in greater detail in the **Remedial Investigation (RI)** and **Feasibility Study (FS)** Reports for the Site 4 - Golf Course Landfill at NCBC Gulfport.

The Navy is issuing this Proposed Plan as part of its public participation responsibilities under Section 117 (a) of the **Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)**, as amended, and Section 300.430(f)(2) of the **National Oil and Hazardous Substances Pollution Contingency Plan (NCP)** to assist and involve the community in the decision-making process.

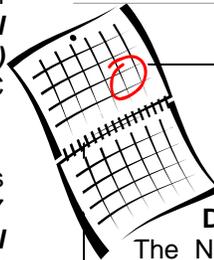
The public is invited to comment on this Proposed Plan during the Public Comment Period beginning on December 15, 2009 and ending on January 15, 2010. The Proposed Plan and other site documents are available for review at the NCBC Gulfport Information Repository, which is located in the Temporary Gulfport 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 4 Decision Document.

SITE BACKGROUND AND HISTORY

NCBC Gulfport is a Navy base located in the western part of Gulfport, Mississippi, in southeastern Harrison County, about 1.2 miles north of the Gulf of Mexico, as shown on Figure 2. The naval installation is approximately 1,100 acres and currently consists of military housing, training and support facilities.



Figure 1 - Site 4 is currently part of the Pine Bayou Golf Course



MARK YOUR CALENDAR

PUBLIC COMMENT PERIOD

December 15, 2009 to January 15, 2010

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

PUBLIC MEETING

December 15, 2009

The Navy will hold a public meeting to explain the Proposed Plan and the alternatives evaluated in the Feasibility Study. Written comments will also be accepted during the meeting, which will be held at the West Side Community Center (4020 8th Street) at the intersection of 8th Street and 41st Avenue in Gulfport, Mississippi starting at 4:30 pm.

INFORMATION REPOSITORY

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

Temporary Gulfport Library
47 Maples Drive #1
Gulfport, MS 39507
Tel. (228) 871-7171



For more information about this plan, please call Mr. Gordon Crane, NCBC Gulfport at (228) 871-3118.

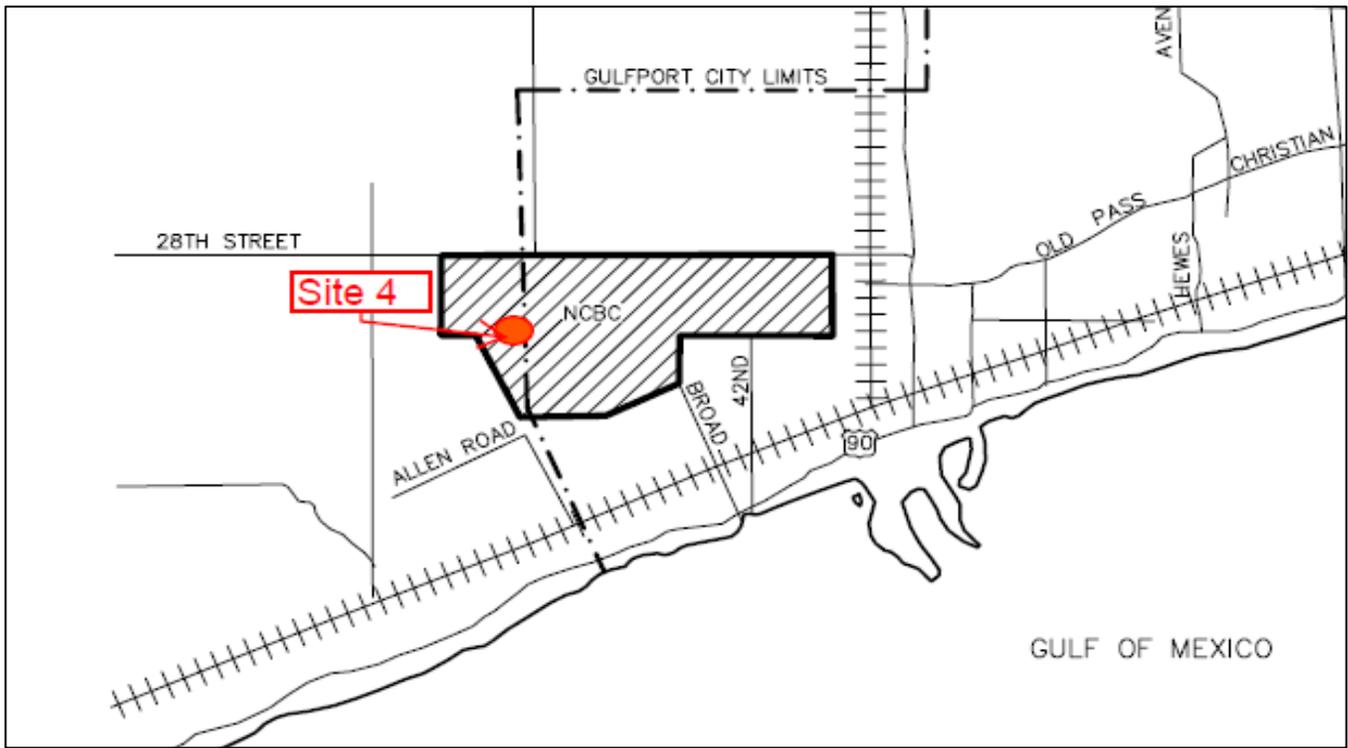


Figure 2 – Site 4 Location

SITE CHARACTERISTICS

Site 4 is a former landfill located in the western section of NCBC Gulfport, northeast of the intersection of 7th Street and Canal No. 1. The landfill is approximately 4 acres in size and is currently utilized as part of a golf course fairway. The northwestern boundary is defined by the drainage ditch known as Canal No. 1, which is the only **surface water** body within the site boundaries. Presently, the southern portion of the site is covered by the greens of the 9th and 18th holes of the Pine Bayou Golf Course.

The site is generally level, with the exception of the man-made golf course topographic relief designed to enhance the golfing experience. The site, which is covered with grass typical of golf courses, is mostly free of dense or high vegetation but is surrounded by trees and other various types of vegetation on the northeastern edge.

The Site 4 landfill operated from 1966 to 1972 and was the only operating landfill on the base during this time. Solid waste such as construction debris and general refuse made up the bulk of the materials disposed of at Site 4. According to previous investigations, nearly 16,000 tons of solid waste, including building and infrastructure debris from damage due to Hurricane Camille (1969), were disposed of at the landfill. Additionally, as much as 20,000 gallons of waste liquids were disposed of at the site, including fuels, oils, solvents, paints, paint

thinners. After waste disposal activities ceased, the site was covered with 4 to 6 feet of fine- to medium-grained sand. The area is currently part of the Pine Bayou Golf Course and has been in use as such since the early 1990s.

Low levels of contaminants in soil and **groundwater** were detected in 1987 as part of a base-wide Initial Assessment Study. Additional samples were collected in 1997 as part of a **surface water, groundwater, and sediment** investigation. During that investigation, **dioxins** and **chlorinated volatile organic compounds (CVOs)** were detected in samples of **groundwater** collected at the site.

To determine the nature and extent of contamination at the site, an **RI** was conducted in 2004 with a follow-up surface soil study in 2007. The **RI** consisted of a **geophysical survey** as well as surface soil, subsurface soil, **sediment, surface water, and groundwater** sampling. The **RI** Report (2007) concluded that conditions at Site 4 were similar to a typical military landfill with characteristics similar to a municipal landfill and that a **presumptive remedy** approach should be applied at the site to expedite cleanup. (See highlight box on page 3 for more information about **presumptive remedies**.)

The following constituents were detected during the **RI** and were retained as **chemicals of potential concern (COPCs)** for Site 4, because their maximum concentrations exceeded **MDEQ Tier 1 Target Remediation Goals (TRGs)** and require further study:

PRESUMPTIVE REMEDY FOR MILITARY LANDFILLS

In the early 1990s, 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.

USEPA has published guidance documents that specifically encourage source containment for military landfills with characteristics similar to municipal landfills. The application of 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 4 fits the criteria of a landfill mentioned in the USEPA guidance because of the following:

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

According to USEPA **Presumptive Remedy** guidance and based on the characteristics of the site, containment using a final cover that minimizes the passage of water, prevents direct contact with the waste disposed and management of landfill gas would be considered to be an adequate alternative for Site 4.

- **Soil**
 - **Polynuclear aromatic hydrocarbons (PAHs)** [Dibenzo (a,h)anthracene, benzo(a) anthracene]
- **Sediment**
 - **PAHs** [Dibenzo(a,h)anthracene and benzo(a)anthracene]
 - **Dioxins**
 - Insecticides (4,4'-DDT and 4-4'-DDD)
 - **Polychlorinated Biphenyl (PCB)** (Aroclor-1260)
 - Metal (Lead)
- **Groundwater**
 - Metals (iron and manganese)
 - **CVOC** [cis-1,2-dichloroethene (DCE), trans-1,2-DCE, trichloroethene (TCE) and vinyl chloride)
 - **Dioxins**
- **Surface Water**
 - Metal (lead)
 - **Dioxins**

Furthermore, in 2006, a **groundwater** bioremediation treatability study, which was done to verify what kind of treatment could remediate the **groundwater** contaminants, showed a significant reduction of the **CVOCs** concentration. More information regarding this study can be found in the **FS**.

SCOPE AND ROLE OF THE ACTION

As part of the Navy's Installation Restoration program, an Initial Assessment Study of the base was performed in the 1980s, and nine sites were identified for further investigation. Although the base has not been placed on the **CERCLA National Priorities List (NPL)**, investigations and cleanup activities are being performed following **CERCLA** regulations, where MDEQ is the lead regulatory agency. Decision Documents and cleanup has been completed for three sites (Sites 8, 5, and 10), four other sites are in the **RI/FS** stage, and one site in **groundwater** monitoring phase. The overall strategy for this environmental program at the base is to perform cleanup on a site-by-site basis to ensure protection of current and future site users to support the military base operation and mission.

Implementation of the **preferred alternative** will allow the current and reasonably anticipated future land use at Site 4, which is recreational. The remedy described in this Proposed Plan is intended to be the only remedial action at Site 4, and addresses the risks involved with exposure to **surface water**, soil, **groundwater**, and **sediment** in Site 4. The remedial

action proposed will address the source area and reduce risk to human health and the environment.

SUMMARY OF SITE RISKS

A summarized explanation of the evaluation and results of the **human health risk assessment** and a **screening level ecological risk assessment** is presented below. Detailed results and in depth information can be found in the **RI**. The **RI**, **FS**, and other documents pertaining to Site 4 are maintained at the **Information Repository**.

Human Health Risk Assessment

A **human health risk assessment** estimates the "baseline risks." This is an estimate of the likelihood of health problems occurring if no cleanup action were taken at the site. A 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 this data to risk based numbers to determine which contaminants are most likely to pose the greatest threat to human health.
- Identification of exposure pathways – In Step 2, consideration is given to the different ways that people might be exposed to the contaminants identified in the previous step, the concentrations that people might be exposed to, and the potential frequency and duration of exposure. Using this information, a "reasonable maximum exposure" scenario is calculated, which portrays the highest level of human exposure that could reasonably be expected to occur.
- 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 risk and non-cancer risk, 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 chance." In other words, for every 1,000,000 people that could be exposed, one extra cancer may occur as a result of exposure to site contaminants. An extra cancer case means that one more person could get cancer than would normally be expected to from all other causes. MDEQ considers any risk above one in a million (1×10^{-6}) unacceptable. For non-cancer health effects, a "hazard index (HI)" is calculated. The key concept here is that a "threshold

level" (measured usually as a HI of less than 1) exists below which non-cancer health effects are no longer predicted.

- 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.

The risk assessment for Site 4 is based on chemical data in soil, **groundwater**, **surface water**, and **sediments** collected during the **RI**. Although a site may have numerous receptors, the **human health risk assessment** for Site 4 evaluated the most sensitive hypothetical receptors, which were trespassers, site / occupational workers, construction / excavation workers, and residents.

Based on the findings of the assessment, unacceptable carcinogenic risk has been identified for the hypothetical future resident (2×10^{-4}) and occupational worker (2×10^{-6}) in soils, mainly because of the concentrations of **CVOCs** and **dioxins** at the site.

For non-cancer causing chemicals at Site 4, a total HI of the hypothetical future resident (HI = 7) is greater than 1.0, indicating unacceptable adverse health effects for **groundwater** exposure, mainly because of the concentrations of **CVOCs**.

Screening Level Ecological Risk Assessment

A **screening level ecological risk assessment** is conceptually similar to a **human health risk assessment** except that it evaluates the potential risks and impacts to ecological receptors (plants, animals, and habitats).

Based on the ecological receptors present in Site 4, which is part of a golf course, and lack of any current natural habitat in this area, there is little potential for significant exposure.

REMEDIAL ACTION OBJECTIVES

To prevent unacceptable human health risk, the following **Remedial Action Objectives** for Site 4 were identified:

Remedial Action Objective #1: Prevent direct contact with landfill contents; therefore, eliminating unacceptable human exposure scenarios for soils.

Remedial Action Objective #2: Minimize infiltration and resulting contaminant of **leaching PAHs** and **dioxins** to **groundwater**.

Remedial Action Objective #3: Prevent human exposure to contaminated **groundwater**, and monitor **groundwater** quality beyond the site boundary.

Remedial Action Objective #4: Prevent direct exposure routes for human and ecological receptors to the **COCs** in **surface water** and **sediments**.

Because a **presumptive remedy** is proposed for this site, the evaluation of alternatives was streamlined and only two remedial alternatives were analyzed.

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 disposed waste, contaminants, or hazardous substances from this site, which may present an imminent and substantial endangerment to public health or welfare.

SUMMARY OF REMEDIAL ALTERNATIVES

The following section summarizes the remedial alternatives developed for Site 4:



Figure 3
Alternative 1

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 as shown on Figure 3.

Alternative 2: Comprehensive Action

This alternative, as shown on Figure 4, consists of the following components: (1) waste containment, (2) **surface water** and **sediment** control, (3) **groundwater** monitoring, (4) landfill gas management and (5) **land use controls**. After implementation of the **presumptive remedy**, the covered site would be available for recreational uses.

Waste containment would be accomplished using a surface cover consistent with MDEQ solid waste regulations. Prior to installing the final cover, the site would be regraded to promote runoff from the site. This final cover would prevent direct contact with solid waste, minimize rainfall passage through soil that could carry contaminants to **groundwater**, and prevent transport of waste from the landfill site to the ditch due to erosion. The cover proposed involves various layers to prevent infiltration and to manage landfill gas and storm-water runoff. Among those

layers, the top layer of the final cover would be topsoil planted with grass.

Sediment would be excavated from the bottom of the ditch. The excavated **sediment** would be reused at Site 4 during initial regrading and prior to final cover installation. The side of the ditch on the landfill side would be covered by extending the landfill cap and placing riprap (large stone) over the cap to protect it from erosion. The extended cap will also reduce the flow of **groundwater** from the site into the **surface water** of the ditches.

Land use controls would be developed and implemented to prevent residential development, digging that may affect the disposed waste, and **groundwater** use at Site 4. Periodic inspections would be conducted to ensure that the cover has not been damaged and to determine whether maintenance of the **surface water** protection, such as the riprap lining, is required.

Periodic **groundwater** monitoring would consist of collecting **groundwater** samples from selected existing and new wells and analyzing these samples for **COCs**. Additionally, a landfill gas management layer and vents will be installed to control and monitor landfill gas.

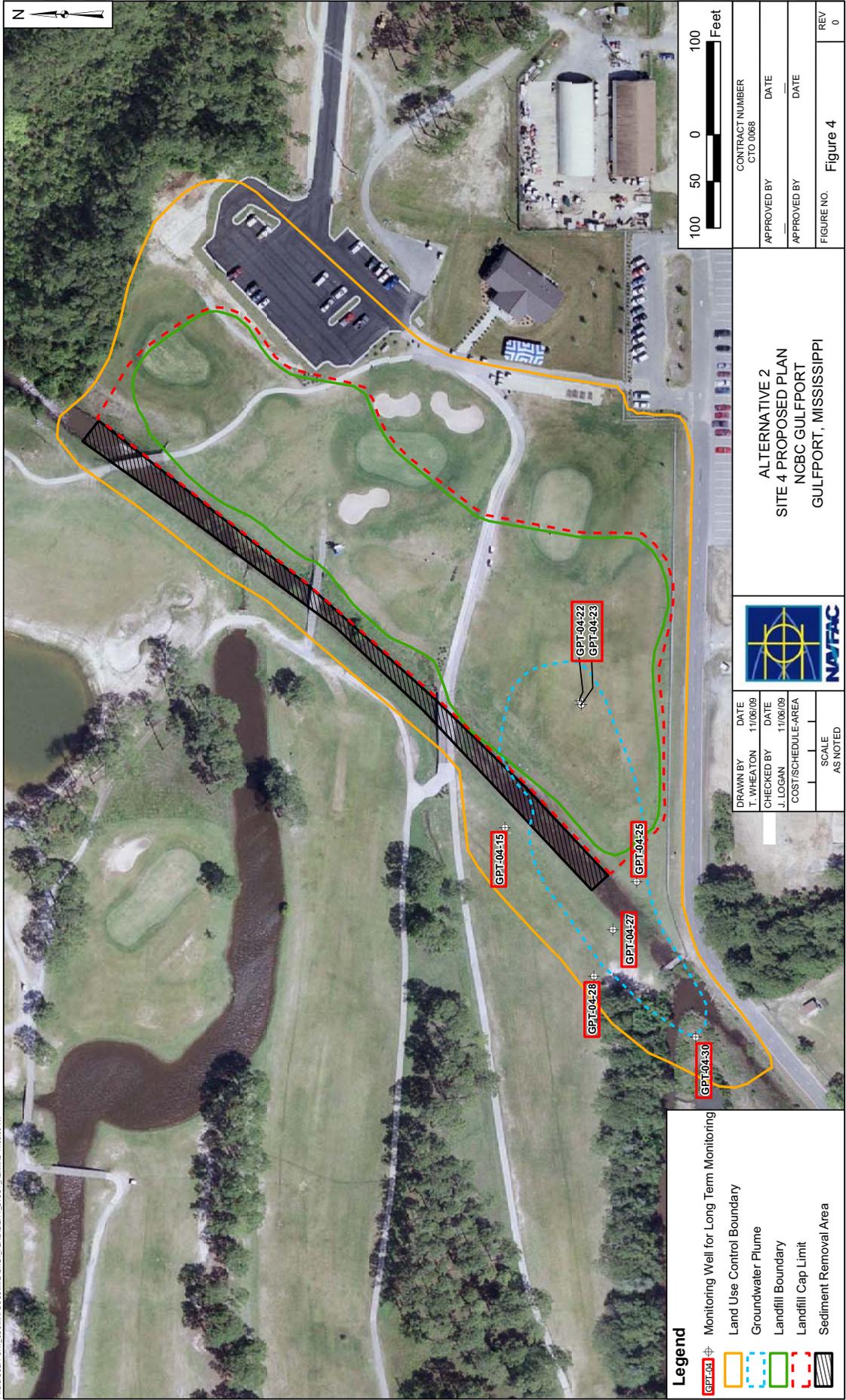
EVALUATION OF ALTERNATIVES

The remedial alternatives were compared to each other using the nine criteria established by the **NCP** (see highlight box on page 7). Please consult the Site 4 **FS** Report for more detailed information. The following is a summary of these comparisons.

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 soil and **groundwater**. Also, the waste disposed in the landfill could be exposed and transported to **surface water** and **sediment** through erosion. Alternative 1 would not meet the **Remedial Action Objectives**

Alternative 2 would be protective of human health and the environment as a final cover would be installed over the area of contamination to ensure that recreational site users would be protected from exposure to unacceptable levels of contaminants. The use of **land use controls** would restrict residential uses of the site and prevent potential exposure to unacceptable levels of contaminants in the **sediment** and **groundwater** that would remain under the capped area. All of the **Remedial Action Objectives** would be met under this alternative.



CONTRACT NUMBER	CTO 0068
APPROVED BY	DATE
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FIGURE NO.	Figure 4
REV	0

ALTERNATIVE 2
 SITE 4 PROPOSED PLAN
 NCBC GULFPORT
 GULFPORT, MISSISSIPPI



DRAWN BY	DATE	DRAWN BY	DATE
T. WHEATON	11/06/09	T. WHEATON	11/06/09
CHECKED BY	DATE	CHECKED BY	DATE
J. LOGAN	11/06/09	J. LOGAN	11/06/09
COST/SCHEDULE-AREA		COST/SCHEDULE-AREA	
SCALE	AS NOTED	SCALE	AS NOTED

Legend

	Monitoring Well for Long Term Monitoring
	Land Use Control Boundary
	Groundwater Plume
	Landfill Boundary
	Landfill Cap Limit
	Sediment Removal Area

NINE EVALUATION CRITERIA

Threshold Criteria

The selected remedy must satisfy these criteria:

Overall Protectiveness of Human Health and the Environment determines whether an alternative eliminates, reduces, or controls threats to public health and the environment through **land use controls** or treatment.

Compliance with ARARs evaluates whether the alternative meets federal and state environmental statutes, regulations, and other requirements that pertain to the site, or whether a waiver is justified.

Balancing Criteria

These criteria are used to weigh the relative merits of the alternatives:

Long-Term Effectiveness and Permanence considers the ability of an alternative to maintain protection of human health and the environment over time.

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.

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.

Implementability considers the technical and administrative feasibility of implementing the alternative, including factors such as the relative availability of goods and services.

Cost includes estimated capital and annual **operation and maintenance** costs, as well as present worth cost. Present worth cost is the total cost of an alternative over time in terms of today's dollar value. Cost estimates are expected to be accurate within a range of +50 to -30 percent.

Modifying Criteria

These criteria are also considered during remedy selection:

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.

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.

Compliance with ARARs and To Be Considered Guidelines

Applicable or Relevant and Appropriate Requirements (ARARs) establish the regulatory constraints of the cleanup. See the "What are ARARs?" highlight box below for more information about ARARs.

Alternative 1 would not comply with chemical-specific 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 chemical-specific and action-specific requirement ARARs, because exposure to soil with contaminant concentrations greater than the regulatory criteria would be prevented.

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

ARAR stands for "**Applicable or Relevant and Appropriate Requirement**." Three types of legal requirements are addressed in a cleanup action:

Chemical-specific ARARs address concentrations of contaminants that cleanup must meet. The MDEQ Target Remediation Goals are chemical-specific ARARs for Site 4.

Action-specific ARARs regulate how a cleanup remedy is implemented and define how contaminants are managed.

Location-specific ARARs address legal issues for special locations such as wetlands and tribal lands. There are no location-specific ARARs for Site 4.

Long-Term Effectiveness and Permanence

Alternative 1 would not have long-term effectiveness or permanence. Alternative 2 would be effective long-term and permanent. Under Alternative 2, contaminated soil would be capped, **groundwater** would be monitored and **land use controls** will assist in the long-term effectiveness of the proposed alternative.

Reduction of Toxicity, Mobility, or Volume through Treatment

Alternative 1 would not achieve any reduction of toxicity, mobility, or volume of contaminated media through treatment.

Short-Term Effectiveness

Implementation of Alternative 1 would not result in risks to site workers or adversely impact the surrounding community or environment, because no remedial activities would be performed.

Implementation of Alternative 2 would result in the possibility of exposing construction workers to contamination during remedial activities. However, the risk of exposure would be effectively controlled by the implementation of engineering controls (e.g., dust suppression) and compliance with applicable regulations and proper site-specific health and safety procedures.

Alternative 2 would be expected to achieve **Remedial Action Objectives** immediately upon completion of all remedial actions.

Implementability

Alternative 1 would be extremely simple to implement because no action would occur.

Alternative 2 would be somewhat harder to implement, although resources, equipment, and materials are readily available to perform the excavation, covering, **groundwater** monitoring, landfill gas management, and transportation activities. **Land use controls** would be developed by the Navy with concurrence by MDEQ and USEPA.

Cost

The capital and **operation and maintenance** costs and **net present worth** of the remedial alternatives were estimated as shown on the table below. The costs have been rounded to the nearest \$1,000 to reflect the preliminary nature of these estimates.

Alternative	Capital Cost	Net Present Worth with Long-Term Monitoring
1	\$0	\$0
2	\$1,938,000	\$2,405,000

PREFERRED ALTERNATIVE

The **Preferred Alternative** for cleaning up Site 4 is Alternative 2: Comprehensive Action, which includes (1) waste containment, (2) **surface water** and **sediment** control, (3) **groundwater** monitoring, (4) landfill gas management and (5) **land use controls**. This alternative follows USEPA guidance for **presumptive remedy** for a landfill.

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 five 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 five-year reviews show that the remedy integrity is compromised and the 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 the "Nine Evaluation Criteria" highlight box on page 6). 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. However, because waste would be left in place and covered under the **presumptive remedy**, the preference for treatment as a principal element would not be satisfied.

The Navy, in conjunction with USEPA and 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 4 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 4 documents. These documents are maintained at the NCBC Gulfport **Information Repository**, which is located at the Temporary Gulfport Library, 47 Maples Drive #1, Gulfport, MS 39507.

A public meeting to present this Proposed Plan will be held on December 15, 2009. The date, location, and time of the public meeting, as well as the dates for the Public Comment Period and the location of the Administrative Record files, are provided on the first page of this Proposed Plan.

CHEMICALS OF POTENTIAL CONCERN AT SITE 4

COPCs are the contaminants at a site that are present in concentrations determined by the human health and/or **screening-level ecological risk assessment** to require further study and/or cleanup. For Site 4, **COPCs** include:

Chlorinated Volatile Organic Compounds

CVOCs are widely used in industry and in common household products. These chemicals are or have been used as degreasing fluids for many different purposes such as dry cleaning clothes, decaffeinating coffee, cleaning metal machinery, and dissolving grease buildup in septic tanks. Some chlorinated solvents are found in household products such as spot removers, typing correction fluids, adhesives, automotive cleaners, inks, and wood furniture cleaners, which could be associated with the household waste disposal that occurred in this landfill. The **CVOCs** found in this site are vinyl chloride and TCE among others as a result of landfill activity that included the disposal of solvents and typical daily waste from a military base.

Dioxins

"**Dioxins**" is a term used to describe a single chemical or group of chemicals known as polychlorinated dibenzodioxins. One of these compounds, 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD), is the **dioxin** found in **herbicide orange (HO)**. Known to be a human carcinogen, **dioxins** are formed as an unintentional by-product of many industrial processes involving chlorine, such as waste incineration, chemical and pesticide manufacturing, and pulp and paper bleaching. The **dioxin** compounds detected in Site 4 [**octachlorodibenzo-p-dioxin (OCDD)** and **heptachlorodibenzo-p-dioxin (HpCDD)**] are not associated with **HO**.

Insecticides

Insecticides were a widely used chemical to control insects on agricultural crops and insects that carry diseases like malaria and typhus. Most of these chemicals are white, crystalline, tasteless, and almost odorless solids. DDD [1,1-dichloro-2,2-bis(p-chlorophenyl)ethane] and DDT [1,1-trichloro-2,2-bis(p-chlorophenyl)ethane] were detected at Site 4 exceeding regulatory standards.

Metals

Metallic elements with high atomic weights can damage living things at low concentrations and tend to accumulate in the food chain. Iron, lead, and manganese, which were found at the site in excess of regulatory standards, are consistent with the use of Site 4 as a landfill.

Polynuclear Aromatic Hydrocarbons

PAHs are a group of chemicals that are formed during the incomplete burning of coal, oil, gas, wood, garbage, or other organic substances, such as tobacco and charbroiled meat. **PAHs** usually occur naturally, but they can be manufactured as individual compounds for research purposes. However, they cannot be manufactured as the mixtures found in combustion products. The **PAHs** found at this site include benzo(a)anthracene and dibenzo(a)anthracene, among others, which are consistent with use of landfill through trench burning at the site.

Polychlorinated Biphenyls

PCBs are a group of synthetic organic chemicals that can cause a number of different harmful effects. There are no known natural sources of **PCBs** in the environment. Before 1977, **PCBs** entered the air, water, and soil during their manufacture and use in the United States. Wastes that contained **PCBs** were generated at that time, and these wastes were often placed in landfills. Aroclor 1260 was detected in sediment exceeding regulatory standards.

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.

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

Chlorinated Volatile Organic Compound (CVOC): Please see “COCs at Site 4” on page 9. Organic compounds that evaporate readily at normal ambient temperatures. Typical CVOCs include light-fraction components of gasoline, such as benzene, toluene, ethylbenzene, and xylenes, and low molecular weight chlorinated solvents such as dichloroethane (DCA), dichloroethene (DCE), and trichloroethene (TCE).

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. This law created a special tax that goes into a trust fund to investigate and cleanup abandoned or uncontrolled hazardous waste sites.

Dioxins: A class of organic compounds composed of two benzene rings connected by two oxygen atoms, typically with one or more chlorine atoms attached to each benzene ring.

Feasibility Study (FS): A report that presents the development, analysis, and comparison of cleanup alternatives.

Geophysical Survey: refers to the collection of information associated with subsurface features. For Site 4, the geophysical survey was used to gather information regarding disturbances that may indicate landfill activities.

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

Herbicide Orange (HO): An herbicide blend of 2,4-dichlorophenoxyacetic acid (2,4-D) and 2,4,5-trichlorophenoxyacetic acid (2,4,5-T) used by the U.S. military in Vietnam.

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.

Land Use Controls: 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.

Leaching: The process by which soluble constituents are dissolved and filtered through soil by a percolating fluid.

MDEQ Tier 1 Target Remediation Goals (TRGs): Mississippi Department of Environmental Quality regulatory standards that were developed to be protective of human health.

National Oil and Hazardous Substances Pollution Contingency Plan (NCP): More commonly called the National Contingency Plan, is the federal government's blueprint for responding to both oil spills and hazardous substance releases. The NCP is the result of our country's efforts to develop a national response capability and promote overall coordination among hierarchy of responders and contingency plans.

National Priority List (NPL): 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: A costing technique that expresses the total of initial capital cost and long-term **operation and maintenance** costs in terms of present day dollars

Operation and Maintenance: Activities conducted after a site action is completed to ensure that the action is effective.

Polychlorinated Biphenyls (PCBs) are a group of synthetic organic chemicals that can cause a number of different harmful effects.

Polynuclear Aromatic Hydrocarbons (PAHs): High molecular weight, relatively immobile, and moderately toxic solid organic chemicals that feature multiple benzenic (aromatic) rings. See the box titled “Chemicals of Concern at Site 4” on page 9.

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.

Glossary

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.

Remedial Action Objectives: A cleanup objective agreed on by the Navy, USEPA, and MDEQ. One or more **Remedial Action Objectives** 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.

Screening Level Ecological Risk Assessment: Evaluates the likelihood that adverse ecological effects may occur or are occurring as a result of exposure to one or more chemicals. The process is simplified and involves comparison of sample results from the **RI** with conservative ecological screening values.

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

Surface Water: Water bodies that are on land surface such as lakes, river, streams, and ditches. The **surface water** body at Site 4 is Canal No. 1.

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