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NCBC GULFPORT
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FACT SHEET "INVITATION TO COMMENT ON THE PROPOSED CLEANUP AT THE
FORMER HERBICIDE ORANGE (AGENT ORANGE) STORAGE AREAS AND DRAINAGE
DITCHES AT THE NCBC BASE" NCBC GULFPORT MS

4/1/2002

NCBC GULFPORT



NAVAL CONSTRUCTION BATTALION CENTER

Gulfport, Mississippi
Installation Restoration Program

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This fact sheet is meant to inform interested citizens of the environmental investigations and remedial actions at the Naval Construction Battalion Center (NCBC) Gulfport. Fact sheets will be produced at program milestones and in response to other items of public interest. Distribution is coordinated through the Public Affairs Office at NCBC Gulfport, (228) 871-2393.

Invitation to Comment on the Proposed Cleanup at the Former Herbicide Orange (Agent Orange) Storage Areas and Drainage Ditches at the NCBC Base

The Navy and Air Force want to hear your views about the plans to remediate areas contaminated with dioxins from Herbicide Orange stored at the NCBC between 1968 to 1977. A Proposed Plan to conduct environmental cleanup at the former Herbicide Orange Storage Areas and associated drainage ditches at the NCBC is now available to the public. In cooperation with the Mississippi Department of Environmental Quality (MDEQ) and the United States Environmental Protection Agency (EPA), we have carefully studied the contaminated areas and now believe that the remedial actions presented in the Proposed Plan are the best way to protect your health and the environment. More details including information on the other cleanup methods that were considered for the dioxin cleanup can also be found in the Proposed Plan document. A public meeting will be held on April 4, 2002 at the Isiah Fredericks Community Center to answer any questions or concerns that the public may have regarding the proposed environmental cleanup. Details of the public meeting and public commenting period were mailed to the Gulfport residents. For further information, please call Jean Remley at (228) 871-2393 or (228) 871-2699.

This fact sheet summarizes information that can be found in greater detail in the Proposed Plan and other documents contained in the Administrative Record file for the former Herbicide Orange Storage Areas and associated drainage ditches at the NCBC. We encourage the public to review these documents to gain a more comprehensive understanding of the environmental condition and remedial activities that have been conducted at the former Herbicide Orange Storage Areas.

SITE HISTORY

From 1968 through 1977, the Air Force used an area located at the central portion of NCBC for storage and handling of approximately 850,000 gallons of Herbicide Orange in 55-gallon drums. Interviews with workers at NCBC indicated that spills and leaks were commonplace from drum ruptures and re-drumming efforts within the storage area. Investigations in the mid-1980s were focused on the 12-acre site (currently designated as Area A) which was the main area where HO drums were stored. However, two additional areas, currently designated as the 17-acre Area B and a 1-acre Area C, were identified as overflow sites for additional drum storage. Collectively, Areas A, B, C, and the drainage ditches associated with them, including portions of the swampland located north of Outfall 3, are referred to as the Installation Restoration Site 8. These areas are the subject of the environmental cleanup presented in the Proposed Plan. Locations of Areas A, B, C, and the drainage ditches are shown on the next page (Figure 1).

Since 1970, various Air Force contractors and contract laboratories have been conducting environmental surveys and analyses of the soils, plants, and the aquatic system in and around the Herbicide Orange storage areas. Tests have shown that surface soil at the former Herbicide Orange storage areas was contaminated with components of Herbicide Orange called "dioxins." In 1977, with a permit from the EPA, the Air Force completed the removal and destruction at-sea of all the drums of Herbicide Orange stored at NCBC. The Air Force also initiated the investigation on the magnitude of spills at the known storage areas. Results of the initial monitoring program conducted in 1984 confirmed that the surface soil at the former storage areas was contaminated with herbicide components of Herbicide Orange and dioxins. There are different forms of dioxins known. The dioxin form that is identified to be directly associated with Herbicide Orange is **2,3,7,8-tetrachlorodibenzo-p-dioxin**.

What is Herbicide Orange?

Herbicide Orange or HO is a herbicide formulation used during the Vietnam War to defoliate trees and shrubbery. It is an equal mix of two agricultural herbicides in diesel fuel or jet fuel. HO is also known as "**Agent Orange**," a code name for the orange band that was used to mark the drums used to store the herbicide mix.

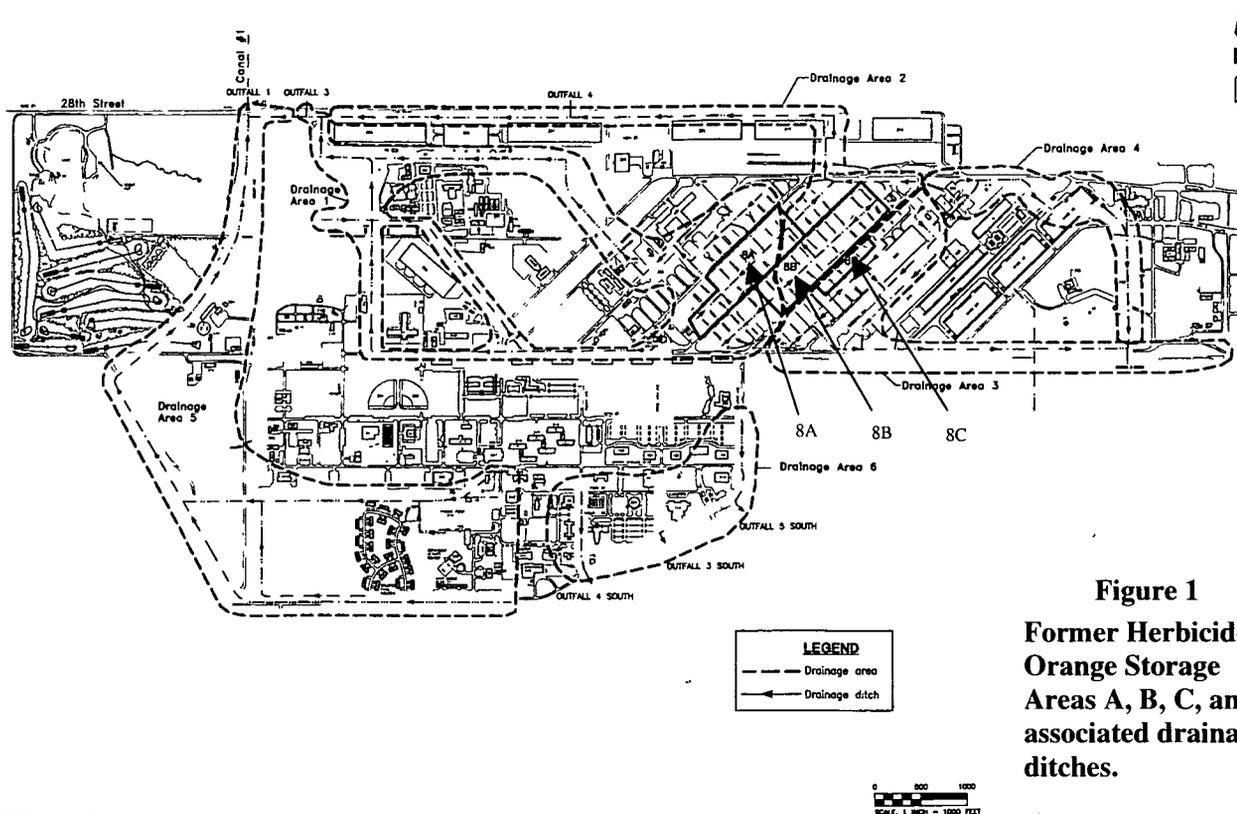


Figure 1
Former Herbicide Orange Storage Areas A, B, C, and associated drainage ditches.

Between 1987 and 1988, the Air Force excavated an estimated 27,000 cubic yards of soil containing more than 1 part per billion dioxin and incinerated it on-site at NCBC. The resulting ashes were stored at Area 8A. Investigations conducted in areas receiving drainage from Areas A, B, and C since 1995 have confirmed the presence of dioxin but not the agricultural herbicides. This confirmed that dioxins are resistant to degradation but herbicides have broken down to non-detectable levels. Other tests were conducted to determine if other chemical compounds have contaminated the soil, sediments, groundwater, and surface water at the site. Results of these analyses have consistently confirmed that dioxins are the only contaminants of concern present at Site 8 and the associated drainage ditches.

REGULATORY BACKGROUND

In 1990, the MDEQ publicized new rules that included stricter requirements lower than 1 part per billion for dioxins. Under this new rule, the amount of dioxin that would trigger cleanup action was established at 4.3 parts per trillion in soil and 30 parts per quadrillion in groundwater.

In November 1997, a joint Agreed Order Number was signed between the Navy, Air Force, and the State of Mississippi that required further delineation, and if warranted, remediation of dioxin that may be present in surface soils, sediment, and/or groundwater at the Installation Restoration Site 8.

In February 2000, the Air Force and the Navy proposed to cleanup the areas outside the NCBC that were contaminated with dioxin from the former Herbicide Orange storage areas under the Mississippi Brownfields Program. Under this program, the contaminated properties located north of Outfall 3 will be remediated at standards higher than 4.3 parts per trillion in soil and 30 parts per quadrillion in groundwater but still protective of human health and the environment. This will allow these properties to be developed expediently as a light industrial complex and put to productive use. The Brownfields program also provides owners of the contaminated properties protection from future state litigation.

Units of Concentrations:

ppb or part per billion: One microgram of dioxin per kilogram of soil or per liter of water. One ppb can also be interpreted as one minute in 2,000 years, or a single penny in \$10,000,000.

ppt or part per trillion: One nanogram of dioxin per kilogram of soil or per liter of water. One ppt can also be interpreted as one minute in 2,000,000 years, or a single penny in \$10,000,000,000.

ppq or part per quadrillion: One picogram of dioxin per kilogram soil or per liter of water. One ppq can also be interpreted as one minute in 2,000,000,000 years, or a single penny in \$10,000,000,000,000.

In December 2001, the Air Force and the Navy submitted a Focused Feasibility Study report to the MDEQ and EPA. This report discussed the different methods that were considered to cleanup Site 8 and associated areas.

SITE CHARACTERISTICS

Site 8. This site is a 30-acre open storage area located in the central area inside the NCBC base. During construction in 1942, the surface soil at Site 8 was treated with cement and compacted to form a 6 to 12-inch layer of hardened surface soil ideal for open storage. The first monitoring program conducted by the Air Force in 1977 identified Site 8 as the primary source of dioxin pollution at NCBC. Past investigations defined locations within and the immediate surroundings of the former Herbicide Orange storage areas containing 1 part per billion of dioxins. This is the same level permitted by the EPA during on-site burning of soil containing dioxins in 1988. Presently, Areas A, B, and C are covered with native plants.

Drainage Ditches. Surface water runoff at the NCBC is conveyed outside the base by a system of drainage ditches and storm sewers. The majority of the NCBC drains into Canal Number 1, which is the major drainage channel at the base. Since the on-site burning of soil containing dioxins in 1988, the most significant source of dioxins remains the sediment in the ditch systems that convey drainage water from the Areas 8A, 8B, and 8C. Contaminated sediments are migrating off base through Outfall 1, Outfall 3, and Outfall 4.

SITE RISKS

The dioxins found in the soils at Site 8 and ditch sediments at the Outfall 3 were at concentrations that could pose a significant human health risk. The excess carcinogenic risks to the on-base resident, occupational worker and site worker is upwards of six in one hundred thousand (6×10^{-5}). This means that, if the contaminated soil and sediments are not remediated, as many as six out of 100,000 individuals exposed to the soil and sediments could develop cancer as a result of that exposure.

As part of the remedial investigation and as required by the Agreed Order, a multi-phase Human Health and Ecological Risk Assessment was conducted at NCBC Gulfport from 1997 to 1999. The risk assessment included the following:

- Community Survey and Exposure Assessment to gather site-specific data on potential exposure routes or pathways through which humans could be exposed to the dioxins in the ditch systems.
- Surface Water and Sediment Delineation of on base and off base dioxin contamination. This delineation (defining and mapping) was conducted in two phases prior to developing the remediation plans. This delineation provided the majority of the analytical data used to support the Human Health and Ecological Risk Assessment.

Data from the risk assessment studies were used to determine the probability or likelihood that public health and the environment may be affected by exposures to dioxins that are present in soil, sediments and surface waters migrating from Site 8. According to the NCBC Gulfport long range planners, the current and future land use for Site 8 and associated base drainage ditches is for industrial-type activities supporting the base mission. Hence, the risk assessment focused on health effects to on-base residents and occupational and excavation workers in an industrial setting that could result from current and future direct contact with contaminated soil and sediment through ingestion and dermal contact. It is the Air Force's and the Navy's current judgement that the cleanup method identified in the Proposed Plan is necessary to protect public health or the environment from actual or threatened releases of dioxins.

What is dioxin?

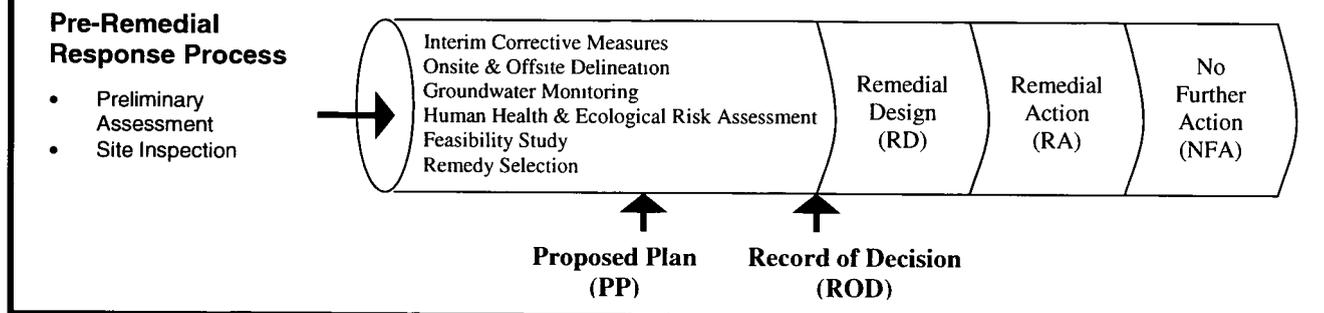
Dioxin is a term used to refer to a group of chemicals known as polychlorinated dibenzodioxins and furans. There are 17 forms or "congeners" of dioxins and furans of varying toxicities that were considered during Site 8 investigations. The most toxic congener is **2,3,7,8-tetrachlorodibenzo-p-dioxin or TCDD**, a known impurity by-product during manufacture of **2,4,5-T**, an agricultural herbicide banned for use in the United States since 1989.

According to EPA Fact Sheets, TCDD do not occur naturally nor are they intentionally manufactured. Dioxins occur as contaminants in the manufacturing process of certain commercial products including pentachlorophenol (a wood preservative), hexachlorophene (a bactericide), and the herbicide 2,4,5-T. Dioxins have been released to the environment during the manufacturing, use, and disposal of these chemicals. Dioxins are also formed during the chlorine bleaching process used by pulp and paper mills and enter the environment in wastewater effluent from these plants. Currently, the major environmental source of dioxins is emissions from the incineration of municipal refuse and certain chemical wastes. Other known sources include burning of leaded gasoline in the past, wood burning in the presence of chlorine, accidental fires involving electrical transformers containing PCBs and chlorinated benzenes, and improper disposal of certain chlorinated chemical wastes.

According to information provided by the Agency for Toxic Substances and Disease Registry, studies in animals demonstrated a wider range of effects associated with dioxin exposure including death, cancer, and wasting, as well as unhealthy effects to the liver, immune system, nervous system, reproductive system (producing offspring), and developmental effects (changes while in the womb). In contrast to laboratory results, direct exposure information is not available in human studies.

Dioxins including TCDD degrades very little in the environment, do not dissolve easily in water, and attach strongly to soil and sediment particles.

Site 8 Remedial Response Process



You have the chance to comment on the Proposed Plan to conduct environmental cleanup at the former Herbicide Orange Storage Areas (Site 8) and associated drainage ditches at the NCBC at a public meeting on April 4, 2002. The Navy and Air Force want to hear your views about the plans to remediate areas contaminated with dioxins from Herbicide Orange stored at the NCBC between 1968 to 1977. In cooperation with the Mississippi Department of Environmental Quality and the United States Environmental Protection Agency, we have carefully studied the contaminated areas and now believe that the following actions are the best way to protect your health and the environment.

- Excavate and remove approximately 58,000 cubic yards of incinerated soil ash, construction debris and dioxin-contaminated sediments from on-base drainage ditches and off-base swampland. Control surface water flow and sediment migration at the ditch areas while doing the excavations.
- Haul the excavated sediments to Area 8A within the former HO storage area inside NCBC. Remove the water (dewater) from the excavated sediments and, if necessary, treat the drained water prior to discharging.
- Blend the dewatered sediments with soil, soil ash and construction debris and lay down approximately 10-inch thickness of the pre-mixed materials over Area 8A. Spread cement over the laid-down materials and mix the cement into the material blend.
- Compact the mixed materials to achieve a standard density and load bearing capacity. Cap the stabilized material blend with a multi-layer cover system designed in accordance with the American Association of State Highway Transportation Officials Highway 20 specifications.
- Restrict access and future land use of the capped areas. Conduct periodic inspection of the cap to maintain its integrity. Continue monitoring groundwater and sediments in the area to determine if any dioxins are leaching.

The cleanup action could cost an estimated \$8.735 million and construction may be completed within two years. Follow-up monitoring could last up to 30 years subject to 5-year periodic reviews.

Public Comment Period:

April 4-May 5, 2002

The Navy and the Air Force will accept written comments on the Proposed Plan during the public meeting period. You may submit your comments to:

Jean Remley, PAO
CO Code 15
Naval Construction Battalion Center
4902 Marvin Shields Blvd.
Gulfport, MS 39501
or
e-mail to: jaremley@cbcgulfport.navy.mil

Locations of the Administrative Record File:

1. **Public Affairs Office**
NCBC
4902 Marvin Shields Blvd.
Gulfport, MS 39501
(228) 871-2393 or 2699
7:00 AM - 3:30 PM (M-F)
2. **Gulfport Public Library**
1300 21st Avenue
Gulfport, MS 39501-2081
(228) 863-6411
9:00 AM to 9:00 PM (M-Th)
9:00 AM to 5:00 PM (F-Sat)