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NCBC GULFPORT
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PRESENTATION SLIDES REGARDING PROPOSED PLAN FOR SITE 8 4 APRIL 2000 NCBC
GULFPORT MS
4/4/2002
NCBC GULFPORT


Mississippi Department
of Environmental Quality




Proposed Plan for IRP Site 8, the Former Herbicide Orange Storage Site and Associated Areas at NCBC Gulfport

April 4, 2002

Public Meeting Objectives

- Present information about IRP Site 8 and associated drainage ditches
- Discuss the *Proposed Plan* and other alternatives evaluated
- Provide a public forum to answer questions and initiate gathering of comments
- Identify sources of information on the *Proposed Plan*
 - Administrative Record file
 - Federal/State agencies (i. e., EPA, MDEQ, ATSDR)
 - Internet (with caution)

Session Outline

- Why are we doing the cleanup?
 - protection of human health and the environment
 - compliance with State and Federal laws
- History of Site 8 and related areas
 - storage of herbicide orange (agent orange)
 - previous studies and cleanup actions
 - chronology of regulatory requirements
- Chemical of concern and current site status
 - health and ecological risks
- The Preferred Alternative or cleanup method
 - the Proposed Plan
- Open forum

Why Are We Doing the Cleanup?

- To protect human health and the environment from unacceptable risks posed by exposure to a chemical pollutant called "dioxins"
 - from surface soil at the former Herbicide Orange storage areas within NCBC
 - from ditch sediments located on-base and certain sections of off-base swamp areas
- To comply with State and Federal laws
 - Agreed Order with the State of Mississippi dated November 6, 1997
 - Department of Defense's Installation Restoration Program based on the CERCLA (Comprehensive Environmental Response, Compensation, and Liability Act)

Herbicide Orange?

- Herbicide Orange - a 50:50 mixture of two common farm herbicides in kerosene or diesel fuel
 - used during the Vietnam War to destroy (defoliate) vegetation that provides cover to the enemy




*Also known as Agent Orange-a code name for the orange band that was used to mark the drums it was stored in.

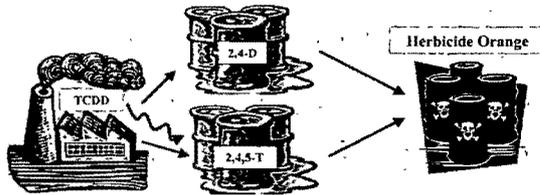
Dioxins In the Environment

- Dioxins - refer to a group of chemicals known as polychlorinated dibenzodioxins and furans.
 - dioxins have different levels of toxicity measured relative to the most toxic type: 2,3,7,8-tetrachlorodibenzo-p-dioxin or TCDD
- There are 17 types (congeners) of dioxins studied in Site 8
 - TCDD is the dioxin type associated with the Herbicide Orange
- Sources of dioxins
 - manufacturing impurities of various commercial products including wood preservatives, bactericide, and herbicide 2,4,5-T
 - chlorine bleaching process in pulp and paper mills
 - emissions from incineration of municipal refuse (major source)

Dioxins are very stable in the environment, not soluble in water and bind strongly to soil and sediments (organic matter)

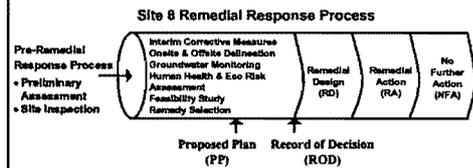
Dioxins In Herbicide Orange?

- TCDD - a manufacturing impurity of various commercial products including wood preservatives, bactericide, and herbicide 2,4,5-T
 - the chemical of concern for Site 8 and associated ditches
 - component herbicides of HO have degraded over time
 - negligible detections of volatile and semivolatile compounds, pesticides, polychlorinated biphenyls, and other petroleum hydrocarbons



To Comply With State and Federal Law

CERCLA - the program that carries out solid waste emergency and long-term removal and remedial activities. At NCBC, the Navy and Air Force in consultation with the support agencies (MDEQ & EPA), conduct and/or supervise the cleanup and other remedial actions through the Installation Restoration Program.

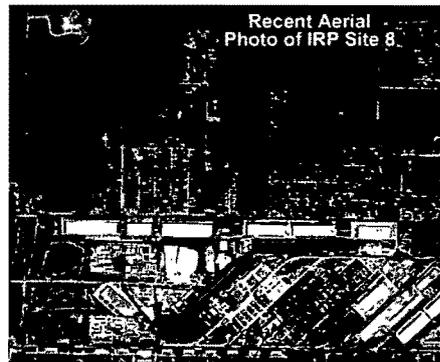


History of Site 8 and Related Areas

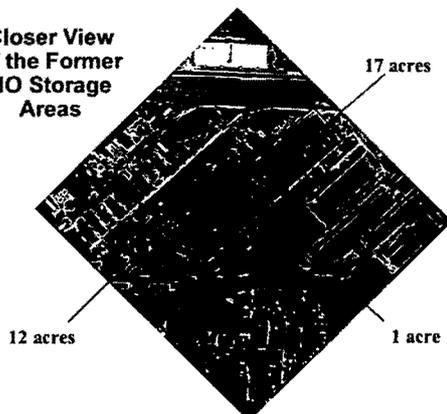
- Site 8 and associated drainage ditches
 - 30 acre former storage area at the central NCBC
 - approximately 8200 linear feet of drainage ditches located on base and off base with varying depth and width up to 10 feet
- Storage, Disposal, and Studies of Herbicide Orange (HO)
 - Storage activities (1968-1977)
 - Incineration of the HO inventory (1977)
 - AF and Navy investigations (1977-2000)



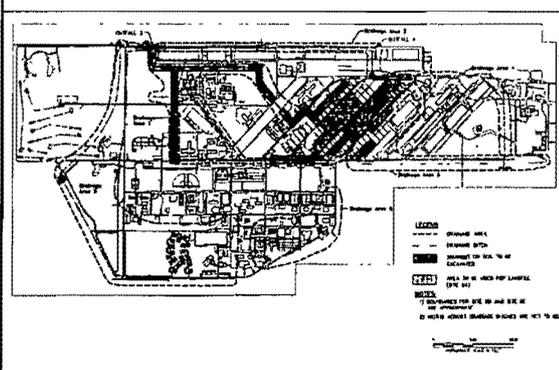
Recent Aerial Photo of IRP Site 8

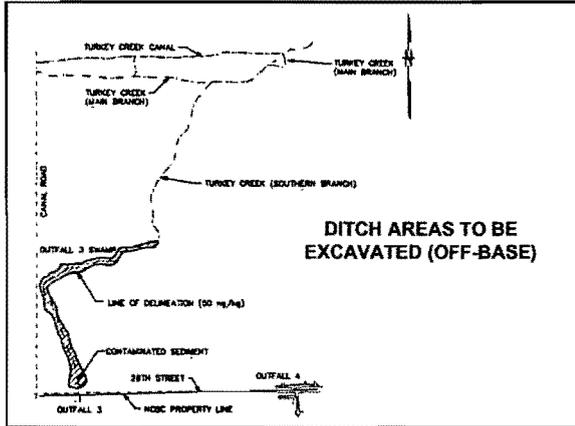


Closer View of the Former HO Storage Areas



DITCH AREAS TO BE EXCAVATED (ON-BASE)





How Are Dioxins Measured?

- **Toxic Equivalent**
 - TCDD is the most toxic type of dioxins
 - measured in terms of TEQ or Toxic Equivalent to express each dioxin type relative to the toxicity of TCDD
- **Units of Measurement or Concentration**
 - part per billion (ppb) – one part per billion corresponds to one minute in 2,000 years, or a single penny in \$10,000,000
 - part per trillion (ppt) – one part per trillion corresponds to one minute in 2,000,000 years, or a single penny in \$10,000,000,000 (ten billion).
 - part per quadrillion (ppq) – one part per quadrillion corresponds to one minute in 2,000,000,000 years or one penny in \$10,000,000,000,000 (ten trillion).

Past Investigations & Regulatory Actions

- **1977-1984: Initial Monitoring Programs**
 - Incinerated HO at sea
 - Studied environmental fate of dioxins (air, soil, water)
- **1984-1988: Comprehensive Soil Characterization and Confirmation Studies**
 - Collected 2,500 samples to establish the extent of dioxin contamination
 - Incinerated contaminated soil
- **1995-2000: Dioxin Delineation Studies**
 - Assessed residual dioxin in soil and sediment
 - Evaluated impact to groundwater
 - Conducted risk assessment
- **1986: EPA issued permit for research & demonstration**
 - incinerated all soil containing more than 1 ppb dioxins
 - kept incineration ash as non-hazardous waste
- **1990: MDEQ issued more stringent cleanup levels**
- **1996: MDEQ issued Adm. Orders 3193-96 & 3194-96**
 - the AF and Navy shall investigate and determine extent of dioxin contamination
- **1997: Agreed Order No. 3466-97 between the AF, Navy, and MDEQ**
 - dioxin remediation
 - baseline risk assessment

What Concentrations Are Considered Safe?

- **Established MDEQ Protective Limits**
 - 4.3 ppt in soil for residential use
 - 30 ppq for drinking water
- **Risk-Based Concentrations - expressed in cancer risk of one in a million**
 - who are likely to be exposed? (potential receptors)
 - ✓ human and ecological (toads, critters, fish, etc.)
 - how are receptors going to be exposed? (exposure pathways)
 - ✓ ingestion, dermal, and inhalation
 - frequency of exposure? (residents, workers, trespassers)

Off-base properties will be remediated under the Mississippi Brownfields Program to conduct cleanup under less stringent criteria (but still protective of human health and the environment) and allows affected properties to be developed for productive use.

Human Health & Ecological Risk Assessment

- **Human Health Risk**
 - reasonable maximum exposure from surface soil and sediments
 - on-base: 100 ppt soil; 365 ppt sediment
 - off-base: 79 ppt soil; 30 ppt sediment
 - receptors: residents and workers
 - exposure routes: ingestion, dermal contact and dust inhalation
- **Ecological Risk**
 - TCDD was not detected above regulatory protective levels in biological samples including edible species of fish
 - ecological impacts of TCDD was eliminated

CLEANUP GOALS

| Area/Media | PRG |
|---|--------|
| On-base Site 8 Surface Soil, Ash, and Sediments | 38 ppt |
| On-base Non-Site 8 Surface Soil and Sediments | 38 ppt |
| Off-base Soil | 15 ppt |
| Off-base Sediment, Shallow Water | 38 ppt |

What is a Proposed Plan?

A public document that summarizes the alternatives studied and identifies NCBC's Preferred Alternative or cleanup method.

- The Preferred Alternative combines various technologies to best protect human health and the environment
- The Preferred Alternative is subject to acceptance, modification, or rejection by the MDEQ and the community
- Public comment period can be extended upon proper request
- All comments, criticisms, and new relevant information submitted during the public comment period and NCBC's response to each issue are documented in the Responsiveness Summary.

Proposed Plan and Next Steps

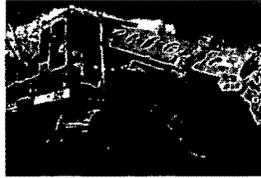
- **Identification of Preferred Alternative** - based upon preliminary balancing of tradeoffs among alternatives using the nine CERCLA evaluation criteria.
- **Proposed Plan and Public Comment** - presents the Preferred Alternative to the public followed by a minimum 30-day public comment period.
- **Remedy Selection** - NCBC determines the final remedy based on MDEQ and community feedback.
- **Record of Decision (ROD)** - documents the remedy selected and the rationale for selection. Requires authorized signature from the MDEQ, AF, and the Navy.
- **Remedy Implementation** - conduct the cleanup, and if necessary long-term remedy maintenance.

The Preferred Alternative

- **Excavate and remove dioxin-contaminated media by mechanical excavator or mechanical dredging**
 - samples will be collected to determine removal efficiency



Front-end loader for removal of soil, soil ash, and debris at Site 8



Gradall-type excavator for drainage ditch and swampland sediment.

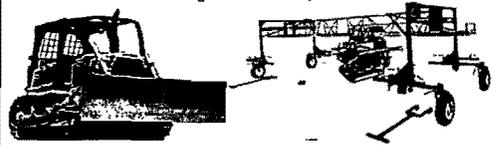
The Preferred Alternative (cont.)

- **Control surface water flow to minimize migration of contaminated sediments**
 - vertical barriers
 - site grading
 - storm water diversion
- **Haul the excavated sediments to Area 8A**
 - lined dump trucks
 - lined roll-off box
- **Dewater the sediments by stockpiling on lined pads**
 - collect water and analyze for residual dioxin
 - collected water may be used during material stabilization with cement



The Preferred Alternative (cont.)

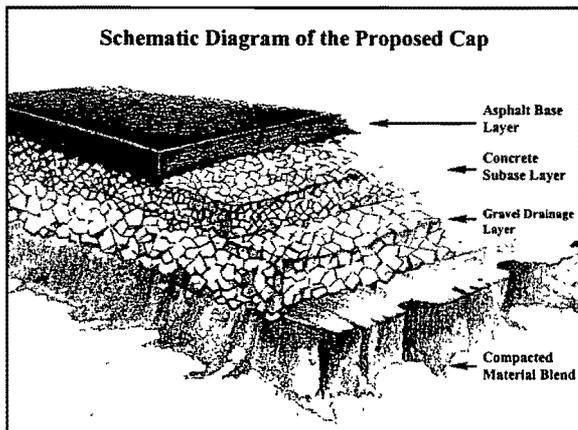
- **Blend the contaminated media using a volume ratio determined during the pilot scale study**
 - bulldozer will be used to mix the contaminated media into a "Material Blend"
 - lay down approximately 10-inch thickness of the Material Blend over Area 8A (this is called a "lift")
 - Spread cement over the lift and mix the cement into the material blend using a mechanical spreader



The Preferred Alternative (cont.)

- **Compact the mixed materials to achieve a standard density and load bearing capacity.**
 - use sheepfoot rollers for compaction
 - pilot scale study confirmed the strength characteristics of the compacted material blend
 - test confirmed that dioxin from the material blend did not leach
- **Cap the stabilized material blend with a multi-layer cover system**
 - Highway 20 specs
 - not water permeable
 - concrete subbase layer
 - asphalt base layer





The Preferred Alternative (cont.)

- Restrict access and future land use of the capped areas
- Conduct periodic inspections of the cap to maintain its integrity.
- If necessary, collect groundwater and sediments in and around the area to ensure that dioxins are not 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.

Summary of Other Alternatives Evaluated

Alternative 1: No Action - Federal regulation requirement that establishes a baseline for comparison.

Alternative 2: Institutional Controls and Monitoring

- All contaminated soils and sediments would be left in-place.
- Implement Institutional Controls to restrict access to contaminated areas.
- Land use controls would be prepared and implemented to prevent residential development at the contaminated areas.
- Long-term monitoring. This includes periodic sampling of soil, sediments, groundwater, and surface water. Monitoring will be evaluated periodically to determine the continued effectiveness of this alternative.

Summary of Other Alternatives Evaluated

Alternative 4: Excavation, Surface Water Controls, Dewatering, and Off-base Incineration

- Dioxin-contaminated media in Alternative 3 and the excavated media from Area 8A would be transported to a permitted incinerator facility
- Burn all contaminated media through high- temperature incineration and dispose of the resulting ashes.

Comparative Analysis of Alternatives

| CRITERIA | Alternative 1 No Action | Alternative 2 IC ¹ & Monitoring | Alternative 3 7-F/Element A F/ESC | Alternative 4 Excavation and Off-Site Incineration |
|--|----------------------------|---|---|---|
| 1. Overall protection of human health and the environment | ○ | ◐ | ● | ● |
| 2. Compliance with ARARs and TBCs | ○ | ◐ | ◐ | ● |
| 3. Long-term effectiveness and permanence | ○ | ◐ | ● | ● |
| 4. Reduction of toxicity, mobility, and volume through treatment | ○ | ○ | ◐ ¹ | ● |
| 5. Short term effectiveness | ◐ | ◐ | ◐ | ◐ |
| 6. Implementability | ● | ● | ◐ | ◐ |
| 7. Cost ² | \$ 0 | \$ 0.309 M | \$ 8.735 M | \$ 61.516 M |
| 8. State/Support agency acceptance | No | No | Concur | No |
| 9. Community Acceptance | TBD | TBD | TBD | TBD |

○ - The alternative does not meet the criteria.
 ◐ - The alternative somewhat meets the criteria (partial compliance or compliance only after a long period of time).
 ● - The alternative meets the criteria.

¹ Reduced toxicity and volume were based on elimination of known exposure areas/points and pathways. Based on 30-year Net Present Worth.

Opportunities for Public Participation

Public comment period starts tonight. NCBC through its Public Affairs Office will accept written, verbal, and emailed comments on the Proposed Plan until 5:00 PM on May 5, 2002. For more information please contact Ms Jean A. Remy at:

(228) 871-2393, or

email your comments to jaremy@cbgulfport.navy.mil

Additional information can be found in the Administrative File records located at the NCBC Public Affairs Office and the Gulfport Harrison County Public Library.