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NAS CECIL FIELD, FL  
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FINAL PROPOSED PLAN FOR REMEDIAL ACTION AT OPERABLE UNIT 8 (OU 8) SITE 3  
NAS CECIL FIELD FL  
1/1/1998  
BROWN AND ROOT



## Installation Restoration Program

January 1998

# Proposed Plan

Operable Unit 8, Site 3  
Naval Air Station Cecil Field  
Jacksonville, Florida

### *The Cleanup Proposal...*

*After careful study of the Operable Unit 8 Site 3, the NAS Cecil Field Partnering Team proposes the following plan to reduce risk from site contamination:*

- In-situ air stripping of groundwater contaminants in the source area by air sparging. Contaminant levels will be reduced to remove the source of future groundwater contamination and to establish contaminant concentrations suitable for natural attenuation.
- Natural attenuation of the remaining source area and downgradient groundwater contaminants to levels that do not pose an unacceptable risk to the public.
- Institutional controls including land use restrictions to prevent future ingestion of contaminated groundwater.
- Long-term monitoring of contaminated groundwater/surface water and five-year site reviews to confirm the restoration of groundwater and ensure the protection of human health and the environment.

More on page 2

### Why is Cleanup Needed?

The Navy's studies of Operable Unit 8, Site 3 concluded that there are elevated levels of contaminants present in site groundwater which could be potentially harmful to human health if ingested in the future. A human health risk assessment showed that the contaminants of most concern are VOCs (volatile organic compounds). While semi-VOCs and metal contaminants are also present, their levels are such that their contribution to human health risk is relatively minor compared to those of VOCs.

- Groundwater at the site is migrating towards Rowell Creek. Low levels of site-related contaminants have been found in the sediments of Rowell Creek. However, the concentrations of the contaminants detected do not pose an unacceptable risk to human health or to fish and wildlife
- A potable water supply exists at the base and this service will be continued for any future residents in this area. The partnering team recommends that measures be taken to protect potential future users of the site from exposure to site groundwater. The site is currently within the flight path of landing aircraft. In the future, it will be within the boundaries of a civilian airport, as depicted in the Base Reuse Plan. No existing residential water supplies have been impacted by site

contamination because of their distance from the site and/or their upgradient location from the groundwater contamination.

- Several contaminants have been found in the soil at this site during the remedial investigation. However, the concentrations of these contaminants do not pose an unacceptable risk to human health or to wildlife.

### What do you think?

The Navy and EPA are accepting formal public comments on this proposal from January 26 through February 25, 1998. You don't have to be a technical expert to comment. If you have a concern or preference, the partnering team wants to hear it before making a final decision on how to protect your community. To comment formally:

**Offer oral comments** during the comment portion of the public hearing, if requested (see page 12 for details).

**Send written comments** postmarked no later than February 25, 1998 to:

Mr. Charles Underwood  
Public Affairs Officer  
NAS, Cecil Field  
P.O. Box 111  
Jacksonville, Florida 32215-0111

**E-mail comments** by February 25, 1998 to:

pao@cecilfield.com

*In accordance with the Comprehensive Environmental Response, Compensation and Liability Act, (Section 117) the law that established the Installation Restoration program, this document summarizes the Partnering Team's cleanup proposal. For detailed information on the options evaluated for use at the site, see the Operable Unit 8 Feasibility Study available for review at the information repository located at the Charles D. Webb Wesconnett Public Library, 6887, 103<sup>rd</sup> Street, Jacksonville, FL 32210, Tel: (904) 778-7305.*

### ***Site Description and History***

Operable Unit 8, Site 3 is located immediately northeast of the intersection of Perimeter road and the Lake Fretwell access road leading west from the southern end of Lake Fretwell (see Figure 1). This access road diagonally divides OUS, with one-third lying north and two-thirds lying south of the road (see Figure 2). The site is currently not being used and is covered with dense vegetation. The following is a summary of the history of the site.

**1950-1975:** Liquid wastes and sludge generated by the facility were disposed of in the Oil and Sludge Disposal Pit at Site 3. Estimated quantities of wastes disposed of in the pit are as follows: waste paint: 4,200 gallons; spent solvent: 10,000 gallons; paint thinner: 20,000 gallons; petroleum/oil/lubricant wastes: 440,000 gallons; and waste fuel/oil/sludge contaminated water: 210,000 to 310,000 gallons.

Disposal activities were discontinued in early 1970. Following closure of the site in 1975, the pit was filled and covered with soil.

**1983-1985:** First environmental study of waste handling and disposal sites at NAS Cecil Field was conducted. Site 3 was included in the study.

**1988:** A Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) was conducted at NAS Cecil Field. Site 3 was included in this investigation.

**1992:** Navy helicopter crashed into a wooded area at the site. Approximately 1,800 to 2,000 gallons of fuel ignited on impact.

**1993:** The USEPA, FDEP and Navy officially identified Site 3 as an Operable Unit.

**1994:** The Navy completed field investigations for the Remedial Investigation/Feasibility Study (RI/FS).

**1996:** The RI Report was completed by the Navy and submitted to EPA.

**1997:** The FS Report was completed by the Navy and submitted to EPA.

## **A Closer Look at the Partnering Team's Proposal...**

### **1. In-situ Air Stripping of Source Area Groundwater by Air Sparging.**

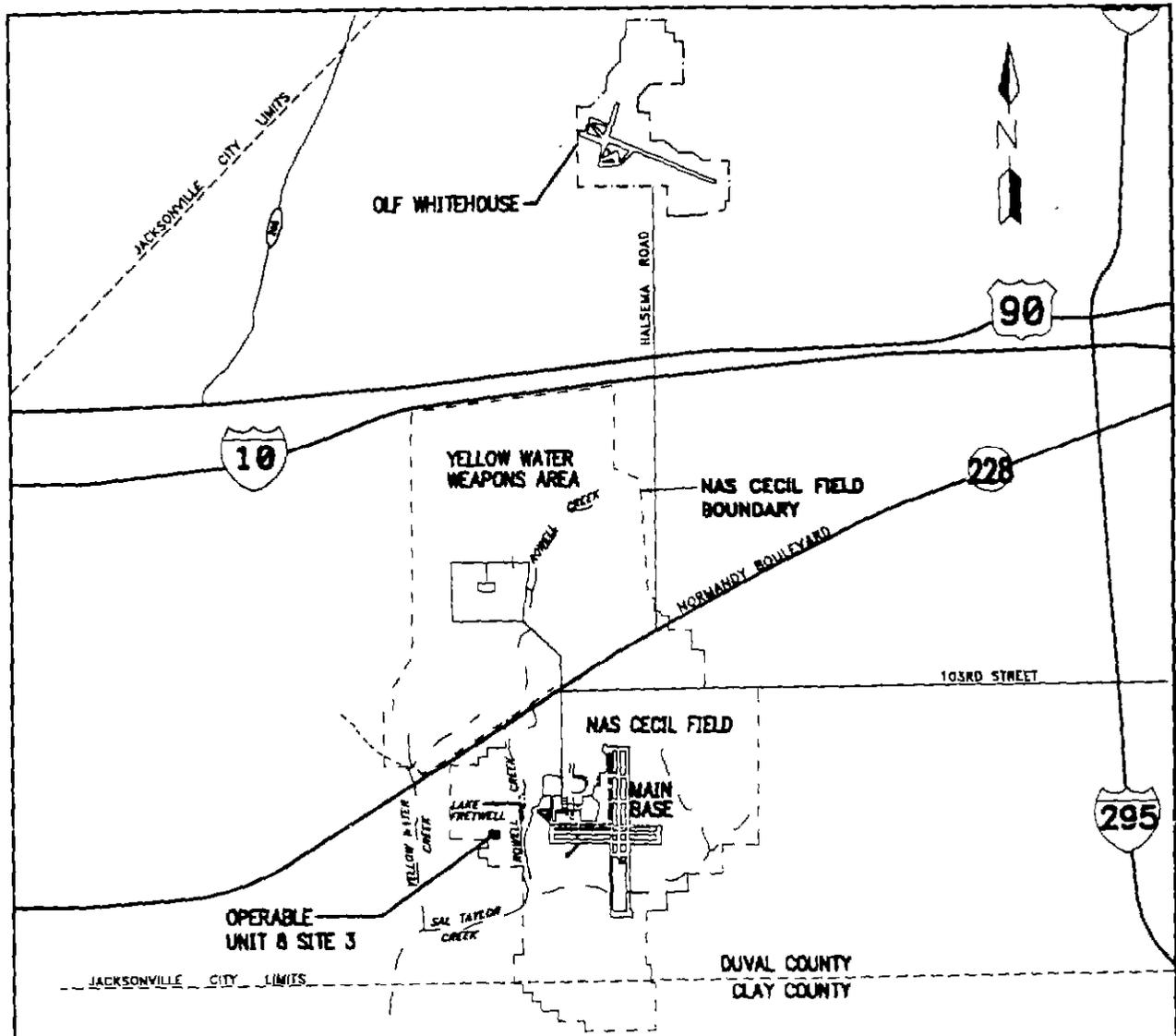
The volatile organic contaminants that are present at high levels exceeding cleanup goal concentrations will be reduced to the extent necessary for natural attenuation to effectively occur. These contaminants will be removed by a process of in-situ, subsurface volatilization, called air sparging, which uses clean air under pressure. During pilot studies, prior to final design and implementation of the system, these contaminants will be captured in the gas phase and tested to ensure that levels comply with Florida and EPA standards. Requirements for vapor and off-gas treatment will be determined at that time. A monitoring plan will be implemented to monitor and evaluate the effectiveness of air sparging and to determine the appropriate time to transition to site-wide natural attenuation.

### **2. Natural Attenuation of Downgradient Groundwater.**

Concentrations of organic contaminants exceeding groundwater cleanup goals in the treated source area and downgradient plume would be reduced through natural attenuation processes, including biodegradation, dilution and dispersion, known to be occurring at the site. Natural attenuation studies have previously been performed at the site and have shown natural attenuation to be effective in reducing contaminant levels. Additional groundwater modeling will be performed during the remedial design, and a long-term monitoring plan will be implemented to further evaluate and monitor the effectiveness of natural attenuation.

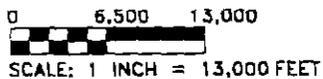
### **3. Implementation of Institutional Controls.**

State of Florida (State) environmental land use restrictions, including deed restrictions, would be implemented to limit the use of impacted groundwater for drinking until cleanup goals are achieved.

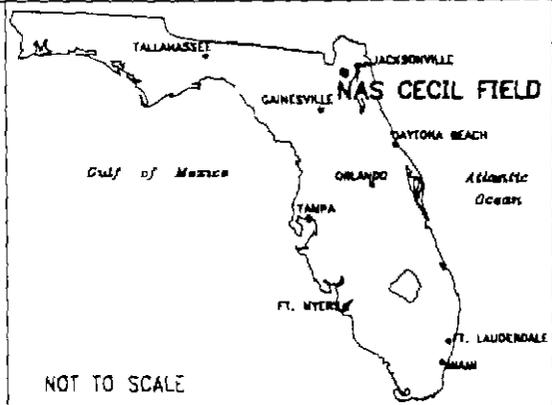


**NOTES:**

NAS = Naval Air Station  
 OLF = Outlying Landing Field



Source: Southern Division, Naval Facilities Engineering Command, 1986



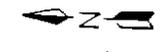
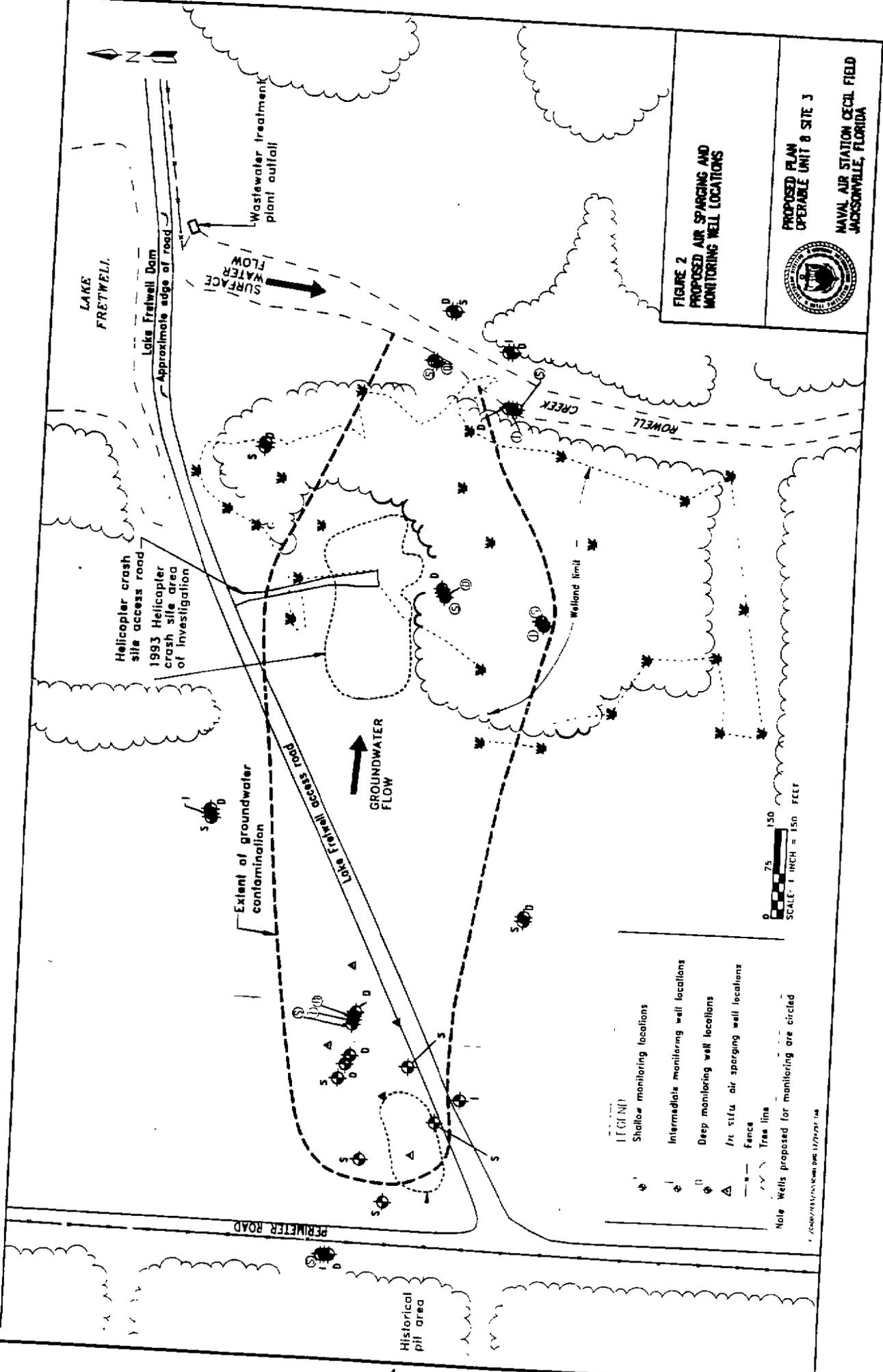
**FIGURE 1  
 GENERAL LOCATION MAP**



**PROPOSED PLAN  
 OPERABLE UNIT 8 SITE 3**

**NAVAL AIR STATION CECIL FIELD  
 JACKSONVILLE, FLORIDA**

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LAKE  
FRETWELL

Lake Fretwell Dam  
Approximate edge of road

SURFACE  
WATER  
FLOW

Wastewater treatment  
plant outfall

Helicopter crash  
site access road  
1993 Helicopter  
crash site area  
of investigation

Extent of groundwater  
contamination

Perimeter Road

GROUNDWATER  
FLOW

Wetland limit

ROWELL  
CREEK

Historical  
pilot area

12/27/91

**4. Long-term Sampling and Analysis of Groundwater and Surface Water.**

To confirm the effectiveness of the air sparging and natural attenuation remedy, sampling and analysis would be performed on groundwater collected from new and existing monitoring wells and on surface water from Rowell Creek. Groundwater monitoring would confirm that levels of contaminants are continuing to decline and would be performed until cleanup goals are achieved. Surface water monitoring would be performed annually until the data confirms that the remedy has eliminated the potential for future contamination of surface water.

**5. Five-year Reviews to Inspect Site Conditions.**

Site conditions would be evaluated every five years until cleanup goals have been achieved to ensure that the cleanup is working and remains effective over time, and that human health and the environment are being protected by the implemented remedy.

**Figure 3 on Page 6 Conceptually Depicts the Proposed Alternative.**

**What are the Cleanup Objectives and Levels?**

Using the information gathered during the site investigation and the results of the Baseline Risk Assessment, the partnering team identified the objective for cleanup of Operable Unit 8, Site 3 that is listed below

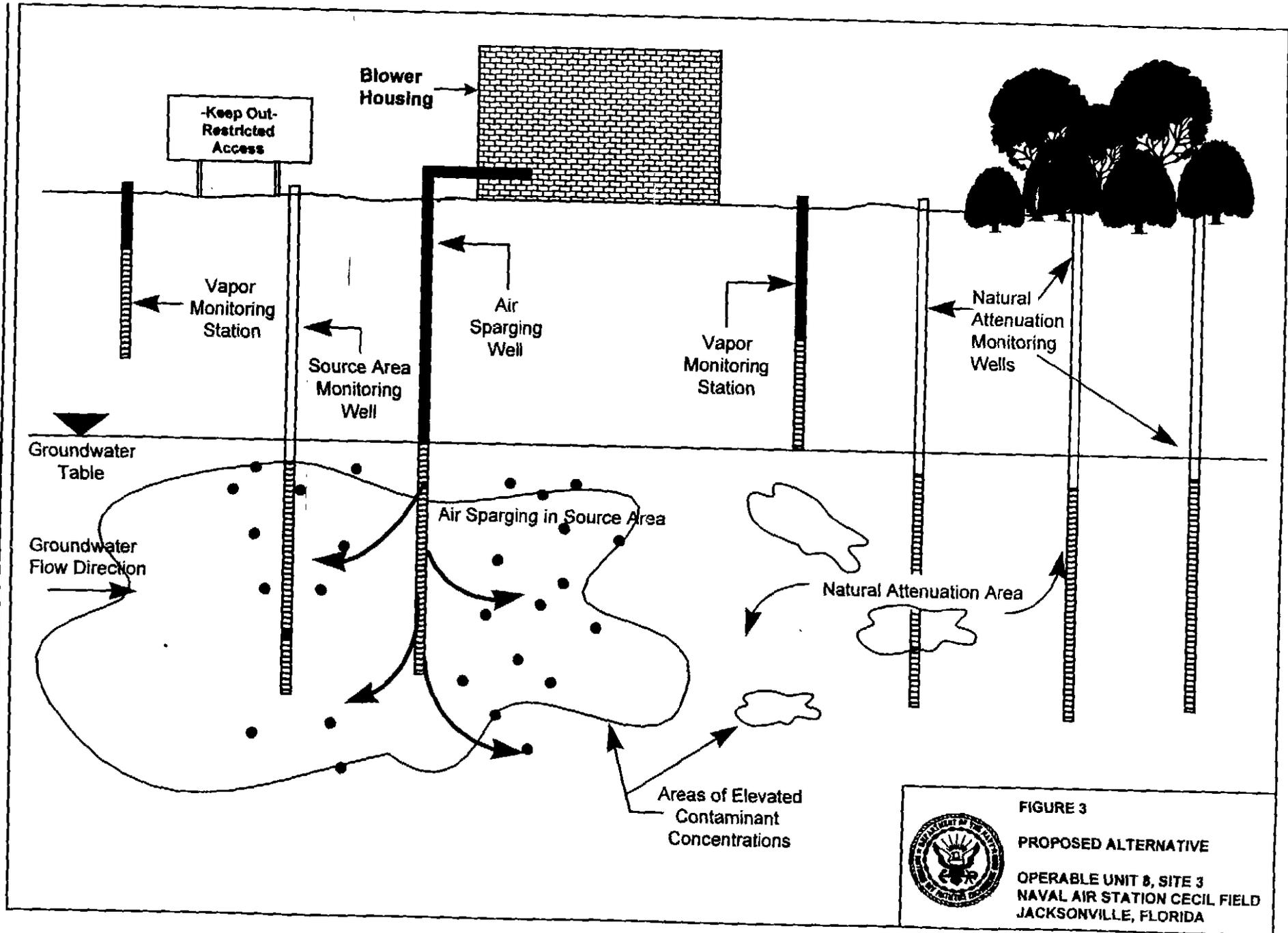
- ❖ Protect human health from exposure to groundwater from the surficial aquifer containing average concentrations of site-related contaminants in excess of risk-based criteria.

To meet this objective, site specific cleanup levels have been established. As stated above, the Baseline Risk Assessment concluded that contaminants in the groundwater pose an unacceptable future human health risk if the water is consumed. To mitigate this risk, cleanup levels for the remedy (air sparging followed by natural attenuation) have been established for 15 contaminants detected in the groundwater above State and Federal groundwater and/or drinking water protection criteria.

Contaminants for which specific cleanup levels have been set include VOCs, semi-VOCs and a PCB. The range of detected concentrations and cleanup levels set for contaminants in the groundwater are listed in the table below.

Site-related Contaminants of Concern	Range of Detection	Cleanup Level
Benzene	26	1
1,2-Dichloroethene	9 - 1,900	70
1,1-Dichloroethene	2 - 350	7
1,2-Dichlorobenzene	350 - 9,800	600
1,3-Dichlorobenzene	9 - 240	10
1,4-Dichlorobenzene	49 - 1,300	75
2,4-Dichlorophenol	5	4
2-Methylnaphthalene	0.8 - 200	100
4-Methylphenol	3 - 61	35
Naphthalene	0.6 - 450	20
Phenol	0.5 - 10	10
1,1,1-Trichloroethane	96 - 860	200
Trichloroethene	9 - 1,700	3
Arochlor-1248	0.6 - 0.79	0.5
Bis(2ethylhexyl)phthalate	0.5 - 61	6

NOTE: Concentrations in parts per billion (ppb)



**FIGURE 3**  
**PROPOSED ALTERNATIVE**  
**OPERABLE UNIT 8, SITE 3**  
**NAVAL AIR STATION CECIL FIELD**  
**JACKSONVILLE, FLORIDA**



## *The Nine Criteria for Choosing a Cleanup*

By law, the partnering team uses nine criteria to balance the pros and cons of cleanup alternatives. The team has already evaluated how well each of the cleanup alternatives developed for Operable Unit 8, Site 3 meets the first seven criteria (see table on page 10). Once formal comments from the EPA, State and the community are received, the partnering team will select the cleanup plan.

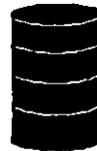
1. **Overall protection of human health and the environment:** Will the cleanup alternative protect you and the plant and animal life on or near the site? By law, the partnering team will not choose a plan that does not meet this basic criterion.
2. **Compliance with Applicable or Relevant and Appropriate Requirements (ARARs):** Does the alternative meet all Federal and State environmental statutes, regulations and requirements?
3. **Long-term effectiveness and permanence:** Will the effects of the cleanup plan last or could contamination cause future risk?
4. **Reduction of toxicity, mobility or volume through treatment:** Does the alternative reduce the harmful effects of the contaminants, the spread of contaminants, and the amount of contaminated material?
5. **Short-term effectiveness:** How soon will site risks be adequately reduced: Could the cleanup cause short-term hazards to workers, residents or the environment?
6. **Implementability:** Is the alternative technically feasible? Are the right goods and services (i.e., treatment machinery, space at an approved disposal facility) available for the plan?
7. **Cost:** What is the total cost of an alternative over time? The partnering team must find a plan that gives necessary protection for a reasonable cost.
8. **State acceptance:** Do State environmental agencies agree with the partnering team's proposal?
9. **Community acceptance:** What objections, suggestions or modifications does the public offer during the comment period?

## Four Kinds of Cleanup

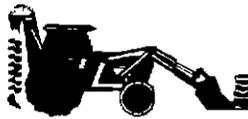
The partnering team looks at numerous technical approaches to determine the best way to reduce the risks presented by a site. The team then narrows the possibilities to approaches that would protect human health and the environment. Although reducing risks often involves combinations of highly technical processes, there are really only four basic options



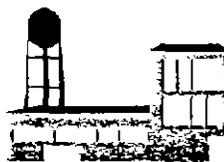
**Take limited or no action:** Leave the site as it is, or just restrict access and monitor it.



**Contain contamination:** Leave contamination where it is and cover or contain it in some way to prevent exposure to, or spread of, contaminants. This method reduces risks from exposure to contamination, but does not destroy or reduce it.



**Move contamination off site:** Remove contaminated material (soil, groundwater, etc.) and dispose of it or treat it then dispose of it elsewhere.



**Treat contamination on site:** Use chemical, physical, and/or natural processes on-site to destroy, remove or reduce the contaminants. Treated material can be left on site. If needed, contaminants captured by the treatment process are disposed of in an off-site licensed waste disposal facility

# Clean-up Alternatives for Operable Unit 8, Site 3

The Operable Unit 8, Site 3 Feasibility Study report reviews all of the options the partnering team considered for cleanup, as well as the proposed cleanup plan. The options, referred to as "cleanup alternatives," are different combinations of plans to restrict access to, contain, move or treat contamination in order to protect public health and the environment.

During the upcoming comment period, the partnering team welcomes your comments on the proposed cleanup plan as well as the other technical approaches that the team evaluated. These alternatives are summarized below. Please consult the Operable Unit 8, Site 3 Feasibility Study for more detailed information.

## Groundwater Cleanup Alternatives



### No Action

#### *Alternative MM-1: No Action*

No remedial activity would occur under this alternative. Evaluation of this activity as a baseline for comparison against the other alternatives is a regulatory requirement. Contaminants would continue to attenuate naturally; however, natural attenuation monitoring would not be performed to evaluate its effectiveness in meeting clean-up levels and preventing the potential migration of contaminants into Rowell Creek. Exposure to contaminated groundwater would be addressed via groundwater use restrictions.

### Natural Attenuation

#### *Alternative MM-6: Natural Attenuation with Institutional Controls*

This alternative contains two components of the preferred alternative that is described on pages 2 and 5.

### Treatment Without Groundwater Extraction

#### *Alternative MM-2: Enhanced Biodegradation*

This alternative relies on the naturally occurring microorganisms in the subsurface of the site to consume and breakdown the organic contaminants. This alternative would manipulate these naturally occurring microorganisms by feeding nutrients to increase the efficiency of their degradation of contaminants.

#### *Alternative MM-3: In-situ Air Stripping with Enhanced Biodegradation*

This alternative is similar to Alternative MM-2, but removes the high levels of VOCs present in the source area as an additional method of treatment. The VOCs are removed by forcing air under pressure into the aquifer and volatilizing the groundwater contaminants. This alternative contains the third component of the preferred alternative that is described on pages 2 and 5.

#### *Alternative MM-7: In-situ Permeable Reactive Wall and Hydraulic Barriers*

This alternative would use reactive materials installed as a permeable wall in the pathway of the groundwater contaminant plume. The contaminants would be broken down into less harmful products because of chemical reactions with the material of the wall during the migration of groundwater through the wall. Hydraulic barriers or impermeable walls would be installed to serve as sides of a "funnel" to direct the groundwater plume through the reactive, permeable wall.

#### *Alternative MM-8: In-situ Air Stripping with Phytoremediation Followed by Natural Attenuation*

This alternative uses a combination of Alternative MM-3 and Alternative MM-6, described earlier, and phytoremediation. Phytoremediation is the use of selected plant species to absorb and/or degrade contaminants during the uptake of groundwater through the roots of these plants.

### Treatment Following Groundwater Extraction

#### *Alternative MM-4: Pump-and-Treat with Discharge to Rowell Creek*

This alternative consists of extracting the contaminated groundwater and vapors from the soil followed by treatment of the contaminants in a facility that would be constructed on site. The treatment facility would remove the organic contaminants by volatilization and adsorption on activated charcoal columns. The treated water would be discharged to Rowell Creek.

#### *Alternative MM-5: Pump-and-Treat with ReInjection for Enhanced Biodegradation*

This alternative is similar to Alternative MM-4 with the exception that the treated water is mixed with nutrients and returned to the aquifer. This alternative removes contaminants by way of an above ground treatment facility in addition to subsurface enhanced biodegradation, which was described under Alternative MM-3.

## What impacts would the cleanup options have on the local community?

- ◆ Any option that involves extraction of groundwater or volatilization of contaminants would pose a potential risk to workers and nearby communities; however, measures would be taken to minimize and control such exposure.
- ◆ All alternatives include institutional controls to limit the use of, and exposure to contaminated groundwater and would limit the future use of the site. Currently the site is industrially zoned, and development for residential use is restricted.
- ◆ All on-site treatment options would use the site to construct and operate a treatment system and associated facilities. This would limit future use and/or development of the site by property owners during the cleanup.
- ◆ The No Action alternative would provide limited control which would result in inadequate protection to humans and the environment.



### Comparison of Groundwater Cleanup Alternatives

Nine Criteria	MM-1 No Action	MM-6* Natural Attenuation with Institutional Controls	MM-2 Enhanced Biodegradation	MM-3* In-situ Air Stripping with Enhanced Biodegradation	MM-7 In-situ Permeable Reactive Wall and Hydraulic Barriers	MM-8 In-situ Air Stripping with Phytoremediation followed by National Attenuation	MM-4 Pump and Treat with Discharge to Rowell Creek	MM-5 Pump and Treat with Reinjection for Enhanced Biodegradation	Proposed Alternative In-situ Air Stripping followed by Natural Attenuation
Protects human health and environment	x	✓	✓	✓	✓	✓	✓	✓	✓
Meets Federal and State Requirements	x	✓	✓	✓	✓	✓	✓	✓	✓
Provides long-term protection	x	✓	✓	✓	✓	✓	✓	✓	✓
Reduces toxicity, mobility and volume	☑	☑	✓	✓	✓	✓	✓	✓	✓
Provides short-term protection	x	✓	✓	✓	✓	✓	☑	✓	✓
Implementability	✓	✓	✓	✓	✓	✓	✓	✓	✓
Cost (Present Worth)	\$427,000	\$606,000	\$3,652,000	\$3,322,000	\$2,170,000	\$1,867,000	\$2,970,000	\$4,072,000	\$1,708,000**
State agency acceptance	TO BE DETERMINED AFTER PUBLIC COMMENT PERIOD								
Community acceptance	TO BE DETERMINED AFTER PUBLIC COMMENT PERIOD								
Time to reach cleanup goal	62 yr.	62 yr.	12 yr.	12 yr.	62 yr.	30 yr.	9 yr.	12 yr.	30 yr.

x: Does NOT meet criterion    ✓: Meets criterion    ☑: Partially meets criterion    \*: Components of Navy's preferred alternative

\*\* : Estimated costs based on selected components from Alternatives MM-3 and MM-6.

## Why Does the Partnering Team Recommend this Proposed Plan

The partnering team recommends a cleanup plan that uses a combination of in-situ air sparging and natural attenuation for cleanup of contaminated groundwater and institutional controls to prevent exposures, because this alternative will.

- Meet the seven criteria for a Superfund remedy, including protecting public health and the environment (see page 7)
- Reduce concentrations of contaminants in groundwater to levels that will be protective of human health in the future.
- Meet all State and Federal environmental statutes, regulations and requirements identified for this site, and
- Provide the necessary level of protection for the cost incurred. While active remedial measures involving a more extensive onsite treatment for the entire plume would decrease the cleanup times, natural attenuation would provide the same level of protection as active remedial measures because institutional controls to restrict future exposures would be required. Because natural attenuation is currently occurring outside of the source area, active remediation is not warranted in this portion of the site.
- While the no action alternative would cost the least, it would not ensure the protection of human health and the environment since it would leave source of future contamination and would not monitor the effectiveness of natural attenuation. Long-term natural attenuation monitoring and analysis of groundwater and surface water will ensure that site remediation goals are being achieved and that there are no adverse human health or environmental impacts from the potential spread of contamination.

### Next Steps

By May 1, 1998, the partnering team expects to have reviewed all comments and signed the Record of Decision document describing the chosen cleanup plan. The Record of Decision and a summary of responses to public comments will then be made available to the public at the Charles D. Webb Wesconnett Public Library, Jacksonville, Florida. The partnering team will announce the decision through the local news media and the community mailing list.

## What's a Formal Comment?



Formal comments are used to improve the cleanup proposal. During the 30-day formal comment period, the partnering team will accept formal written comments and hold a hearing, if requested, to accept formal verbal comments.

To make a formal comment you need only speak during the public hearing, or submit a written comment during the comment period. A request for a public hearing to present your formal comments must be made in writing postmarked no later than February 25, 1998 and sent to:

Mr. Charles Underwood  
Public Affairs Officer  
NAS Cecil Field  
P.O. Box 111  
Jacksonville, Florida 32215-0111

Federal regulations require the partnering team to distinguish between "formal" and "informal" comments. While the partnering team uses your and the Restoration Advisory Board (RAB) comments throughout site investigation and cleanup, the team is required to respond

to formal comments on the proposed plan in writing only. If a public hearing is requested, there will be no verbal response to your comments during the formal hearing portion of the meeting. However, the fact that the partnering team must respond to formal comments in writing only, does not mean that the team cannot answer questions. Once the formal hearing portion of the public meeting is closed, the partnering team can respond to informal questions.

The partnering team will review the transcript of all formal comments received at the hearing, and all written comments received during the formal comment period, before making a final cleanup decision. They will then prepare a written response to all formal comments received.

Your formal comment will become part of the official public record. The transcript of comments and the partnering team's written responses will be issued in a document called a Responsiveness Summary when the team releases the final Record of Decision (ROD).



## For More Detailed Information

To help the public understand and comment on the proposal for the site, this publication summarizes a number of reports and studies. All of the technical and public information publications prepared to date for the site are available at the following information repository:

Charles D. Webb Wesconnett  
Public Library  
6887, 103<sup>rd</sup> Street  
Jacksonville, Florida 32210  
Tel: (904) 778-7305



Additional information on NAS Cecil Field and its ongoing environmental programs can also be found on the Internet at <http://www.cecilfield.com>.

**Use This Space to Write Your comments  
or to be added to the mailing list**

The partnering team wants your written comments on the options under consideration for dealing with the contamination at Operable Unit 8, Site 3. You can use the form below to send written comments. If you have questions about how to comment, please call Charles Underwood at (904) 778-6055. This form is provided for your convenience. Please mail this form or additional sheets of written comments, postmarked no later than February 25, 1998 to:

Mr. Charles Underwood  
Public Affairs Officer  
NAS, Cecil Field  
P.O. Box 111  
Jacksonville, Florida 32215-0111  
or E-Mail to: pao@cecilfield.com

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(Attach sheets as needed)

Comment submitted by: \_\_\_\_\_

**Mailing list additions, deletions or changes**

If you did not receive this through the mail and would like to

- be added to the site mailing list
- note a change of address
- be deleted from the mailing list

Name: \_\_\_\_\_

Address: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

please check the appropriate box and fill in the correct address information above.



**Information Repository:**

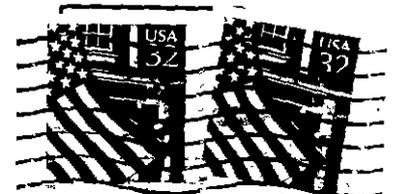
Charles D. Webb Wesconnett Branch  
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**General Point of Contact:**

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Jacksonville, Florida 32215-0111  
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