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FACT SHEET 14 PROPOSED GROUNDWATER REMEDIAL ACTION AT OPERABLE UNIT 7 (OU 7) SITE 16 NAS CECIL FIELD FL

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ABB ENVIRONMENTAL SERVICES INC

ENVIRONMENTAL UPDATE

Naval Air Station Cecil Field

Installation Restoration Program

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Fact Sheet 14: Proposed Groundwater Remedial Action at Site 16

Site 16, the Aircraft Intermediate Maintenance Department (AIMD) Seepage Pit Area (also referred to as Operable Unit 7) is located on the Naval Air Station (NAS) Cecil Field property near the flightline in the industrial area, almost in the center of the base (see Figure 1). The site formerly contained a 4,100-gallon underground storage tank and a *seepage pit* from which solvents were allowed to seep into the ground.

The tank, seepage pit, and some contaminated soils were removed during April and May 1994 as part of a fast-track cleanup effort (called an interim remedial action). The interim remedial action was completed to remove the *source* of contamination, thereby preventing further contamination of the groundwater. The environmental cleanup discussed below addresses *groundwater* contamination at the site.

Environmental Update, Fact Sheet 14, is one in a series developed to inform interested citizens about the Installation Restoration program (IRP) being conducted at NAS Cecil Field. Distribution is coordinated through the Public Affairs Office.

[Words in italics are defined in the glossary on page 6.]

Environmental Investigations...

The recommendations in the Proposed Plan are based on the findings of four studies:

- The **initial assessment study**, completed in 1985, identified Site 16 as one of 18 waste sites requiring further investigation.

- In 1988, Site 16 was included in a Resource Conservation and Recovery Act (RCRA) **facility investigation**. This assessment included collecting and analyzing soil and groundwater samples.

- A **remedial investigation** was completed in July 1995 to determine the type and extent of contamination. Solvents and *inorganics* released from the seepage pit were found in the groundwater. The primary solvent-related compound found at the site was trichloroethylene, which is a solvent used for degreasing. It is also used in drycleaning fluids, paints, and adhesives.

- As part of the remedial investigation, a baseline risk assessment was completed in January 1996. This report evaluated the potential for risks to human health or the environment resulting from contamination at Site 16. Risk assessment results are summarized in Table 1, on page 2.

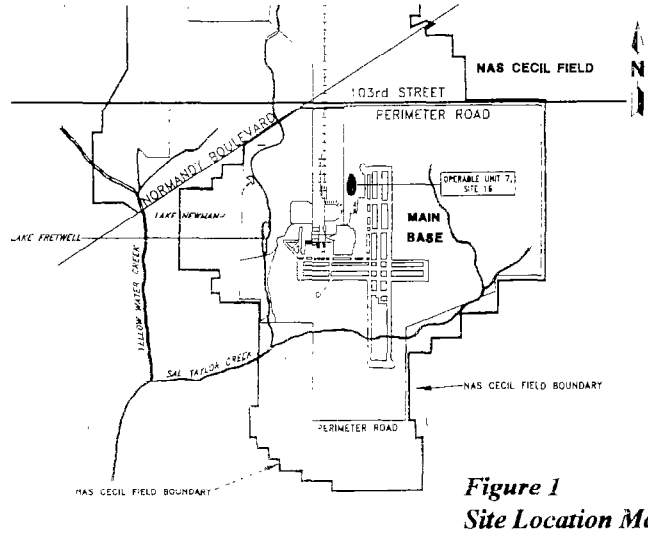

Figure 1
Site Location Map

Site Studies (continued)

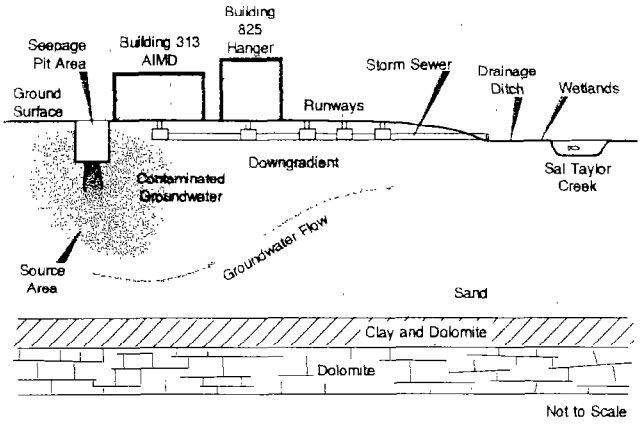

Figure 2
Areas of Groundwater Contamination

Figure 2 shows two areas of groundwater contamination: (1) the *source area*, which is the more highly contaminated groundwater immediately beneath the former seepage pit, and (2) the less contaminated *downgradient* area. Contaminants are moving to the east, which is toward a drainage ditch and wetland and ultimately Sal Taylor Creek. *Computer modeling* predicts that contamination will take more than 100 years to reach the drainage ditch.

Table 1 - Risk Assessment Results

Media	Human Health Risks	Ecological Risks
Soil	None	None
Groundwater	Risks if used for drinking water	None
Surface water	None	None
Sediment	None	Risks present but contaminants not related to Site 16.

Groundwater Cleanup Alternatives

A feasibility study (FS) to evaluate the best technique (or *alternative*) to manage or clean up contamination at the site was completed in August 1995. The FS evaluated five alternatives, as follows:

MM-1 No Action: Evaluation of a no-action alternative is required by law. This remedy would leave the site the way it exists today. Use of groundwater at the site for drinking water would be prohibited.

MM-2 Enhanced Bioremediation: This remedy involves adding nutrients to the water to encourage the growth of *microbes* to break down contaminants into less harmful substances. The alternative would include prohibiting the use of groundwater for drinking water. Figure 3 shows alternative MM-2.

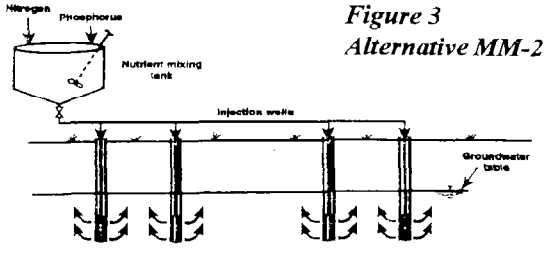

Figure 3
Alternative MM-2

MM-3 Groundwater Extraction, Treatment, and Discharge to Surface Water: This remedy would involve pumping the contaminated groundwater out of the ground and treating it using *ultraviolet oxidation* (UV/OX), a treatment technology that breaks down contaminants into safe substances by using ultraviolet light (the purplish light used in plant "grow" lights) and oxidizers (such as hydrogen peroxide). The treated groundwater is then pumped into a stormwater drain near the site. Figure 4 is a diagram of alternative MM-3.

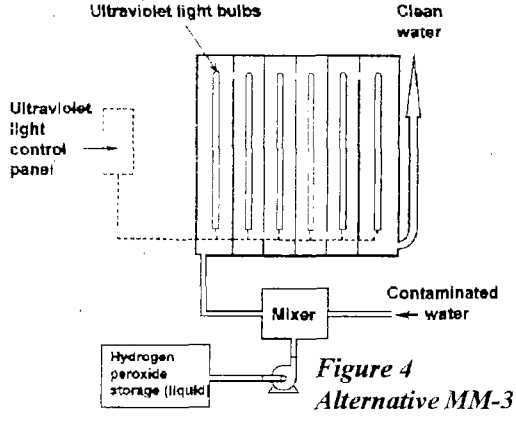

Figure 4
Alternative MM-3

MM-4 Sparging of Groundwater: *Air sparging* involves pumping air into the groundwater through wells. The air agitates *volatile organic compounds* in water and causes them to turn into a gas (vaporize). The vaporized gases are then collected with a vacuum extraction system at the surface. The air sparging system evaluated in the FS is shown on Figure 5.

...Alternatives (continued)

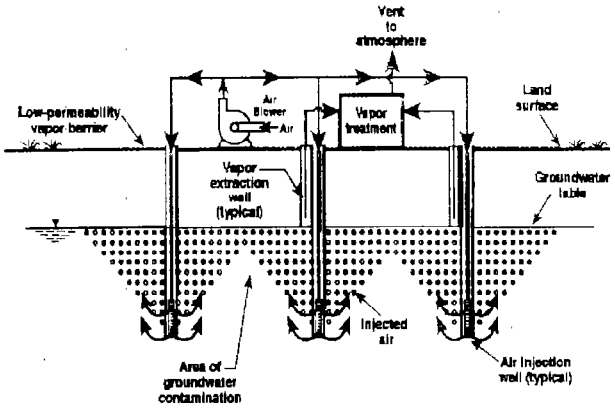

Figure 5
Alternative MM-4

MM-5 Groundwater Extraction, Pretreatment, and Discharge to a Wastewater Treatment Facility: Like MM-3, the first step in this alternative is to pump the contaminated groundwater out of the ground. The water is then treated in a tall tank called an *air stripper*, which is a proven method to remove volatile organic compounds from water. The air stripper allows contaminated water to flow past a stream of air, which causes the contaminants to turn into a gas. The gas is collected for treatment with a carbon filter much like the carbon filter used in household aquariums. The air is vented to the atmosphere after it is treated. Figure 6 is a diagram of alternative MM-5.

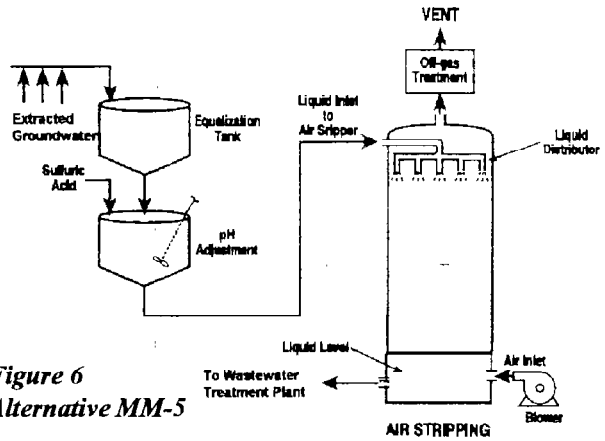

Figure 6
Alternative MM-5

A summary of all the alternatives is provided in Table 2 on page 4. Table 3 (on page 5) lists the nine standard criteria used to evaluate the alternatives. It also shows how MM-6, the preferred remedy, was evaluated against the nine criteria.

The Proposed Plan

MM-6

The Proposed Plan for Site 16 will be available for public comment on March 21, 1996. The purpose of the Proposed Plan is to recommend the best method for cleaning up groundwater at the site. A combination of alternatives MM-2 and MM-5, referred to as MM-6, was recommended in the plan. Extraction and treatment of groundwater (MM-5) would be used to treat the more highly contaminated water in the source area. Enhanced bioremediation (MM-2) would be used to break down contaminants in the downgradient area by helping natural processes to work more quickly. MM-6 would cost $2,360,000 over the initial 12-year period (5 years of pumping and treatment of groundwater and 12 years of adding nutrients to enhance microbe growth). An additional $556,000 would be needed for 30 years of continued operation and maintenance, for a total of $2,916,000. Figure 7 presents Remedial Alternative MM-6 (See attachment three).

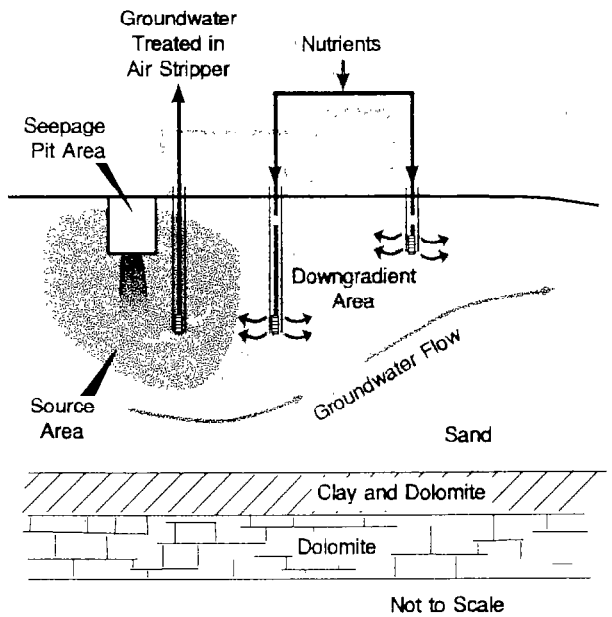

Figure 7
Alternative MM-6

Table 2
Alternatives Evaluated for Groundwater Remediation at Site 16

Alternatives	MM-1 (no action)	MM-2 (enhanced bioremediation)	MM-3 (groundwater extraction, treatment, and discharge to surface water)	MM-4 (sparging of groundwater)	MM-5 (groundwater extraction, pretreatment, and discharge to a wastewater treatment plant)	MM-6 Preferred Alternative
Description	- Monitor groundwater. - Restrict groundwater use.	- Promote growth of microbes. - Monitor groundwater - Restrict groundwater use.	- Pump water out of the ground. - Treat water using UV/OX. - Restrict groundwater use.	- Inject air into groundwater through wells - Extract vaporized contaminants from soil. - Treat vapor to destroy contaminants. - Restrict groundwater use.	- Pump water out of the ground. - Remove vaporized contaminants with air stripper. - Treat vapor before venting to destroy contaminants - Release cleaned water to the wastewater treatment plant. - Restrict groundwater use	A combination of MM-5 and MM-2 - Groundwater extraction and treatment would be used in the more highly contaminated source area. - Enhanced bioremediation would be used in the less contaminated downgradient area.
Estimated Cost	$524,000	$2,256,000	$5,732,000	$1,629,000	$3,672,000	$2,916,000
Organics Destroyed?	No	Yes	Yes	Yes	Yes	Yes
Organics removed from Groundwater?	No	No	Yes	No	Yes	Partially
Harmful effects of contaminants reduced?	No	Partially	Yes	Partially	Yes	Yes
Remedy permanent?	No	Yes	Yes	Yes	Yes	Yes
Certainty of meeting required concentrations	Moderate	Moderate	High	Moderate	High	Moderate to High
Time to reach required concentrations	over 100 Years	12 Years (over 100 years for inorganics)	30 Years	12 Years (over 100 years for inorganics)	30 Years	- 5-30 years for organics - 30 years for inorganics in source area - more than 100 years for inorganics in the downgradient area.

Table 3

Analysis of MM-6 Against the Nine Evaluation Criteria

1. Overall Protection of Human Health and the Environment

Will the alternative protect people and the environment?

The preferred alternative treats organic and inorganic contaminants. Human health will be further protected by restricting the use of groundwater in the immediate area until Florida and Federal drinking water standards are met.

2. Compliance with State and Federal Regulations

Will it meet Florida and Federal legal requirements?

Organic compound concentrations would reach State and Federal standards between 5 and 30 years; inorganic compounds would reach standards in 30 years in the source area and 100 years in the downgradient area.

3. Long-Term Effectiveness

After cleanup is completed, will risks remain at the site?

Use of groundwater will be restricted until the water is determined to be safe according to State and Federal drinking water standards.

4. Reduction of Contaminant Toxicity, Mobility, and Volume

Will it reduce harmful qualities of the contaminant and keep it from moving?

Organics in the source area will be destroyed with air stripping; inorganics in the source area will be removed in a wastewater plant. Downgradient, organic contaminants will be broken down into less harmful substances by enhancing bioremediation. Pumping water out of the ground for treatment will prevent movement of contaminants away from the source area.

5. Short-Term Effectiveness

How long will it take to complete the cleanup? Will there be any health risks during the cleanup?

The concentrations of organic and inorganic contaminants in the source area will be reduced almost immediately. The reduction of concentrations of organic contaminants in the downgradient area will be slightly slower because the microbes need time to adjust to their new, enriched environment. The cleanup action will be designed and monitored to ensure the safety of workers and the community during the cleanup action.

6. Implementabiltiy

Will it be possible to make it work?

The treatment methods proposed for the preferred alternative have been successfully implemented at other sites.

7. Cost

What will it cost?

The estimated cost for MM-6 is $2,916,000.

8. USEPA and FDEP Acceptance

Will the U.S. Environmental Protection Agency (USEPA) and the Florida Department of Environmental Protection (FDEP) accept it?

The FDEP and USEPA have concurred with the Navy that this is the preferred alternative.

9. Community Acceptance

Will the community accept it?

Community acceptance of this preferred alternative will be evaluated after the public comment period.

Glossary

Air sparging: A treatment technology which works by injecting air into the groundwater, which causes organic compounds to vaporize (turn into a gas). The vaporized compounds are then collected at the surface with the aid of a vacuum extraction system.

Air stripping: A water treatment technology which works by passing water containing organic compounds through a column of flowing air. The flowing air agitates the organic compounds and causes them to turn into a gas. The gas is typically treated before being vented to the atmosphere.

Computer Modeling: An evaluation tool which allows the scientist to use a computer to answer mathematical questions such as, "Where will a particular drop of water be in 10 years?"

Downgradient: In reference to groundwater, downslope (or a lower elevation). Groundwater generally flows downgradient.

Groundwater: The fresh supply of water found beneath the earth's surface, which is often used to supply wells and springs.

Groundwater monitoring: Sampling and analysis of groundwater to determine if risks to human health or the environment are present.

Inorganics: Chemicals of mineral origin, such as metals.

Microbes: Microscopic organisms, such as bacteria, yeast, or fungi.

Organic compounds: Compounds which contain carbon and are usually associated with life processes.

RCRA: Resource Conservation and Recovery Act: the environmental law that establishes a step-by-step approach to monitor and control waste from the time it is generated until it is disposed of. RCRA governs both solid waste (such as your household garbage) and hazardous waste.

Seepage pit: At Site 16, a covered concrete pit designed to allow fluids to slowly leak out (through spaces in the bottom of the pit) and seep into the ground.

Source area: In reference to contamination, the area from which contamination can spread; usually the area of the highest contaminant concentrations.

Trichloroethylene (TCE): A solvent used for degreasing and in drycleaning fluids, paints, and adhesives.

Ultraviolet oxidation (UV/OX): A treatement technology which uses a combination of ultraviolet light (the purplish light used for grow lights) and oxidizers (chemicals which can give up "extra" oxygen, such as the peroxide kept in the medicine cabinet) to break down contaminants into safer substances.

Volatile organic compounds: Organic compounds that are easily evaporated, such as the vapors you smell when filling a gas tank.

Community Participation Activities

In addition to this fact sheet series, NAS Cecil Field has established a comprehensive community relations program to encourage public involvement in the environmental cleanup process. Highlights of the program are presented below.

Information Availability: An Information Repository has been established at the Charles D. Webb Westconnett Branch of the Jacksonville Public Library.

This repository contains documents prepared in connection with Site 16 as well as other installation Restoration program information and is available for your review.

The Administrative Record for NAS Cecil Field environmental program is also available for public review. This file contains the specific documents and correspondence that form the basis for site cleanup decisions. Both the Administrative Record and the Information Repository are located at:

Charles D. Webb Wesconnett Branch
Jacksonville Public Library
6887 103rd Street
Jacksonville, Florida 32210
(904) 778-7305

Restoration Advisory Board (RAB). The public is invited to monthly RAB meetings. RAB meetings are held on the third Tuesday of each month at 7 P.M. at the NAS Cecil Field Bachelors' Officers Quarters Complex. The purpose of the RAB is to bring together Navy representatives, regulatory officials, and community members to review environmental cleanup plans and actions at NAS Cecil Field. Established in October 1994, the 26 member RAB provides a two-way flow of communication between the community and NAS Cecil Field concerning the base's environmental restoration program before final cleanup decisions are made. For more information about the RAB, contact the NAS Cecil Field Public Affairs Office.

Mailing List: A comprehensive list of community members, local organizations, and public officials has been developed to distribute information on the cleanup program. The list will be updated regularly to include additional parties expressing interest in NAS Cecil Field cleanup activities. If you would like to be on the mailing list, please contact:

Bert Byers
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NAS Cecil Field
P.O. Box 111
Jacksonville, Florida 32215-0111
(904)778-6055

What's Next?

Public Meetings and Comment Period: The public comment period for the Site 16 groundwater remediation will be held from March 21 to April 22, 1996. The public meeting will be held as follows:

March 21, 1996
7:00 p.m.
NAS Cecil Field
Conference Center
Jacksonville, Florida

Comments received during this meeting will be reviewed together with any written comments received during the comment period to ensure that the public supports the alternative selected for Site 16. Mailed comments may be postmarked as late as April 22, 1996.

Public Notices: Look for public notices to be published in the *Florida Times Union* newspaper.

Responsiveness Summary: Information received during this comment period will be summarized in a responsiveness summary, which will be incorporated into the Record of Decision (ROD) and added to the documents in the Information Repository at the Charles D. Webb Wesconnett Branch of the Jacksonville Public Library.