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DECISION DOCUMENT FOR STUDY AREA 2 WITH TRANSMITTAL LETTER NTC  
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**DECISION DOCUMENT**

**STUDY AREA 2**

**NAVAL TRAINING CENTER  
ORLANDO, FLORIDA**

**Contract No. N62467-94-D-0888**

**Contract Task Order 0024**

**Prepared by:**

**Tetra Tech NUS, Inc.  
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**Prepared for:**

**Department of the Navy, Southern Division  
Naval Facilities Engineering Command  
2155 Eagle Drive  
North Charleston, South Carolina 29419**

**April 2000**

05101.02.0002  
00518

0400-A050

April 25, 2000

Ms. Barbara Nwokike (Code 1873) (IRP RPM)  
P.O. Box 190010  
2155 Eagle Drive  
North Charleston, SC 29419-9010

Reference: CLEAN Contract No. N62467-94-D-0888  
Contract Task Order No. 0024

Subject: Study Area Decision Documents  
Naval Training Center, Orlando, Florida

Dear Ms. Nwokike:

Enclosed are the final Decision Documents for Study Areas 2, 21, 25, and 52. The documents include changes received from the Orlando Partnering Team at the March meeting. Please note the signature block (in each of the documents) to be signed and dated by Wayne Hansel.

If you have any questions regarding the documents, please contact me at (865) 220-4730.

Sincerely,

Steven B. McCoy, P.E.  
Task Order Manager

SBM:ckf

Enclosures

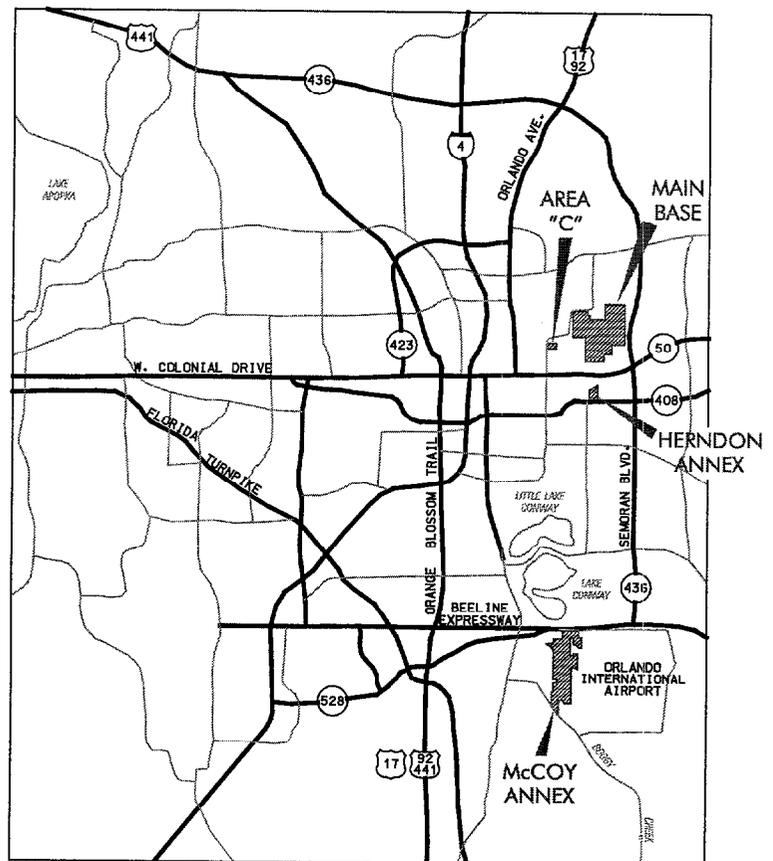
c: Mr. Rick Allen, Harding Lawson  
Mr. Michael J. Campbell, Tetra Tech NUS  
Mr. David Grabka, FDEP  
Mr. Wayne Hansel, SOUTHDIV (2 copies)  
Mr. Allan Jenkins, Tetra Tech NUS  
Mr. Mark Perry/File, Tetra Tech NUS (unbound)  
Ms. Nancy Rodriguez, USEPA Region 4  
Mr. Steve Tsangaris, CH2M Hill  
Ms. Debbie Wroblewski, Tetra Tech NUS (cover letter only)  
File/Edb

## Introduction

A site screening investigation has been completed at the Navy's Herndon Annex property, designated as Study Area (SA) 2. The results of the investigation and the actions selected by the Orlando Partnering Team to clean up environmental contamination associated with the site are described in this Decision Document. The Orlando Partnering Team was assembled to address environmental issues at the Naval Training Center (NTC), Orlando and consists of representatives from the Navy and its contractors, the Florida Department of Environmental Protection (FDEP), and the U.S. Environmental Protection Agency.

## Site Background

Herndon Annex is one of four facilities that comprised the NTC, Orlando. The other three facilities are the Main Base, Area C, and McCoy Annex. Herndon Annex (Figure 1) is located approximately 1.5 miles south of the Main Base and adjacent to the city-owned Orlando Executive Airport. Private homes (the Azalea Park neighborhood) are located east of the site with Lake Barton to the northeast (Figure 2). The SA includes an abandoned septic system (Facility 6001) and several former aircraft parking aprons. A review of NTC Public Works Department drawings indicates that Building 602 was the only facility connected to the septic system. Building 606, which once contained a machine shop and baths for metal treatment, appears to have discharged wastewater to an off-site treatment system.



**Figure 1. Herndon Annex Location**

Beginning in 1940, the facilities were known as the Orlando Army Air Base and were operated under the command of the U.S. Army Air Corps. Between 1947 and 1968, the U.S. Air Force

(USAF) commanded the facilities at Orlando and the facilities were renamed the Orlando Air Force Base (OAFB). The USAF used the Herndon Annex property as a sanitary landfill on an occasional basis in the 1950s and early 1960s. In 1968, the USAF ceased operations at the OAFB and the Navy acquired the properties now known as the Main Base, Area C, and Herndon Annex. NTC, Orlando was closed in April 1999 as part of the Defense Base Realignment and Closure Act of 1990.

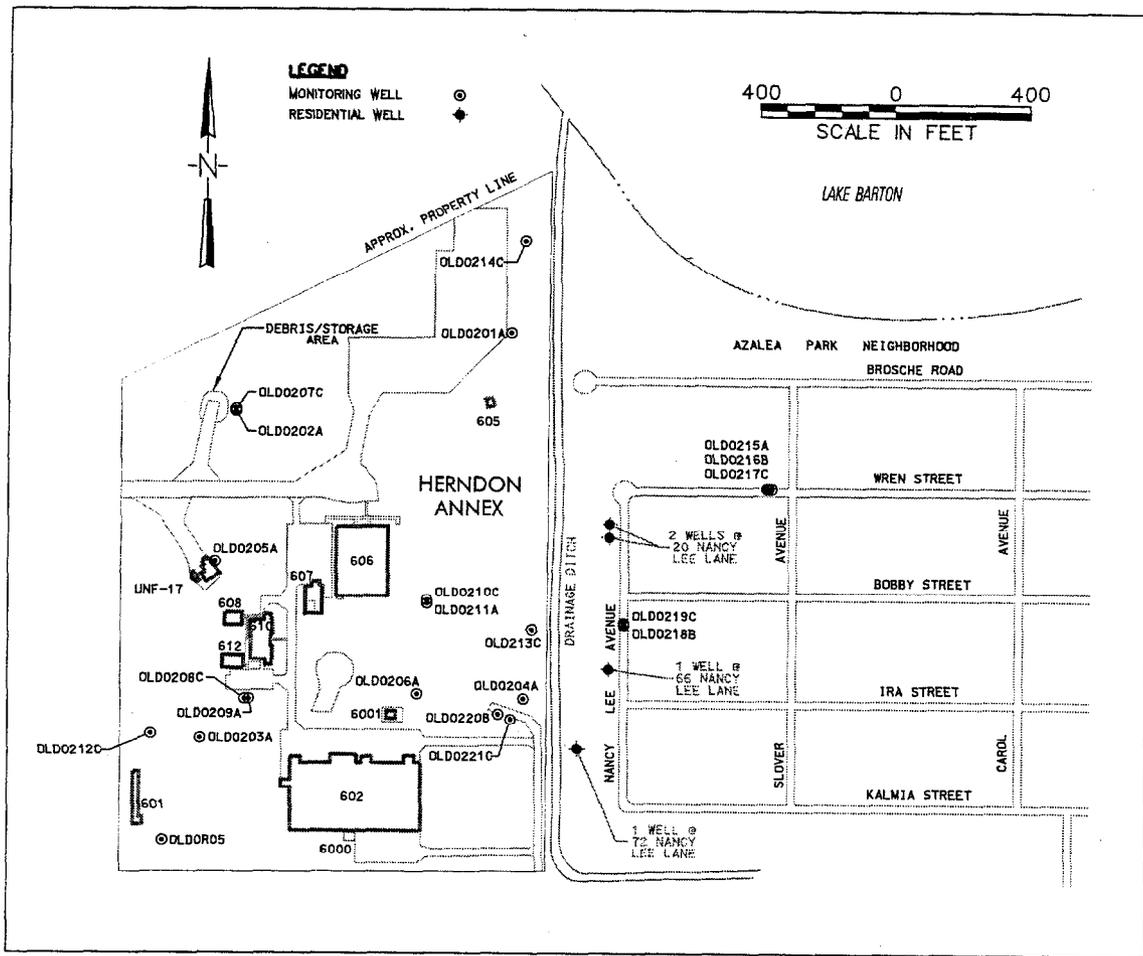
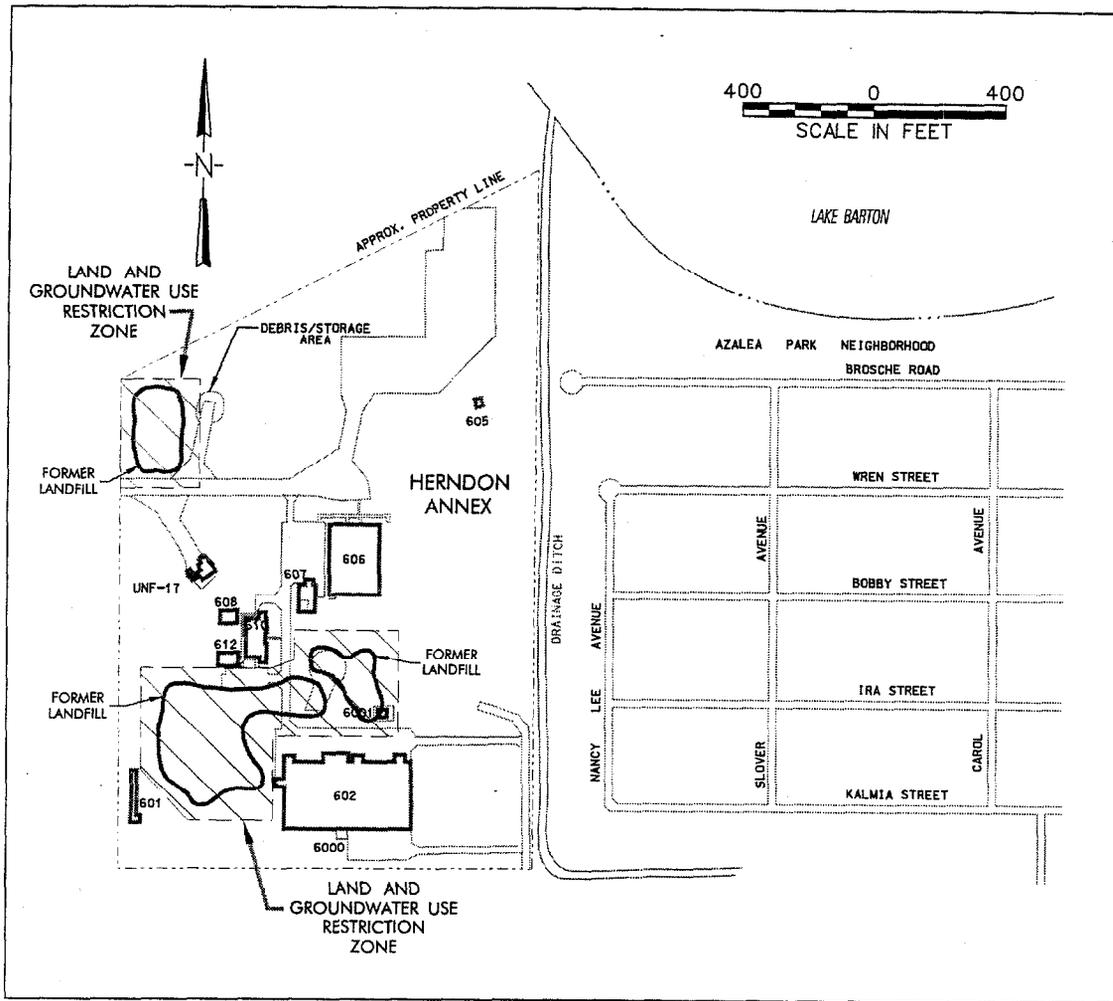


Figure 2. Wells Sampled During the Site Screening Investigation at Study Area 2

### Investigation Summary

The site screening investigation of SA 2 was completed in five phases starting in July 1994 and ending in December 1998. The results of the investigation are described in a report entitled *Base Realignment and Closure, Environmental Site Screening Report, Study Area 2, Herndon Annex* (Harding Lawson Associates, July 1999). The investigation is summarized below.

**Soil/Landfill Investigation.** During the Phase I field investigation completed in September 1994, no contaminants were found in excess of screening criteria in either soil or groundwater. Six soil borings were completed as monitoring wells. However, geophysical surveys indicated the likelihood that landfill materials were present, and concerns about the leaching of landfill materials to groundwater prompted a Phase II investigation. The three areas where landfill materials were identified are shown in Figure 3.



**Figure 3. Land and Groundwater Use Restriction Zones Associated with Former Landfills at Study Area 2**

During the Phase II investigation conducted in the fall of 1994, ten surface soil samples were collected from the three landfill areas. One sample contained benzo(a)pyrene at a concentration exceeding the Florida industrial Soil Cleanup Target Levels (SCTLs).

**Groundwater Investigation.** During the Phase I investigation, two groundwater samples from wells screened at the base of the surficial aquifer contained benzene concentrations exceeding the State maximum contaminant level (MCL) of 1 µg/L. An additional Phase II screening investigation was completed using direct-push technology (DPT). This investigation concluded that an off-site (upgradient) benzene source was likely.

In July 1996, the U. S. Army Corps of Engineers conducted an investigation of groundwater upgradient of Herndon Annex and found no benzene contamination in groundwater samples collected at depths up to 40 feet below land surface (bls).

The results of the Phase III screening activities in October and November 1996 showed that the benzene contamination plume was largely confined to the southeastern corner of Herndon Annex at depths ranging from 40 to 62 feet bls. The conclusions of the study were that the data cannot preclude the existence of an on-site benzene source. However, the absence of benzene detections at depths shallower than 40 feet bls reduces the likelihood of an on-site release. Historical evidence suggests the possibility of other upgradient sources of the benzene plume.

Phase IV site activities in 1997 focused on additional mapping of the benzene plume in the deep surficial aquifer. Additional groundwater screening using DPT was conducted on-site and off-site in the Azalea Park neighborhood to the east. Data collected through 1997 indicate that a benzene plume exists under Herndon Annex and the Azalea Park neighborhood.

Additional work during Phase IV included the collection of three surface water samples from Lake Barton (see Figure 2 for the location of Lake Barton). Tetrachloroethene was detected in two of the three samples with a maximum concentration which exceeded the Florida primary groundwater standard but not the Florida Class III (recreation) standard for surface water.

Phase V was conducted from October through December 1998. The data for the four monitoring wells in which there are benzene concentrations and multiple sampling events supported the conclusion that natural attenuation is taking place. From August 1997 to November/December 1998, there was a 14 to 100% decrease in groundwater benzene concentrations. Subsequent sampling has been performed on a quarterly basis beginning in July 1999. The trend in benzene concentrations is shown in Figure 4.

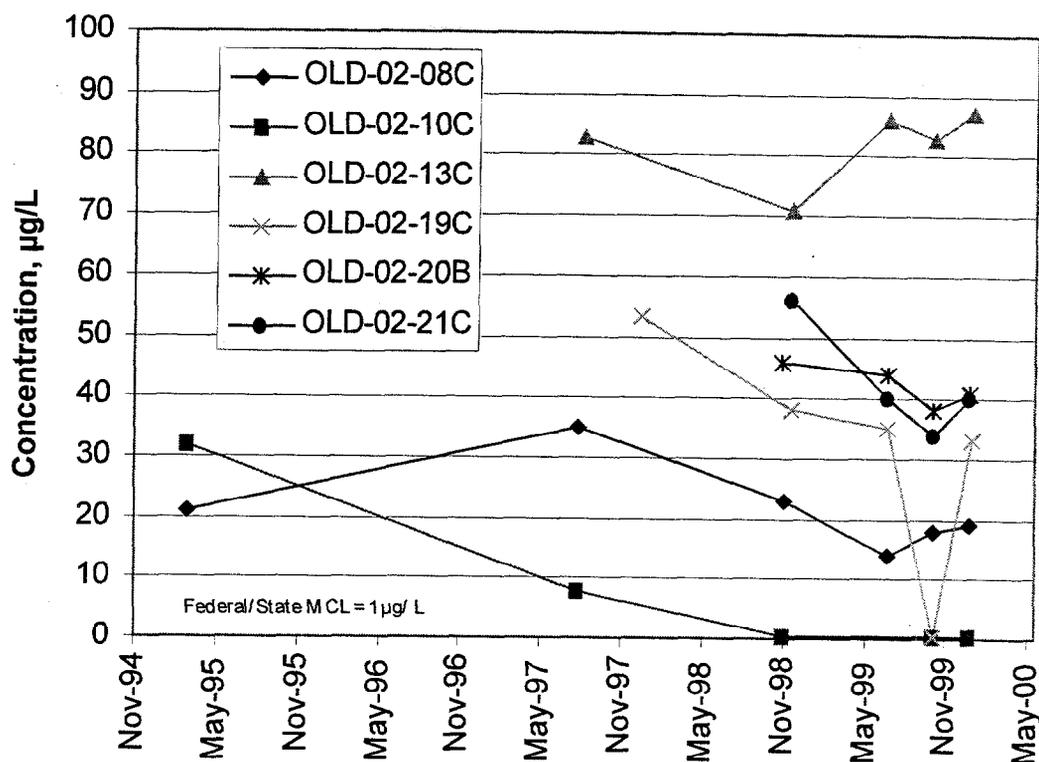


Figure 4. Benzene Concentrations in Groundwater at Study Area 2

**Private Wells.** The Navy and the City of Orlando conducted a well survey and found no permitted potable water wells screened in the surficial aquifer in the Azalea Park Neighborhood. However, three private irrigation wells and one well used to cool an air conditioning system exist in this neighborhood at the locations shown in Figure 2.

The private Azalea Park wells were sampled in August 1999, and benzene concentrations above State and Federal criteria were measured in the samples collected from the irrigation and air conditioning wells at 20 Nancy Lee. The source of the benzene has not been determined, but based upon the hydrogeology of the area, it is unlikely that Herndon Annex is the source of the contamination. The wells at 20 Nancy Lee are believed to be less than 20 feet deep, while the benzene contamination associated with the Herndon Annex has been detected in wells more than 35 feet deep.

**Selected Remedy**

The remedy for the contamination at SA 2 is a combination of active and passive remediation methods and institutional controls. The steps to be taken for each medium are described below and institutional controls to be implemented at SA 2 are discussed further in the following section.

**Surface Soil.** The surface soil at Herndon Annex does not have contaminants at concentrations that justify the need for additional delineation or remediation, because the intended reuse for the parcel is industrial. Only benzo(a)pyrene in one surface soil location exceeded the Florida SCTL for industrial use.

**Landfill Areas.** The transfer documents will require that future users be notified of the presence of the former landfills and that institutional controls be established to maintain existing soil cover and to prevent intrusive activities on the landfills. In addition, institutional controls will be implemented to prevent use of groundwater beneath the landfill areas. The landfill areas where land and groundwater use restrictions will be implemented are shown in Figure 3.

**Groundwater.** The selected groundwater remedy for the benzene-contaminated groundwater consists of

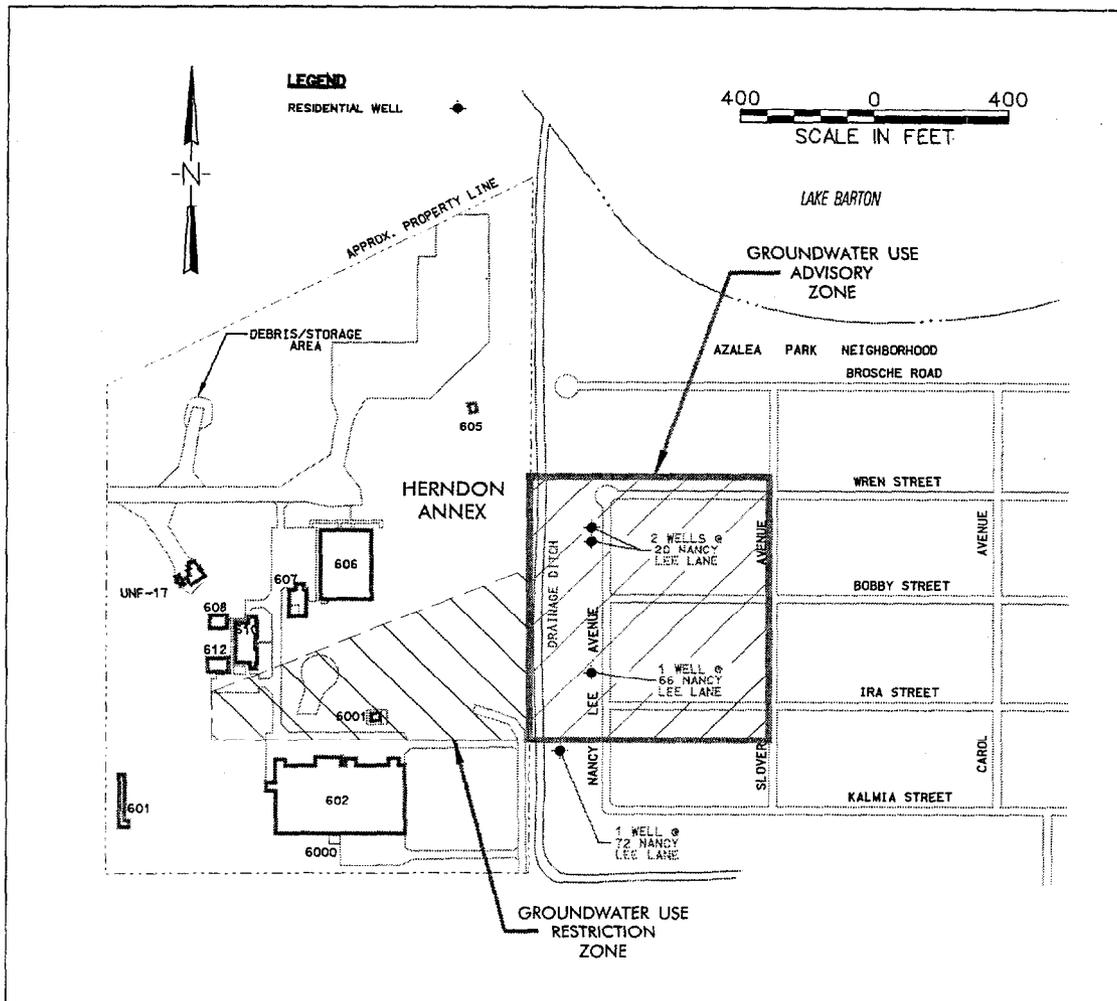
- Injecting Oxygen Release Compound (ORC) to enhance natural attenuation of the benzene plume
- Groundwater monitoring of the enhanced natural attenuation
- Implementing temporary groundwater use restrictions for the surficial aquifer

Due to the depth of the benzene plume, the bacteria in the groundwater may not have an adequate supply of oxygen to effectively consume the benzene. ORC will be pumped into the aquifer to supply the necessary oxygen and significantly speed up the benzene cleanup.

A quarterly groundwater monitoring program will be performed to verify attenuation. Samples will be analyzed for volatile organic compounds and natural attenuation parameters, and the resulting data evaluated to determine trends in benzene concentrations, specifically, decreases or increases over time. With permission of the residents, the monitoring program will include the four private wells within the Azalea Park neighborhood. The data will be reviewed quarterly and, after a period of one year, the monitoring program will be reevaluated to determine if additional ORC injections are necessary.

A temporary groundwater use restriction will be imposed for the surficial aquifer as shown in Figure 5. The groundwater use restriction will include an advisory to the St. Johns River Water Management District, the Orange County Environmental Protection Division, and the City of Orlando recommending that no wells in the surficial aquifer be permitted while the restriction is in place. In addition, local residents will be issued a groundwater use advisory warning them of the

potential hazards associated with using the surficial aquifer as a potable water source. The institutional controls to be implemented at SA 2 are described in greater detail in the following section.



**Figure 5. Groundwater Use Restriction and Advisory Zones Associated with the Benzene Plume at Study Area 2**

### Institutional Controls

The goals of the institutional controls at SA 2 are to protect human health and the environment by

- Limiting risk associated with exposure to landfill waste materials that are left in place
- Preventing the exposure/consumption of groundwater that exceeds State standards and groundwater cleanup target levels or Federal MCLs
- Maintaining the integrity of remediation/monitoring systems

Institutional controls at SA 2 will consist of administrative measures taken to prevent exposure of human receptors to waste materials left in place within the landfill boundary and to contaminated groundwater in the surficial aquifer. These institutional controls will be established on the Navy property at the time of property transfer, employing deed restrictions, notices, and agreements in a layering strategy to mutually reinforce the goals of the institutional controls. To provide for enforceability of the institutional controls, a Restrictive Covenant shall be applied to the property implementing those land and groundwater use restrictions. The Restrictive Covenant shall grant the FDEP a perpetual conservation easement on the property that shall be tied to the title to the property and that will be binding on all subsequent owners of the property. The Restrictive Covenant shall also be enforceable by the FDEP through injunctive relief or other available remedies. The Restrictive Covenant shall only be released with FDEP concurrence.

**Land Use Restrictions.** Land use restrictions will be placed on areas within the delineated landfill boundaries (see Figure 3) prohibiting residential use as well as prohibiting excavation, construction, drilling, and other activities (including use of heavy equipment) that may jeopardize the integrity of the existing soil cover or disturb wastes left in place. The land use restrictions shall be implemented by attaching a Restrictive Covenant to the deed providing for a perpetual conservation easement to FDEP granting FDEP enforcement rights to the land use restrictions.

The deed shall also specify that site workers must adhere to regulations for hazardous waste site workers (29 CFR Part 1910) during all excavation activities below 12 inches. Any activity involving the disturbance of soil below 12 inches should be approved in advance by the FDEP, and any excavated soil must be disposed of in accordance with all State, Federal, and local laws and regulations. In addition, the landfill is covered with a 2-foot layer of soil which must be maintained at all times, except when pre-approved excavation is occurring.

**Groundwater Use Restrictions.** Two separate groundwater use restrictions will be implemented at SA 2:

- A prohibition against using groundwater beneath the landfill areas
- A temporary prohibition against use of groundwater in the benzene plume on Navy property

The use of groundwater beneath the landfills (including drinking and irrigation) will be prohibited to prevent exposure to landfill materials that may have leached into the groundwater. The groundwater use restrictions will be included in the Restrictive Covenant to the deed as described above.

The use of benzene-contaminated groundwater within the groundwater restriction boundary that is located within the confines of the Navy property (see Figure 5) shall be prohibited (including drinking and irrigation) through the Restrictive Covenant until released by FDEP. The installation of new wells for any purpose other than assessing groundwater quality or remediating groundwater contamination shall be prohibited through the covenant. The disturbance of existing groundwater remediation systems, including monitoring wells, will also be prohibited.

The Navy will issue a groundwater use advisory to local residents of Azalea Park to the east of Herndon Annex notifying them of the presence of benzene in the surficial aquifer at depths ranging from 36 to 62 feet and warning them of the potential hazards from using the surficial aquifer for drinking purposes. Notification will also be provided to the St. Johns River Water Management District, the Orange County Environmental Protection Division, and the City of Orlando of the presence of benzene in the surficial aquifer both on the Herndon Annex property and the Azalea Park neighborhood.

Zoning and redevelopment activities at SA 2 must be consistent with land use and groundwater restrictions. The above-mentioned restrictions shall remain in place until such time when groundwater cleanup goals are met and land use restrictions have been removed by the Navy with FDEP concurrence.

### **Community Acceptance**

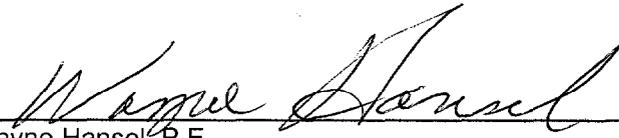
The public was informed of the activities regarding Herndon Annex in several meetings, including presentations to the facility's Restoration Advisory Board (RAB). RAB meetings are open to the public and their bimonthly meetings are publicized in *The Orlando Sentinel*. At the meeting held on September 17, 1997, the investigation of SA 2 was discussed and a fact sheet entitled *Update on Environmental Studies at Herndon Annex* was distributed. Subsequently, in November 1997 a Public Availability Session was held at the Azalea Park Elementary School to discuss the environmental studies and upcoming activities at Herndon Annex.

In September 1999 a notice was published weekly for 4 weeks inviting the public to the September RAB meeting and publishing the dates for the public comment period (September 8 through October 8, 1999). The status of SA 2 was the special topic for the meeting. The alternatives for remediating the site and the results of the quarterly monitoring were presented. There were no unresolved comments or questions from the public.

**Declaration**

Based on the administrative record compiled for this corrective action, the Navy has determined that the remedies selected for SA 2 are appropriate and protective of human health and the environment and comply with the Federal and State regulatory requirements. The Orlando Partnering Team concurs with the selected remedies.

**Signature**

  
\_\_\_\_\_  
Wayne Hansel, P.E.  
Base Realignment and Closure Environmental Coordinator

5-4-00  
Date