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STATEMENT OF BASIS SOLID WASTE MANAGEMENT UNIT 7 (SWMU 7) BUILDING N-126
PLATING SHOP DRY WELL MILLINGTON SUPPACT TN
12/01/2005
TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION



STATEMENT OF BASIS

SWMU 7 – Building N-126 Plating Shop Dry Well Naval Support Activity Mid-South Millington, Tennessee



Purpose of the Statement of Basis

This Statement of Basis (SB) has been prepared to inform the public and provide an opportunity to comment on a proposed remedy at solid waste management unit (SWMU) 7 — Building N-126 Plating Shop Dry Well, formerly part of the Naval Support Activity (NSA) Mid-South, Millington, Tennessee. NSA Mid-South is responsible for corrective action at SWMU 7 as a required by its Resource Conservation and Recovery Act (RCRA) permit. The United States Environmental Protection Agency (USEPA) Region IV and the Tennessee Department of Environment and Conservation (TDEC) have determined that the proposed remedy, land use controls that prohibits the use of site groundwater and restricts residential reuse is protective of human health and the environment.

Before the remedy is finalized, the USEPA and TDEC would like to give the public an

Site Description

Building N-126 is within the 538-acre airfield land parcel that was transferred to the City of Millington in 1999. The building is a two-story aircraft hangar/building with classrooms and offices. Formerly, the Aircraft Intermediate Maintenance Department (AIMD) operated a plating shop which reportedly used a 10-foot square by 6-foot deep gravel-filled dry well for disposing of plating wastes. To evaluate whether past operations impacted soil and groundwater, the dry well was designated as Solid Waste Management Unit (SWMU) 7 (Figure 1), prompting its characterization within the RCRA program.

opportunity to comment on the proposed remedy. At any time during the comment period, the public may comment as described in the following section "How Can You Participate?" Upon closure of the public comment period, USEPA and TDEC will evaluate all comments and determine if there is a need to modify the proposed remedy.

How Can You Participate?

The USEPA and TDEC solicit public review and comment on this SB prior to implementation of the proposed remedy as the final one. The final remedy for SWMU 7 will be incorporated in the Hazardous and Solid Waste Amendments (HSWA) Permit TNHW-094 for NSA Mid-South, scheduled to be updated in 2006.



Figure 1 – SWMU 7 at NSA Mid-South in Millington, Tennessee

Public comment on this SB and the proposed remedy will begin on the date that a notice of the SB's availability is published in *The Millington Star* and *The Commercial Appeal* local daily newspapers. Since community input could affect selection of a final remedy for SWMU 7, a public comment period has been established for 45 days from **(insert date)**. If requested during the comment period, USEPA and TDEC will hold a public meeting to respond to any oral comments or questions regarding the proposed remedy. To request a hearing or to provide comments, contact the following person in writing within the 45-day comment period:

Mr. Roger Donovan
TDEC — Division of Solid Waste Management
5th Floor, L&C Annex
401 Church Street
Nashville, TN 37243-1538



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Investigative reports and documents related to SWMU 7 are referenced at the end of this SB and are included in the Administrative Record, which can be reviewed in the Information Repository that was established to provide public access to documents pertaining to the Navy's environmental restoration program. The Information Repository is maintained at:

Millington Civic Center
8077 Wilkinsville Road
Millington, Tennessee 38053
(901) 873-5770

Background Summary

Past operations at the former Naval Air Station (NAS) Memphis included metal plating, repair work, and other operations that involved the use of toxic and hazardous materials. Land use changed as a result of the 1990 Base Closure and Realignment (BRAC) Act, and the name of the facility was changed from NAS Memphis to NSA Mid-South.

A significant portion of NSA Mid-South was transferred to the City of Millington, including SWMU 7. The remaining property was realigned (i.e., an operation was reassigned from NSA Mid-South to another facility, and/or an operation from another facility was reassigned to NSA Mid-South). Three facility operations changed: (1) Navy airfield operations ceased in October 1995, (2) training operations were realigned to NAS Pensacola in 1996 and (3) administrative operations for the Navy Bureau of Personnel (BUPERS) were realigned from Washington D.C. to NSA Mid-South in 1997.

Operations at Building N-126 included the former plating conducted by Aircraft Intermediate Maintenance Department (AIMD) between 1955 and 1978. Interviews with former AIMD employees found that plating wastes may have been transferred, via floor piping in the building, to the outside dry well (SWMU 7) where they percolated into the surrounding soil.

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As required by the Navy's RCRA Permit, NSA Mid-South is required to assess all SWMUs for potential environmental impacts. Due to the former operations at the site and their potential impact to the environment, the dry well was designated a SWMU.

The subsequent RCRA Facility Investigation initially focused on the dry well but expanded to include a large area when it became apparent there were multiple sources of the groundwater contaminant trichloroethylene, a common degreaser, beneath the tarmac and airport infield (RFI; EnSafe, 2000). The distribution of the contamination in the fluvial aquifer (40 and 80 feet in depth) appeared unrelated to the dry well leading the TDEC and USEPA to designate the impacted aquifer as Area of Concern A (AOC A) — Northside Fluvial Groundwater.

The SWMU 7 dry well was later removed through a Voluntary Corrective Action (VCA; EnSafe, 1999). Fluvial deposits groundwater impacts beneath SWMU 7 are being addressed as part of Area of Concern A. A Corrective Measures Study for AOC A recommended enhanced bioremediation with natural attenuation monitoring (CMS; EnSafe, 2003). Substrate injections to facilitate enhanced bioremediation began in May 2004.

Since fluvial groundwater impacts beneath SWMU 7 are being addressed under the Area of Concern A corrective measures, the selected remedy for SWMU 7 is land-use controls that prohibit use of the site's groundwater and restrict residential reuse. The basis for this remedy is provided under the "Summary of Contaminant Evaluation" and the "Summary of Site Risk" sections of the SB.

Summary of Contaminant Evaluation

Multiple investigations have been conducted at SWMU 7, beginning in 1983 and concluding with the 1999 VCA. However, the most comprehensive soil and groundwater data set were collected as part of the RFI. A summary of



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the number of samples collected from each media and those that exceeded health-based screening criteria are discussed below. Soil and groundwater sample locations are provided on Figures 2 and 3 (Attachment 1).

Soil

As part of the soil assessment, 57 soil samples were submitted from the loess for analyses, 13 from the fluvial deposits, and 12 from the Cockfield Formation confining unit that underlies the fluvial deposits aquifer. While the initial focus was the dry well area, as shown on Figure 2 sample locations expanded to cover a much larger area than the dry well.

Soil contaminants detected above risk based screening criteria consisted of dieldrin, a pesticide aerially applied in the 1950s and 1960s; several polycyclic aromatic hydrocarbons (PAHs), and a single detection of the polychlorinated biphenyl (PCBs) Aroclor 1260. Table 1 lists contaminants detected above the residential and/or industrial screening criteria, sample locations, and the associated concentrations.

**Table 1
Soil Contaminants Exceeding Risk Based Screening Criteria (ppb)^a**

Sample Location	Analyte	Result	RBC-RES ^b	RBC-IND ^b
PAHs^c				
007S0002	Benzo(a) pyrene	1,200	87	780
007S0002	Benzo(a)anthracene	1,200	870	7800
007S0002	Benzo(b)fluoranthene	1,200	870	7,800
007S0002	Dibenz(a,h)anthracene	240	87	780
007SMW11	Benzo(a) pyrene	360	87	780
007SMW11	Dibenz(a,h)anthracene	97	87	780
007SMW13	Benzo(a)anthracene	930	870	7,800
007SMW13	Benzo(a) pyrene	840	87	780
007SMW13	Benzo(b)fluoranthene	960	870	7,800
007SMW13	Dibenz(a,h)anthracene	240	87	780
007SMW16	Benzo(a)pyrene	216	87	780
007SMW17	Benzo(a)pyrene	140	87	780
007SMW18	Benzo(a)pyrene	350	87	780
Pesticides/PCBs				
007SMW16	Dieldrin ^d	420	40	360
007SMW17	Dieldrin ^d	360	40	360
007S0007	Aroclor 1260	20,000	320	2,900

Notes:

- ^a — Units of ppb denote parts per billion.
- ^b — Denotes residential (RES) and industrial (IND) risk based concentration taken from *Risk-Based Concentration Table*, October 7, 1999 (USEPA, 1999).
- ^c — Contaminant is a PAH (polycyclic aromatic hydrocarbon).
- ^d — Note the background reference concentration (262 ug/kg) —above the USEPA's residential RBC screening values.

Groundwater

Three groundwater units were evaluated as part of the SWMU 7 RFI, which from shallowest to deepest they are the loess, fluvial deposits, and the Cockfield Formation — the confining unit that separates the fluvial aquifer from the Memphis sand aquifer, a municipal water supply for the City of Millington. As previously discussed, since the fluvial deposits groundwater is undergoing corrective measures as part of *Area of Concern A* the loess groundwater is the only unit that remains associated with SWMU 7. The Cockfield formation was evaluated to demonstrate the vertical extent of fluvial contaminants migrating vertically and is therefore associated with *Area of Concern A*. Locations of monitoring wells set in the loess are provided in Figure 3.

Seven monitoring wells (007G01LS, 007G03LS, 007G05LS through 007G09LS) were set in the loess — clay/silt deposits that extend from the ground surface to a depth of approximately 30 feet. Contaminants detected in groundwater above either the maximum contaminant level (MCL) or USPEA's risk based concentration for tap water include: trichloroethene (TCE), tetrachloroethene (PCE), 1,1-dichloroethane (1,1-DCA), 1,2-dichloroethane (1,2-DCA), 1,2 dichloropropane (1,2-DCP), benzene, chloroform and total petroleum hydrocarbons — diesel range organics (TPH-DRO). The maximum contaminants detected above a screening value were primarily limited to a single monitoring well (007G01LS).

Table 2
Exceedances in Loess Groundwater (ug/L)
Max. of Three Monitoring Events

Sample Location	Analyte	Result	MCL ^a	RBC-Tap Water ^b
007G01LS	TCE	19	5	1.6
007G01LS	Benzene	8	5	0.36
007G01LS	1,1-DCE	4	7	0.44
007G01LS	PCE	2	5	1.1
007G01LS	1,2-DCA	4	5	0.12
007G01LS	1,2-DCP	2	5	0.16
007G09LS	Chloroform	3	100	0.15
007G09LS	TPH-DRO ^c	120		0.1 ^d

Notes:

- ^a — Maximum Contaminant Levels (MCLs) in drinking water are from the *Drinking Water Regulations and Health Advisories* (USEPA, 1996).
- ^b — Tap water RBC is from the *Risk-Based Concentration Table*, 1999 (USEPA, 1999).
- ^c — Units for TPH-DRO in milligrams per kilogram (mg/kg).
- ^d — No Tap Water RBC exists for this compound, so TDEC's drinking water aquifer standard was used.

Removal Actions

In September 1996, the dry well was removed through a VCA, during which the pit floor and walls were over-excavated by approximately 2 feet. Six confirmation soil samples were collected from the floor of the excavation and analyzed for metals, VOCs, and TPH. Based on the analytical data coupled with the absence of related impacts in groundwater near the dry well, the VCA report recommended No Further Action for the site. The excavation was backfilled and capped with concrete (EnSafe, 1999).

Summary of Site Risk

Risks to human health and the environment from the contaminants identified at SWMU 7 were evaluated in accordance with existing USEPA and TDEC methods.

Human Health Risk

Risk assessments use estimated intake as part of the calculations. Intake is affected by the land-use scenarios, where one scenario may account for lifetime exposure to groundwater and soil, and another scenario may only include occasional exposure to soil with no groundwater exposure. To assess human health

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risk at SWMU 7, data from the RFI were used to evaluate risks using future residential, construction, and industrial land-use scenarios (EnSafe, 2005).

• **Soil**

The human health risk associated with SWMU 7 soil indicates no contaminants of concern are present under an industrial reuse of the site. Aroclor 1260 was determined to be a chemical of concern for a hypothetical resident.

• **Groundwater**

TCE in loess groundwater was found to pose a risk to populations who would use loess groundwater as tap water.

• **Air**

TCE was detected at 007G01LS above the USEPA's target groundwater threshold of 5.3 ppb (USEPA, 2002) that is used to gauge whether TCE could pose an indoor air quality/inhalation concern to future occupants of the site.

Ecological Risk

The site is covered with concrete and based on the heavy development of the area and the high level of human disturbance, the ecological risk assessment concluded the area is not capable of supporting a viable terrestrial community (EnSafe, 2000).

Selected Remedy for SWMU 7

Based on evaluation of risks, the selected remedies for SWMU 7 are the following land-use controls:

- The site must be reused for nonresidential purposes only.
- The use of shallow (loess) groundwater is prohibited. The installation of wells in the Memphis Sand or deeper aquifers must be double-cased to prevent any downward migration of contamination.



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These land-use controls have been incorporated into the *Land-Use Control Implementation Plan (LUCIP)* for Area of Concern A which apply to the entire Airfield area and are memorialized in the Airfield deed (*Quitclaim Deed JY7103*).

The LUCIP includes a *Land-Use Control Compliance Certification* form to be completed annually which ensures the protections remain in place and includes the following:

- Location of land subject to LUC
- Explanation of LUC (e.g., signage and fencing requirements, restrictions, etc.)
- Duration of the LUC
- Requirements and frequency of LUC inspections, including documentation requirements.

Although TCE was detected at well 007G01LS above USEPA's target groundwater threshold that is used to gauge whether it could pose an indoor air quality/inhalation concern, no additional land-use controls are proposed at this time because this threshold is based on a residential scenario and data used for comparison are over 10 years old. However, it may be prudent prior to development in the area of well 007G01LS to collect additional data for a more comprehensive evaluation of potential indoor air quality hazards.

Since the USEPA and TDEC's goals for human health and ecological risks have been met, no other remedial alternatives were evaluated. The proposed remedy of land-use controls is considered protective of human health and the environment. The remedy meets the four general standards of corrective measures, which are:

- Overall protection of human health and the environment
- Attainment of media cleanup standards
- Controlling the sources of release
- Compliance with standards for management

References

Technical Memorandum – Preliminary Risk Evaluation SWMU 7 – Building N-126 Dry Well; Naval Support Activity Mid-South. (EnSafe, December 21, 2005).

RCRA Facility Investigation Report; Naval Support Activity Mid-South. AOC A. Northside Fluvial Groundwater. Revision 02 (EnSafe, February 17, 2000).

RCRA Facility Investigation Report Addendum; Naval Support Activity Mid-South. Area of Concern A. Northside Fluvial Groundwater. Revision 0 (EnSafe, February 17, 2000).

Voluntary Corrective Action Report; RCRA Facility Investigation; Naval Support Activity Memphis; SWMU 3, 7, 17, 18, 19, 67, and Apron Area Gasoline Pits; Revision 2 (EnSafe, May 1999).

Assembly A Long-Term Groundwater Monitoring Report (March 1995 – August 1996); Naval Support Activity Memphis; Revision 1 (EnSafe, May 30, 1997).

Attachment 1
Figures