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NSA MID SOUTH  
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STATEMENT OF BASIS SOLID WASTE MANAGEMENT UNIT 59 (SWMU 59) PESTICIDE  
STORAGE FACILITY OLD PESTICIDE SHOP MILLINGTON SUPPACT TN  
11/01/2005  
TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION

STATEMENT OF BASIS



**SWMU 59 — Pesticide Storage Facility  
(Old Pesticide Shop)  
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) 59 — Pesticide Storage Facility (i.e., commonly referred to as the Old Pesticide Shop), at Naval Support Activity (NSA) Mid-South, Millington, Tennessee. NSA Mid-South is responsible for corrective action at SWMU 59, as required by a Resource Conservation and Recovery Act (RCRA) permit. The Tennessee Department of Environment and Conservation (TDEC) has determined that the proposed remedy of No Further Action is protective of human health and the environment.

**How Can You Participate?**

TDEC solicits public review and comment on this SB prior to implementation of the proposed remedy as the final one. The final remedy for SWMU 59 will be incorporated into the Hazardous and Solid Waste Amendments Permit TNHW-094 for NSA Mid-South, scheduled to be updated in 2006.

Before the remedy is finalized, TDEC would like to give the public an opportunity to comment on the proposed remedy.

**Site Description**  
West of First Avenue on NSA Mid-South's Southside, SWMU 59 consists of Building S-335, a wood-framed, sheet metal exterior structure (Figure 1). An asphalt parking lot surrounds the building on the north, south, and west sides. Building S-335 is an estimated 30 years old and reportedly stored pesticides and fertilizers. The area slopes gently to the east, with runoff flowing toward a storm drain and under First Street to an outfall at SWMU 38. Little historical information is available regarding SWMU 59 operations, as employees associated with the SWMU 59 pesticide operation are no longer at NSA Mid-South.

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 TDEC will evaluate all comments and determine if there is a need to modify the proposed remedy.



Figure 1 SWMU 59 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 59, a public comment period has been established for 45 days from (*insert date*). If requested during the comment period, 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:



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Investigative reports and documents related to SWMU 59 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 program. The Information Repository is maintained at:

**Millington Public Library**  
**4858 Navy Road**  
**Millington, Tennessee 38053**  
**(901) 872-1585**

**Background Summary**

Past operations at the former Naval Air Station (NAS) Memphis included metal plating, manufacturing, 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 Naval Support Activity (NSA) Mid-South.

A significant portion of NSA Mid-South's Northside was transferred to the City of Millington, and 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 were realigned from Washington, D.C., to NSA Mid-South in 1997.

SWMU 59 is part of the remaining NSA Mid-South property. According to the 1990 *Resource Conservation and Recovery Act (RCRA) Facility Assessment Report* (RFA; ERC/EDGE, 1990a), the site warranted further investigation because pesticides were reported to have been stored at Building S-335, SWMU 59, including chlordane, dieldrin, and DDT. Arsenic, a common component of early pesticide formulations, was also noted as a possible contaminant in the 1990 RFA report.

As required by the Navy's RCRA Permit, NSA Mid-South is required to evaluate and assess all SWMUs for potential environmental impacts. Due to the former operations at the site, Building S-335 and its immediate surroundings were designated as a site warranting further evaluation to determine the potential risks to human health and the environment.

Subsequent investigations consisted of the *RCRA Facility Investigation, NAS Memphis Site No. 59* (RFI; ERC/EnSafe, 1990), a *Visual Site Inspection Report* (ERC/EDGE, 1990b), and the *Assembly E RFI* (EnSafe/Allen and Hoshall, 1998), which ultimately led to the *Voluntary Corrective Action Report* (VCA; EnSafe, 1999) to remove pesticide-contaminated soil surrounding Building S-335. A follow-up revision to the RFI was completed, which evaluated the residual contaminants and risk after the removal action (EnSafe, 2000). Analytical results from these investigations resulted in a "No Further Action" remedy for SWMU 59. The basis for the remedy selection is provided under the "Summary of Contaminant Evaluation" and "Summary of Site Risk" sections of the SB.



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**Summary of Contaminant Evaluation**

Throughout the course of the RFI, 23 surface soil and 34 subsurface soil samples were collected to characterize possible impacts to site soil. As part of the groundwater characterization, two groundwater units were sampled: three monitoring wells were constructed in loess (clays and silts) at a depth of approximately 20 feet, and two groundwater samples were collected from the deeper fluvial sand and gravel unit at a depth of approximately 54 feet. Soil and groundwater sample locations are shown in Figures 2 and 3 (Attachment 1), respectively.

**Soil**

Table 1 lists the maximum chemical concentrations in soil that were detected above the U.S. Environmental Protection Agency's (USEPA) risk-based screening concentrations. These detected chemicals primarily consist of pesticides (chlordanes, dieldrin, aldrin, 4,4-DDT, heptachlor epoxide) and, to a lesser degree, semi-volatile organic compounds (benzo(a)pyrene, benzo(a)fluoranthene) and metals (arsenic and lead).

**Table 1  
Soil Contaminants Exceeding Risk-Based  
Screening Criteria  
(maximum detections in ppb)<sup>a</sup>**

Sample Location (depth)	Analyte	Result	RBC Res.	RBC Ind.
SS1 (0-1')	Arsenic	33 <sup>b</sup>	0.43 <sup>b</sup>	3.8 <sup>b</sup>
SS3 (0-1')	Chlordane	279,719	1,800	16,000
059S0011 (0-6")	Dieldrin	1,800	40	360
059S0011 (0-6")	Technical Chlordane	52,000	1,800	16,000
059S0011 (0-1')	Lead	625 <sup>b</sup>	400 <sup>b,c</sup>	1,300 <sup>b,c</sup>
059S0012 (0-6")	Aroclor-1260	5,400	320	2,900
059S0012 (0-6")	Benzo(a) fluoranthene	1,200	870	7,800
059S0012 (0-6")	Benzo(a) pyrene	950	87	780
059S0012 (0-6")	4,4-DDT	4,000	1,900	17,000
059S02LS (0-2')	Heptachlor epoxide	2,200	70	630
059S02LS (0-2')	Aldrin	840	38	340
059S02LS (0-2')	4,4-DDE	2,500	1,900	17,000

**Notes:**

- <sup>a</sup> = parts per billion (ppb)
- <sup>b</sup> = Arsenic and lead concentrations are in units of parts per million (ppm).
- <sup>c</sup> = No RBC exists for lead; the soil screening values for residential and industrial soil are used for comparison.
- RBC = Risk-based concentration

**Groundwater**

Groundwater sampling showed pesticides, TPH, and lead were present in loess groundwater above their respective screening criteria, however, these contaminants were absent in fluvial deposits groundwater. Monitoring well 059G02LS, located in the same area where pesticides were detected in soil, was the most impacted of the three monitoring wells. Table 2 lists the maximum chemical concentrations in groundwater that were detected above their respective screening criteria.

**Table 2  
Groundwater Contaminants Exceeding Risk or  
Regulatory Based Screening Criteria  
(maximum detections in ppb)<sup>a</sup>**

Sample Location	Analyte	Result	Tap Water RBC	MCL	RC
059G02LS	TPH-DRO	160	100 <sup>b</sup>	100 <sup>b</sup>	NA
059G02LS	Technical Chlordane	1.1	0.19	2	NA
059G02LS	Dieldrin	0.052	0.0042	NA	NA
059G02LS	Heptachlor	0.069	0.015	0.4	NA
059G02LS	Heptachlor epoxide	0.19	0.00074	0.2	NA
059G01LS	Lead	30.6	15 <sup>c</sup>	15 <sup>c</sup>	17.5

**Notes:**

- <sup>a</sup> = parts per billion (ppb)
- <sup>b</sup> = TPH does not have an RBC or MCL. The TDEC groundwater cleanup standard of 100 ppb for drinking water has been used for comparison.
- <sup>c</sup> = Lead does not have an RBC or MCL; therefore, the USEPA treatment technique action level of 15 ppb has been substituted for screening purposes.
- NA = denotes that no MCL or background RC is available for this organic compound.
- ppb = parts per billion (ppb)
- MCL = Maximum contaminant level



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**Summary of Site Risk**

Risks to human health and the environment from the contaminants identified at SWMU 59 were evaluated using human health and ecological risk assessments, which were developed in accordance with existing USEPA and TDEC methods as part of the RFI.

**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. Human health risk at SWMU 59 was assessed using three scenarios: hypothetical resident, construction worker, and site worker. Chemicals of concern identified through the risk assessment include the following.

- **Soil**

Chemicals of concern in soil to a hypothetical resident include aldrin, Aroclor 1260, alpha chlordane, gamma-chlordane, arsenic, chromium, dieldrin, heptachlor, heptachlor epoxide, 4,4-DDT. No chemicals of concern were identified in subsurface soil for the construction worker scenario. No chemicals of concern were identified in surface soil for the hypothetical site worker scenario.

- **Groundwater**

Chemicals of concern in groundwater to a hypothetical resident include barium, lead, vanadium, and heptachlor epoxide. No chemicals of concern were identified in groundwater for a hypothetical site worker scenario.

**Ecological Risk**

Because the site is surrounded by asphalt and a minimal area of grass (1,600 square feet), the ecological risk assessment concluded there is no quality habitat available and no viable terrestrial community present at SWMU 59.

Based on the detected contaminants and their associated risk, the RFI recommended the demolition of Building S-335 and the removal of contaminated soil surrounding the building (EnSafe/Allen and Hoshall, 1998). Additionally, the RFI recommended groundwater monitoring of paired wells 059G03LS and 059G03UF (hydraulically downgradient from Building S-335) and well 059G01LS (hydraulically upgradient of Building S-335).

**Removal Actions**

Building S-335 was demolished in 1999 and contaminated soils were excavated through a VCA. At the conclusion of the VCA, approximately 374 cubic yards of contaminated soil were removed from an area surrounding Building S-335 (excavation area shown in Figures 2 and 3, Attachment 1) and included the area of impacted monitoring well 059G02LS. Confirmation samples collected from the bottom of the excavation indicated that all residual pesticides had been removed from the site soils. The VCA report (EnSafe, 1999) recommended that site risk be reevaluated in a revision to the RFI report and that additional groundwater monitoring be conducted to verify the absence of the previously identified groundwater contaminants.



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In the revision to the RFI report, a preliminary risk evaluation of the confirmation data associated with the removal action concluded that since no chemicals of concern were present in soil, a soil risk is no longer posed at the site. This, coupled with the absence of pesticides after two additional groundwater monitoring events, led to the RFI recommendation of No Further Action and the conclusion that the site is suitable for both residential and industrial reuse (EnSafe, 2000). TDEC and USEPA both approved the RFI in 2001.

### **Selected Remedy for SWMU 59**

Since TDEC's goals for human health and ecological risks have been met, no alternative remedies were evaluated. The Navy's proposed remedy of No Further Action 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

There are no site-related contaminants that would pose an excessive risk to an unrestricted reuse of the property or warrant implementation of institutional controls.

### **References**

- EnSafe Inc. (1999). *Voluntary Corrective Action Report; SWMU 59 — Old Pesticide Shop. Revision 2*. Memphis, Tennessee.
- EnSafe Inc. (2000, October 6). *RCRA Facility Investigation Report (RFI) Assembly E — SWMUs 2, 9, 14, 38, 59, and 65 NSA Mid-South, Millington, Tennessee Revision 2*. Memphis, Tennessee.
- EnSafe/Allen and Hoshall. (1998). *Assembly E RFI Report. Revision 1*. Memphis, Tennessee.
- ERC/EDGE. (1990a, September). *RCRA Facility Assessment (RFA), NAS Memphis*. Nashville, Tennessee.
- ERC/EDGE. (1990b, April). *Visual Site Inspection Report — NAS Memphis*. Millington, Tennessee. Nashville, Tennessee.
- ERC/EnSafe. (1990, October). *RCRA Facility Investigation Report, NAS Memphis Site No. 59 (Building No. S-335, Former Pesticide Storage Facility), NAS Memphis*. Knoxville, Tennessee.

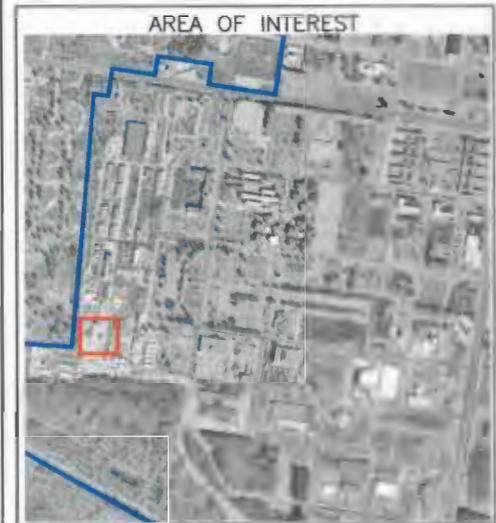
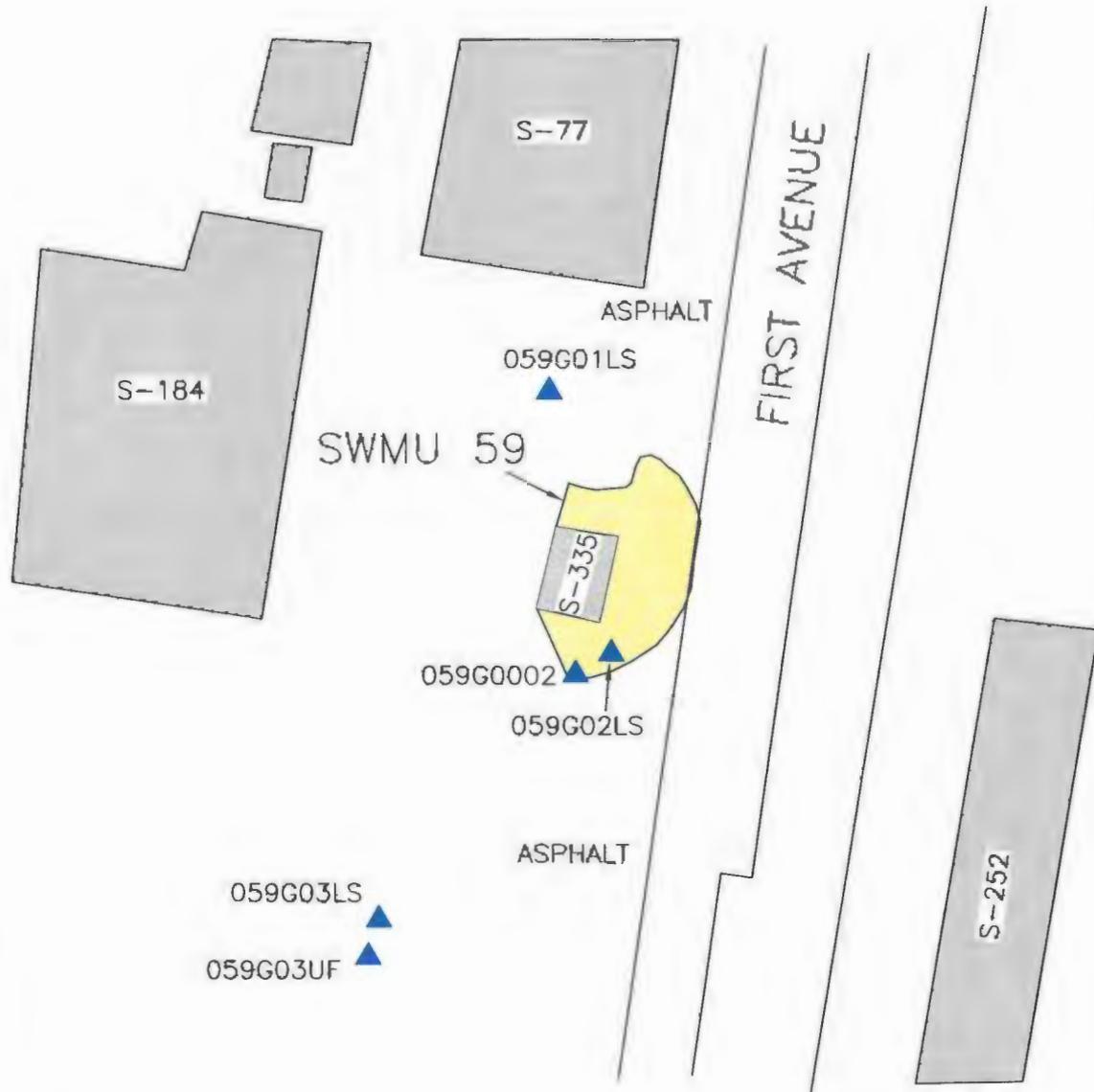
**Attachment 1**  
**Figures**

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FIGURE 2  
 SWMU 59 STATEMENT OF BASIS  
 SOIL SAMPLE LOCATIONS

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 K:\CAD\084\0084-001\009\4001\0017\_P163\_SWMU\_59.DWG



LEGEND

- ▲ - GROUNDWATER SAMPLE LOCATION
- 059G0002 - DPT GROUNDWATER SAMPLE DESIGNATION
- 059G03LS - LOESS MONITORING WELL GROUNDWATER SAMPLE DESIGNATION
- 059G03UF - UPPER FLUVIAL GROUNDWATER SAMPLE DESIGNATION
- - AREA EXCAVATED DURING VCA
- - NSA MID-SOUTH BOUNDARY
- - AREA OF INVESTIGATION
- - BUILDING



FIGURE 3  
 SWMU 59 STATEMENT OF BASIS  
 GROUNDWATER SAMPLE LOCATIONS