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HAZARDOUS WASTE MANAGEMENT PERMIT MILLINGTON SUPPACT TN
9/29/2011
NAVFAC SOUTHERN

**State of Tennessee
Department of Environment
and Conservation
Division of Solid Waste Management**

**Hazardous Waste Management Program
5th Floor, L & C Tower
401 Church Street
Nashville, Tennessee 37243-1535**

HAZARDOUS WASTE MANAGEMENT PERMIT

Permittee: Naval Support Activity Mid-South
Facility: Naval Support Activity Mid-South
Owner/Operator: Naval Support Activity Mid-South
Location: 5722 Integrity Drive, Millington, TN 38054
EPA ID Number: TN2 17 002 2600
Permit Type: Corrective Action Only
Units: Facility SWMUs and AOCs
Permit Number: TNHW-149

Pursuant to the Tennessee Hazardous Waste Management Act, as amended [Tennessee Code Annotated (T.C.A.) §68-212-101 *et seq.*] and Regulations [Tennessee Rule Chapter (Chapter) 1200-01-11] promulgated thereunder by the Tennessee Solid Waste Disposal Control Board, a corrective action only, hazardous waste permit is issued to Naval Support Activity Mid-South (hereinafter called the permittee). The facility is located in Millington, Shelby County, Tennessee at latitude 35° 20' 00" north and longitude 89° 52' 04" west. The permittee shall be required to perform corrective action in accordance with the terms of this permit.

This permit is issued under the authority of T.C.A. §68-212-108. The permittee shall be required to investigate any releases of hazardous waste or hazardous constituents pursuant to this permit at the facility regardless of the time at which waste was placed in a unit and to take appropriate corrective action for any such releases. The permit also requires the permittee to comply with all applicable land disposal restrictions and air emission standards, and to notify of imminent hazards.

The permittee must comply with all terms and conditions of this permit. This permit consists of the conditions contained herein (including those in any attachments) and the applicable regulations contained in Chapter 1200-01-11, as specified in the permit. Applicable regulations are those from Tennessee Rule (Rule) 1200-01-11-.06, which are in effect on the date of issuance of the permit. For all other rules in Chapter 1200-01-11, applicable regulations are those in effect on the date of the issuance of this permit and any subsequent modifications to those rules as they become effective.

Continuation, Transfer, Modification, Revocation and Reissuance, and Termination of this permit shall comply with and conform to Rule 1200-01-11-.07(9).

This permit is based on the premise that the information and reports submitted by the permittee prior to issuance of this permit or prior to any subsequent modification to this permit are accurate. Any inaccuracies found in this information or information submitted as required by this

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permit may be grounds for termination or modification of this permit and enforcement action. The Commissioner may modify this permit if information is received which was not available at the time of permit issuance and which would have justified the application of different permit conditions at the time of issuance. The permittee must notify the Commissioner of any deviation from or changes in the information in the application which would affect the permittee's ability to comply with the applicable regulations or permit conditions.

This permit is effective as of September 29, 2011 and shall remain in effect until September 29, 2021, unless revoked and reissued, or terminated, or continued.

Mike Apple
Director

September 29, 2011
Date

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I. STANDARD CONDITIONS

A. EFFECT OF PERMIT

The permittee is required to conduct corrective action for any releases of hazardous waste or hazardous constituents in accordance with the conditions of this permit. Any receipt or handling of hazardous waste not authorized in this permit is prohibited, unless such management is not subject to a permit as set forth at Rule 1200-01-11-.07(1)(b), is operating under interim status as set forth in Rule 1200-01-11-.07(3)(a), or is subject to a separate hazardous waste management permit issued by the Tennessee Department of Environment and Conservation (Department). Compliance with this permit during its term constitutes compliance, for the purposes of enforcement, with the Tennessee Hazardous Waste Management Act of 1977, as amended, as it applies to the permitted activities, except for those requirements not included in the permit which: (1) become effective by statute or (2) are promulgated under Rule 1200-01-11-.10 restricting the placement of hazardous waste in or on the land. However, this permit may be modified, revoked and reissued, or terminated during its term for cause as set forth in this permit and Paragraph (9) of Rule 1200-01-11-.07. Issuance of this permit does not authorize any injury to persons or property, any invasion of other private rights, or any infringement of other State or local laws or regulations. This permit does not convey any property rights of any sort or any exclusive privilege. Compliance with the terms of this permit does not constitute a defense to any order issued or any action brought under Section 3013 or Section 7003 of the Resource Conservation and Recovery Act of 1976 as amended (42 U.S.C.A. 6901 et seq., commonly referred to as RCRA), Sections 104, 106(a) and 107 of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (42 U.S.C.A. 9601 et seq., commonly known as CERCLA), Sections 68-212-206(a), 207 and 215(c) of the Tennessee Hazardous Waste Management Act of 1983, as amended, or any other law providing for protection of public health or the environment.

B. SEVERABILITY

The provisions of this permit are severable, and if any provision of this permit or the application of any provision of this permit to any circumstance is held invalid, the application of such provision to other circumstances and the remainder of this permit shall not be affected thereby.

C. DEFINITIONS

For the purpose of this permit, terms used herein shall have the same meaning as those in Rules 1200-01-11-.01, .02, .06, .07 and .10, unless this permit specifically provides otherwise. Where terms are not defined in the regulations, the permit, or U.S. Environmental Protection Agency (EPA) guidelines or publications, the meaning associated with such

terms shall be as defined by a standard dictionary reference or the generally accepted scientific or industrial meaning of the term.

1. "Area of concern" (AOC) includes any area having a probable release of a hazardous waste or hazardous constituent that is not from a solid waste management unit and is determined by the Commissioner to pose a current or potential threat to human health or the environment. Such areas of concern may require investigations and remedial action as required by this permit and Rule 1200-01-11-.07(8)(b)2(ii) in order to ensure adequate protection of human health and the environment.
2. "Contamination" refers to the presence of any hazardous constituent in a concentration that exceeds the naturally occurring concentration of that constituent in the immediate vicinity of a unit.
3. A "corrective action management unit" (CAMU) includes any area within a facility that is designated by the Commissioner under Rule 1200-01-11-.06(22), for the purpose of implementing corrective action requirements under Rule 1200-01-11-.06(6)(1). A CAMU shall only be used for the management of remediation wastes pursuant to implementing such corrective action requirements at the facility.
4. "Corrective measures" include all corrective action necessary to protect human health and the environment for all releases of hazardous waste or hazardous constituents from any solid waste management unit at the facility, regardless of the time at which the waste was placed in the unit, as required under Rule 1200-01-11-.06(6)(1). Corrective measures may address releases to air, soil, sediment, surface water or groundwater.
5. "Extent of contamination" is defined as the horizontal and vertical area in which the concentrations of hazardous constituents in an environmental media are above detection limits or background concentrations indicative of the region, whichever is appropriate as determined by the Commissioner.
6. "Facility" includes all contiguous land, and structures, other appurtenances, and improvements on the land, used for treating, storing, or disposing of hazardous waste. A facility may consist of several treatment, storage, or disposal operational units, e.g., one or more landfills, surface impoundments or combination of them. For the purposes of implementing corrective action under Rule 1200-01-11-.06(6)(1), a facility includes all contiguous property under the control of the owner or operator seeking a permit under the Tennessee Hazardous Waste Management Act.
7. "Hazardous constituent(s)" or "hazardous waste constituent(s)" are those substances listed in Rule 1200-01-11-.02(5), Appendix VIII, including hazardous constituents released from any waste and hazardous constituents that are reaction by-products.
8. "Interim measures" are actions necessary to minimize or prevent the further migration of contaminants and limit actual or potential human and environmental

exposure to contaminants while long-term corrective action remedies are evaluated and, if necessary, implemented.

9. "Land disposal" means placement in or on the land, except for a "corrective action management unit," and includes, but is not limited to, placement in a landfill, surface impoundment, waste pile, injection well, land treatment facility, salt dome formation, underground mine or cave, or concrete vault or bunker intended for disposal purposes.
10. "Landfill" includes any disposal facility or part of a facility where hazardous waste is placed in or on the land and which is not a pile, a land treatment facility, a surface impoundment, an underground injection well, a salt dome formation, a salt bed formation, an underground mine, a cave or a corrective action management unit.
11. "Point of compliance" refers to the vertical surface located at the hydraulically downgradient limit of the waste management area that extends down into the uppermost aquifer underlying the regulated unit.
12. "Point of exposure" refers to a point in place and time that an organism can come in contact (ingestion, inhalation or dermal contact) with a hazardous constituent. Facilities are usually evaluated for human health and environmental concerns. Environmental is synonymous with the term ecological, which includes all plants and animals, except humans.
13. "Registered engineer," "registered professional engineer" or "qualified professional engineer" shall mean a person authorized to perform engineering in Tennessee pursuant to Tennessee Code Annotated, Title 62, Chapter 2.
14. "Release" includes any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping or disposing into the environment of any hazardous waste or hazardous constituents.
15. "Remediation waste" includes all solid and hazardous wastes, and all media (including groundwater, surface water, soil and sediment), and all debris which contain a listed hazardous waste or which themselves exhibit a hazardous waste characteristic, that are managed for the purpose of implementing the corrective action requirements of Rule 1200-01-11-.06(6)(1). For a given facility, remediation wastes may originate only from within the facility boundary, but may include waste managed for releases that have migrated beyond the facility boundary.
16. "Screening levels" are health-based concentrations of hazardous constituents determined to be indicators for the protection of human health and/or the environment.
17. "Solid waste" means any garbage, refuse, sludge from a waste treatment plant, water supply treatment plant or air pollution control facility and other discarded material, including solid, liquid, semisolid or contained gaseous material resulting from

industrial, commercial, mining or agricultural operations, or from community activities, but does not include solid or dissolved materials in domestic sewage or solid or dissolved materials in irrigation return flows or industrial discharges that are point sources subject to permits under Section 402 of the Federal Water Pollution Control Act, as amended (86 Stat. 880), or source, special nuclear, or by-product material as defined by the Atomic Energy Act of 1954, as amended (68 Stat. 923).

18. A "solid waste management unit" (SWMU) includes any unit that has been used for the treatment, storage or disposal of solid waste at any time, irrespective of whether the unit is or ever was intended for the management of solid waste. Permitted or interim status hazardous waste management units are also solid waste management units. Solid waste management units include areas that have been contaminated by routine and systematic releases of hazardous waste or hazardous constituents, excluding one-time accidental spills that are immediately remediated and cannot be linked to solid waste management activities, e.g., product or process spills.
19. "Surface impoundment" or "impoundment" includes any facility or part of a facility which is a natural topographic depression, man-made excavation or diked area formed primarily of earthen materials, although it may be lined with man-made materials, which is designed to hold an accumulation of liquid wastes or wastes containing free liquids, and which is not an injection well. Examples of surface impoundments are holding, storage, settling and aeration pits, ponds and lagoons.
20. A "temporary unit" (TU) includes any temporary tanks and/or container storage areas used solely for treatment or storage of hazardous remediation wastes during specific remediation activities. Designated by the Commissioner, such units must conform to specific standards and may only be in operation for the period of time as specified in this permit.
21. A "unit" includes, but is not limited to, any landfill, surface impoundment, waste pile, land treatment unit, incinerator, injection well, tank, container storage area, septic tank, drain field, wastewater treatment unit, elementary neutralization unit, transfer station or recycling unit.

D. GENERAL DUTIES AND REQUIREMENTS

1. Duty to Comply: The permittee shall comply with all conditions of this permit, except that the permittee need not comply with the conditions of the permit to the extent and for the duration that such noncompliance is authorized in an emergency permit. Any permit noncompliance, except under the terms of an emergency permit, constitutes a violation of the Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application.
2. Duty to Reapply: If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for and

obtain a new permit. The permittee must submit a new application at least 180 calendar days before the expiration date of the effective permit, unless permission for a later date has been granted by the Commissioner. The Commissioner shall not grant permission for applications to be submitted later than the expiration date of the existing permit.

3. Need to Halt or Reduce Activity Not a Defense: It shall not be a defense for the permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.
4. Duty to Mitigate: In the event of noncompliance with the permit, the permittee shall take all reasonable steps to minimize releases to the environment, and shall carry out such measures as are reasonable to prevent significant adverse impacts on human health or the environment.
5. Proper Operation and Maintenance: The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems only when necessary to achieve compliance with the conditions of the permit.
6. Permit Actions: This permit may be modified, revoked and reissued, or terminated for cause as specified in Rule 1200-01-11-.07(9)(c). The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes under Subparagraph I.D.11(a) or anticipated noncompliance under Subparagraph I.D.11(b), does not stay any existing permit condition.
7. Duty to Provide Information: The permittee shall furnish to the Commissioner, within a reasonable time, any relevant information which the Commissioner may request to determine whether cause exists for modifying, revoking and reissuing, terminating this permit, or to determine compliance with this permit. The permittee shall also furnish to the Commissioner, upon request, copies of records required to be kept by this permit.
8. Inspection and Entry: The permittee shall allow the Commissioner, or any authorized representative, upon presentation of credentials and other documents as may be required by law to:
 - (a) Enter, at reasonable times, upon the permittee's premises where a regulated unit(s) or activity is located or conducted, or where records must be kept under the conditions of this permit;

- (b) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
- (c) Inspect, at reasonable times, any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit;
- (d) Sample or monitor, at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the Act, any substances or parameters at any location; and
- (e) Make photographs for the purpose of documenting items of compliance or noncompliance at waste management units or, where appropriate to protect legitimate proprietary interests, make such photographs for him or her.

9. Monitoring and Records

- (a) Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity. The permittee shall perform all monitoring in accordance with the methods described in this permit, including the attachments. If not specified in this permit, the method used to obtain a representative waste sample to be analyzed must be the appropriate method from Appendix I of Rule 1200-01-11-.02(5); the most recent version of the USEPA, Region 4, Science and Ecosystem Support Division's (SESD) Field Branches Quality System and Technical Procedures, which can be found at <http://www.epa.gov/region4/sesd/fbqstp>; or an equivalent method approved by the Commissioner. If not specified in this permit, procedures for sampling media must be those identified in the latest edition of the Field Branches Quality System and Technical Procedures or an equivalent method approved by the Commissioner. Laboratory methods must be those specified in the most recent edition of Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, SW-846 which can be found at <http://www.epa.gov/osw/hazard/testmethods/sw846/online/>, or an equivalent method approved by the Commissioner.
- (b) The permittee shall retain at the facility, as provided for under Rule 1200-01-11-.06, or other location approved by the Commissioner, records of all monitoring information required under the terms of this permit, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, records of all data used to prepare documents required by this permit, copies of all reports and records required by this permit, and records of all data used to complete the application for this permit, for a period of at least five (5) years from the date of the sample, measurement, report, certification, or application, or until corrective action is completed, whichever date is later. As a generator of hazardous waste, the permittee shall retain a copy of all notices, certifications, demonstrations, waste analysis data, and other documentation produced pursuant to Rule

1200-01-11-.10 for at least five (5) years from the date that the waste which is subject of such documentation was last sent to on-site or off-site treatment storage or disposal, or until corrective action is completed, whichever date is later. The permittee shall maintain records from all groundwater monitoring wells and associated groundwater surface elevations, for the active life of the facility, and, for disposal facilities, for the post-closure care period as well. These periods may be extended by request of the Commissioner at any time and are automatically extended during the course of any unresolved enforcement action regarding this facility.

- (c) Records of monitoring information shall include:
 - (i) The date, exact place, and time of sampling or measurements;
 - (ii) The individual(s) who performed the sampling or measurements;
 - (iii) The date(s) analyses were performed;
 - (iv) The name of the laboratory that performed the analyses;
 - (v) The analytical techniques or methods used; and
 - (vi) The results of such analyses.

10. Signatory Requirement: All applications, reports, or information submitted to the Commissioner shall be signed and certified. All signatures and certifications shall satisfy the requirements of Rule 1200-01-11-.07(2)(a).

11. Reporting Requirements

- (a) Planned changes: The permittee shall give written notice to the Commissioner as soon as possible of any planned physical alterations or additions to the permitted facility SWMUs and AOCs requiring institutional/administrative controls, including permittee-initiated Interim Measures under Subparagraph III.F.1(b) or other activities that impact known or suspected contamination at or from SWMUs or AOCs, including areas off-site from the facility. The notice shall include at a minimum, a summary of the planned change, the reason for the planned change, a discussion of the impact(s) the planned change will have on the ability to investigate contamination at or from the SWMU or AOC, and a discussion of the impact(s) the planned change will have on the contamination.
- (b) Anticipated noncompliance: The permittee shall give advance notice to the Commissioner as soon as possible of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

- (c) Transfers: This permit is not transferable to any person except after notice to the Commissioner. The Commissioner may require modification or revocation and reissuance of the permit to change the name of the permittee and incorporate such other requirements as may be necessary under the Act. (See Rule 1200-01-11-.07(9)(b); in some cases, modification or revocation and reissuance is mandatory).
- (d) Monitoring reports: Monitoring results shall be reported at the intervals specified in this permit.
- (e) Compliance schedules: Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit shall be submitted no later than 14 days following each schedule date. Submittal of a required item according to the schedule constitutes notification of compliance.
- (f) Twenty-four hour reporting:
 - (i) The permittee shall report any noncompliance, or any imminent or existing hazard from a release of hazardous waste or hazardous constituent that may endanger health or the environment, orally within twenty-four (24) hours from the time the permittee becomes aware of the circumstances, including but not limited to:
 - (I) Information concerning release of any hazardous waste or hazardous constituent that may cause an endangerment to public drinking water supplies.
 - (II) Any information of a release or discharge of hazardous waste or hazardous constituent, or of a fire or explosion from the hazardous waste management facility, which may endanger or threaten the environment or human health outside the facility.
 - (ii) The description of the occurrence and the cause shall include:
 - (I) Name, address, and telephone number of owner or operator;
 - (II) Name, address, and telephone number of the facility;
 - (III) Date, time, and type of incident;
 - (IV) Name and quantity of material(s) involved;
 - (V) The extent of injuries, if any;

- (VI) An assessment of actual or potential hazards to the environment and human health outside the facility; and
 - (VII) Estimated quantity and disposition of recovered material that resulted from the incident.
- (iii) A written submission shall also be provided within five (5) days of the time the permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. The Commissioner may waive the five-day written notice requirement in favor of a written report within fifteen (15) days.
- (g) Other noncompliance: The permittee shall report all instances of noncompliance not reported under Subparagraphs I.D.11(d), (e) or (f) above, at the time monitoring reports are submitted. The reports shall contain the information listed in Subparagraph I.D.11(f) as appropriate.
- (h) Other information: Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any document to the Commissioner, it shall promptly submit such facts or information. In addition, upon request, the permittee shall furnish to the Commissioner any information related to compliance with this permit.
12. Continuation of Expiring Permit: When the permittee has made timely and sufficient application for a new permit, the existing permit does not expire until the application has been finally determined by the Commissioner and, in case the application is denied, or the terms of the new permit limited, until the last day for seeking review of the Commissioner's order or a later date fixed by order of the reviewing court.
13. Obligation for Corrective Action: Pursuant to the requirements of Section III, Specific Conditions for Corrective Action, the permittee is required to select and implement corrective actions as necessary to protect human health and the environment for all releases of hazardous waste or constituents from any solid waste management unit at the facility, regardless of the time at which waste was placed in such unit. The permittee is required to continue this permit for any period necessary to comply with the corrective action requirements of this permit. If corrective action is expected to continue beyond the expiration date of this permit, the permittee shall be required to comply with the reapplication requirement in Paragraph I.D.2.

E. CONFIDENTIAL INFORMATION

In accordance with Rules 1200-01-11-.01(7) and .07(1)(h), the permittee may claim for confidential handling any proprietary information required to be submitted by this permit.

F. DOCUMENTS TO BE MAINTAINED AT THE FACILITY

The permittee shall maintain at the facility, until corrective action is completed and certified by a qualified Professional Engineer, the following documents and the amendments, revisions and modifications to these documents:

1. A copy of this permit;
2. Personnel training documents and records required by this permit, except that training records on former employees are not required to be kept for more than three (3) years from the date the employee last worked at the facility. Personnel training records may accompany personnel transferred within the same company;
3. All corrective action work plans, reports and other documents as specified by the Commissioner and section III, Specific Conditions for Corrective Action, and the Attachments to this permit;
4. Operating and other applicable administrative records as required by this permit and Chapter 1200-01-11; and
5. Monitoring information and inspection records in accordance with Subparagraph I.D.9(b) and Paragraph II.B.3, except that inspection records need only be kept for five (5) years after the date of the inspection.

G. REQUIRED NOTICE FOR OWNERSHIP TRANSFER

Before transferring ownership or operation of a facility, the permittee must notify the new owner or operator in writing of the requirements of this permit and Rule 1200-01-11-.07. However, the permittee's failure to notify the new owner or operator of the requirements of this permit condition in no way relieves the new owner or operator of his obligation to comply with all applicable requirements.

H. ORDER OF PRECEDENCE

In the event of any inconsistency between the permit conditions and the material contained in any attachment to this permit, the permit conditions shall take precedence.

I. PERMIT STRUCTURE

This permit is organized, numbered, and referenced according to the following outline form:

I. Section

A. Subsection

1. Paragraph

(a) Subparagraph

(i) Part

(I) Subpart

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II. GENERAL FACILITY CONDITIONS

A. SECURITY

1. The permittee shall prevent the unknowing entry, and minimize the possibility for the unauthorized entry, of persons or livestock onto the active portions of the facility. The permittee shall provide and maintain appropriate site security measures to minimize the threat of exposure to hazardous waste or hazardous constituents in accordance with this subsection, Attachment 2, Security, and Attachment 4.6, Corrective Action Remedies.
2. The permittee shall post signs on or near fenced SWMUs, as well as the non-fenced areas identified as requiring signage in Table 4.6-1 of Attachment 4.6, Corrective Action Remedies. The legend shall read "DANGER-UNAUTHORIZED PERSONNEL KEEP OUT" or other appropriate legend, and shall be in sufficient numbers to be seen from any reasonable approach to the unit. The legend must be written in English and in any other language predominant in the area surrounding the facility, and must be legible from a distance of at least twenty-five (25) feet. To avoid the threat of exposure, signs or other means of notification shall be used as specified in Table 4.6-1 to identify required institutional controls.

B. GENERAL INSPECTION REQUIREMENTS

1. Inspections: The permittee shall inspect the SWMUs and AOCs in Table 4.1-6 of Attachment 4.1 and the groundwater monitoring wells listed in Table 5-1 of Attachment 5, for malfunctions and deterioration, operator errors, and discharges which may be causing or may lead to (1) a release of hazardous waste or hazardous constituents to the environment or (2) a threat to human health. The permittee shall inspect each item listed on the inspection form(s) in Attachment 3. The inspection type and frequency shall be in accordance with Attachment 3.
2. Remedies: The permittee shall remedy any deterioration or malfunction of equipment or structures which the inspection reveals, on a schedule which ensures that the problem will not lead to an environmental or human health hazard. When a hazard is imminent or has already occurred, remedial action shall be taken immediately.
3. Inspection Records: The permittee shall record inspections in an inspection log or summary. The permittee shall keep these records for at least five (5) years from the date of inspection. At a minimum, these records shall include the date and time of the inspection, the name of the inspector, a notation of the observations made, and the date and nature of any repairs or other remedial actions. The permittee may change the format and content of the inspection form(s) in Attachment 3, as deemed

necessary to provide the information he needs to properly manage the facility. Any deletion of information from such form(s), however, must be approved in advance, in writing, by the Commissioner as a modification to this permit.

C. PERSONNEL TRAINING

1. The permittee shall ensure that facility personnel that serve to meet the requirements of this permit successfully complete a program of classroom instruction and/or on the job training that teaches them to perform their specific duties in a way that assures the permittee's compliance with this permit and the applicable portions of Rule 1200-01-11-.06(2)(g) associated with a corrective action permit. The permittee shall ensure that the training program is directed by a person(s) trained in hazardous waste management procedures and shall include instruction which teaches facility personnel the hazardous waste management procedures relevant to the positions in which they are employed. Appropriate training shall also be provided for personnel involved with corrective action investigation and remediation activities, and for any additional permit-specific requirements in the attachments to this permit.
2. Retention of Training Records: Training records on current personnel shall be kept until closure of the facility; training records on former employees shall be kept for at least three (3) years from the date the employee last worked at the facility. Personnel training records may accompany personnel transferred within the same company.

D. RECORDKEEPING AND REPORTING

The permittee shall comply with all notification and reporting requirements specified in the permit and keep a written operating record at the facility throughout the corrective action period. The following information shall be recorded by the permittee, as it becomes available, and maintained in the operating record until closure of the facility:

1. Records and results of inspections as required by Paragraph II.B.3, except these data need to be kept only five (5) years;
2. Copies of all work plans and reports submitted in accordance with Section III, Specific Conditions for Corrective Action, and the Attachments to this permit; and
3. Monitoring, testing or analytical data as required by Subsection II.F, Section III and the permit attachments.

E. LAND DISPOSAL RESTRICTIONS

1. Rule 1200-01-11-.10 identifies hazardous wastes that are prohibited from land disposal and defines those limited circumstances under which an otherwise prohibited waste may continue to be placed in a land treatment, storage or disposal unit. The permittee shall comply with all applicable requirements of Rule 1200-01-

11-.10. Where the permittee has applied for an extension, waiver or variance under Rule 1200-01-11-.10, the permittee shall comply with all applicable restrictions of Rule 1200-01-11-.10 pending final approval of such application.

2. A restricted waste identified in Rule 1200-01-11-.10(2) may not be placed in a land disposal unit without further treatment unless the requirements of Rule 1200-01-11-.10(2) and/or Rule 1200-01-11-.10(3) are met.
3. The storage of hazardous waste restricted from land disposal under Rule 1200-01-11-.10 is prohibited unless the requirements of Rule 1200-01-11-.10(4) are met.

F. ORGANIC AIR EMISSION STANDARDS

Prior to constructing or installing any equipment with process vents subject to the requirements of Rule 1200-01-11-.06(30) or installing any additional equipment subject to the requirements of Rule 1200-01-11-.06(31) or units subject to Rule 1200-01-11-.06(32), the permittee shall supply the specific Part B Application information required pursuant to Rules 1200-01-11-.07(5)(b)10, 11 and 13, as applicable, and shall obtain a permit modification in accordance with the requirements of Rule 1200-01-11-.07(9).

G. RESTRICTION ON OWNERSHIP OF THE FACILITY

No person who has been convicted of any felony or has been convicted of a misdemeanor for the unlawful storage, treatment, or disposal of hazardous waste may, at any time, be the legal or beneficial owner of ten percent (10%) or more of the stock of the facility.

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III. SPECIFIC CONDITIONS FOR CORRECTIVE ACTION

A. APPLICABILITY: The conditions of this section apply to:

1. The solid waste management units (SWMUs) and areas of concern (AOCs) identified in Attachment 4.1, Table 4.1-1, which require no further action under this permit at this time;
2. The SWMUs and AOCs identified in Attachment 4.1, Table 4.1-2, which require confirmatory sampling;
3. The SWMUs and AOCs identified in Attachment 4.1, Table 4.1-3, which require a RCRA Facility Investigation;
4. The SWMUs and AOCs identified in Attachment 4.1, Table 4.1-4, which require interim measures;
5. The SWMUs and AOCs identified in Attachment 4.1, Table 4.1-5, which require a corrective measures study;
6. The SWMUs and AOCs identified in Attachment 4.1, Table 4.1-6, which require implementation of the selected corrective action remedy;
7. Any additional SWMUs or AOCs discovered during the course of groundwater monitoring, field investigations, environmental audits, or other means. As used in this section of the permit, the terms "discover", "discovery", or "discovered" refer to the date on which the permittee either, (1) visually observes evidence of a new SWMU or AOC, (2) visually observes evidence of a previously unidentified release of hazardous constituents to the environment, or (3) receives information which suggests the presence of a new release of hazardous waste or hazardous constituents to the environment; and
8. Contamination, which has migrated beyond the facility boundary, if applicable. The permittee shall implement corrective actions beyond the facility boundary where necessary to protect human health and the environment, unless the permittee demonstrates to the satisfaction of the Commissioner that, despite the permittee's best efforts, as determined by the Commissioner, the permittee was unable to obtain the necessary permission to undertake such actions. The permittee is not relieved of all responsibility to clean up a release that has migrated beyond the facility boundary where off-site access is denied. On-site measures to address such releases will be determined on a case-by-case basis. Assurances of financial responsibility for completion of such off-site corrective action will be required.

B. NOTIFICATION AND ASSESSMENT REQUIREMENTS FOR NEWLY IDENTIFIED SWMUs AND AOCs

1. The permittee shall notify the Commissioner, in writing, within fifteen (15) calendar days of discovery, of any suspected new AOC as discovered under Paragraph III.A.7. The notification shall include, at a minimum, the location of the AOC and all available information pertaining to the nature of the release (e.g., media affected, hazardous constituents released, magnitude of release, etc.). The Commissioner may conduct, or require the permittee to conduct, further assessment (i.e., confirmatory sampling) in order to determine the status of the suspected AOC. The Commissioner will notify the permittee, in writing, of the final determination as to the status of the suspected AOC. If the Commissioner determines that further investigation or other corrective action of an AOC is required, the permittee shall modify the permit in accordance with Rule 1200-01-11-.07(9).
2. The permittee shall notify the Commissioner, in writing, within fifteen (15) calendar days of discovery, of any additional SWMU as discovered under Paragraph III.A.7.
3. The permittee shall prepare and submit to the Commissioner, within ninety (90) calendar days of notification, a SWMU Assessment Report (SAR) for each SWMU identified under Paragraph III.B.2. At a minimum, the SAR shall provide the following information:
 - (a) Location of unit(s) on a topographic map of appropriate scale such as required under Rule 1200-01-11-.07(5)(a)1(xix);
 - (b) Designation of type and function of unit(s);
 - (c) General dimensions, capacities and structural description of unit(s) (supply any available plans/drawings);
 - (d) Dates that the unit(s) was operated;
 - (e) Specification of all wastes that have been managed at/in the unit(s) to the extent available. Include any available data on hazardous constituents in the wastes; and
 - (f) All available information pertaining to any release of hazardous waste or hazardous constituents from such unit(s). Include any available information and analytical results for air, soil, sediment, surface water and groundwater.
4. Based on the results of the SAR, the Commissioner shall determine the need for further investigations at the SWMUs covered in the SAR. If the Commissioner determines that such investigations are needed, the permittee shall be required to prepare a plan for such investigations as outlined in Subparagraph III.E.1(a) or Paragraph III.D.1.

C. NOTIFICATION REQUIREMENTS FOR NEWLY DISCOVERED RELEASES FROM SWMUs OR AOCs

1. The permittee shall notify the Commissioner, in writing, of any newly discovered release(s) of hazardous waste or hazardous constituents discovered during the course of groundwater monitoring, field investigations, environmental audits, or other means, within fifteen (15) calendar days of discovery. Such newly discovered releases may be from SWMUs or AOCs identified in Paragraph III.A.1 or SWMUs or AOCs identified in Paragraph III.A.7 for which further investigation under Paragraph III.B.4 was not required.
2. If the Commissioner determines that further investigation of the SWMUs or AOCs is needed, the permittee shall be required to prepare a plan for such investigations as outlined in Subparagraph III.E.1(a).

D. CONFIRMATORY SAMPLING (CS)

1. Upon notification by the Commissioner, the permittee shall prepare and submit a Confirmatory Sampling (CS) Work Plan for suspected AOCs per Paragraph III.B.1 or newly identified SWMUs per Paragraph III.B.4. The work plan shall be submitted within forty-five (45) calendar days of notification by the Commissioner that a CS Work Plan is required. The CS Work Plan shall include schedules of implementation and completion of specific actions necessary to determine whether or not a release has occurred. It should also address applicable requirements and affected media. In order to partly or wholly satisfy the CS requirement, previously existing data may be submitted with the work plan for the Commissioner's consideration.
2. The CS Work Plan must be approved by the Commissioner, in writing, prior to implementation. The Commissioner shall specify the start date of the CS Work Plan schedule in the letter approving the CS Work Plan. If the Commissioner disapproves the CS Work Plan, the Commissioner shall either (1) notify the permittee in writing of the CS Work Plan's deficiencies and specify a due date for submission of a revised CS Work Plan, (2) revise the CS Work Plan and notify the permittee of the revisions, or (3) conditionally approve the CS Work Plan and notify the permittee of the conditions.
3. The permittee shall implement the confirmatory sampling in accordance with the approved CS Work Plan.
4. The permittee shall prepare and submit to the Commissioner, in accordance with the schedule in the approved CS Work Plan, a CS Report identifying all SWMUs or AOCs that have released hazardous waste or hazardous constituents into the environment. The CS Report shall include all data, including raw data, and a summary and analysis of the data that supports the above determination. If submittal of the CS Report coincides with submittal of the RFI Report, then the CS Report and the RFI Report may be combined into one submittal.

5. Based on the results of the CS Report, the Commissioner shall determine the need for further investigations at the SWMUs or AOCs covered in the CS Report. If the Commissioner determines that such investigations are needed, the permittee shall be required to prepare a plan for such investigations as outlined in Subparagraph III.E.1(a). The Commissioner will notify the permittee of any no further action decision.

E. RCRA FACILITY INVESTIGATION (RFI)

1. RFI Work Plan(s)

- (a) The permittee shall prepare and submit to the Commissioner, within ninety (90) calendar days of notification by the Commissioner, an RFI Work Plan for those units identified under Paragraph III.B.4, Paragraph III.C.2, or Paragraph III.D.5. The RFI Work Plan(s) shall be developed to meet the requirements of Subparagraph III.E.1(b).
- (b) The RFI Work Plan(s) shall meet the requirements of Attachment 4.2. The RFI Work Plan(s) shall include schedules of implementation and completion of specific actions necessary to determine the nature and extent of contamination and the potential pathways of contaminant releases to the air, soil, surface water, and groundwater. The permittee must provide sufficient justification and associated documentation that a release is not probable or has already been characterized if a unit or a media/pathway associated with a unit (groundwater, surface water, soil, subsurface gas, or air) is not included in the RFI Work Plan(s). Such deletions of a unit, media or pathway from the RFI(s) are subject to the approval of the Commissioner. The permittee shall provide sufficient written justification for any omissions or deviations from the minimum requirements of Attachment 4.2. Such omissions or deviations are subject to the approval of the Commissioner. In addition, the scope of the RFI Work Plan(s) shall include all investigations necessary to ensure compliance with Rule 1200-01-11-.06(6)(l)3.
- (c) The RFI Work Plan(s) must be approved by the Commissioner, in writing, prior to implementation. The Commissioner shall specify the start date of the RFI Work Plan schedule in the letter approving the RFI Work Plan(s). If the Commissioner disapproves the RFI Work Plan(s), the Commissioner shall either (1) notify the permittee in writing of the RFI Work Plan's deficiencies and specify a due date for submission of a revised RFI Work Plan, (2) revise the RFI Work Plan and notify the permittee of the revisions and the start date of the schedule within the approved RFI Work Plan, or (3) conditionally approve the RFI Work Plan and notify the permittee of the conditions.

2. RFI Implementation

The permittee shall implement the RFI(s) in accordance with the approved RFI Work Plan(s) and Attachment 4.2. The permittee shall notify the Commissioner at least twenty (20) days prior to any sampling activity.

3. RFI Reports

- (a) The permittee shall prepare and submit to the Commissioner Draft and Final RCRA Facility Investigation Report(s) for the investigations conducted pursuant to the RFI Work Plan(s) submitted under Paragraph III.E.1. The Draft RFI Report(s) shall be submitted to the Commissioner for review in accordance with the schedule in the approved RFI Work Plan(s). The Final RFI Report(s) shall be submitted to the Commissioner within thirty (30) calendar days of receipt of the Commissioner's final comments on the Draft RFI Report. The RFI Report(s) shall include an analysis and summary of all required investigations of SWMUs and AOCs and their results. The summary shall describe the type and extent of contamination at the facility, including sources and migration pathways, identify all hazardous constituents present in all media, and describe actual or potential receptors. The RFI Report(s) shall also describe the extent of contamination (qualitative/quantitative) in relation to background levels indicative of the area. If the Draft RFI Report is a summary of the initial phase investigatory work, the report shall include a work plan for the final phase investigatory actions required based on the initial findings. Approval of the final phase work plan shall be carried out in accordance with Subparagraph III.E.1(c). The objective of this task shall be to ensure that the investigation data are sufficient in quality (e.g., quality assurance procedures have been followed) and quantity to describe the nature and extent of contamination, potential threat to human health and/or the environment, and to support a Corrective Measures Study, if necessary.
- (b) The permittee shall prepare and submit to the Commissioner, along with the Draft and Final RFI Report(s), screening levels for each of the hazardous constituents reported in Subparagraph III.E.3(a). Screening levels shall be calculated as specified in Attachment 4.5 of this permit.
- (c) The Commissioner will review the RFI Report(s), including the screening levels described in Subparagraph III.E.3(b). The Commissioner shall notify the permittee of the need for further investigative action if necessary and, if appropriate at this moment of the investigation, inform the permittee of the need for a Corrective Measures Study to meet the requirements of Subparagraph III.G.1(b) and Rule 1200-01-11-.06(6)(l). The Commissioner will notify the permittee of any no further action decision. Any further investigative action required by the Commissioner shall be prepared and submitted in accordance with a schedule specified by the Commissioner and approved in accordance with Subparagraph III.E.1(c).

- (d) If the time required to conduct the RFI(s) is greater than one hundred eighty (180) calendar days, the permittee shall provide the Commissioner with quarterly RFI Progress Reports (90-day intervals) beginning ninety (90) calendar days from the start date specified by the Commissioner in the RFI Work Plan approval letter. The Progress Reports shall contain the following information at a minimum:
 - (i) A description of the portion of the RFI completed;
 - (ii) Summaries of findings;
 - (iii) Summaries of any deviations from the approved RFI Work Plan during the reporting period;
 - (iv) Summaries of any significant contacts with local community public interest groups or State government;
 - (v) Summaries of any problems or potential problems encountered during the reporting period;
 - (vi) Actions taken to rectify problems;
 - (vii) Changes in relevant personnel;
 - (viii) Projected work for the next reporting period; and
 - (ix) Copies of daily reports, inspection reports, data, etc.

F. INTERIM MEASURES (IM)

1. IM Work Plan

- (a) Upon notification by the Commissioner, the permittee shall prepare and submit an Interim Measures (IM) Work Plan for any SWMU or AOC that the Commissioner determines is necessary. IM are necessary in order to minimize or prevent the further migration of contaminants and limit actual or potential human and environmental exposure to contaminants while long-term corrective action remedies are evaluated and, if necessary, implemented. The IM Work Plan shall be submitted within thirty (30) calendar days of such notification and shall include the elements listed in Subparagraph III.F.1(c). Such interim measures may be conducted concurrently with investigations required under the terms of this permit.
- (b) The permittee may initiate IM at a SWMU or AOC by submitting the appropriate notification pursuant to Subparagraph I.D.11(a). The permittee shall give written notice to the Commissioner as soon as possible of any planned physical alterations or additions, including permittee-initiated

Interim Measures, which impact known or suspected contamination at or from SWMUs or AOCs, including the areas off-site from the facility. The notice shall include at a minimum, a summary of the planned change, the reason for the planned change, a discussion of the impact(s) the planned change will have on the ability to investigate contamination at or from the SWMU or AOC, and a discussion of the impact(s) the planned change will have on the known or suspected contamination. The Commissioner will process permittee-initiated IM by either conditionally approving the IM or imposing an IM Work Plan per Subparagraph III.F.1(a). Permittee-initiated IM shall be considered conditionally approved unless the Commissioner specifically imposes an IM Work Plan within thirty (30) calendar days of receipt of notification of the permittee-initiated IM. The scope and success of permittee-initiated IM conditionally approved per Subparagraph III.F.1(b) shall be subject to subsequent in-depth review with the Commissioner providing comments and/or an approval letter for the permittee-initiated IM. Permittee-initiated IM must follow the progress and final reporting requirements in Paragraph III.F.3.

- (c) The IM Work Plan shall ensure that the interim measures are designed to mitigate any current or potential threat(s) to human health or the environment and is consistent with and integrated into any long-term solution at the facility. The IM Work Plan shall include: the interim measures objectives, procedures for implementation (including any designs, plans, or specifications), and schedules for implementation.
- (d) The IM Work Plan imposed under Subparagraph III.F.1(a) must be approved by the Commissioner, in writing, prior to implementation. The Commissioner shall specify the start date of the IM Work Plan schedule in the letter approving the IM Work Plan. If the Commissioner disapproves the IM Work Plan, the Commissioner shall either (1) notify the permittee in writing of the IM Work Plan's deficiencies and specify a due date for submission of a revised IM Work Plan, (2) revise the IM Work Plan and notify the permittee of the revisions and the start date of the schedule within the approved IM Work Plan, or (3) conditionally approve the IM Work Plan and notify the permittee of the conditions.

2. IM Implementation

- (a) The permittee shall implement interim measures imposed under Subparagraph III.F.1(a) in accordance with the approved IM Work Plan.
- (b) The permittee shall give notice to the Commissioner as soon as possible of any planned changes, reductions or additions to the IM Work Plan imposed under Subparagraph III.F.1(a) or initiated by the permittee under Subparagraph III.F.1(b).

- (c) Final approval of corrective action required under Rule 1200-01-11-.06(6)(l), which is achieved through interim measures, shall be in accordance with Rule 1200-01-11-.07(9)(c) and Subsection III.H as a permit modification.

3. IM Reports

- (a) The permittee shall prepare and submit to the Commissioner, within ninety (90) calendar days of completion of interim measures conducted under Subsection III.F, an Interim Measures (IM) Report. The IM Report shall contain the following information at a minimum:
 - (i) A description of interim measures implemented;
 - (ii) Summaries of results;
 - (iii) Summaries of all problems encountered;
 - (iv) Summaries of accomplishments and/or effectiveness of interim measures; and
 - (v) Copies of all relevant laboratory/monitoring data, etc. in accordance with Paragraph I.D.9.
- (b) If the time required for completion of interim measures imposed under Subparagraph III.F.1(a) or implemented under Subparagraph III.F.1(b) is greater than one year, the permittee shall provide the Commissioner with progress reports at intervals specified in the approved Work Plan or semi-annually for permittee-initiated interim measures. The Progress Reports shall contain the following information at a minimum:
 - (i) A description of the portion of the interim measures completed;
 - (ii) Summaries of findings;
 - (iii) Summaries of any deviations from the IM Work Plan during the reporting period;
 - (iv) Summaries of any problems or potential problems encountered during the reporting period; and
 - (v) Projected work for the next reporting period.

G. CORRECTIVE MEASURES STUDY (CMS)

1. CMS Work Plan

- (a) The permittee shall prepare and submit a CMS Work Plan for those units requiring a CMS within ninety (90) calendar days of notification by the Commissioner that a CMS is required. This CMS Work Plan shall be developed to meet the requirements of Subparagraph III.G.1(b). The permittee may seek approval from the Commissioner for concurrent RFI/CMS. The CMS may be performed concurrent with the RFI process if the Commissioner determines that sufficient investigative details are available to allow concurrent action.
- (b) The CMS Work Plan shall meet the requirements of Attachment 4.3 at a minimum. The CMS Work Plan shall include schedules of implementation and completion of specific actions necessary to complete a CMS. The permittee must provide sufficient justification and/or documentation for any unit deleted from the CMS Work Plan. Such deletion of a unit is subject to the approval of the Commissioner. The CMS shall be conducted in accordance with the approved CMS Work Plan. The permittee shall provide sufficient written justification for any omissions or deviations from the minimum requirements of Attachment 4.3. Such omissions or deviations are subject to the approval of the Commissioner. The scope of the CMS Work Plan shall include all investigations necessary to ensure compliance with the Act and Rules 1200-01-11-.06(6)(i), -.06(22)(c), and -.07(8)(b)2(ii). The permittee shall implement corrective actions beyond the facility boundary, as set forth in Paragraph III.A.8.
- (c) The Commissioner shall either approve or disapprove, in writing, the CMS Work Plan. If the Commissioner disapproves the CMS Work Plan, the Commissioner shall either (1) notify the permittee in writing of the CMS Work Plan's deficiencies and specify a due date for submittal of a revised CMS Work Plan, (2) revise the CMS Work Plan and notify the permittee of the revisions, or (3) conditionally approve the CMS Work Plan and notify the permittee of the conditions. This modified CMS Work Plan becomes the approved CMS Work Plan.

2. CMS Implementation

The permittee shall begin to implement the Corrective Measures Study according to the schedules specified in the CMS Work Plan, no later than fifteen (15) calendar days after the permittee has received written approval from the Commissioner for the CMS Work Plan. Pursuant to Subparagraph III.G.1(b), the CMS shall be conducted in accordance with the approved CMS Work Plan.

3. CMS Report

- (a) The permittee shall prepare and submit to the Commissioner a draft and final CMS Report for the study conducted pursuant to the approved CMS Work Plan and in accordance with Attachment 4.3. The draft CMS Report shall be submitted to the Commissioner in accordance with the schedule in the approved CMS Work Plan. The final CMS Report shall be submitted to the Commissioner within thirty (30) days of receipt of the Commissioner's final comments on the draft CMS Report. The CMS Report shall summarize any bench-scale or pilot tests conducted. The CMS Report must include an evaluation of each remedial alternative. If a remedial alternative requires the use of a CAMU, the CMS report shall include all information necessary to establish and implement the CAMU. The CMS Report shall present all information gathered under the approved CMS Work Plan. The CMS Final Report must contain adequate information to support the Commissioner's decision on the recommended remedy of Subsection III.H.
- (b) If the Commissioner determines that the CMS Final Report does not fully satisfy the information requirements specified under Subparagraph III.G.3(a), the Commissioner may disapprove the CMS Final Report. If the Commissioner disapproves the CMS Final Report, the Commissioner shall notify the permittee in writing of deficiencies in the CMS Final Report and specify a due date for submittal of a revised CMS Final Report. The Commissioner will notify the permittee of any no further action decision.
- (c) As specified under Subparagraph III.G.3(b), based on preliminary results and the CMS Final Report, the Commissioner may require the permittee to evaluate additional remedies or particular elements of proposed remedies.

H. REMEDY APPROVAL AND PERMIT MODIFICATION

1. A remedy shall be selected from the remedial alternatives evaluated in the CMS. It will be based at a minimum on protection of human health and the environment, as per specific site conditions and existing regulations. The selected remedy may include any interim measures implemented to date.
2. Pursuant to Rule 1200-01-11-.07(9)(c), a permit modification will be initiated by the Commissioner after recommendation of a remedy under Paragraph III.H.1. This modification will serve to incorporate a final remedy, including a CAMU if necessary, into this permit.
3. As part of the public notification during the modification process all supporting documentation for the proposed remedy, including a Statement of Basis, will be made available for public review and comment. The Statement of Basis will be prepared utilizing EPA's Guidance on RCRA Corrective Action Decision Documents (EPA/540/G-91/011) as a reference.

I. CORRECTIVE MEASURES IMPLEMENTATION

1. The permittee shall implement corrective action for the SWMUs and AOCs identified in Attachment 4.1, Table 4.1-6, in accordance with the requirements in Attachment 4.6, Corrective Action Remedies and Attachment 5, Monitoring.
2. The permittee is also performing corrective action in accordance with the Military Munitions Response Program (MMRP) regulations. MMRP units are not regulated by the corrective action conditions of this permit.

J. MODIFICATION OF THE CORRECTIVE ACTION COMPLIANCE SCHEDULE

1. If at any time the Commissioner determines that modification of the Corrective Action Compliance Schedule is necessary, the Commissioner may initiate a modification to the Corrective Action Compliance Schedule in Attachment 4.4. All corrective action schedules specified in this permit section are summarized in Attachment 4.4.
2. Modifications that are initiated and finalized by the Commissioner will be in accordance with the applicable provisions of Rule 1200-01-11-.07(9). The permittee may also request a permit modification in accordance with Rule 1200-01-11-.07(9) to change the Corrective Action Compliance Schedule.

K. WORK PLAN AND REPORT REQUIREMENTS

1. All work plans and schedules shall be subject to approval by the Commissioner prior to implementation to assure that such work plans and schedules are consistent with the requirements of this permit and with applicable regulations. The permittee shall revise all submittals and schedules as specified by the Commissioner. Upon approval, the permittee shall implement all work plans and schedules as written.
1. All work plans and reports shall be submitted in accordance with the approved schedule. Extensions of the due date for submittals may be granted by the Commissioner based on the permittee's demonstration that sufficient justification for the extension exists.
2. If at any time, the permittee determines that the SAR information required under Subsection III.B, the CS Work Plan under Subsection III.D, or the RFI Work Plan(s) required under Subsection III.E no longer satisfy the requirements of Rule 1200-01-11-.06(6)(l) or this permit for prior or continuing releases of hazardous waste or hazardous constituents from solid waste management units and/or areas of concern, the permittee shall submit an amended Work Plan(s) to the Commissioner within ninety (90) calendar days of such determination.
4. Unless notified by separate letter that additional hard copies are necessary, only three (3) hard copies and one (1) electronic copy of all reports and plans shall be

provided by the permittee to the Commissioner. Submittals shall be addressed in care of the Division Director, as follows.

Director
Division of Solid Waste Management
5th Floor, L & C Tower
401 Church Street
Nashville, Tennessee 37243-1535

3. The permittee shall also submit (1) hard copy of all report and plan submittals to the Division's Memphis Environmental Field Office at the following address.

Field Office Manager
Division of Solid Waste Management
TDEC Memphis Environmental Field Office
8383 Wolf Lake Drive
Bartlett, TN 38133

L. APPROVAL/DISAPPROVAL OF SUBMITTALS

The Commissioner will review the work plans, reports, schedules, and other documents (submittals) that require the Commissioner's approval in accordance with the conditions of this permit. The Commissioner will notify the permittee in writing of any submittal that is disapproved, and the basis therefore. Subsection III.M shall apply only to submittals that have been disapproved and revised by the Commissioner, or that have been disapproved by the Commissioner, then revised and resubmitted by the permittee, and again disapproved by the Commissioner.

M. DISPUTE RESOLUTION

The Commissioner and the permittee shall use their best effort to resolve any disputes concerning submissions hereunder and the proper application of permit, statutory or regulatory provisions informally and in good faith. If a disagreement cannot be resolved informally, the parties jointly or individually may pursue the matter formally by requesting a Declaratory Order by the Tennessee Solid Waste Disposal Control Board in a contested case hearing under T.C.A. §4-5-223.

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ATTACHMENT 1. FACILITY DESCRIPTION

Naval Support Activity Mid-South (NSA Mid-South) is a U.S. Navy Facility located in Millington, Shelby County, Tennessee. It is approximately 20 miles north of the downtown area of Memphis, Tennessee and 13 miles east of the Mississippi River. The facility is bordered on the west and the south by the City of Millington and on the east and north by agricultural and residential areas.

NSA Mid-South began as Park Field, an Army Signal Corps Aviation School used to train pilots and ground crews for service during World War I. When commissioned as a Naval Reserve Air Base in 1942, the mission of the base remained much the same: train aviation cadets for action in World War II. The runways and associated operations were located north of Navy Road, as was the Naval Hospital. Because the primary mission of NAS Memphis was training, no large-scale industrial, ordnance or radiological operations were performed. Operation of the airfield and fire training activities were the cause of many fuel and solvent releases to soil and groundwater on the north side of the installation. Training for aircraft maintenance activities, including plating and painting operations, are responsible for many releases on the south side.

The 1993 Base Realignment and Closure Commission directed the realignment of Naval Air Station Memphis. The airfield, associated support operations, and undeveloped land on the northern portion of the installation (1,867 of the total 3,446 acres) were transferred to the City of Millington for commercial development. The facilities on the remaining 1,579 acres, primarily on the southern portion of the installation were realigned as Naval Support Activity. Today, the facility operates and functions with an allowance of approximately 6000 enlisted and officer personnel, civilians, and full-time contract personnel, who provide all essential logistic and operational support to the commands and activities on board, including site security.

In 1996 NSA was issued a permit for storage of hazardous waste that included requirements for corrective action. The permitted hazardous waste storage area was closed on September 28, 2006, but the permit requirements to perform corrective action at all solid waste management units (SWMUs) and areas of concern (AOCs) at the facility remained in effect.

There are 68 SWMUs and AOCs identified at NSA Mid-South. Of the 68 SWMUs identified in the permit, 33 units are located on transferred property. Fifty-two SWMUS of the 68 were determined to be no further action (NFA), either through a RCRA Facility Assessment (RFA), confirmatory sampling (CS), RCRA facility investigation (RFI) or after interim measures (IM). Of the remaining SWMUs and AOCs, 4 require an RFI, no SWMUs require IM, 3 require a corrective measures study (CMS), and 9 require implementing a remedy. As detailed in Attachment 4.6, the permit requires NSA Mid-South to implement the selected corrective action remedies at eight SWMUs located on transferred property and one SWMU located on the active portion of the base.

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ATTACHMENT 2. SECURITY

In accordance with this attachment, the conditions in permit Subsection II.A, Security, and Attachment 4.6, Corrective Action Remedies, the permittee shall provide appropriate security measures at the facility. The measures include maintaining control of the site by limiting access and performing specific inspection and maintenance requirements.

The permittee shall maintain, in good condition, the signage and 8-foot chain link fence that surrounds SWMU 2, Southside Landfill. Access and egress to SWMU 2 is currently controlled by authorization from security and through locked gates maintained by Navy security.

Because of exposure concerns at SWMU 2, the permittee is required to maintain the institutional controls detailed in Attachment 4.6, Corrective Action Remedies. The controls include: no disturbances to the landfill cover; restricting access through maintenance of the existing fence; and, maintaining the existing monitoring wells.

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ATTACHMENT 3. INSPECTIONS

In accordance with this attachment, the conditions in permit Subsection II.B, General Inspection Requirements, and Attachment 4.6, Corrective Action Remedies, the permittee shall perform regular inspections at the facility. The inspections will be performed on a semi-annual basis. The inspections shall include verification that proper security measures are in place, and that institutional controls and groundwater monitoring wells are maintained in good condition. The permittee shall complete the “Land Use Controls Inspection Form” and the “Wellhead Integrity Checklist” included in this attachment during each semi-annual inspection.

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ATTACHMENT 4. SOLID WASTE MANAGEMENT UNITS AND AREAS OF CONCERN

Attachment 4 consists of six separate sections as follows:

- 4.1 SUMMARY TABLES OF REQUIREMENTS FOR SWMUS AND AOCS
- 4.2 RCRA FACILITY INVESTIGATION (RFI) OUTLINE
- 4.3 CORRECTIVE MEASURES STUDY (CMS) OUTLINE
- 4.4 CORRECTIVE ACTION COMPLIANCE SCHEDULE
- 4.5 SCREENING LEVELS
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ATTACHMENT 4.1. SOLID WASTE MANAGEMENT UNIT SUMMARY

4.1-1 List of solid waste management units (SWMUs) and areas of concern (AOCs) requiring no further action (NFA) under the corrective action conditions of this permit:				
SWMU/ AOC	SWMU/AOC Name	Unit Comment	Dates of Operation	NFA Documentation
1*	Fire Department Drill Area (Assembly A)	Solvents, fuel, PCBs, battery acid, oil, ethylene oxide, hydraulic fluid, diesel, chlorinated pesticides, dieldrin, Ba	1942-1998	RCRA Facility Investigation submitted with no further action decision; approval from EPA 3/17/97
3	Building N-121 Plating Shop Dry Well	Possible disposal area for plating wastes	1951-1976	Interim Measures Report submitted 1/7/04 with no further action decision; approval from TDEC 2/13/04.
4*	Bldg. N-121 Plating Shop Storm Sewer and Drainage Ditch (Assembly B)	VOCs, SVOCs, TPH, metals, pesticides, herbicides	1951-1976	RCRA Facility Investigation submitted 10/7/96 with no further action decision; approval from EPA 3/17/97
5*	Aircraft Fire Fighting Training Facility	JP-4, solvents, oils, VOCs, SVOCs, TPH, Metals, pesticides, herbicides	1949-1996	Technical Memorandum to RFI submitted 2003 with no further action decision; approval from TDEC and EPA in May and August 2003
6*	Bldg. N-126 Battery Shop Storm Sewer and Ditch (Assembly B)	Waste electrolyte and neutralized waste acid solution, VOCs, SVOCs, TPH, metals, pesticides, herbicides	1951-1981	RCRA Facility Investigation submitted 10/7/96 with no further action decision; approval from EPA 3/17/97
9	Sewage Lagoons (Assembly E)	Part of sanitary wastewater treatment system	1969-1978	Remedy proposed in RCRA Facility Investigation Report; EPA and TDEC approval in 2001. Further review by TDEC changed remedy to NFA
11*	Oiled Dirt Roads (Assembly D)	Waste oil, PCBs	1942-early 1970s	RCRA Facility Investigation submitted 10/17/96 with no further action decision; approval from EPA 3/17/97
12	Galley Disposal	Food and food container wastes	Unknown	NFA per EPA letter dated 2/22/90
13	Bldg. 499 (Grease Pit)	Grease from kitchen	Unknown	NFA per EPA letter dated 2/22/90

* These SWMUs were transferred to the City of Millington and the Airport Authority.

4.1-1 List of solid waste management units (SWMUs) and areas of concern (AOCs) requiring no further action (NFA) under the corrective action conditions of this permit (Continued):				
SWMU/AOC	SWMU/AOC Name	Unit Comment	Dates of Operation	NFA Documentation
15*	N-94 Underground Tank Farm	Petroleum products, waste paint, solvents	Unknown	No further action in Excavation Summary Report for Additional Soil Remediation (Interim Measures) dated 1/11/06, approved by TDEC 3/14/06
16*	N-94 Above-Ground Waste Tanks (Assembly D)	Waste lubricating oil, waste jet fuel (JP-4/JP-5)	Unknown	No further action decision in Confirmatory Sampling Report/Voluntary Corrective Action (Interim Measures) dated 3/2/99, approved by TDEC 5/10/99
19	N-757 Underground Waste Tank (formerly 341 and 1648 UST)	Waste oil and hydraulic fluid	1979-1996	No further action decision in Voluntary Corrective Action Report dated 10/20/03, approved by EPA and TDEC February 2004
20	1594 Underground Waste Tank	Stored waste oil and hydraulic fluid	Unknown	The RFI report with NFA decision was approved by TDEC and USEPA in March and April of 2001, respectively.
23	S-8 Underground Fuel Tank (Assembly H)	Stored fuel oil, diesel	1944-1986	NFA proposed in Assembly G & H Confirmatory Sampling Report; TDEC approval 5/19/00
24	N-114 Auto Hobby Shop Waste Oil Tanks	Lubricating oils, grease and hydraulic fluids	Unknown	NFA proposed in VCA Report; EPA and TDEC approval 6/29/01
25	Big Creek Landfill	Demolition landfill	1960s-early 1970s	NFA per EPA letter dated 2/22/90
26*	N-102 Battery Acid Treatment – Underground Tank Only (Assembly C)	Sulfuric acid, metals	Unknown	NFA in Confirmatory Sampling Report Assembly C; EPA approval 3/17/97
28	Southside Sewage Treatment Plant	Domestic sewage and small amounts of industrial wastes	1943-1984	NFA per EPA letter dated 2/22/90
29*	Lakehouse Sewage Treatment Plant	Domestic sewage	1969-Unknown	NFA per EPA letter dated 2/22/90
30	Park Field Waste Treatment Tank (Assembly F)	Domestic sewage, oils, solvents and waste paints	1917-1942	NFA in Assembly F Confirmatory Sampling Report; approval from TDEC 6/7/99
* These SWMUs were transferred to the City of Millington and the Airport Authority.				

4.1-1 List of solid waste management units (SWMUs) and areas of concern (AOCs) requiring no further action (NFA) under the corrective action conditions of this permit (Continued):

SWMU/ AOC	SWMU/AOC Name	Unit Comment	Dates of Operation	NFA Documentation
31*	Aircraft Wash Rack @ 4 th Street (Assembly B)	Chromic acid, detergent	1956-1986	NFA in Ass. B RCRA Facility Investigation; EPA approval 3/17/97
32*	N-7 Aircraft Wash Rack	Chromic acid, detergent	1979-1996	NFA per EPA letter dated 2/22/90
33*	H-10 Incinerator	Pathological wastes	1943-1972	NFA per EPA letter dated 2/22/90
34*	H-109 Incinerator	Pathological wastes	1990s- Unknown	NFA per EPA letter dated 2/22/90
35	1579 Incinerator	Paper and plastic	1970s- Unknown	NFA per EPA letter dated 2/22/90
36*	Northside Sewage Treatment Plant Incinerator (Assembly D)	Ash from incineration of paper and plastic, VOCs, SVOCs, herbicides	1943-1984	NFA proposed in Confirmatory Sampling Report Assembly D; EPA approval 3/17/97
37	Southside Sewage Treatment Plant Incinerator	Paper and plastic	1943-1984	NFA per EPA letter dated 2/22/90
38	Miscellaneous Drainage Ditches – Southside of Navy Rd. (Assembly E)	Solvents, degreasers, soils, paints, VOCs, SVOCs, TPH, metals, pesticides, herbicides	1943-1980	NFA proposed in Assembly E RCRA Facility Investigation Report; TDEC approval 3/16/01
40*	Salvage Yard No. 1 (Assembly B)	Scrap metal, gasoline, oil, battery acid, VOCs	1945-1988	NFA proposed in Assembly B RCRA Facility Investigation Report; EPA approval 3/17/97
41	Salvage Yard No. 2	Scrap metal, tires, batteries, wood	1944- Unknown	NFA was recommended for the site in Technical Memorandum submitted to TDEC (EnSafe, 2005). TDEC concurred with the recommendation on 6/21/05.
42*	N-12 Interim Hazardous Waste Storage Area (Assembly D)	Paint waste, benzo(a)pyrene, dieldrin, Ba, Ni, Cr	Unknown- 1989	NFA proposed in Assembly D Confirmatory Sampling Report; EPA approval 3/17/97
43	Hazardous Waste Accumulation Point at Building S-176	Solvents, waste paints, paint strippers	Unknown- 1986	The RFI report recommended a NFA for SWMU 43, approved by TDEC in January 2003.

* These SWMUs were transferred to the City of Millington and the Airport Authority.

4.1-1 List of solid waste management units (SWMUs) and areas of concern (AOCs) requiring no further action (NFA) under the corrective action conditions of this permit (Continued):				
SWMU/AOC	SWMU/AOC Name	Unit Comment	Dates of Operation	NFA Documentation
44*	Hazardous Waste Accumulation Point @ Bldg. N-102 (Assembly D)	Scrap batteries, sulfuric acid and metals, benzo(a)pyrene, aroclor-1260, Cd, Cr, TPH	Unknown	Confirmatory Sampling to Interim Measures to NFA; TDEC approval 3/8/99
45	Hazardous Waste Accumulation Point @ Bldg. S-142 (Assembly G)	Drummed paint wastes including solvents and paint strippers	1983-1989	NFA proposed in Interim Measures Report submitted in 1995; EPA approval 1/19/96
46	Hazardous Waste Accumulation Point @ Bldg. S-140 (Assembly G)	Waste Paint	Unknown	Addendum to report 8/13/02 recommended an NFA for soils, approved by TDEC on 1/13/03. Groundwater being handled as part of SWMU 14
47	Hazardous Waste Accumulation Point at building 344	Mineral Spirits	Unknown	NFA proposed in VCA Report; TDEC approval 8/24/01
48	Hazardous Waste Accumulation Point at Building S-9	Petroleum products, waste paint, solvents	Unknown-1983	NFA proposed in VCA Report; TDEC approval 8/24/01
49	Hazardous Waste Accumulation Point at Building N-757	Sent battery storage, mineral spirits and paint wastes	Unknown	NFA proposed in VCA Report; EPA and TDEC approval 2/04
50*	Hazardous Waste Accumulation Point @ Bldg. N-126, MAG-42 (Assembly D)	Mineral spirits, paint thinners	Unknown	NFA in Confirmatory Sampling Report for Assembly D; EPA approval 3/17/97
51*	Hazardous Waste Accumulation Point @ Bldg. N-126, VR-60 (Assembly D)	Mineral spirits, paint thinners	Unknown	NFA in Confirmatory Sampling Report for Assembly D; EPA approval 3/17/97
52*	Hazardous Waste Accumulation Point @ Bldg. N-126, VP-67 (Assembly D)	Mineral spirits, paint thinners	1955-1987	NFA in Confirmatory Sampling Report for Assembly D; EPA approval 3/17/97
53*	Hazardous Waste Accumulation Point @ Bldg. N-126, AIMD (Assembly D)	Trichloroethene, trichloroethane, mineral spirits, paint thinners, benzo(a)pyrene, dieldrin, Ba, Ni, Cr	1955-1987	NFA in Confirmatory Sampling Report for Assembly D; EPA approval 3/17/97

* These SWMUs were transferred to the City of Millington and the Airport Authority.

4.1-1 List of solid waste management units (SWMUs) and areas of concern (AOCs) requiring no further action (NFA) under the corrective action conditions of this permit (Continued):

SWMU/ AOC	SWMU/AOC Name	Unit Comment	Dates of Operation	NFA Documentation
54	Hazardous Waste Accumulation Point @ Dental Clinic	Stored x-ray film fixer and dental amalgam (mercury/silver)	Unknown	NFA per EPA letter dated 2/22/90
55	Hazardous Waste Accumulation Point @ Medical Clinic	Stored used x-ray developer and fixer solution	Unknown	NFA per EPA letter dated 2/22/90
56	Hazardous Waste Accumulation Point @ Bldg. 352	Stored used auto batteries	Unknown	NFA per EPA letter dated 2/22/90
57	Hazardous Waste Accumulation Point @ Bldg. S-183	Paint storage for machine shop	Unknown	NFA per EPA letter dated 2/22/90
58	Hazardous Waste Accumulation Point @ Bldg. S-360	Accumulation point for waste paint and thinners	Unknown	NFA per EPA letter dated 2/22/90
59	Pesticide Storage Facility (old Pesticide Shop)	Stored DDT, dieldrin, chlorodane, and arsenic based pesticides	Unknown	NFA proposed in RCRA Facility Investigation Report; EPA and TDEC approval in 2001
61	Building N-26 – Former Printing Shop (Assembly G)	Hydraulic fluid, lubricating oil, diesel fuel	Early 1980s	NFA in Confirmatory Sampling Report Assembly G&H; TDEC approval 5/19/00
62*	M-21 Arresting Gear Drainage Area (Assembly C)	Solvents, fuel, PCBs, battery acid, ethylene oxide, hydraulic fluid, oil, diesel, chlorinated pesticides, dieldrin	1985-1990	NFA in Confirmatory Sampling Report; EPA approval 3/17/97
63	Underground waste Tank S-75N	Accumulation of wastes from central heating plant; MEK, acetone, ethyl benzene, toluene and xylene	Unknown-1992	NFA proposed in RCRA Facility Investigation Report; EPA approval 4/3/01 and TDEC approval 3/7/01
66*	Radar Area Dump (Assembly A)	Scrap metal, wood, empty drums, appliances, benzo(a)pyrene	Unknown	NFA proposed in Voluntary Cor.Action Report (Interim Measures) dated 8/14/98; approved by EPA 10/23/98
67*	Horse Pasture Dump (Assembly A)	Scrap metal, at least two drums and wood	Unknown	NFA proposed in Voluntary Corrective Action Report (Interim Measures) dated 8/14/98; approved by EPA 10/23/98

* These SWMUs were transferred to the City of Millington and the Airport Authority.

4.1-2 List of solid waste management units (SWMUs) and areas of concern (AOCs) that require Confirmatory Sampling:

As of permit issuance, there are no units identified as requiring Confirmatory Sampling in accordance with the corrective action conditions of this permit.

4.1-3 List of solid waste management units (SWMUs) and areas of concern (AOCs) that require a RCRA Facility Investigation (RFI):

As of permit issuance, there are no units identified as requiring Confirmatory Sampling in accordance with the corrective action conditions of this permit.

4.1-4 List of solid waste management units (SWMUs) and areas of concern (AOCs) that require Interim Measures:

As of permit issuance, there are several units listed in Table 4.1-5, Corrective Measures Study, that are currently also undergoing remedial actions in accordance with the Interim Measures conditions of this permit (Subsection III.F). When the Corrective Action Final Remedy is selected for each unit, in accordance with Subsection III.H of this permit, TDEC will public notice the proposed remedy for public review and comment in accordance with the conditions of permit Paragraph II.H.3.

4.1-5 List of solid waste management units (SWMUs) and areas of concern (AOCs) that require a Corrective Measures Study (CMS):

SWMU/AOC	SWMU/AOC Name	Unit Comment	Dates of Operation	Potentially Affected Media
14	Bldg. S-140 Site and 7th Avenue Ditch (Assembly E)	Waste paint, metals, petroleum products, solvents	1943-1989	Groundwater
17	S-9 Underground Waste Tank (Assembly F)	Waste lubricating oil and hydraulic fluid	Unknown-1976	Soil, Groundwater
22	S-75 Underground Fuel Tanks	No. 2 fuel oil, diesel	1942-1992	Soil, Groundwater
39	Former PCB Storage Area (Assembly F)	Transformer storage	1980-1983	Groundwater
65	Building S-362 (Training Mockup Site)	Jet fuel, hydraulic fluid, lubricating oil	Unknown-1992	NFA proposed in VCA; EPA approval 6/7/01 and TDEC approval 3/16/01
AOC A	Northside Fluvial Groundwater	Site-Wide Fluvial Groundwater	Unknown	Groundwater

See comment to Table 4.1-4, List of solid waste management units (SWMUs) and areas of concern (AOCs) that require Interim Measures.

4.1-6 List of solid waste management units (SWMUs) and areas of concern (AOCs) that require Corrective Action Remedies:				
SWMU/AOC	SWMU/AOC Name	Unit Comment	Dates of Operation	Final Remedy
2	Southside Landfill (Assembly E)	Sludges, oils, solvents solid waste	1942-1972	Institutional Controls, Groundwater and Surface Water Monitoring
7*	Building N-126 Plating Shop Dry Well	Acid, CH, mineral spirits, paint thinners, TCE, TCA, paint, lubricants, fuel, diesel, hydraulic fluid, MEK, engine oil, VOCs, SVOCs, TPH, metals, pesticides, herbicides	1955-1997	Institutional Controls, Fluvial Deposits Groundwater incorporated into AOC A
8*	Cemetery Disposal Area (Assembly A)	Ethylene oxide, metals, waste oil, transformers, capacitors, dieldrin, Ni	1965-1980	Institutional Controls
10*	Northside Landfill -Eastern Portion (Assembly B)	Construction debris	1951-1986	Institutional Controls
18*	N-112 Underground Waste Tank (Assembly C)	Used oil and hydraulic fluid, VOCs, TPH, pesticides	Unknown-1996	Institutional Controls; Fluvial Deposits Groundwater incorporated into AOC A
21*	N-10 Underground Waste Tank (Assembly C)	Waste oil and hydraulic fluid, VOCs, SVOCs, TPH-DRO, chlorinated pesticides/PCBs, herbicides, metals	1940s-Unknown	Institutional Controls; Fluvial Deposits Groundwater incorporated into AOC A
27*	Northside Sewage Treatment Plant (Assembly C)	Domestic sewage, oils, solvents, paints, VOCs, SVOCs, herbicides, metals	1943-1984	Institutional Controls
60*	Northside Landfill (Western Portion)	Construction Debris	Unknown	Institutional Controls
64*	Materials Storage Area N-16 (Assembly D)	Used oil, fire extinguishing agents, transformer, VOCs, SVOCs, herbicides, metals	Unknown	Institutional Controls
*These SWMUs were transferred to the City of Millington and the Airport Authority.				
MMRP 1	Pistol Range (UXO 1)			
MMRP 2	Trap/Skeet Ranges #1 and #2 (AOC 1)			
MMRP 3	Aircraft Firing Range (AOC 2)			
MMRP 4	Horse Stables Skeet Range #1 (AOC 3)			
MMRP 5	Horse Stables Skeet Range #2(UXO 000002)			
MMRP 6	Former Navy Rifle Range (UXO 000001)			
NSA Mid-South is also performing corrective action under the Military Munitions Response Program (MMRP) regulations. MMRP units are not regulated by the corrective action conditions of this permit.				

ATTACHMENT 4.2. RCRA FACILITY INVESTIGATION (RFI) OUTLINE

The purpose of the RFI portion of the hazardous waste corrective action process is to evaluate the nature and extent of releases of hazardous wastes and/or hazardous constituents and to gather necessary data to support the Corrective Measures Study (CMS) and/or Interim Measures. Planning for the investigation is best accomplished through a logical progression of tasks:

- Gather information on the source of the release(s) to the environment (Source Characterization);
- Gather information on the physical aspects of the environment which will affect the migration and fate of the release and identification of exposure pathways for both humans and non-human members of the environment (Environmental Setting); and
- Use Source Characterization and Environmental Setting to develop a conceptual model of the release that will be used to plan and conduct a program to define the nature, rate and extent of the release (Sampling and Analysis Plan).

An RFI Work Plan and RFI Report are generally required elements of the hazardous waste corrective action process. The requirements for a full, detailed RFI are listed in this attachment. The Tennessee Department of Environment and Conservation (TDEC) recognizes that each facility is unique. Therefore, the scope and requirements of the RFI shall be focused to fit the complexity of the site-specific situation. The work plan requirements listed in this attachment in no way limit the site-specific opportunities for a permittee. For example, the RFI may be implemented in phases. Relevant information contained in previously developed documents, such as a hazardous waste Part B permit application, may be referenced as appropriate, but must be summarized in either the RFI Work Plan or the RFI Report. In addition, TDEC understands that risk assessments are becoming more widely utilized to place characterization information into context and to aid in determining remedial solutions. If a risk assessment is expected to be performed in the future, note that the Environmental Protection Agency (EPA) Region 4 has developed a series of Risk Bulletins to provide permittees and their contractors with the general format and process TDEC expects a risk assessment to follow.

In some cases, it may be possible to implement the RFI concurrent with the CMS (also see Attachment 4.3). This approach can save time and money because the earlier in the corrective action process potential remedies can be identified, the more effectively information gathering can be focused. TDEC anticipates that a concurrent RFI/CMS approach may be appropriate in the following types of situations, among others: facilities where removal remedies have been proposed by the owner/operator, facilities with straightforward remedial solutions or where presumptive remedies can be applied, facilities where few remedial options are available, and facilities where the remedy is phased. TDEC will determine on a case-by-case basis if a concurrent RFI/CMS is appropriate. Because of the unique data collection requirements necessary for a remedial solution which includes natural attenuation of contaminants in groundwater, if natural attenuation is expected to be part of the remedial solution, then the Sampling and Analysis Plan should be crafted to include monitoring of specific water quality parameters unique to natural attenuation (e.g., nitrites/nitrates, ferrous iron, sulfides, dissolved oxygen, methane, hydrogen, etc.).

I. RFI WORK PLAN REQUIREMENTS - ELEMENTS OF THE RFI WORK PLAN

The RFI Work Plan shall include, at a minimum, the following elements:

A. Introduction - Summary of any relevant existing assessment data

The permittee shall describe the purpose or objective of the RFI Work Plan and provide a summary of any existing environmental data that is relevant to the investigation. At a minimum, the summary should provide all the following items:

1. Land ownership history;
2. Facility operating dates;
3. Facility's product(s);
4. Raw materials used in facility operations, wastes generated;
5. Nature and extent of any known contamination;
6. Summary of any ongoing Interim Measures and past assessments; and
7. Summary of permit objective and how this objective will be satisfied.

B. Environmental Setting

The permittee shall provide information on the environmental setting at the facility. The permittee shall characterize the Environmental Setting as it relates to identified sources, pathways and areas of releases of hazardous constituents from solid waste management units (SWMUs) and/or areas of concern (AOCs). Data gaps pertinent to characterization of releases shall be identified and provisions made in Section E to obtain the relevant information to fill the data gap. The Environmental Setting shall cover the following items, at a minimum:

1. Hydrogeology

The permittee shall provide a summary of the hydrogeologic conditions at the facility. This discussion shall include, but not be limited to, the following information:

- a. A description of the regional and facility specific geologic and hydrogeologic characteristics affecting groundwater flow beneath the facility, including:
 - i) Regional and facility specific stratigraphy: description of strata including strike and dip, identification of stratigraphic contacts;

- ii) Structural geology: description of local and regional structural features (e.g., folding, faulting, tilting, jointing, metamorphic foliation, etc.);
 - iii) Depositional history;
 - iv) Regional and facility specific groundwater flow patterns (porous media, fracture media, karst media); and
 - v) Identification and characterization of areas and amounts of recharge and discharge (springs in karst terrane, base level streams and rivers).
- b. An analysis of any topographic features that might influence the groundwater flow system (e.g., sinkholes and sinking streams in karst terranes).
- c. Based on any existing field data, tests (e.g., pump tests, tracer tests), and cores, a representative and accurate classification and description of the hydrogeologic units which may be part of the migration pathways at the facility (i.e., the aquifers and any intervening saturated and unsaturated units), including:
- i) Hydraulic conductivity and porosity (total and effective), groundwater flow velocity, groundwater basin discharge;
 - ii) Lithology, grain size, sorting, cementation;
 - iii) An interpretation of hydraulic interconnections between saturated zones (i.e., aquifers) and surface waters; and
 - iv) The attenuation capacity and mechanisms of the natural earth materials (e.g., ion exchange capacity, organic carbon content, mineral content, etc.).
- d. Based on data obtained from groundwater monitoring wells and piezometers installed upgradient, water wells and/or springs downgradient of the potential contaminant source, a representative description of water level or fluid pressure monitoring including:
- i) Water-level contour and/or potentiometric maps, including seasonal variations;
 - ii) Hydrologic cross sections showing gradients;
 - iii) The flow system, including the vertical and horizontal components of flow; and

- iv) Any temporal changes in hydraulic gradients, for example, due to tidal or seasonal influences and for karst terrane, stormflow.
- e. A description of man-made influences that may affect the hydrology of the site, identifying:
 - i) Local water supply and production wells with an approximate schedule of pumping; and
 - ii) Man-made hydraulic structures (pipelines, french drains, ditches, roofs, runways, parking lots, etc.).

2. Soils

The permittee shall provide an explanation of the soil and rock units above the water table in the vicinity of contaminant release(s). This summary may include, but not limited to, the following types of information:

- a. Surface soil distribution;
- b. Soil profile, including ASTM classification of soils;
- c. Transects of soil stratigraphy;
- d. Hydraulic conductivity (saturated and unsaturated);
- e. Relative permeability;
- f. Bulk density;
- g. Porosity;
- h. Soil sorption capacity;
- i. Cation exchange capacity (CEC);
- j. Soil organic content;
- k. Soil pH;
- l. Particle size distribution;
- m. Depth of water table;
- n. Moisture content;

- o. Effect of stratification on unsaturated flow;
- p. Infiltration;
- q. Evapotranspiration;
- r. Storage capacity;
- s. Vertical flow rate; and
- t. Mineral content.

3. Surface Water and Sediment

The permittee shall provide a description of the surface water bodies in the vicinity of the facility. This summary may include, but not limited to, the following activities and information:

- a. Description of the temporal and permanent surface water bodies including:
 - i) For lakes and estuaries: location, elevation, surface area, inflow, outflow, depth, temperature stratification, and volume;
 - ii) For impoundments: location, elevation, surface area, depth, volume, freeboard, and construction and purpose;
 - iii) For streams, ditches, and channels: location, elevation, flow, velocity, depth, width, seasonal fluctuations, flooding tendencies (i.e., 100-year event), discharge point(s), and general contents;
 - iv) Drainage patterns; and
 - v) Evapotranspiration.
- b. Description of the chemistry of the natural surface water and sediments. This includes determining the pH, total dissolved solids, total suspended solids, biological oxygen demand, alkalinity, conductivity, dissolved oxygen profiles, nutrients, chemical oxygen demand, total organic carbon, specific contaminant concentrations, etc.
- c. Description of sediment characteristics including:
 - i) Deposition area;

- ii) Thickness profile; and
- iii) Physical and chemical parameters (e.g., grain size, density, organic carbon content, ion exchange capacity, pH, etc.)

4. Air

The permittee shall provide information characterizing the climate in the vicinity of the facility. Such information may include, but not be limited to:

- a. A description of the following parameters:
 - i) Annual and monthly rainfall averages;
 - ii) Monthly temperature averages and extremes;
 - iii) Wind speed and direction;
 - iv) Relative humidity/dew point;
 - v) Atmospheric pressure;
 - vi) Evaporation data;
 - vii) Development of inversions; and
 - viii) Climate extremes that have been known to occur in the vicinity of the facility, including frequency of occurrence (i.e., hurricanes).
- b. A description of topographic and man-made features that affect air flow and emission patterns, including:
 - i) Ridges, hills or mountain areas;
 - ii) Canyons or valleys;
 - iii) Surface water bodies, e.g., rivers, lakes, or bays; and
 - iv) Buildings.

C. Source Characterization

For those sources from which releases of hazardous constituents have been detected, the permittee shall provide analytical data to completely characterize the wastes and the areas where wastes have been placed, to the degree that is possible

without undue safety risks, including: type, quantity; physical form; disposition (containment or nature of deposits); and facility characteristics affecting release (e.g., facility security, and engineering barriers). Data gaps on source characterization shall be identified and provisions made in subsection I.E of this attachment to obtain the relevant information to fill the data gap. This summary shall include quantification of the following specific characteristics, at each source area:

1. Unit/Disposal Area Characteristics:

- a. Location of unit/disposal area;
- b. Type of unit/disposal area;
- c. Design features;
- d. Operating practices (past and present); and
- e. Period of operation;
- f. Age of unit/disposal area;
- g. General physical conditions; and
- h. Method used to close the unit/disposal area.

2. Waste Characteristics:

- a. Type of wastes placed in the unit:
 - i) Hazardous classification (e.g., flammable, reactive, corrosive, oxidizing or reducing agent);
 - ii) Quantity; and
 - iii) Chemical composition.
- b. Physical and chemical characteristics such as:
 - i) Physical form (solid, liquid, gas);
 - ii) Physical description (e.g., powder, oily sludge);
 - iii) Temperature;
 - iv) pH;

- v) General chemical class (e.g., acid, base, solvent);
 - vi) Molecular weight;
 - vii) Density;
 - viii) Boiling point;
 - ix) Viscosity;
 - x) Solubility in water;
 - xi) Cohesiveness of the waste; and
 - xii) Vapor pressure.
- c. Migration and dispersal characteristics of the waste such as:
- i) Sorption capability;
 - ii) Biodegradability, bioconcentration, and/or biotransformation;
 - iii) Photodegradation rates;
 - iv) Hydrolysis rates; and
 - v) Chemical transformations.

D. Potential Receptors

The permittee shall provide data describing the human populations and environmental systems that are susceptible to contaminant exposure from the facility. Data gaps pertinent to receptor analysis shall be identified and provisions made in subsection I.E of this attachment to obtain the relevant information to fill the data gap. The following characteristics shall be identified at a minimum:

1. Current local uses and planned future uses of groundwater:
 - a. Type of use (e.g., drinking water source: municipal or residential, agricultural, domestic/non-potable, and industrial); and
 - b. Location of groundwater users, to include withdrawal and discharge wells and springs, within one mile of the impacted area.

The above information should also indicate the aquifer or hydrogeologic unit used and/or impacted for each item.

2. Current local uses and planned future uses of surface waters directly impacted by the facility:
 - a. Domestic and municipal (e.g., potable and lawn/gardening watering);
 - b. Recreational (e.g., swimming, fishing);
 - c. Agricultural;
 - d. Industrial; and
 - e. Environmental (e.g., fish and wildlife propagation).
3. Human use of or access to the facility and adjacent lands, including but not limited to:
 - a. Recreation;
 - b. Hunting;
 - c. Residential;
 - d. Commercial; and
 - e. Relationship of population locations and prevailing wind direction.
4. A general description of the biota in surface water bodies on, adjacent to, or affected by the facility.
5. A general description of the ecology within the area adjacent to the facility.
6. A general demographic profile of the people who use or have access to the facility and adjacent land, including, but not limited to age; sex; and sensitive subgroups.
7. A description of any known or documented endangered or threatened species near the facility.

E. Sampling and Analysis Plan(s) for Characterization of Releases of Hazardous Waste/Hazardous Constituents

The permittee shall prepare a plan to document all monitoring procedures necessary to characterize the extent, fate and transport of releases (i.e., identify sample locations, sample procedures and sample analysis to be performed during the investigation to characterize the environmental setting, source, and releases of

hazardous constituents, so as to ensure that all information and data are valid and properly documented). The sampling strategy and procedures shall be in accordance with the most recent version of the EPA, Region 4, SESD's Field Branches Quality System and Technical Procedures, which can be found online at www.epa.gov/region4/sesd/fbqstp, or an equivalent method approved by the Commissioner.

The Sampling and Analysis Plan must specifically discuss the following unless a particular procedure in the Field Branches Quality System and Technical Procedure is directly referenced:

1. Sampling Strategy

- a. Selecting appropriate sampling locations, depths, etc;
- b. Obtaining all necessary ancillary data;
- c. Determining conditions under which sampling should be conducted;
- d. Determining which media are to be sampled (e.g., groundwater, air, soil, sediment, subsurface gas);
- e. Determining which parameters are to be measured and where;
- f. Selecting the frequency of sampling and length of sampling period;
- g. Selecting the types of samples (e.g., composite vs. grab) and number of samples to be collected.

2. Sampling Procedures

- a. Documenting field sampling operations and procedures, including:
 - i) Documentation of procedures for preparation of reagents or supplies that become an integral part of the sample (e.g., filters, preservatives, and absorbing reagents);
 - ii) Procedures and forms for recording the exact location and specific considerations associated with sample acquisition;
 - iii) Documentation of specific sample preservation method;
 - iv) Calibration of field instruments;
 - v) Submission of appropriate blanks (e.g., field, equipment, trip, etc.);

- vi) Potential interferences present at the facility;
 - vii) Construction materials and techniques, associated with monitoring wells and piezometers;
 - viii) Field equipment listing and sampling containers;
 - ix) Sampling order; and
 - x) Decontamination procedures.
- b. Selecting appropriate sample containers;
 - c. Sampling preservation; and
 - d. Chain-of-custody, including:
 - i) Standardized field tracking reporting forms to establish sample custody in the field prior to shipment;
 - ii) Pre-prepared sample labels containing all information necessary for effective sample tracking; and
 - iii) Chain-of-custody seals for sample containers and coolers.

3. Sample Analysis

Sample analysis shall be conducted in accordance with SW-846: Test Methods for Evaluating Solid Waste - Physical/Chemical Methods (most recent version) or an alternate TDEC approved method. The sample analysis section of the Sampling and Analysis Plan shall specify the following:

- a. Chain-of-custody procedures, including:
 - i) Identification of a responsible party to act as sampling custodian at the laboratory facility authorized to sign for incoming field samples, obtain documents of shipment, and verify the data entered onto the sample custody records;
 - ii) Provision for a laboratory sample custody log consisting of serially numbered standard lab-tracking report sheets; and
 - iii) Specification of laboratory sample custody procedures for sample handling, storage, and dispersment for analysis.

- b. Sample storage (e.g., maximum holding times);
- c. Sample preparation methods;
- d. Analytical Procedures, including:
 - i) Scope and application of the procedure;
 - ii) Sample matrix;
 - iii) Potential interferences;
 - iv) Precision and accuracy of the methodology; and
 - v) Method Detection Limits; and
 - vi) Practical Quantitative Limits
- e. Calibration procedures and frequency;
- f. Data reduction, validation and reporting;
- g. Internal quality control checks, laboratory performance and systems audits and frequency, including:
 - i) Method blank(s);
 - ii) Laboratory control sample(s);
 - iii) Calibration check sample(s);
 - iv) Replicate sample(s);
 - v) Matrix-spiked sample(s);
 - vi) "Blind" quality control sample(s);
 - vii) Control charts;
 - viii) Surrogate samples;
 - ix) Zero and span gases; and
 - x) Reagent quality control checks.
- h. External quality control checks by TDEC, including:

- i) Spikes and blanks at sampling events for which TDEC or its technical representative provides oversight; and
 - ii) The equivalent of a Contract Laboratory Program (CLP) data package for samples split with TDEC or for which TDEC specifically requests the package.
- i. Preventive maintenance procedures and schedules;
 - j. Corrective action (for laboratory problems); and
 - k. Turnaround time.

F. Data Management Plan

The permittee shall develop and initiate a Data Management Plan to document and track investigation data and results. This plan shall identify and set up data documentation materials and procedures, project file requirements, and project-related progress reporting procedures and documents. The plan shall also provide the format to be used to present the raw data and conclusions of the investigation.

1. Data Record

The data record shall include the following:

- a. Unique sample or field measurement code;
- b. Sampling or field measurement location and type;
- c. Sampling or field measurement raw data;
- d. Laboratory analysis ID number;
- e. Property or component measures; and
- f. Result of analysis (e.g. concentration, data qualifiers).

2. Tabular Displays

The following data shall be presented in tabular displays:

- a. Unsorted (raw) data;
- b. Results for each medium, or for each constituent monitored;
- c. Data reduction for statistical analysis, as appropriate;

- d. Sorting of data by potential stratification factors (e.g., location, soil layer, topography); and
- e. Summary data.

3. Graphical Displays

The following data shall be presented in graphical formats (e.g., bar graphs, line graphs, area or plan maps, isopleth plots, cross-sectional plots or transects, three dimensional graphs, etc.):

- a. Display sampling location and sampling grid;
- b. Indicate sampling boundaries, and where more data are required;
- c. Display geographical extent of contamination, both horizontally and vertically;
- d. Illustrate changes in concentration in relation to distances from the source, time, depth or other parameters; and
- e. Indicate features affecting inter-media transport and show potential receptors.

G. Project Management Plan - Schedule of Implementation

The permittee shall prepare a Project Management Plan which will cover qualifications of personnel categories and the management control structure for the project. The permittee shall also provide a schedule for completing the planned RFI activities. The schedule shall be as specific as possible (i.e., it should indicate the number of days/weeks/months required for each major work plan task).

II. RFI REPORT REQUIREMENTS - ELEMENTS OF THE RFI REPORT

The RFI Report shall include, at a minimum, the following elements:

A. Introduction

The permittee shall describe the purpose of the RFI Work Plan and provide a summary description of the project.

B. Environmental Setting

The permittee shall describe the environmental setting in and around the facility. The RFI Work Plan should contain some, if not all, of the information on the

environmental setting. Any information collected during implementation of the work plan that clarifies or improves understanding of the environmental setting should be provided in this section.

C. Source Characterization

The permittee shall summarize the sources of contamination and nature of releases identified at the facility. The RCRA Facility Assessment and the RFI Work Plan should contain some, if not all, of the information on source characterization. Any information collected during work plan implementation or obtained from the sources (e.g., voluntarily or from other environmental programs) that directly addresses source characterization should be provided in this section.

D. Sampling and Analysis Results

The permittee shall present data results obtained pursuant to the RFI Work Plan. The permittee shall identify any work plan proposals which were not completed and explain why such actions were not finished. The permittee shall also present its analysis/interpretation of how the sampling data meet the RFI objective and how the sampling data fits or modifies the contaminant conceptual model. For all analytical data, the permittee shall discuss the results of data quality/data review.

E. Data Quality Assurance/Data Quality Data Review

The permittee shall perform a Quality Assurance/Quality Control data review on all data present in the RFI. The Quality Assurance/Quality Control data review shall be in accordance with the U.S. EPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (EPA-540/R94-013) and the U.S. EPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (EPA-540/R94-012). The data review shall address the following, at minimum:

1. Holding times;
2. Blanks;
3. Laboratory Control Samples;
4. Field Duplicates;
5. Surrogate Recoveries;
6. Matrix Spike/Matrix Spike Duplicates; and
7. Data Assessment - Data Usability.

F. Conclusions

The permittee shall summarize the major conclusions reached after analysis of the environmental setting, source characterization, sampling and analysis results and data quality. Any data gaps, needed to complete characterization of the scope and extent of the releases from SWMUs and/or AOCs or to refine further the contaminant conceptual model, shall be identified and recommendations made in the Recommendations Section of the report.

G. Recommendations

The permittee shall provide its recommendations on what, if any, further action is needed to complete the characterization of release(s) from SWMUs and/or AOCs.

H. Work Plan for Additional Investigations

If further investigations are determined to be needed to complete the objective of the RFI, then the permittee shall provide a work plan to complete characterization of the release(s).

ATTACHMENT 4.3. CORRECTIVE MEASURE STUDY (CMS) OUTLINE

The purpose of the CMS portion of the hazardous waste corrective action process is to identify and evaluate potential remedial alternatives for the releases of hazardous constituents that have been identified at the facility through the RCRA Facility Investigation (RFI) or other investigations that need further evaluation. The scope and requirements of the CMS are balanced with the expeditious initiation of remedies and rapid restoration of contaminated media. The scope and requirements of the CMS should be focused to fit the complexity of the site-specific situation. It is anticipated that permittees with sites with complex environmental problems may need to evaluate a number of technologies and corrective measure alternatives. For other facilities, however, the evaluation of a single corrective measure alternative may be adequate. Therefore, a streamlined or focused approach to the CMS may be initiated. Information gathered during any stabilizations or interim measures will be used to augment the CMS and in cases where corrective action goals are met, may be a substitute for the final CMS.

Regardless of whether a streamlined/focused or a detailed CMS is required, a CMS Work Plan and CMS Report are generally required elements. The requirements for a full, detailed CMS are listed below. The Tennessee Department of Environment and Conservation (TDEC) has the flexibility not to require sections of the plan and/or report, where site-specific situations indicate that all requirements are not necessary. Additionally, TDEC may require additional studies besides these discussed in order to support the CMS.

I. CORRECTIVE MEASURES STUDY (CMS) WORK PLAN

A. Elements of the CMS Work Plan

The Corrective Measures Study (CMS) Work Plan shall include at a minimum the following elements:

1. A brief site-specific description of the overall purpose of the CMS;
2. A brief description of the corrective measure objectives, including proposed target media cleanup standards (e.g., promulgated federal and state standards) and preliminary points of compliance or a description of how a risk assessment will be performed (e.g., guidance documents);
3. A brief description of the specific corrective measure technologies and/or corrective measure alternatives which will be studied;
4. A brief description of the general approach to investigating and evaluating potential corrective measures;
5. A detailed description of any proposed pilot, laboratory and/or bench scale studies;
6. A proposed outline for the CMS Report including a description of how information will be presented;

7. A brief description of overall project management including overall approach, levels of authority (include organization chart), lines of communication, project schedules, budget and personnel. Include a description of qualifications for personnel directing or performing the work;
8. A project schedule that specifies all significant steps in the process and when key documents (*e.g.*, CMS Progress Reports, draft CMS Report) are to be submitted to TDEC; and
9. A detailed Public Involvement Plan.

II. CORRECTIVE MEASURES STUDY (CMS) REPORT

The detail of a CMS may vary based upon the complexity of the site, on-going Interim Measures, established presumptive remedies, etc. However, the CMS Report may include the following elements:

A. Introduction/Purpose

The permittee shall describe the purpose of the CMS Report and provide a summary description of the project.

B. Description of Current Situation

The permittee shall submit a summary and an update to the information describing the current situation at the facility and the known nature and extent of the contamination as documented by the RFI Report. This discussion should concentrate on those issues which could significantly affect the evaluation and selection of the corrective measures alternative(s). The permittee shall provide an update to information presented in the RFI regarding previous response activities and interim measures which have or are being implemented at the facility. The permittee shall also make a facility-specific statement of the purpose for the response, based on the results of the RFI. The statement of purpose should identify the actual or potential exposure pathways that should be addressed by corrective measures.

C. Establishment of Proposed Media Specific Cleanup Standards

The permittee shall describe the proposed media cleanup standards and point of compliance. The standards must be either background, promulgated federal and state standards or risk-derived standards. If media cleanup standards are not proposed, then TDEC will unilaterally propose setting media cleanup standards to either background, promulgated federal and state standards or the most conservative risk-derived standards.

D. Identification, Screening and Development of Corrective Measure Technologies

1. Identification: List and briefly describe potentially applicable technologies for each affected media that may be used to achieve the corrective action objectives. Include a table that summarizes the available technologies.

The permittee should consider innovative treatment technologies, especially in situations where there are a limited number of applicable corrective measure technologies.

2. Screening: The permittee shall screen the corrective measure technologies to eliminate those that may prove infeasible to implement, that rely on technologies unlikely to perform satisfactorily or reliably, or that do not achieve the corrective measure objective within a reasonable time period. This screening process focuses on eliminating those technologies which have severe limitations for a given set of waste and site-specific conditions. The screening step may also eliminate technologies based on inherent technology limitations.

Site, waste, and technology characteristics which are used to screen inapplicable technologies are described in more detail below:

- a. Site Characteristics: Site data should be reviewed to identify conditions that may limit or promote the use of certain technologies. Technologies whose use is clearly precluded by site characteristics should be eliminated from further consideration.
- b. Waste Characteristics: Identification of waste characteristics that limit the effectiveness or feasibility of technologies is an important part of the screening process. Technologies clearly limited by these waste characteristics should be eliminated from consideration. Waste characteristics particularly affect the feasibility of in-situ methods, direct treatment methods, and land disposal (on/off-site).
- c. Technology Limitations: During the screening process, the level of technology development, performance record, and inherent construction, operation and maintenance problems should be identified for each technology considered. Technologies that are unreliable, perform poorly, or are not fully demonstrated may be eliminated in the screening process. For example, certain treatment methods have been developed to a point where they can be implemented in the field without extensive technology transfer or development.

3. **Corrective Measure Development:** The permittee shall assemble the technologies that pass the screening step into specific alternatives that have the potential to meet the corrective action objectives for each media. Options for addressing less complex sites could be relatively straightforward and may only require evaluation of a single or limited number of alternatives. Each alternative may consist of an individual technology or a combination used in sequence (i.e., treatment train). Different alternatives may be considered for separate areas of the facility, as appropriate. List and briefly describe each corrective measure alternative.

E. Evaluation of a Final Corrective Measure Alternative

For each remedy which warrants a more detailed evaluation (i.e., those that passed through the screening step), including those situations when only one remedy is being proposed, the permittee shall provide detailed documentation of how the potential remedy will comply with each of the standards listed below. These standards reflect the major technical components of remedies including cleanup of releases, source control and management of wastes that are generated by remedial activities. The specific standards are as follows:

1. Protect human health and the environment.
2. Attain media cleanup standards set by TDEC.
3. Control the source of releases so as to reduce or eliminate, to the extent practicable, further releases that may pose a threat to human health and the environment.
4. Comply with applicable standards for management of wastes.
5. Other factors.

In evaluating the selected alternative(s), the permittee shall prepare and submit information that documents that the specific remedy will meet the standards listed above. The following guidance should be used in completing this evaluation.

1. **Protect Human Health and the Environment**

Corrective action remedies must be protective of human health and the environment. Remedies may include those measures that are needed to be protective, but are not directly related to media cleanup, source control or management of wastes. An example would be a requirement to provide alternative drinking water supplies in order to prevent exposures to releases from an aquifer used for drinking water purposes. Therefore, the Permittee shall provide a discussion of any short term remedies necessary to meet this standard, as well as discuss how the corrective measures alternative(s) meet this standard.

2. Attain Media Cleanup Standards

Remedies will be required to attain media cleanup standards. As part of the necessary information for satisfying this requirement, the permittee shall address whether the potential remedy will achieve the remediation objectives. An estimate of the time frame necessary to achieve the goals shall be included. Contingent remedies may be proposed if there is doubt if the initial remedy will be successful (e.g., contingent remedies to innovative technologies).

3. Control of Sources of Releases

The permittee shall address the issue of whether source control measures are necessary, and if so, the type of actions that would be appropriate. Any source control measure proposed should include a discussion on how well the method is anticipated to work given the particular situation at the facility and the known track record of the specific technology.

4. Comply with any Applicable Standards for Management of Wastes

The permittee shall include a discussion of how the specific waste management activities will be conducted in compliance with all applicable state and federal regulations (e.g., closure requirements, Land Disposal Restrictions).

5. Other Factors

There are five general factors that will be considered as appropriate by TDEC in selecting/approving a remedy that meets the four standards listed above. These five decision factors include:

- a. Long-term reliability and effectiveness;
- b. Reduction in the toxicity, mobility or volume of wastes;
- c. Short-term effectiveness;
- d. Implementability; and
- e. Cost.

Examples of the type of information to include are:

- a. Long-term reliability and effectiveness: The permittee may consider whether the technology, or combination of technologies, have been used effectively under analogous site conditions, whether failure of any one technology in the alternative would

have any immediate impact on receptors, and whether the alternative would have the flexibility to deal with uncontrollable changes at the site. Operation and maintenance requirements include the frequency and complexity of necessary operation and maintenance. In addition, each corrective measure alternative should be evaluated in terms of the projected useful life of the overall alternative and of its component technologies. Useful life is defined as the length of time the level of effectiveness can be maintained.

- b. Reduction in the toxicity, mobility or volume of wastes: As a general goal, remedies will be preferred that employ techniques that are capable of eliminating or substantially reducing the potential for the wastes in SWMUs and/or contaminated media at the facility to cause future environmental releases. Estimates of how the corrective measure alternative will reduce toxicity, mobility and or volume of the waste is required and may be accomplished through a comparison of initial site conditions to expected post-corrective measures conditions.
- c. Short-term effectiveness: The permittee shall evaluate each corrective measure alternative for short-term effectiveness. Possible factors to consider are fire, explosion, exposure to hazardous constituents and potential threats associated with the treatment, excavation, transportation and re-disposal or containment of the waste material.
- d. Implementability: Information to consider when assessing implementability include:
 - i) The administrative activities needed to implement the corrective measure alternative (e.g. permits, rights of way, etc.) and the length of time these activities will take;
 - ii) The constructibility, time for implementation, and time for beneficial results;
 - iii) The availability of adequate off-site treatment, storage capacity, disposal services, needed technical services and materials; and
 - iv) The availability of prospective technologies for each corrective measure alternative.
- e. Cost: The permittee shall develop an estimate of the cost of each corrective measure alternative (and for each phase or segment of the alternative). The cost estimate shall include both capital and

operation and maintenance costs. The capital costs shall include, but are not limited to, costs for: engineering, site preparation, construction, materials, labor, sampling/analysis, waste management/disposal, permitting, health and safety measures, etc. The operation and maintenance costs shall include labor, training, sampling and analysis, maintenance materials, utilities, waste disposal and/or treatment, etc. Costs shall be calculated as the net present value of the capital and operation and maintenance costs.

F. Justification and Recommendation of the Corrective Measure or Measures

The permittee shall justify and recommend in the CMS Report a corrective measure alternative for consideration by TDEC. Such a recommendation should include a description and supporting rationale for the preferred alternative that is consistent with the corrective action standards and remedy selection decision factors discussed above. In addition, this recommendation shall include summary tables which allow the alternative or alternatives to be understood easily. Trade-offs among health risks, environmental effects, and other pertinent factors shall be highlighted. The Commissioner will select the corrective measure alternative or alternatives to be implemented based on the results presented in the CMS Report.

ATTACHMENT 4.4. CORRECTIVE ACTION COMPLIANCE SCHEDULE

Compliance Schedule	Due Date
Notification of Newly Identified SWMUs and AOCs: <i>Paragraphs III.B.1 and III.B.2</i>	Within fifteen (15) calendar days of discovery
SWMU Assessment Report: <i>Paragraph III.B.3</i>	Within ninety (90) calendar days of notification
Notification for Newly Discovered Releases from SWMUs or AOCs: <i>Paragraph III.C.1</i>	Within fifteen (15) calendar days of discovery
Confirmatory Sampling Work Plan for suspected AOCs under paragraph III.B.1 or SWMUs identified under paragraph III.B.4: <i>Paragraph III.D.1</i>	Within forty-five (45) calendar days of notification by the Commissioner
Implementation of Confirmatory Sampling: <i>Paragraph III.D.2</i>	As specified by Commissioner in the CS Work Plan approval letter
Confirmatory Sampling Report: <i>Paragraph III.D.4</i>	In accordance with the schedule in the approved CS Work Plan
RFI Work Plan for SWMU(s) and AOC(s) identified under paragraphs III.B.4, III.C.2, or III.D.5: <i>Subparagraph III.E.1(a)</i>	Within ninety (90) calendar days of notification by the Commissioner which SWMUs or AOCs require an RFI
Notify to implement RFI Sampling: <i>Paragraph III.E.2</i>	Twenty (20) days prior to any RFI sampling activity
Draft RFI Report: <i>Subparagraph III.E.3(a)</i>	In accordance with the schedule in the approved RFI Work Plan
Final RFI Report: <i>Subparagraph III.E.3(a)</i>	Within thirty (30) calendar days of receipt of Commissioner's final comments on Draft RFI Report
RFI Progress Reports: <i>Subparagraph III.E.3(d)</i>	Quarterly, beginning ninety (90) calendar days from the start date specified by the Commissioner*
Interim Measures Work Plan: <i>Subparagraph III.F.1(a)</i>	Within thirty (30) calendar days of notification by the Commissioner
Interim Measures Report: <i>Subparagraph III.F.3(a)</i>	Within ninety (90) calendar days of completion of Interim Measures

Compliance Schedule	Due Date
Interim Measures Progress Reports: <i>Subparagraph III.F.3(b)</i>	In accordance with the approved Interim Measures Work Plan ** or semi-annually for permittee-initiated IM
CMS Work Plan: <i>Subparagraph III.G.1(a)</i>	Within ninety (90) calendar days of notification by the Commissioner that a CMS is required
Implementation of CMS Work Plan: <i>Paragraph III.G.2</i>	No later than fifteen (15) calendar days after receipt of the Commissioner's approval of CMS Work Plan
Draft CMS Report: <i>Subparagraph III.G.3(a)</i>	In accordance with the schedule in the approved CMS Work Plan
Final CMS Report: <i>Subparagraph III.G.3(a)</i>	Within thirty (30) calendar days of the Commissioner's final comments on the draft CMS Report
Noncompliance/Imminent Hazard Report: <i>Subparagraph I.D.11(f)</i>	Oral within 24 hours and written within five (5) calendar days of becoming aware of the hazardous circumstances
Notification for plans to initiate the closure of monitoring wells and piezometers and submittal of Closure Report after P&A <i>Section VI, Attachment 5</i>	Commissioner shall be notified thirty (30) days prior to implementing well closure procedures and reporting within 30 days after completing P&A.
<p>The above reports must be signed and certified in accordance with Tennessee Hazardous Waste Management Rules 1200-01-11-.07(2)(a)7 through 10.</p> <p>Italicized conditions provide the locations in the permit with compliance schedule requirements</p> <p>* This applies to Work Plan execution that requires more than one hundred eighty (180) calendar days.</p> <p>** This applies to Work Plan execution that requires more than one year.</p>	

ATTACHMENT 4.5. SCREENING LEVELS

I. DEFINITION

Screening levels are conservative health-based concentrations of hazardous constituents determined to be indicators for the protection of human health or the environment. Screening levels shall be set for all hazardous constituents, a subset of hazardous wastes, identified in the RCRA Facility Investigation (RFI) Report(s) or for those hazardous constituents which the Commissioner has reason to believe may have been released from a Solid Waste Management Unit (SWMU) or an Area of Concern (AOC) at the facility. Should the concentration of a hazardous constituent(s) in an aquifer, surface water, soil or air exceed its screening level for any environmental medium, the Commissioner may require the permittee to conduct a Corrective Measure Study (CMS) to meet the requirements of Subsection III.G, Attachment 4.3, and Rule 1200-01-11-.06(6)(1). If the Commissioner determines that a constituent(s) released from a SWMU or AOC in quantities below its respective screening level(s) may pose a threat to human health or the environment, given site-specific exposure conditions, cumulative effects, ecological concerns, etc., then the Commissioner has the authority to require a CMS to meet the requirements of Subsection III.G, Attachment 4.3, and Rule 1200-01-11-.06(6)(1).

- A. Screening levels shall be concentration levels that satisfy the following criteria:
 - 1. Are derived in a manner consistent with the U.S. Environmental Protection Agency (EPA) guidelines for assessing human and environmental health risks from hazardous constituents; and
 - 2. Are based on scientifically valid studies conducted in accordance with the Toxic Substances Control Act (TSCA) Good Laboratory Practice Standards, or equivalent; and
 - 3. For human health screening levels to address carcinogens, represents a concentration associated with an excess upper bound lifetime cancer risk of 1×10^{-6} for carcinogens due to continuous constant lifetime exposure; and
 - 4. For human health screening levels to address systemic toxicants, represents a concentration to which the human population (including sensitive subgroups) could be exposed on a daily basis that is likely to be without appreciable risk of deleterious effects during a lifetime.
- B. For constituent(s) detected in groundwater, air, surface water or soil, for which a concentration level that meets the criteria specified in paragraphs I.A.1 through I.A.4 of this attachment is not available or possible, the screening level for the constituent(s) shall be the background concentration of the constituent(s).

II. GROUNDWATER

- A. Screening levels for groundwater constituents shall be concentrations specified as:

1. Maximum contaminant levels (MCLs) for Drinking Water Standards; or
 2. For constituents for which MCLs have not been promulgated, a concentration which satisfies the criteria specified in paragraphs I.A.1 through I.A.4 of this attachment shall be calculated.
- B. In deriving human health screening levels for constituents for which MCLs have not been promulgated, the recommended equations/assumptions shall be that followed by U.S. Environmental Protection Agency's (EPA) "Regional Screening Levels for Chemical Contaminants at Superfund Sites," most recent version, which can be found at <http://epa-prgs.ornl.gov/chemicals/index.shtml>. Because the science of risk assessment is in flux and technical criteria/opinion of today (e.g., content of standardized equations, use of default exposure assumptions, etc.) may change, the Commissioner reserves that right to revise the above recommended equations/assumptions as needed to meet the criteria listed in paragraphs I.A.1 through I.A.4 of this attachment.

III. SURFACE WATER

- A. Screening levels for surface water constituents shall be concentrations specified as:
1. Water Quality Standards established pursuant to the Clean Water Act by the State of Tennessee, where such standards are expressed as numeric values; or
 2. Numeric interpretations of State narrative water quality standards where water quality standards expressed as numeric values have not been established by the State; or
 3. MCLs for constituents in surface water designated by the State for drinking water supply, where numeric values or numeric interpretations, described in paragraphs III.A.1 and 2 of this attachment, are not available; or
 4. For constituents in surface waters designated by the State for drinking water supply for which numeric values, numeric interpretations, or MCLs are not available, a concentration which meets the criteria specified in paragraphs I.A.1 through I.A.4 of this attachment shall be calculated assuming exposure through consumption of the water contaminated with the constituent; or
 5. For constituents in surface waters designated for use or uses other than drinking water supply and for which numeric values or numeric interpretations have not been established, a concentration established by the Commissioner which meets the criteria specified in paragraphs I.A.1 through I.A.4 of this attachment shall be calculated.

- B. In deriving human health screening levels for constituents in surface water, the recommended equations/assumptions shall be that followed by "Regional Screening Levels for Chemical Contaminants at Superfund Sites," most recent version, which can be found at <http://epa-prgs.ornl.gov/chemicals/index.shtml>. Because the science of risk assessment is in flux and technical criteria/opinion of today (e.g., content of standardized equations, use of default exposure assumptions, etc.) may change, the Commissioner reserves that right to revise the above recommended equations/assumptions as needed to meet the criteria listed in paragraphs I.A.1 through I.A.4 of this attachment.

IV. AIR

- A. Screening levels for constituents in air shall be defined as concentrations which meet the criteria specified in paragraphs I.A.1 through I.A.4 of this attachment. The screening levels for air shall be measured or estimated at the facility boundary, or another location closer to the unit if necessary to protect human health and the environment.
- B. In deriving human health screening levels for constituents in air, the reference concentration (RfC) should be utilized as the screening level, where available. The RfC includes exposure assumptions, and no calculations are necessary to calculate a screening level. If an RfC is not available, the recommended methodology/assumptions shall be that followed by "Regional Screening Levels for Chemical Contaminants at Superfund Sites," most recent version, which can be found at <http://epa-prgs.ornl.gov/chemicals/index.shtml>. Because the e.g., content of standardized equations, use of default exposure assumptions, etc.) may change, the Commissioner reserves that right to revise the above recommended equations/assumptions as needed to meet the criteria listed in paragraphs I.A.1 through I.A.4 of this attachment.

V. SOIL

- A. Screening levels for constituents in soil shall be concentrations which meet the criteria specified in paragraphs I.A.1 through I.A.4 of this attachment.
- B. The calculation of human health screening levels for soil includes several specific exposure routes which must be evaluated individually: 1) ingestion, 2) inhalation and 3) leachability to groundwater. In deriving screening levels to address ingestion, inhalation and leaching, the methodology/assumptions found in the most recent EPA Soil Screening Level Guidance should be reviewed for appropriate equations and assumptions. Because the science of risk assessment is in flux and technical criteria/opinion of today (e.g., content of standardized equations, use of default exposure assumptions, etc.) may change, the Commissioner reserves that right to revise the above recommended equations/assumptions as needed to meet the criteria listed in paragraphs I.A.1 through I.A.4 of this attachment.

VI. SEDIMENT

- A. Screening levels for constituents in sediment shall be based on whether human health or ecological health is the major concern. If ecological concerns are deemed to predominate, then screening levels for constituents in sediment shall be concentrations based on the latest sediment screening values as calculated by EPA Region 4. Because the science of risk assessment is in flux and technical criteria/opinion of today (e.g., content of standardized equations, use of default exposure assumptions, etc.) may change, the Commissioner reserves that right to revise the above recommended equations/assumptions as needed to meet the criteria listed in paragraphs I.A.1 through I.A.4 of this attachment.

- B. If an ecological sediment screening value for a constituent of concern has not been generated by EPA Region 4 and cannot be generated using the criteria in paragraphs I.A.1 and I.A.2 of this attachment, then the ecological screening level for sediment shall be background. If human health is the prevailing concern, then the human health screening level for sediment shall address all applicable exposures.

ATTACHMENT 4.6. CORRECTIVE ACTION REMEDIES

This Attachment provides the corrective action requirements for the solid waste management units and areas of concern that have a selected final remedy at Naval Support Activity Mid-South (NSA Mid-South) located in Millington, Shelby County, Tennessee.

I. CORRECTIVE ACTION REQUIREMENTS

The following sections describe the procedures for implementing the selected corrective action remedies for this site. Institutional Controls (ICs) are necessary to protect human health and the environment. The ICs will prevent exposures to the contaminated soils by limiting site access and enforcing other administrative measures. The facility will be required to maintain the land use controls and perform inspections to verify that the ICs are maintained. Groundwater, contaminated with VOCs, will require long-term monitoring to ensure that human health and the environment remain protected.

II. INSTITUTIONAL CONTROLS FOR ALL SWMUS

This section provides the conditions for maintaining control and limiting access to the entire facility, including specific inspection and maintenance requirements for the facility's SWMUs and AOCs. As these units have exposure concerns, the permittee shall be required to maintain the following institutional controls for those SWMUs and AOCs that require the implementation of the selected corrective action remedy.

TABLE 4.6-1: INSTITUTIONAL CONTROLS

SWMU/ AOC	SWMU/AOC Name	Unit Comment	Dates of Operation	Final Remedy
2	Southside Landfill	Sludges, oils, solvents, solid waste	1942-1972	4
7*	Building N-126 Plating Shop Dry Well	Acid, CH, mineral spirits, paint thinners, TCE, TCA, paint, lubricants, fuel hydraulic fluid, MEK, engine oil, diesel, VOCs, SVOCs, TPH, metals pesticides, herbicides	1955-1997	1, 2, 3, 5
8*	Cemetery Disposal Area (Assembly A)	Ethylene oxide, metals, waste oil, transformers, capacitors, dieldrin, Ni	1965-1980	1, 2, 3
10*	Northside Landfill - Eastern Portion (Assembly B)	Construction debris	1951-1986	2
18*	N-112 Underground Waste Tank (Assembly C)	Used oil and hydraulic fluid, VOCs, TPH, pesticides	Unknown- 1996	1, 3

Table continued on next page.

TABLE 4.6-1: INSTITUTIONAL CONTROLS (Continued)

SWMU/ AOC	SWMU/AOC Name	Unit Comment	Dates of Operation	Final Remedy
21*	N-10 Underground Waste Tank (Assembly C)	Waste oil and hydraulic fluid, VOCs, SVOCs, TPH-DRO, chlorinated pesticides/PCBs, herbicides, metals	1940s-Unknown	1, 3
27*	Northside Sewage Treatment Plant (Assembly C)	Domestic sewage, oils, solvents, paints, VOCs, SVOCs, herbicides, metals	1943-1984	1
60*	Northside Landfill - Western Portion (Assembly A)	Construction debris, VOCs, TPH	1951-1986	1, 2, 3
64*	Materials Storage Area N-16 (Assembly D)	Used oil, fire extinguishing agents, transformer, VOCs, SVOCs, herbicides, metals	Unknown	1

*These SWMUs were transferred to the City of Millington and the Airport Authority.

Implementation and enforcement of the land use controls for SWMUs 8, 18, 27, 60 and 64 are detailed in the Land Use Control Implementation Plan (LUCIP) for the Non-Airfield Parcel. Implementation and enforcement of the land use controls for SWMUs 10 and 21 are detailed in the Land Use Control Implementation Plan (LUCIP) for the Airfield Parcel. A part of each LUCIP states that periodic physical inspections of the property to ensure that all Land Use Controls (LUCs) are being complied with, will be conducted by Navy personnel and reported to TDEC at a frequency concurrent with the operation and/or monitoring reporting requirements of any/all remedial systems. If no remedial systems will be installed and operated on the property, at a minimum, physical inspections of the property will be performed by Navy personnel as part of the CERCLA 5-year review process for each site where hazardous substance contamination will remain in place.

Remedy 1 -- The site must be reused for nonresidential purposes only.

Remedy 2 -- The excavation, drilling, or other disturbance of soil is prohibited without prior approval from the Navy.

Remedy 3 -- The use of shallow (loess and fluvial deposits) groundwater is prohibited. The installation of wells in the Memphis sand or deeper aquifers must preclude the downward migration of contamination by using double-cased and grouted wells, and prior written authorization from the Navy and approval from the Memphis-Shelby County Health Department must be obtained. The Commissioner shall be notified of all such authorizations.

Remedy 4 -- Specific requirements for SWMU 2 follow.

Remedy 5 -- Prior to any construction, Navy and TDEC approval is required.

III. ADDITIONAL INSTITUTIONAL CONTROLS FOR SWMU 2

- A. The permittee shall maintain, in good condition, the 8-foot chain link fence that surrounds the facility. Access and egress to the facility shall be controlled through locking gates.

- B. The permittee shall maintain signs as specified in Permit Subsection II.A and Attachment 2, Security.
- C. Without prior written permission from the Commissioner, the permittee shall not allow any digging, construction activity or other action that disturbs the soil within the fenced SWMU 2 areas shown on Figure 5-2 of Attachment 5, or other affected areas downgradient that may affect migration of the groundwater contaminant plume. During sampling, inspection or any other activity in these areas, workers are required to adhere to established safety measures in order to minimize exposures.
- D. The permittee shall regularly perform inspections on a semi-annually basis as specified in Attachment 3. A copy of the security inspection form is included in Attachment 3.
- E. The permittee shall maintain in the facility record, copies of all inspection reports in accordance with Paragraph I.F.5.
- F. The permittee shall notify the Commissioner within fifteen (15) days of discovery that any institutional control required by this permit does not remain in place.

IV. GROUNDWATER MONITORING REQUIREMENTS FOR SWMU 2

This section provides the conditions for groundwater sampling and analysis. As follows, the permittee is required to monitor the groundwater to ensure that the contaminant plume does not exceed the Groundwater Protection Standards, as listed in Table 5-2 of Attachment 5, at the Point of Compliance.

- A. The permittee shall maintain the groundwater monitoring wells in accordance with the specifications of Table 5-1, Monitoring Well Construction Details, at the locations shown on Figure 5-3 of Attachment 5, Monitoring.
- B. The permittee shall semi-annually collect groundwater samples following the sampling schedule and procedures specified in Section III of Attachment 5, Monitoring.
- C. The permittee shall analyze the monitoring well samples collected following the methods described in Section V of Attachment 5, Monitoring.
- D. The permittee shall notify the Commissioner within 7 days of determining that the discharge of contaminated groundwater may be impacting Big Creek Drainage Canal. Any statistical analysis used to make that determination must be performed within sixty (60) days of the receipt of the analytical results.
- E. The permittee shall submit the semi-annual compliance sampling data and analytical results as part of the annual report, as specified in Paragraph III.H of Attachment 5, Monitoring. The report should also contain the results of the statistical analysis performed in accordance of Paragraph IV.D of this attachment.

- F. At such time that closure is necessary and with prior written approval by the Commissioner, the permittee shall close monitoring wells according to the procedures outlined in *Rules and Regulations of Wells in Shelby County*.

V. SURFACE WATER MONITORING REQUIREMENTS FOR SWMU 2

- A. This section provides the conditions for surface water monitoring. The permittee shall semi-annually monitor Big Creek Drainage Canal to verify that any Constituent of Concern in groundwater discharging from SWMU 2 has not impacted the surface water.
- B. The permittee shall use the surface water sampling equipment and methods as outlined in Section IV of Attachment 5. Prior to sample collection, surface water characteristics, flow direction and sample location should be documented in a field log book and/or on a sampling form. The first sample shall be the most downgradient location with each proceeding location in the upstream or up current direction.
- C. The permittee shall analyze the surface water samples collected following the methods described in Section V of Attachment 5, Monitoring.
- D. The permittee shall notify the Commissioner within 7 days of determining that the discharge of contaminated groundwater is impacting Big Creek Drainage Canal. Any statistical analysis used to make that determination must be performed within sixty (60) days of the receipt of the analytical results.
- E. The permittee shall submit the semi-annual compliance sampling data and analytical results as part of the annual report, as specified in Paragraph IV.H of Attachment 5, Monitoring. The report should also contain the results of the statistical analysis performed in accordance of Paragraph V.D of this attachment.

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ATTACHMENT 5. MONITORING

This Attachment provides the sampling and analysis procedures, monitoring well maintenance requirements, and the Groundwater Protection Standards for SWMU 2, Southside Landfill at NSA Mid-South. Procedures for sampling and analysis of the Big Creek Drainage Canal are also provided in this attachment.

I. MONITORING WELLS

Wells selected for groundwater sampling and analysis are depicted on the site map on Figure 5-3 of this Attachment, Monitoring Well and Surface Water Sample Locations. Monitoring wells will monitor groundwater conditions in the deep alluvium aquifer at SWMU 2. Specifications for the groundwater monitoring wells for SWMU 2 are provided in Table 5-1, Monitoring Well Construction Details.

Monitoring wells 002G24DA, 002G25DA, and 002G26DA will serve as the Point of Compliance (POC) with respect to protection of surface water conditions. The POC represents where the Groundwater Protection Standards are to be achieved. An appropriate POC for groundwater discharge to surface water is at a point upgradient of the surface water body (USEPA 1996a). The POC was selected based on the location of the wells relative to the VOC plume and Big Creek.

In addition to these wells, VOC groundwater monitoring will include 002G02DA, 002G03DA, and 002G28DA to evaluate long-term trends for Constituents of Concern (COCs) adjacent to the landfill. Water level data will be collected from the above wells in addition to well locations 002G01DA, 002G05DA, 002G27DA, and 002GGM02DA. Data will be used to construct a site-wide potentiometric map for each sampling event.

II. GROUNDWATER PROTECTION STANDARDS

The Groundwater Protection Standards, Table 5-2, were established to be protective of the surface water into which contaminated groundwater from the SWMU 2 landfill discharges (Big Creek Drainage Canal). The applied Tennessee Water Quality Standard used for deriving the standard, considers a recreational surface water body and organisms only criteria, and not a domestic water supply. Flow was calculated using a three-day, twenty-year low flow.

As an added level of conservatism, the Groundwater Protection Standards presented in Table 5-2 reflect 1/10th of the actual DAF-derived value. Historically, none of the COCs have been detected in surface water.

TABLE 5-1: MONITORING WELL CONSTRUCTION DETAILS

MONITORING WELL ID	SCREENED INTERVAL (FEET BLS)	REFERENCE ELEVATION MSL (FEET)	PURPOSE OF WELL	WELL DIAMETER (INCHES)	TOTAL DEPTH (FEET)	AQUIFER
002G01DA	48' – 58'	269.55	Water Levels	2.0	58'	Deep Alluvium
002G02DA	41' - 51'	269.56	Side Gradient	2.0	51'	Deep Alluvium
002G03DA	38 - 48	269.62	Downgradient	2.0	48'	Deep Alluvium
002G05DA	40' - 50'	269.33	Water Levels	2.0	50'	Deep Alluvium
002G06DA	44' - 54'	269.62	Water Levels	2.0	54'	Deep Alluvium
002G11DA	32' - 42'	266.77	Water Levels	2.0	42	Deep Alluvium
002G12DA	38' - 48'	268.63	Water Levels	2.0	48	Deep Alluvium
002G24DA	41' - 51'	271.59	POC	2.0	51'	Deep Alluvium
002G25DA	43' – 53'	272.08	POC	2.0	53'	Deep Alluvium
002G26DA	38' - 48'	265.04	POC	2.0	48'	Deep Alluvium
002G27DA	32' - 42'	263.28	Water Levels	2.0	42'	Deep Alluvium
002G28DA	40' – 50'	269.89	Downgradient	2.0	50'	Deep Alluvium
002GGM02DA	39' - 44'	269.45	Water Levels	2.0	44'	Deep Alluvium
002GGM05DA	52' - 57'	268.29	Water Levels	2.0	57'	Deep Alluvium

POC – Point of Compliance

The permittee shall notify the Commissioner within fifteen (15) days of discovery that a Groundwater Protection Standard is exceeded at the POC. An exceedance may require additional sampling, implementation of corrective measures and/or modification of the final remedy.

TABLE 5-2: GROUNDWATER PROTECTION STANDARDS

Groundwater Constituent of Concern (COC)	Groundwater Protection Standard*
Trichloroethylene	6,522
1,1,2-Trichloroethane	3,478
cis-1,2Dichloroethene	25,217
trans-1,2-Dichloroethene	25,217
Vinyl Chloride	522

*All concentrations in micrograms per liter (µg/L)

III. GROUNDWATER MONITORING

Permittee shall collect, analyze and report the results of groundwater monitoring as specified in this attachment at the locations depicted on Figure 5-3 of this attachment. Sample collection shall be in general accordance with the sampling procedures outlined below or via sampling procedures as described in the most recent version of the EPA, Region 4, Field Branches Quality System and Technical Procedures Science and Ecological Support Division (SESD) (which can be found online at www.epa.gov/region4/sesd/fbqstp). A description of the monitoring and reporting procedures follows.

- A. Groundwater samples will be collected and analyzed on a semi-annual basis.
- B. Groundwater samples to be analyzed for VOCs will be collected via low-flow sampling methods and dedicated sample tubing or through use of passive diffusion bags (PDBs). The low-flow method will provide for representative groundwater samples while minimizing disturbance of sediment in the wells, which would contribute to turbidity of the groundwater samples. Sampling methods will follow the SESD’s operating procedures described at <http://www.epa.gov/region4/sesd/fbqstp/Groundwater-Sampling.pdf>.

If wells are sampled using passive diffusion, new PDBs will be filled with laboratory grade deionized water and placed approximately 1 foot above the bottom of the well within the screened interval. The PDBs will be allowed to equilibrate for a minimum of 14 days prior to sample collection. On the sampling date, the PDBs will be removed from each well and the water decanted into the sampling container.

- C. The samples will be collected in laboratory-prepared, 40-milliliter, glass sample containers (VOAs) with a Teflon[®] septum in the lids. The VOAs will be preserved with hydrochloric acid. Following completion of the groundwater sampling event, new PDBs will be deployed for the next sampling event.

- D. Groundwater samples will be analyzed for VOCs using U.S. EPA Method 8260B.
- E. Immediately following sample collection, the groundwater samples will be placed into iced coolers for overnight shipment to the laboratory. Completed chain-of-custody documentation will accompany all shipments of samples submitted to the laboratory.
- F. Field parameters, including pH, temperature, specific conductivity, dissolved oxygen, and oxidation/reduction potential, will be measured in-situ during all groundwater sampling events that utilize PDBs. Otherwise, field parameters will be analyzed at the surface using a water quality meter with a flow-thru cell.
- G. Quality assurance samples to be collected include a duplicate sample and trip blanks. The duplicate sample is collected to evaluate the laboratory's ability to reproduce the analytical results. One duplicate groundwater sample will be collected from one well and analyzed for VOCs during each groundwater sampling event. Trip blanks accompany the sample containers from the time they are shipped from the laboratory, in the field during the sampling event, and during shipping back to the lab to evaluate whether they pick up contamination from ambient sources. One trip blank will be included in each shipment containing groundwater samples for VOC analysis. The trip blanks will also be analyzed for VOCs.
- H. An annual report summarizing the two semi-annual sampling events will be prepared and submitted to the Division within 60 days after receipt of analytical results from the second sampling event of the calendar year. The annual groundwater monitoring reports will include summary tables of the groundwater analytical results and a potentiometric surface map of the deep alluvial aquifer based on groundwater level measurements gathered during the sampling event. The report shall also include an evaluation of long-term trends of source area COCs. The permittee shall perform an analysis of the results in order to assure the Commissioner that concentrations at the POC are not expected to exceed the Groundwater Protection Standard. Attachments to the reports will include field sampling logs completed during the sampling event, and laboratory analytical reports with quality assurance summaries.

IV. SURFACE WATER MONITORING

Permittee shall collect, analyze and report the results of surface water monitoring as specified in this attachment at the locations depicted on Figure 5-3 in this attachment. Sample collection shall be in general accordance with the sampling procedures outlined below or via sampling procedures as described in the most recent version of the EPA, Region 4, SESD's Field Branches Quality System and Technical Procedures (which can be found online at www.epa.gov/region4/sesd/fbqstp). A description of the monitoring and reporting procedures follows.

- A. Surface water samples will be collected and analyzed on a semi-annual basis following SESD's Operating Procedure for Surface Water Sampling at <http://www.epa.gov/region4/sesd/fbqstp/Surfacewater-Sampling.pdf>.
- B. Surface water samples will be collected at three locations (Upstream of confluence of Big Creek Tributary, Mid-Stream, and Downstream) as presented on Figure 5-3 of this attachment.
- C. Surface water samples will be collected using a PVC dipping ladle at each location approximately 10 feet from the riverbank.
- D. The samples will be collected in laboratory-prepared, 40-milliliter, glass sample containers (VOAs) with a Teflon® septum in the lids. The VOAs will be preserved with hydrochloric acid.
- E. Surface water samples will be submitted for VOC analysis using EPA SW-846 Method 8260B.
- F. Immediately following sample collection, the surface water samples will be placed into iced coolers for overnight shipment to the laboratory. Completed chain-of-custody documentation will accompany all shipments of samples submitted to the laboratory.
- G. Trip blanks will accompany the sample containers from the time they are shipped from the laboratory, in the field during the sampling event, and during shipping back to the lab to evaluate whether they pick up contamination from ambient sources. One trip blank will be included in each shipment containing surface water for VOC analysis. The trip blanks will also be analyzed for VOCs.
- H. Data from the surface water sampling will be included in the annual groundwater monitoring report which will be submitted to the Division within sixty (60) calendar days following receipt of analytical results from the second sampling event of the calendar year. The annual monitoring report will include summary tables of any VOC detections in the surface water. Attachments to the reports will include field sampling logs completed during the sampling events, and laboratory analytical reports with quality assurance summaries.

V. LABORATORY ANALYTES AND METHODS

The permittee shall analyze all samples using Method 8260B Volatile Organic Compounds (GC/MS) as specified in the most recent edition of Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, SW-846, or an equivalent method approved by the Commissioner. The constituents of concern (COCs) for reporting purposes consist of all those identified by the 8260B analysis.

VI. PLUGGING AND ABANDONMENT PROCEDURES

At such time that well closure is necessary, the permittee shall close monitoring wells according to the Shelby County Health Department Rules and Regulations of Wells (Section 9.0). Before any well abandonment, TDEC will be notified of its intentions with a rationale and figures explaining why the wells are proposed for closure. Following TDEC's approval, an application will be filed by the Navy with the Shelby County Health Department Water Quality Division for well closure. No well shall be closed unless prior written approval is granted from TDEC and the SCHD. Written certification of the completion of closure action shall be submitted to the SCHD and TDEC within thirty (30) days of plugging and abandonment procedures.

FIGURES FOR SWMU 2

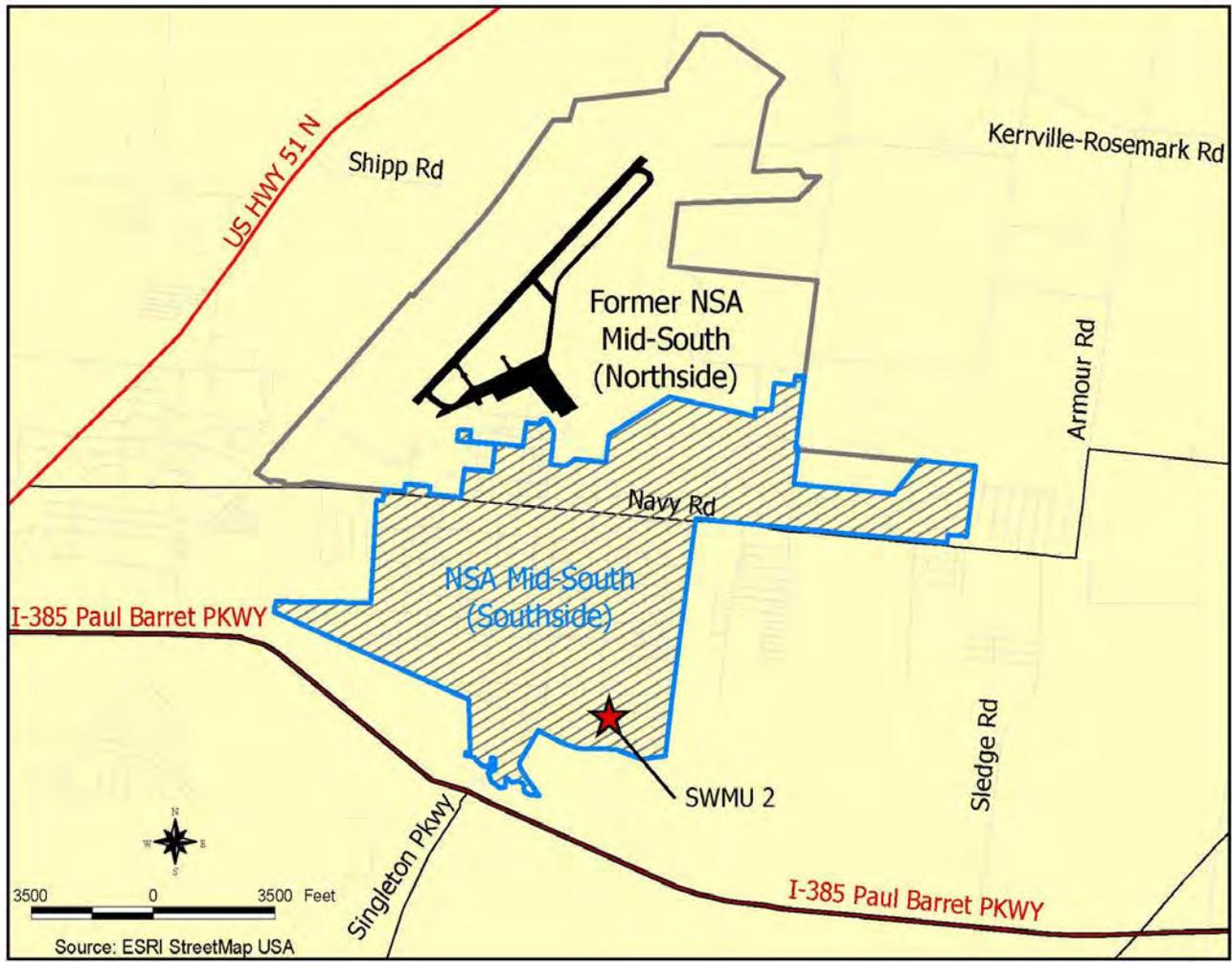


Figure 5-1: SWMU 2 Location at NSA Mid-South, Millington, Tennessee Southside Landfill



Figure 5-2: Location of Security Fencing and Gates SWMU 2, Southside Landfill



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Figure 5-3: Monitoring Well and Surface Water Sampling Locations
 SWMU 2, Southside Landfill