

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION III

IN THE MATTER OF:)	
)	
United States)	ADMINISTRATIVE ORDER
Department of the Army)	
)	
RESPONDENT)	U.S. EPA Docket Number
)	RCRA-03-2007-0213TH
)	
Fort George G. Meade)	
Fort Meade, Maryland)	
EPA I.D. No. MD 921 002 0567)	Proceeding under Section
)	7003 of the Resource
)	Conservation and Recovery
FACILITY)	Act, as amended, 42 U.S.C.
<hr/>)	§ 6973.

ADMINISTRATIVE ORDER

ADMINISTRATIVE ORDER

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ATTACHMENTS

- A. RCRA Facility Investigation Scope of Work
- B. Corrective Measures Study Scope of Work
- C. Scope of Work for a Health and Safety Plan
- D. Interim Measures Scope of Work
- E. Corrective Measures Implementation Scope of Work
- F. Facility Location Map
- G. List of Solid Waste Management Units
- H. List of Performance-Based Contract Sites

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ADMINISTRATIVE ORDER

I. JURISDICTION

This Order is issued to the United States Department of Army ("the Army" or "the Respondent") pursuant to the authority vested in the Administrator of the United States Environmental Protection Agency ("EPA") by Section 7003 of the Resource Conservation and Recovery Act of 1976, as amended by the Hazardous and Solid Waste Amendments of 1984 ("HSWA") (collectively referred to hereinafter as "RCRA"), 42 U.S.C. § 6973. The authority vested in the Administrator has been delegated to the Regional Administrators by EPA Delegation No. 8-22-B dated May 11, 1994 and further delegated to, among others, the Director, Region III Hazardous Site Cleanup Division on September 1, 2005.

On February 11, 1985, EPA granted the State of Maryland ("the State") authorization to operate a hazardous waste management program in lieu of EPA, pursuant to Section 3006(b) of RCRA, 42 U.S.C. § 6926(b). The State, however, does not have authority to enforce Section 7003 of RCRA. The State has been

given notice of the issuance of this Order pursuant to Section 7003(a) of RCRA, 42 U.S.C. § 6973(a).

The Army, a Department of the Executive Branch of the Federal Government, is subject to, and must comply with, Section 7003 of RCRA in the same manner and to the same extent as any "person," as defined in Section 1004(15) of RCRA, and is subject to such requirements, in accordance with Section 6001 of RCRA.

II. PARTIES BOUND

A. This Order shall apply to, and be binding upon, the Army and its agents and assigns, and upon all other persons and entities who are under the direct or indirect control of Respondent.

B. No change in ownership of any property covered by this Order, or in the status of the Army, shall in any way alter, diminish, or otherwise affect the Army's obligations and responsibilities under this Order.

C. The Army shall provide a copy of this Order to all Army supervisory personnel, contractors, subcontractors, laboratories and consultants retained to conduct or monitor any portion of the work performed pursuant to this Order within seven (7) days of the effective date of this Order or date of such retention, whichever is later, and shall condition all contracts with the aforementioned in compliance with the terms and conditions of this Order. All Army supervisory personnel, contractors, subcontractors, laboratories and consultants retained to conduct or monitor any work pursuant to this Order shall perform such work in accordance with the requirements of this Order. It shall not be a defense to any violation of this Order that the supervisory personnel, contractors, subcontractors, laboratories or consultants committing the violation were not informed of the requirements of this Order.

D. In the event of any change in ownership or control of the Facility (as defined in Section III, below), the Army shall notify EPA in writing of the nature of any such change no later than fifteen (15) calendar days after the effective date of such change. In addition, the Army shall provide a copy of this Order to any successor to the Facility, or portions thereof, at least fifteen (15) calendar days prior to the effective date of such change.

III. STATEMENT OF PURPOSE

The purpose of this Order is to require the Army to do the following at the Fort George G. Meade National Priorities List ("NPL") site in Fort Meade, Maryland, which includes the active Fort Meade Army installation, as well as former installation parcels (hereafter "FGGM" or "the Facility"): (1) perform Interim Measures ("IM") at the Facility to prevent or mitigate threats to human health and/or the environment; (2) perform a RCRA Facility Investigation ("RFI") to determine fully the nature and extent of any release of hazardous wastes, solid wastes and/or hazardous constituents at and/or from the Facility; (3) perform a Corrective Measures Study ("CMS") to identify and evaluate alternatives for corrective action necessary to prevent or mitigate migration or releases of hazardous wastes, solid wastes and/or hazardous constituents at and/or from the Facility; and (4) perform the Corrective Measures Implementation ("CMI"). The Army shall perform all work required by this Order in a manner consistent with all applicable federal, state and local laws and regulations.

IV. FINDINGS OF FACT

A. Fort George G. Meade has been a permanent United States Army Installation since 1917 and once occupied approximately 13,500 acres of land in northwestern Anne Arundel County, Maryland, midway between Baltimore, Maryland and Washington, D.C. See Attachment F for a map of the Facility. The Facility was authorized by Congress as a training cantonment for troops during World War I. Fort George G. Meade's current mission is to provide support to approximately 50 tenant organizations, which include all four Department of Defense branches and several Federal agencies.

B. At all relevant times hereto, the Army has been a generator of hazardous waste and is the owner and operator of the Fort George G. Meade facility located in Fort Meade, Maryland.

C. Subsequent to the HSWA amendments of 1984, FGGM applied for a RCRA Part B permit. In 1987, FGGM began a Solid Waste Management Unit ("SWMU") investigation and a Site Investigation ("SI") at the now Closed Sanitary Landfill ("CSL") to determine the potential impacts to groundwater from the landfill. FGGM was placed on the Federal Agency Hazardous Waste Compliance Docket on February 12, 1988 pursuant to the Comprehensive Environmental Response, Compensation and Liability Act ("CERCLA") Section

120(c), 42 U.S.C. § 9620(c). FGGM's Part B permit was issued on April 28, 1988.

D. The Defense Authorization Amendments and Base Closure and Realignment Act of 1988 ("BRAC") mandated the closure and/or realignment of approximately 9,000 acres of FGGM. In October 1991, the Army transferred 7,600 of the 9,000 acres to the United States Department of the Interior/United States Fish and Wildlife Service ("DOI/FWS") for use as part of a pre-existing wildlife refuge, the Patuxent Research Refuge ("the Refuge"). In January 1993, an additional 500 acres were transferred to DOI/FWS. In 1998, 366 acres were transferred to Anne Arundel County for use as an aviation facility.

E. During an evaluation of FGGM, releases into the environment of solvents, pesticides, polychlorinated biphenyls ("PCBs"), heavy metals, waste fuels and waste oils were detected at or from the Defense Reutilization and Marketing Office ("DRMO"), CSL, Clean Fill Dump ("CFD"), and the Post Laundry Facility ("PLF"). The contaminant releases at or from these four sites were evaluated using the Hazard Ranking System ("HRS"), which generated a score of 51.44. As a result, on April 1, 1997, EPA proposed FGGM for inclusion on the NPL. The addition of FGGM on the NPL was published in the Federal Register on July 28, 1998.

F. Contamination detected at the DRMO was documented by the Army in the Draft Final Focused Feasibility Study dated November 2006. The report referenced several phases of SI and Remedial Investigations ("RIs") that occurred between 1990 and 2006 that revealed contamination above maximum contaminant levels ("MCLs"), established under the Safe Drinking Water Act, and risk-based concentrations ("RBCs") in soil and groundwater. MCLs are the maximum permissible levels of contaminants in water which is delivered to any user of a public water system.

G. Groundwater at FGGM lies within three separate and distinct aquifers, the Upper Patapsco, the Lower Patapsco, and the Patuxent. Contamination is present in the unconfined Upper and Lower Patapsco aquifers, the beneficial use of which are as drinking water sources.

H. Levels of tetrachloroethene ("PCE") have been detected in groundwater samples at the DRMO site ranging from 189 parts per billion ("ppb") in September 1999 to 128 ppb in May 2006, in exceedence of the applicable MCL of 5 ppb. The source of contamination appears to be formerly buried drums and contaminated soil that were removed in 1995 prior to the construction of a storage facility at the site. PCE is a

volatile organic compound. Persons who drink water containing PCE, also referred to as tetrachloroethylene, in excess of the MCL may develop liver problems and may have an increased risk of getting cancer. See 40 C.F.R. Part 141, Subpart Q, Appendix B.

I. The CSL was a mixed residential/commercial, non-hazardous solid waste landfill permitted by the Maryland Department of the Environment ("MDE") pursuant to Code of Maryland Regulations, Subtitle 4, Chapter 7, Section 26.04.07.04 until the Army ceased operations there in January 1996. The RI report for the CSL groundwater operable unit dated August 2005 revealed levels of volatile organic compounds ("VOCs"), metals, and carbon tetrachloride that exceeded MCLs and RBCs. Sample results also revealed elevated levels of carbon tetrachloride at deep and shallow depths in off-site groundwater monitoring wells that were installed by the Army; the off-site contamination migrated from the FGGM boundary, which is adjacent to a Maryland Transit Administration's MARC train station and a residential neighborhood.

Persons who drink water containing carbon tetrachloride in excess of the MCL over many years may develop liver problems and may have an increased risk of getting cancer. See 40 C.F.R. Part 141 Subpart Q, Appendix B. Furthermore, the presence of a volatile chemical like carbon tetrachloride in the subsurface environment near homes can pose a concern for vapor intrusion, i.e., the migration of subsurface vapors upward into the air of homes, which in turn can pose a human health risk due to inhalation of the vapors.

J. The CFD operated from approximately 1972 to 1985 for the disposal of miscellaneous debris, ash and possibly hazardous waste. In a Record of Decision ("ROD") signed by FGGM and EPA on September 29, 2000, a remedy of "No Further Action with Groundwater Monitoring" was selected at the CFD based on the results of the human health and ecological risk assessments. The decision to monitor the groundwater at the CFD was based on heavy metals contamination found in the Upper Patapsco aquifer at the CFD. FGGM submitted a Five-Year Review report to EPA in May 2006. EPA agreed with the recommendation to continue the monitoring program that was selected in the ROD.

K. The PLF was used as a laundry facility from 1941 until it was converted to a recycling center in 1991. Dry cleaning chemicals were introduced to the PLF in the 1960s. Initial soils investigations revealed elevated levels of PCE, a solvent commonly used in dry cleaning, in soils, groundwater and surface water. Several investigations have taken place at the site, and

it is one of the sites currently being investigated pursuant to a May 25, 2005, contract. VOCs exceeding MCLs, including PCE, have been documented in the PLF Site Work Plan dated May 2006. Persons who drink water containing PCE in excess of the MCL may develop liver problems and may have an increased risk of getting cancer. See 40 C.F.R. Part 141, Subpart Q, Appendix B.

L. The Fort Meade partnering team, which include representatives from EPA, MDE, and the Army, completed a desktop review of approximately 150 SWMUs between July 2001 and February 2002. The SWMUs were placed into four categories: (1) no further action, (2) continue further action under CERCLA, (3) continue further action under RCRA, and (4) status to be determined based on additional sampling. The SWMU list is set forth in Attachment G to this Order.

M. Based on the four categories found in Attachment G, 31 sites were deemed to be eligible for consideration under the Army's Installation and Restoration Program ("IRP"). SIs at the 31 sites concluded that the following 15 sites required no further action:

1. FGGM 03 Water Treatment Plant Building 8688
2. FGGM 08 Ammo Supply Point
3. FGGM 11 Chemical Weapons Area
4. FGGM 14 Hazardous Waste Storage Facility
5. FGGM 18 Ammo Supply Point #2
6. FGGM 19 Wastewater Treatment Facility
7. FGGM 33 Battery Shop Building 2283
8. FGGM 36 Photo Labs Building 4553, 6530
9. FGGM 37 Kimbrough Army Hospital
10. FGGM 45 Calibration Lab Building 2220
11. FGGM 49 DOL Building 2246
12. FGGM 51 Building 2216
13. FGGM 70 Building 6513 Indoor Range

14. FGGM 71 Building 6512 Indoor Range
15. FGGM 75 Pre-1984 Underground Storage Tanks

N. The SIs concluded that 11 sites required further investigation, including:

1. FGGM 07 DRMO is described in Paragraph F, above, and several environmental investigations have been performed at the site. The primary groundwater contaminant of concern is PCE. PCE is a volatile solvent that is associated with liver problems and an increased risk of getting cancer. Carbon tetrachloride also was detected in groundwater at levels above its MCL of 5 ppb. Persons who drink water containing carbon tetrachloride in excess of the MCL may develop liver problems and may have an increased risk of getting cancer.
2. FGGM 05 Troop Housing Boiler Plant Building 8481 remained in operation until 2000. The building was demolished in 2004. The building had a total of six tanks, five of which have been removed. Monitoring wells installed in the area revealed soil and groundwater contamination of No. 2 fuel oil.
3. FGGM 47 PLF is described in Paragraph I, above.
4. FGGM 83 Trap and Skeet Range (at Fort George G. Meade) was discovered during an Environmental Baseline Survey. Two separate SIs have been completed that revealed lead and polycyclic aromatic hydrocarbon ("PAH") contamination above RBCs in surface soil and pond sediments at the site.

Sampling data from this range indicate soil lead concentrations exceed the 400 ppm screening level of lead in soil under residential exposure scenarios. Lead may cause a range of health effects, from behavioral problems and learning disabilities to seizures and death.

According to the Agency of Toxic Substances and Disease Registry ("ATSDR"), "[l]ead can affect almost every organ and system in your body. The main target for lead toxicity is the nervous system, both in adults and children. Long-term exposure of adults can result in decreased performance in some test that measure functions of the nervous system." Other potential health effects from lead exposure include anemia and kidney damage. See ATSDR ToxFacts, <http://www.atsdr.cdc.gov/tfacts13.html#bookmark05>.

Lead shot also was reported in 73% of the sample locations from the site. Lead shot can serve as a continuing source of lead to the environment as the shot breaks down. In addition, ecological receptors may ingest whole pieces of shot, leading to acute hazards.

5. FGGM 86 Former Motor Pool Maintenance Facility was constructed in 1941. Vehicle painting and repair was conducted at the site, and paint, paint strippers, and solvents were used or stored there. This site was identified during a 1996 SWMU study. Some soil samples taken during a 2004 sampling event revealed lead at levels up to 892 mg/kg, which exceeds EPA's level of concern for lead for residential (400 ppm) exposure scenarios. As noted previously, lead can be of concern for neurological and other health effects. Groundwater samples taken during the 2004 sampling event revealed PCE ranging from 5.5 ppb to 2,900 ppb, exceeding its MCL of 5 ppb. TCE also was detected at concentrations ranging from 5.6 ppb to 342 ppb, above its MCL of 5 ppb. An RI currently is being conducted at this site.

TCE and PCE are both volatile solvents and degreasers. Persons who drink water containing TCE and PCE in excess of the MCL may develop liver problems and may have an increased risk of getting cancer. See 40 C.F.R. Part 141, Subpart Q, Appendix B.

6. FGGM 87 Former Nike Fire Control Site was constructed in 1955 and supported Nike missile activities until 1972. The site was identified in a 1994 SWMU study. During a 2004 sampling event PAH contamination was detected above residential RBC values in surface soil; lead and arsenic were also detected at levels up to 46.9 mg/kg and 17.1 mg/kg, respectively. The soil background level for arsenic in soil is 4.84 mg/kg and the soil background level for lead in subsurface soil is 3.58 mg/kg. TCE was detected in groundwater samples at levels up to 218 ppb; the applicable MCL is 5 ppb. An RI currently is being conducted at this site.

Persons who drink water containing TCE in excess of the MCL may develop liver problems and may have an increased risk of getting cancer. See 40 C.F.R. Part 141, Subpart Q, Appendix B.

7. FGGM 88 Former Tank Maintenance Facility Shop was identified during a 1994 SWMU study. During an Initial

Delineation Study in 2001, lead was detected above its soil background level of 3.58 mg/kg at concentrations between 6.2 mg/kg and 160 mg/kg. Groundwater samples collected during this study revealed arsenic, barium, chromium, copper, lead, and mercury above their respective MCLs. An RI currently is being conducted at the site.

Persons who drink water containing arsenic in excess of the MCL may develop skin or circulatory problems and may have an increased risk of getting cancer. Persons who use water containing chromium well in excess of the MCL may experience allergic dermatitis. Infants and children who drink water containing lead in excess of the action level could experience delays in their physical or mental development. Children could show slight deficits in attention span and learning abilities. Adults who drink this water over many years could develop kidney problems or high blood pressure. Persons who drink water containing inorganic mercury well in excess of the MCL over many years could experience kidney damage. See 40 C.F.R. Part 141, Subpart Q, Appendix B.

8. FGGM 89 Former Tank Maintenance Facility Shop 2 was constructed in 1918. Located in Building 2217, it was used as a tank maintenance facility until 1973. A former wash rack (SWMU 41) and a former oil/water separator (SWMU 40) were located in the northwest corner of the site. Total Petroleum Hydrocarbon-diesel in soil exceeded the MDE soil cleanup standard of 2,300 ppb. Arsenic, beryllium, VOCs, Total Petroleum Hydrocarbon-Gasoline Range Organics ("TPH-GRO"), and Total Petroleum Hydrocarbon-Diesel Range Organics ("TPH-DRO") were also detected in groundwater at concentrations that exceed the MDE screening criterion of 47 ppb. An RI currently is being conducted at this site.

9. FGGM 90 Former Tank Cleaning Supply Warehouse is a complex of buildings 2240, 2241, 2242, 2243, 2247, 2248 and 2249. The buildings had several uses, including laundry dry cleaning (2240), storage of degreasers and vehicle batteries (2241, 2242 and 2243), hazardous material storage (2247), and standard ordnance shops (2248 and 2249). An RI currently is being conducted at this site. PCE has been detected in groundwater samples above its MCL of 5 ppb at concentrations as high as 1,400 ppb. Bis(2-ethylhexyl)phthalate was detected above its MCL of 6 ppb in groundwater at concentrations between 7.8 ppb and 23.6 ppb.

Persons who drink water containing PCE in excess of the MCL may develop liver problems and may have an increased risk of getting cancer. Persons who drink water containing bis(2-ethylhexyl)phthalate well in excess of the MCL may develop liver problems, or experience reproductive difficulties, and may have an increased risk of getting cancer.

10. FGGM 91 Former Missile Repair Shop currently is used as an electronic maintenance and equipment calibration shop but was used as a missile repair shop in the 1960s. Past activities in the building have included the use of solvents and have produced solvent waste. Historical records include a report of a one gallon spill of fuel oil in 1993. The SI recommendation that further investigation be conducted was due to the history of activities at the site. Temporary groundwater monitoring wells revealed metals at levels above EPA Region III Risk-Based Concentrations ("RBCs"). An RI currently is being conducted at this site.

11. FGGM 92 Former Heavy Gun Cleaning/Repair is a maintenance facility comprised of four separate buildings with various uses, including warehousing and vehicle and heavy equipment maintenance. During the initial delineation study of the site, soil samples revealed levels of PCE that exceeded 5.3 mg/kg, the RBC value for industrial soil, and levels of TPH-DRO that exceeded the MDE soil cleanup standard of 2,300 ppb. These levels of volatile chemicals in soil poses a concern form migration to groundwater. Groundwater samples collected in 2004 revealed PCE levels in exceedance of the MCL of 5 ppb with concentrations as high as 560 ppb. TCE also was detected in groundwater in exceedance of its MCL of 5 ppb with concentrations as high as 340 ppb. TPH-DRO and TPH-GRO were detected in groundwater at concentrations between 50 ppb and 1000 ppb, exceeding the MDE screening criteria of 47 ppb. An RI currently is being conducted at this site.

PCE and TCE are solvents and degreasers often used to clean metal. Persons who drink water containing PCE or TCE in excess of the MCL may develop liver problems and may have an increased risk of getting cancer.

O. FGGM 13 the Pesticide Shop was in operation from 1958 to 1978. It was also used as a maintenance facility for lawn mowers and tractors. Pesticides stored in the building included malathion, diazinon, and baygon. The 1997 SI Report documented soil RBC exceedances for chlordane, alpha-chlordane, gamma-chlordane, 4,4'-DDD, 4,4'-DDT, heptachlor, dieldrin, 4,4'-DDE,

arsenic and mercury. All of these substances are pesticides, pesticide breakdown products, or metals that have been used in pesticides. EPA is currently reviewing the RI/FS for this site.

P. FGGM 93 Manor View Dump Site was discovered during the construction of private base housing in 2003. The site is located behind the Manor View Elementary School. Historical aerial photographs show an incinerator in the vicinity, and ash may have been disposed in the dump. The Army conducted a Preliminary Assessment/SI at the site in January 2003 and a subsequent RI in July 2003 that revealed metals and PAH contamination in exceedance of RBCs and methane gas in exceedance of the 15 percent by volume Upper Explosive Limit. Twenty homes were built on the parcel in an area where methane was discovered, and in December 2005, 12 families were relocated to alternative housing. The Army currently is utilizing a soil-gas venting system to reduce the levels of methane in the dump. Methane, which can be produced in landfill gas as landfilled waste breaks down, is of concern because it can pose an explosive hazard. Additionally, in enclosed spaces such as basements, it can act as an asphyxiant by displacing air.

Q. FGGM 74 Architect of the Capital ("AOC"), also known as the Library of Congress Facility, was transferred to the Library of Congress in October 1994. The area consists of warehouse facilities, underground storage tanks, a motor pool and the archive facility. An RI at the site revealed elevated levels of semi-volatile organic compounds, metals and pesticides in groundwater. The RI was completed in July 2006.

Some sampling results indicate that lead levels greatly exceed EPA's level of concern for lead for both residential (400 ppm) and industrial (780 to 1,235 ppm; default screening levels generated by EPA's Adult Lead Model) exposure scenarios. As noted previously, lead can be of concern for neurological and other health effects.

R. The Ordnance Demolition Area ("ODA") was transferred to DOI/FWS as a part of the 7,600-acre transfer that occurred on October 16, 1991. The ODA was used as a demolition area for Unexploded Ordnance ("UXO") encountered at FGGM and the DOI/FWS property. The ODA was constructed between 1957 and 1963. Soil and groundwater samples taken for the RI dated October 2001 and the Long-Term Monitoring Reports dated April 2003, September 2004, and November 2006 at the site revealed levels of cyclotrimethylenetrinitramine ("RDX"), amino-dinitrotoluene ("amino-DNT"), trinitrotoluene ("TNT"), cadmium, PCE, and TCE above levels of concern, as established by a Superfund Baseline

Risk Assessment. Several of these compounds, especially RDX and TNT, are associated with explosives. Groundwater sampling by EPA in 2003 also detected perchlorate that exceeded the screening level.

On January 20, 2006, the Army signed, without the necessary EPA signature and MDE concurrence, a Decision Document ("DD") that selected a remedy of natural attenuation with annual monitoring. In a letter dated November 2, 2006, EPA informed the Army that it had exceeded its authority under Section 120 of CERCLA by unilaterally issuing the DD.

S. Past military training activities have resulted in the presence of UXO at various locations at FGGM. As a result, the Army conducted a Historical Records Review ("HRR") in response to the Department of Defense Military Munitions Response Program ("MMRP"). The Army's inventory of closed and transferred military ranges identified sites with UXO, discarded military munitions, and munitions constituents. Based on the HRR, six sites at FGGM were determined to be MMRP eligible.

An SI was conducted in August 2006 and concluded that the FGGM 003 Mortar Range Site warrants an RI based on the potential presence of munitions and explosives of concern and the identification of subsurface anomalies.

T. Prior to the transfer to DOI/FWS, the Refuge property in the vicinity of the Little Patuxent River was used for multiple types of range training. In accordance with an August 2001 Action Memorandum, which was supported by a June 2001 Engineering Evaluation/Cost Analysis ("EE/CA"), and the Army's Explosives Safety Submission for the Patuxent Research Refuge, the Army conducts annual UXO sweeps of the Little Patuxent River. In 2005, the UXO sweeps resulted in the discovery of two rockets, which contained live rocket motors and propellant. The Army's most recent ordnance sweep was concluded in August 2006, and six M7 series 2.36-inch rockets and one M9 rifle grenade were recovered. In addition, 12 munition debris components associated with the M7 series rockets were located. The rockets were detonated on the DOI/FWS property.

UXO in the soils continue to migrate upward through the seasons as freezing and thawing occur. Also, UXO may be uncovered during soil disturbance and construction activities. Potential risks associated with UXO can include bodily injury or death, health risks due to exposure to chemical agents, and environmental degradation due to explosions and dispersal of chemicals.

U. The former Tipton Airfield served as an Army training area and later was the site of three landfills, a helicopter hangar area, and a fire training area. In 1996 and 1997, the Army performed an Ordnance, Ammunition, and Explosives Removal Action, which resulted in an UXO clearance to a depth of four feet at the Tipton Airfield, excluding the then-inactive landfill areas. In 1998, the Army issued DDs and took actions to address the three inactive landfills, as well as to establish institutional controls for land and groundwater use at the Tipton Airfield parcels. EPA and the Army signed CERCLA RODs for the Tipton Airfield parcels in December 1998 and July 1999. The July 1999 FOD required the Army to monitor the groundwater bi-annually because of explosives contamination detected in groundwater monitoring wells. The Tipton Airfield parcels were transferred to Anne Arundel County in July 2001 for use as a County Airport.

V. Range 17 is a former Trap and Skeet Range located on the DOI/FWS property. The range was operational from 1970 to 2000 and was part of the 1991 BRAC property transfer to DOI/FWS and is now a part of the North Tract of the Refuge. July 2003 sampling at the site conducted by DOI/FWS revealed concentrations of lead in soil up to 44,000 mg/kg and arsenic in soil up to 220 mg/kg.

W. Potential human and ecological receptors at or near the Facility include:

1. Onsite workers/employees, visitors and recreational users at the Facility may be exposed to elevated levels of the contaminants referred to in Paragraphs E, F, H, I, J, K, N, O, P, Q, R, S, T, U and V of this Section IV.
2. Workers/employees and residents living near the Facility may be exposed to PCBs. Once bound to soil PCBs may persist for years with slow desorption providing continuous, low-level exposure to the surrounding locality. Bioaccumulation of PCBs also occurs, with most of the compound stored in the adipose tissue of the body. Possible effects associated with PCBs include skin rashes, immune system effects, and a potential for increased cancer risk.
3. On- and off-Refuge adults and children who may be exposed to groundwater from the ODA contaminated with TCE, PCE, cadmium, RDX, TNT, and amino-DNT.
4. On-Facility adults and children who may be exposed to soil and groundwater at Sites FGGM - 47, 86, 88, 89, 90, 91 and 92, which are contaminated variously with PCE, TCE,

lead, mercury, arsenic, barium, chromium, beryllium, and cadmium.

5. Children and adults in the residential areas southwest of the Facility, as well as the CSL Area and the town of Odenton, located to the east of the Facility due to groundwater contaminated with PCE, TCE, cis 1,2-DCE, arsenic, and chromium. Off-Facility adults and children may be exposed to contaminated groundwater from FGGM Sites 47, 86, 90, 92 and the Patuxent River.

6. Children at the Manor View Elementary School and children and adult residents of the Shea Court Housing Area in the vicinity of the Manor View Dump Site due to soil contaminated with arsenic, lead, and methane.

7. Gallinaceous birds at Range 17 and FGGM 83 are at risk due to the direct ingestion of lead shot.

8. Workers, residents, and recreational users of FGGM facilities may encounter UXO, which is an explosive hazard.

X. Each of the contaminants detected in the soil, groundwater, surface water and sediment samples, referred to in Paragraphs E, F, H, I, J, K, N, O, P, Q, R, S, T, U and V of this Section IV, may have detrimental impacts on human health and/or the environment. The toxicological impact of these contaminants and specific risk estimates where they have been generated, can be found in the Administrative Record, which supports the issuance of this Order.

Y. All of the substances referred to in Paragraphs E, F, H, I, J, K, N, O, P, Q, R, S, T, U and V of this Section IV and those referred to in the Administrative Record may further migrate to human and environmental receptors by way of soil, surface water, groundwater and air. Metals, when present in soil, can be mobilized in wind-blown or construction-generated dust. Volatile organic chemicals like PCE and TCE tend to migrate rapidly from soil to groundwater, soil to air, groundwater to air, and within groundwater. PCBs can bioaccumulate in living organisms.

V. CONCLUSIONS OF LAW AND DETERMINATIONS

Based on the Findings of Fact set forth above and upon EPA's review of information in the Administrative Record, EPA makes the following Conclusions of Law and Determinations:

A. The Army is a Department of the Executive Branch of the Federal government and is subject to the requirements of Section 6001 of RCRA, 42 U.S.C. § 6961.

B. The Army is a "person" within the meaning of Section 1004(15) of RCRA, 42 U.S.C. § 6903(15) and is subject to the requirements of RCRA, including Section 7003 of RCRA, in the same manner as any other "person," pursuant to Section 6001 of RCRA, 42 U.S.C. § 6961.

C. The substances referred to in Paragraphs E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, and T of Section IV of this Order are solid wastes and/or hazardous wastes within the meaning of Section 7003 of RCRA, 42 U.S.C. § 6973.

D. The solid wastes and hazardous wastes referred to in Paragraph E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, and T of Section IV have been handled, stored, treated and/or disposed of at the Facility.

E. Based on the information described in Section IV, "FINDINGS OF FACT," EPA has determined that the past or present handling, storage, treatment, transportation or disposal of solid and/or hazardous wastes at or from the Facility may present an imminent or substantial endangerment to health or the environment. Chemicals associated with site activities have been found in environmental media, to which people and ecological receptors are now or in the future could be exposed, and the adverse effects that may result from such exposure were described in the Findings of Fact, above.

F. The Army is a person who has contributed to the handling, storage, treatment and/or disposal of solid wastes and/or hazardous wastes at the Facility which may present an imminent and substantial endangerment to human health or the environment.

G. The actions required by this Order are necessary to protect human health and/or the environment.

VI. WORK TO BE PERFORMED

Some of the tasks required by this Order may have already been completed and that the Army may have available some of the information and data required by this Order. This previously completed work may be used to meet the requirements of this Order upon submission to, and formal approval by, EPA under the terms of this Order.

A. Pursuant to Section 7003 of RCRA, 42 U.S.C. § 6973, the Army is ordered to perform the following acts in the manner and by the dates specified herein. All work undertaken pursuant to this Order shall, as EPA deems appropriate, be performed in accordance with: the RCRA Facility Investigation Scope of Work set forth in Attachment A; the Corrective Measures Study Scope of Work set forth in Attachment B; the Scope of Work for a Health and Safety Plan set forth in Attachment C; the Interim Measures Scope of Work set forth in Attachment D; the Corrective Measures Implementation Scope of Work set forth in Attachment E; and RCRA and its implementing regulations and relevant EPA guidance documents. These Scopes of Work attached to this Order are incorporated herein by reference, but EPA acknowledges that the Scopes of Work are standard-form documents intended to be tailored to each submittal required herein. Relevant EPA guidance documents are available at: http://www.epa.gov/reg3wcmd/ca/ca_resources.htm and are incorporated herein by reference.

B. "Days" as used in this Order shall mean calendar days unless otherwise specified.

C. Portions of the Facility have been transferred to DOI/FWS, Anne Arundel County, and the Architect of the Capitol. The Army is responsible for implementing all of the work required under this Order, regardless of whether such work pertains to current or former FGGM property. The Army shall implement all requirements in the time and manner set forth herein.

D. Within forty-five (45) calendar days from the effective date of this Order, the Army shall submit to MDE for review and comment and to EPA for review and approval a Site Management Plan ("SMP") for the Facility, as defined by this Order. The SMP shall address each area at the Facility requiring the actions specified in Sections VI.A, B, C, E and F, below, and shall include proposed schedules and deadlines for the completion of all workplans and reports required in Sections VI.A, B, C, E and F, below.

E. EPA shall review, provide comments on as necessary, and approve the SMP submitted by the Army. Within thirty (30) calendar days of receipt of EPA's comments, if any, the Army shall submit to EPA a revised SMP that incorporates EPA's comments. Once approved by EPA, the proposed schedules and deadlines shall be final. The EPA-approved SMP, and the EPA-approved final schedules and deadlines contained therein shall be incorporated into and become enforceable under this Order.

F. This Order establishes a process for updating and amending the SMP annually. Each year, on the anniversary of the effective date of this Order, the Army shall submit an amended SMP to MDE and EPA which updates the prior, approved SMP to reflect work completed and any proposed change in the projected schedule for work being or to be performed. Any proposed amendments to the schedules and deadlines set forth in the annually-proposed SMP shall not be deemed effective until EPA approves such amendments, and the prior approved SMP shall remain in effect and enforceable until the annual SMP is approved by EPA. The SMP shall include all proposed actions to address the areas of concern at the Facility, including all actions necessary to mitigate any immediate threat to human health or the environment. Such potential actions include all actions that may otherwise be performed pursuant to RCRA and CERCLA, including CERCLA removal actions, and the SMP shall identify estimated completion dates for the associated documentation required in support of all such actions.

A. INTERIM MEASURES

1. The Army shall take immediate actions as are necessary and appropriate to protect human health and the environment to address any release(s) of solid wastes, hazardous wastes, and hazardous constituents at the sites listed in Paragraph 2, immediately below. These actions shall be consistent with RCRA, applicable EPA guidance and any long-term remediation at the Facility.

2. The Army shall continue to implement the requirements of the groundwater monitoring plans at the CSL, the CFD, the ODA, and the Tipton Airfield Site, among others, and continue the UXO sweeps at the Little Patuxent River and the actions pursuant to the EPA-approved workplans for the PBC sites. The Army also shall continue the planned remediation at the Former Pesticide Shop Building (FGGM 13), AOC (FGGM 74), the Trap and Skeet Range (FGGM 83), the Manor View Dump Site (FGGM 93), and the sites in the MMRP.

3. Within thirty (30) days of the effective date of this Order the Army shall submit an "Interim Measures Assessment Report" to EPA and MDE for review and comment, which shall include: (a) an identification and assessment of previously implemented interim measures which were intended to mitigate and/or prevent releases of solid wastes, hazardous wastes and/or hazardous constituents into the environment; (b) an identification and evaluation of other interim measures that could be implemented at the Facility including, but not

limited to, remediation of contamination at and around the sites described in Paragraphs E, F, G, H, I, J, K, L, M, N, O, P, Q, R and S of Section IV and Attachments G and H of this Order; and (c) an identification of any new data needed for making decisions regarding implementation of interim measures. EPA will review the Interim Measures Assessment Report and other information available to EPA, and if appropriate, will select an interim measure(s) and notify the Army of the interim measure(s) selected. Within ten (10) calendar days of receipt of such notice from EPA, the Army shall submit to MDE for review and comment and to EPA for review and approval an Interim Measures Workplan in accordance with the Interim Measures Scope of Work set forth in Attachment D for the interim measure(s) selected by EPA.

4. If at any time during the pendency of this Order the Army obtains or discovers information concerning a release of any solid waste, hazardous waste and/or hazardous constituent at or from the Facility into the environment in addition to or different from that described in Section IV, "FINDINGS OF FACT," the Army shall immediately notify EPA orally of such release and in writing within three (3) calendar days of providing oral notification. The notification shall describe the nature and extent of the release and any threat or potential threat to human health or the environment posed by such release. If EPA determines that corrective action for such release is necessary to protect human health or the environment, EPA shall notify the Army. Within ten (10) calendar days of receipt of such notice from EPA, the Army shall submit to MDE for review and comment and to EPA for review and approval an Interim Measures Workplan which identifies interim measures which will protect human health and the environment from such release and which are, to the extent practicable, consistent with and integrated into any long-term remediation at the Facility.

5. Each Interim Measures Workplan shall be developed in accordance with the Interim Measures Scope of Work in Attachment D to this Order. Each Interim Measures Workplan shall document the procedures to be used by the Army for the implementation of Interim Measures and shall include, but not be limited to, a Community Relations Plan and Interim Measures Objectives. In addition to an Interim Measures Workplan, the Army shall submit in accordance with Attachment A to this Order: a Data Collection Quality Assurance Plan; a Data Management Plan; Design Plans and Specifications; an Operation and Maintenance Plan; a Project

Schedule for expeditious completion of Interim Measures; an Interim Measures Construction Quality Assurance Plan; and Reporting Requirements associated with the various plans.

6. Concurrent with submission of an Interim Measures Workplan, the Army shall submit to MDE for review and comment and to EPA for review and approval an Interim Measures Health and Safety Plan in accordance with Attachment C of this Order.

7. Upon receipt of EPA approval of each Interim Measures Workplan, the Army shall implement the approved Interim Measures Workplan in accordance with the requirements and schedules contained therein.

B. RCRA FACILITY INVESTIGATION ("RFI")

1. The July 2006 Installation Action Plan, the RI Workplans for all 11 PBC sites, and the ODA LTM Report together serve as a description of current conditions at the Facility.

2. Within thirty (30) calendar days of the effective date of this Order, the Army shall submit to MDE for review and comment and to EPA for review and approval a Final Basewide Cleanup Plan.

3. Within ninety (90) calendar days of the effective date of this Order, the Army shall submit to MDE and to EPA a "Pre-Investigation Evaluation of Corrective Measures Technologies" report, and a workplan for expeditious implementation and completion of a RCRA Facility Investigation ("RFI Workplan"). The RFI Workplan is subject to approval by EPA and shall be developed in accordance with, at a minimum, the RFI Scope of Work contained in Attachment A.

4. The RFI Workplan shall be designed to determine the presence, magnitude, extent, direction, and rate of movement of any hazardous wastes, solid wastes and/or hazardous constituents identified at and/or from the Facility. The RFI Workplan shall document the procedures the Army shall use to conduct those investigations necessary to: (a) characterize the potential pathways of contaminant migration; (b) characterize the source(s) of contamination; (c) define the degree and extent of contamination; (d) identify actual or potential human or ecological receptors;

and (e) support the development of alternatives from which a corrective measure(s) will be selected by EPA.

5. In accordance with the provisions of Attachment A, the RFI Workplan shall include: (a) a Project Management Plan; (b) a Data Collection Quality Assurance Plan; (c) a Data Management Plan; and (d) a Community Relations Plan. The RFI Workplan shall also include a Health and Safety Plan, in accordance with the provisions of Attachment C, and shall provide for the submission of a draft and final RFI Report.

6. Upon receipt of EPA approval of the RFI Workplan, the Army shall implement the EPA-approved RFI Workplan in accordance with the terms and schedules contained therein. Upon completion of implementation of the RFI Workplan, the Army shall submit to MDE for review and comment and to EPA for review and approval draft and final RFI Reports and draft and final Laboratory and Bench-Scale Study Reports in accordance with the requirements and schedules contained in the EPA-approved RFI Workplan.

C. CORRECTIVE MEASURES STUDY ("CMS")

1. Within sixty (60) calendar days after EPA approval of the Final RFI Report, the Army shall submit to MDE and to EPA for review and comment a draft CMS Report in accordance with the CMS Scope of Work contained in Attachment B.

2. Within thirty (30) calendar days of receipt of EPA's comments on the draft CMS Report, the Army shall submit to EPA for approval the final CMS Report, revised to respond to all comments received from and/or remedy all deficiencies identified by EPA on the draft CMS Report.

D. PUBLIC COMMENT AND PARTICIPATION

1. After approval of the Final CMS Report, EPA will make the Final RFI Report and the Final CMS Report, a description of EPA's proposed corrective measure(s) and EPA's justification for proposing selection of such corrective measure(s), available to the public for review and comment for at least thirty (30) calendar days in a Statement of Basis.

2. Following the public review and comment period, EPA will notify the Army of the corrective measure(s) selected by EPA in a Final Decision and Response to Comments ("FDRTC"). If the corrective measure(s) selected by EPA

after consideration of public comments differs significantly from the corrective measure(s) originally proposed by EPA in the Statement of Basis, EPA will explain the basis for such difference in the FDRTC.

E. CORRECTIVE MEASURES IMPLEMENTATION

1. Upon its issuance, the FDRTC shall be incorporated into and become enforceable under this Order.

2. Corrective Measures Workplan and Design

a. Within thirty (30) calendar days of the issuance of the FDRTC, the Army shall submit to MDE and to EPA for review and comment a Corrective Measures Implementation Workplan ("CMI Workplan") for implementation of the corrective measures selected in the FDRTC. The CMI Workplan is subject to approval by EPA and shall be developed in accordance with Attachment E of this Order.

b. Within thirty (30) calendar days of receipt of EPA approval of the CMI Workplan, the Army shall submit to MDE and to EPA for review and comment a CMI Design Report. The CMI Design Report is subject to approval by EPA and shall be developed in accordance with Attachment E of this Order.

3. Corrective Measures Construction

a. The Army shall commence and complete construction and/or implementation of the corrective measures selected in the FDRTC in accordance with the Scope of Work for the CMI set forth in Attachment E of this Order, the schedules and specifications set forth in the EPA-approved CMI Workplan and the EPA-approved CMI Design Report.

b. Within thirty (30) calendar days of completion of construction of the corrective measures selected by EPA in the FDRTC, the Army shall submit to MDE for review and comment and to EPA for review and approval a CMI Report and certification. A registered professional engineer and the Army's Project Coordinator must state in the CMI Report that the EPA-approved cleanup standards have been attained in full satisfaction of the requirements of the FDRTC and this Order. The CMI Report shall be developed in accordance with Attachment

E of this Order and shall describe activities performed during construction, provide actual specifications of the implemented remedy, and provide an assessment of CMI performance.

c. EPA shall determine, on the basis of the CMI Report and any other relevant information, whether the constructed project is consistent with the EPA-approved CMI Design Report. If EPA determines that the constructed project is consistent with the EPA-approved CMI Design Report and that the corrective measures have achieved or are achieving all of the requirements set forth in the FDRTC and the performance criteria established in the CMI Design Report, EPA shall approve the CMI Report.

d. If EPA determines that the constructed and/or implemented project is inconsistent with the EPA-approved CMI Design Report and/or that the corrective measures have not achieved or are not achieving all of the requirements set forth in the FDRTC and the performance criteria established in the CMI Design Report, EPA shall notify the Army in writing of those activities that must be undertaken to complete the corrective measures requirements and shall set forth a schedule for the completion of those activities. The Army shall complete the activities in accordance with the schedule set forth in the EPA notification.

e. The Army may request, at any time following EPA approval of all pre-design or investigative activities required by the FDRTC, that EPA select, for the purposes of this Order, an Alternative and/or Supplemental Corrective Measure(s).

e. Nothing in this Section VI.E.3 shall limit EPA's authority to implement or require performance of Alternative and/or Supplemental Corrective Measure(s) or to take any other appropriate action under RCRA, CERCLA, or any other legal authority.

4. Corrective Measures Assessment Reports

a. Within ninety (90) calendar days after approval of the CMI Report pursuant to Paragraph VI.E.3.c or d, the Army shall submit a CMI Assessment Report to MDE for review and comment and to EPA for review and approval.

The CMI Assessment Report shall provide an evaluation of the effectiveness of the remediation.

b. If, based on the CMI Assessment Report or any other information, EPA determines that the corrective measures are not meeting the cleanup objectives set forth in the FDRTC, EPA shall notify the Army in writing of those activities that must be undertaken to meet the objectives of the corrective measures and shall set forth a schedule for the completion of those activities. The Army shall complete the activities in accordance with the schedule set forth in the EPA notification.

c. No later than five years after the effective date of this Order and every five (5) years thereafter until receipt of approval by EPA of a Certificate of Completion submitted pursuant to Paragraph VI.E.5.d of this Order, the Army shall submit to EPA and MDE a CMI Five-Year Assessment Report. Such report shall contain an evaluation of the past and projected future effectiveness of the corrective measures to attain the cleanup standards.

5. Completion of Corrective Measures

a. After the Army has determined that the corrective measures have been fully implemented in accordance with the EPA-approved CMI Design Report, the Army shall notify EPA and MDE in writing and request EPA's approval to discontinue the corrective measure(s) in accordance with Section VI.F of this Order. The request shall explain the basis for the Army's conclusion and include all available documentation supporting such conclusion.

b. Upon receipt of EPA's approval of the Army's request to discontinue all corrective measures, the Army may discontinue such corrective measures, except that the Army shall continue to monitor, where applicable, groundwater in accordance with an EPA-approved CMI Design Report. The Army shall submit the results of such post-construction monitoring with the Quarterly and Annual Progress Reports in accordance with Section VI.F of this Order.

c. If, at any time during the post-construction monitoring program, EPA determines that the level of

any hazardous constituent and/or hazardous waste in the soils has increased above the media cleanup standards set forth in the FDRTC for such hazardous constituent and/or hazardous waste, EPA may determine if Alternative and/or Supplemental Corrective Measures need to be initiated to achieve the established media cleanup standards. EPA shall issue, in writing, a notification to the Army of any such determination. Any decision by EPA to require Alternative and/or Supplemental Corrective Measures shall be made pursuant to applicable EPA regulations and guidance.

d. If, after the post-construction monitoring program is completed to EPA's satisfaction, the established media cleanup standards have been maintained and all other aspects of the Corrective Measures Construction and Operation and Maintenance ("O&M") have been completed, the Army shall submit a Certification of Completion for all corrective measures to MDE for review and comment and to EPA for review and approval in accordance with Section VI.F of this Order. The Certification of Completion shall provide documentation sufficient to support a determination that media cleanup standards set forth in the FDRTC have been maintained and shall include all available documentation supporting such a determination.

6. Corrective Measure Operation and Maintenance

a. The Army shall perform the O&M activities in accordance with the timetable set forth in the EPA-approved CMI Design Report and the EPA-approved O&M Plan.

F. SUBMISSIONS/MDE REVIEW AND COMMENT/EPA REVIEW AND APPROVAL/ADDITIONAL WORK

1. MDE and EPA will review and comment on, as appropriate, the Army's Interim Measures, RFI and CMI Workplans; RFI, CMS and Lab and Bench Scale Study Draft and Final Reports; CMI and CMI Assessment Reports; and any other documents submitted pursuant to this Order ("submissions"), with the exception of progress reports. EPA will notify the Army in writing of EPA's approval or disapproval of each submission. EPA may, in its discretion, direct the Army to implement non-deficient portions of a Submission.

2. Within thirty (30) calendar days of receipt of MDE's and EPA's comments on any submission, or ten (10) days in the case of an Interim Measures Workplan, the Army shall submit to EPA for approval a revised submission, which responds to any comments received and/or corrects any deficiencies identified by EPA.

3. Any submission approved or revised by EPA under this Order shall be deemed incorporated into and made an enforceable part of this Order.

4. Beginning with the first day of the second full month following the effective date of this Order, and every two months thereafter on the first day of the month, throughout the period that this Order is effective, the Army shall provide MDE and EPA with bimonthly (every two months) progress reports. The bimonthly progress reports shall address the current status of work ongoing or planned for the Facility pursuant to the relevant Scope(s) of Work attached hereto.

5. The original and two (2) copies of all documents required to be submitted under the terms of this Order shall be hand-delivered or sent by Overnight Mail to the Project Coordinator designated pursuant to Section XII, "PROJECT COORDINATORS," below.

6. All work performed pursuant to this Order shall be under the direction and supervision of a professional engineer or professional geologist with expertise in hazardous waste site investigation. Within fourteen (14) days after the effective date of this Order, the Army shall submit to EPA, in writing, the name, title, and qualifications of the professional engineer or professional geologist and of any contractors and subcontractors to be used in carrying out the terms of this Order. Notwithstanding the Army's selection of an engineer, geologist, contractor or subcontractor, nothing herein shall relieve the Army of its obligation to comply with the terms and conditions of this Order. EPA shall have the right to disapprove at any time use of a professional engineer, professional geologist, contractor and/or subcontractor selected by the Army. Within fifteen (15) days of receipt of EPA's written notice disapproving the use of a professional engineer, professional geologist, contractor and/or subcontractor, the Army shall notify EPA in writing of the name, title and qualifications of the personnel who will replace the personnel disapproved by EPA.

7. EPA or the Army may determine that certain tasks and deliverables including, but not limited to, investigatory work or engineering evaluation require additional work. These tasks and deliverables may or may not have been in the RFI Workplan. If EPA determines that such additional work is necessary, EPA shall notify the Army in writing of this determination and shall specify the reasons for EPA's determination that additional work is necessary. Within fifteen (15) calendar days after the receipt of such notification, the Army shall have the opportunity to meet or confer with the Hazardous Site Cleanup Division Director of EPA Region III to discuss the additional work EPA has determined is required. As a result of this meeting, EPA shall determine if a Scope of Work is required to address this additional work. If a Scope of Work is required by EPA, within fifteen (15) calendar days after the determination that a Scope of Work is required, the Army shall submit a Scope of Work to EPA for approval. Any additional work proposed by the Army shall be subject to approval by EPA; this Order shall be modified in accordance with Section XXI, "SUBSEQUENT MODIFICATION," below, and such work shall be performed in accordance with this Order.

VII. QUALITY ASSURANCE

Throughout all sample collection and analysis activities, the Army shall use EPA-approved quality assurance, quality control, and chain-of-custody procedures, as specified in the EPA-approved workplans. In addition, the Army shall:

A. Ensure that laboratories used by the Army for analyses perform such analyses according to the EPA methods included in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," (SW-846), 3rd Edition, as updated or other methods deemed satisfactory to EPA. If methods other than EPA methods are to be used, the Army shall submit all analytical protocols to be used for analyses to EPA for approval at least thirty (30) days prior to the commencement of analyses and shall obtain EPA approval prior to the use of such analytical protocols.

B. Ensure that laboratories used by the Army for analyses participate in a quality assurance/quality control program equivalent to that which is followed by EPA.

C. Inform the EPA Project Coordinator at least fourteen (14) calendar days in advance of any laboratory analysis regarding which laboratory will be used by the Army and ensure that EPA

personnel and EPA authorized representatives have reasonable access to the laboratories and personnel used for analysis.

VIII. PUBLIC REVIEW OF ADMINISTRATIVE RECORD

The Administrative Record supporting the issuance of this Order and any written decisions or determinations made by EPA pursuant to the Order will be available for public review on Mondays through Fridays, from 8:00 a.m. to 4:30 p.m., by contacting the EPA Remedial Project Manager, Robert W. Stroud at:

U.S. Environmental Protection Agency
Region III (3HS11)
701 Mapes Road
Fort Meade, Maryland 20755
Telephone: 410-305-2748

IX. ON-SITE AND OFF-SITE ACCESS

A. EPA and/or its authorized representatives have the authority to enter and move about the Facility at all reasonable times for any purpose consistent with this Order including, among other things:

1. Interviewing Facility personnel and contractors;
2. Inspecting and copying records, operating logs, sampling and monitoring data, contracts and other documents and photographs relevant to the implementation of this Order;
3. Reviewing the progress of the Army and/or its contractors in implementing this Order;
4. Conducting such tests, sampling or monitoring as EPA deems necessary; and
5. Verifying data submitted to EPA by the Army.

E. To the extent that work required by this Order, or by any approved Scope(s) of Work or Workplan prepared pursuant hereto, must be done on property not owned or controlled by the Army, the Army shall use its best efforts to obtain site access agreements from the present owner(s) and/or lessee(s) of such property, as appropriate, within thirty (30) calendar days of receipt of EPA

approval of any Scope of Work or Workplan pursuant to this Order. The term "best efforts," as used in this paragraph, shall include at a minimum, but shall not be limited to, a certified letter from the Army to the present owner(s) and/or lessee(s) of such property requesting access agreements to permit the Army, EPA, and its authorized representatives to access such property and the payment of reasonable sums of money in consideration of access. "Reasonable sums of money" means the fair market value of the right of access necessary to implement the requirements of this Order. In the event that agreement for access is not obtained within thirty (30) calendar days after receipt of EPA approval of any Scope of Work or Workplan pursuant to this Order which requires work on property which is not owned or controlled by the Army, the Army shall notify EPA in writing within seven (7) calendar days after failure to obtain such agreements regarding both the efforts undertaken to obtain access and the failure to obtain such agreements.

C. Nothing in this Order limits or otherwise affects EPA's rights of access and entry pursuant to applicable law, including but not limited to, RCRA and CERCLA.

X. SAMPLING AND DATA/DOCUMENT AVAILABILITY

A. The Army shall submit to EPA the results of all sampling or tests or other data generated by, or on behalf of, the Army in accordance with the requirements of this Order and the Attachments appended hereto and incorporated herein. The Army shall have access to all sampling and test data generated by EPA in accordance with the requirements of this Order and its Attachments, after such data has undergone Quality Assurance/Quality Control by EPA.

B. The Army shall notify EPA, in writing, at least fourteen (14) calendar days in advance of any field activities, such as well drilling, installation of equipment, or sampling. At the request of EPA, the Army shall provide or allow EPA or its authorized representatives to take split or duplicate samples of all samples collected by the Army pursuant to this Order. In the event that EPA obtains samples for analysis, EPA shall provide to the Army a portion of each such sample equal in volume or weight to the portion retained by EPA. If any analysis is made of such samples, a copy of the results of such analysis shall be furnished promptly to the Army.

C. The Army shall permit EPA or its authorized representatives to inspect and copy all records, files, photographs, documents,

and other writings, including all sampling and monitoring data, that pertain to work undertaken pursuant to this Order. Nothing in this Order shall limit or otherwise affect EPA's authority to collect samples pursuant to applicable law, including, but not limited to, RCRA and CERCLA.

XI. RECORD PRESERVATION

The Army shall preserve, during the pendency of this Order and for a minimum of at least ten (10) years after its termination, all data, records and documents in its possession or in the possession of its divisions, officers, directors, employees, agents, contractors, successors, and assigns which relate in any way to this Order or to hazardous waste management and/or disposal at the Facility. After ten (10) years, the Army shall make such records available to EPA for inspection or shall provide copies of such records to EPA. The Army shall notify EPA at least thirty (30) calendar days prior to the proposed destruction of any such records, and shall provide EPA with a reasonable opportunity to inspect, copy and/or take possession of any such records. The Army shall not destroy any record to which EPA has requested access for inspection and/or copying until EPA has obtained such access or withdrawn its request for such access. Nothing in this Section XI shall in any way limit the authority of EPA under Section 3007 of RCRA, 42 U.S.C. § 6927, or any other access or information-gathering authority.

XII. PROJECT COORDINATORS

A. EPA hereby designates Robert W. Stroud as the EPA Project Coordinator. Within ten (10) calendar days of the effective date of this Order, the Army shall notify EPA, in writing, of the Project Coordinator it has selected. Each Project Coordinator shall be responsible for overseeing the implementation of the Order. The EPA Project Coordinator will be EPA's primary designated representative for the Facility. To the maximum extent possible, all communications between the Army and EPA, and all documents, reports, approvals, and other correspondence concerning the activities performed pursuant to the terms and conditions of this Order, shall be directed through the Project Coordinators.

B. Each party shall provide at least seven (7) calendar days written notice to the other party prior to changing Project Coordinators.

C. If EPA determines that conditions or activities at the Facility, whether or not in compliance with this Order, have caused or may cause a release or threatened release of hazardous wastes, solid wastes, hazardous constituents, hazardous substances, pollutants or contaminants which threaten or may pose a threat to health or the environment, EPA may direct that the Army stop further implementation of this Order for such period of time as may be needed to abate any such release or threatened release or to undertake any action which EPA determines is necessary to abate such release or threatened release.

D. The absence of the EPA Project Coordinator at the Facility shall not be cause for the delay or stoppage of work.

XIII. NOTIFICATION

A. Unless otherwise specified, reports, correspondence, approvals, disapprovals, notices, or other submissions relating to or required under this Order shall be in writing and shall be hand-delivered, certified mail, or sent by Overnight Mail as follows:

1. One original and two (2) copies to:

Robert W. Stroud (3HS11)
U.S. EPA, Region III
701 Mapes Road
Fort Meade, Maryland 20755

2. Two (2) copies of all documents to be submitted to EPA shall also be sent to:

Maryland Department of the Environment
Waste Management Administration
1800 Washington Blvd., Suite 625
Baltimore, Maryland 21230

B. Any notice, report, certification, data presentation, or other document submitted by the Army pursuant to this Order which discusses, describes, demonstrates, supports any finding or makes any representation concerning the Army's compliance or noncompliance with any requirement of this Order shall be certified by a duly authorized representative of the Army. A person is a "duly authorized representative" only if: (1) the authorization is made in writing; (2) the authorization specifies either an individual or position having responsibility for overall operation of the regulated facility or activity (a duly

authorized representative may thus be either a named individual or any individual occupying a named position); and (3) the written authorization is submitted to the Project Coordinator designated by EPA in Section XII, "PROJECT COORDINATORS," of this Order.

C. The certification required by Paragraph B, above, shall be in the following form:

I certify that the information contained in or accompanying this [type of submission] is true, accurate, and complete.

As to [the/those identified portion(s)] of this [type of submission] for which I cannot personally verify [its/their] accuracy, I certify under penalty of law that this [type of submission] and all attachments were prepared in accordance with procedures designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, or the immediate supervisor of such person(s), the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

Signature : _____
Name : _____
Title : _____

XIV. RESERVATION OF RIGHTS

A. EPA expressly reserves all rights and defenses that it may have, including the right both to disapprove of work performed by the Army pursuant to this Order, to require that the Army correct or reperform any work disapproved by EPA, and to request that the Army perform tasks in addition to those stated in the Scope(s) of Work, Workplans, or this Order.

B. EPA hereby reserves all of its statutory and regulatory powers, authorities, rights and remedies, both legal and equitable, which may pertain to the Army's failure to comply with any applicable laws and regulations and with any of the requirements of this Order, including, but not limited to, the

right both to disapprove of work performed by the Army and to request that the Army perform tasks in addition to those stated in the Workplans. This Order shall not be construed as a limitation of any rights, remedies, powers and/or authorities, which EPA has under RCRA, CERCLA, or any other statutory, regulatory or common law authority of the United States.

C. Compliance by the Army with the terms of this Order shall not relieve the Army of its obligations to comply with RCRA or any other applicable local, state, or federal laws and regulations.

D. The issuance of this Order shall not limit or otherwise preclude EPA from taking additional enforcement action pursuant to Section 7003 of RCRA, 42 U.S.C. § 6973, or any other authority, should EPA determine that such action is warranted.

E. This Order is not intended to be, nor shall it be construed as, a permit. This Order does not relieve the Army of any obligation to obtain and comply with any local, state, or federal permit or approval.

F. EPA reserves the right to perform any portion of the work required herein or any additional site characterization, feasibility study, and response/corrective actions it deems necessary to protect health or welfare or the environment. EPA may exercise its authority under RCRA, CERCLA or any other authority to undertake or require the performance of response actions at any time. EPA reserves the right to seek reimbursement from the Army for costs incurred in connection with any such response actions. Notwithstanding compliance with the terms of this Order, the Army is not released from liability, if any, for the costs of any such response actions taken by EPA.

XV. OPPORTUNITY TO CONFER WITH THE REGIONAL ADMINISTRATOR

Within ten (10) calendar days of the Army's receipt of this Order, the Army's Assistant Secretary (Installations and Environment) may request an opportunity to confer with the Regional Administrator on this Order. Such request must be in writing and identify the issues which the Assistant Secretary wishes the Regional Administrator to consider. Within five (5) calendar days of receipt of the request, the Regional Administrator will notify the Assistant Secretary of the arrangements and time for the conference. To request an opportunity to confer with the Regional Administrator, the

Assistant Secretary must first comply with the procedures set forth in this Section XV.

The purpose of the conference shall be to discuss the issues that the Army would like the Regional Administrator to consider in connection with this Order, the implementation of the response actions required by this Order, and whether the Army intends to comply with this Order. No official stenographic record of the conference will be made. Within ten (10) calendar days of the conference, the Regional Administrator will determine the status of the Order and so notify the Assistant Secretary in writing.

XVI. OPPORTUNITY TO CONFER WITH THE ADMINISTRATOR

Within ten (10) calendar days of the Assistant Secretary's receipt of the Regional Administrator's determination, made in accordance with Section XV, if the Secretary of the Army wishes to confer with the Administrator, either through an exchange of letters or through a direct meeting, he must file a written request addressed to the Administrator seeking an opportunity to confer with the Administrator. The request should specifically identify those issues previously discussed with the Regional Administrator which the Army wishes the Administrator to consider. The request should be served on the Administrator (Mail Code 1101A, U.S. EPA, 1200 Pennsylvania Avenue, N.W., Washington, DC 20460) with a copy to the Director, Federal Facilities Enforcement Office (Mail Code 2261A, U.S. EPA, 1200 Pennsylvania Ave., NW, Washington, DC 20460) and Region III's Regional Counsel (Mail Code 3RC00, U.S. EPA, 1650 Arch Street, Philadelphia, Pennsylvania, 19103).

If the conference will occur through an exchange of letters, the letter requesting the conference should specifically identify those issues previously discussed with the Regional Administrator which the Army wishes the Administrator to consider.

If the Secretary of the Army wishes to confer through a direct meeting, the request for a conference should also specifically identify the issue(s) that the Army proposes to discuss with the Administrator, as well as the person(s) who will represent the Army. In addition, as part of its request for a conference either through an exchange of letters or a direct meeting, the Secretary of the Army should attach copies of all necessary information regarding the issue(s). Failure to request a conference within the ten-day period will be deemed a waiver of the right to confer with the Administrator.

If the conference is to be conducted through a direct meeting, representatives of the Army and EPA in addition to the Secretary of the Army and the Administrator of EPA may request to be present during the conference. This request to attend the conference should likewise be in writing and served on the Director, Federal Facilities Enforcement Office, and EPA and Army counsel. After a determination is made that a direct meeting will occur, the Administrator will notify the Secretary of the Army, and EPA and Army counsel.

Within thirty (30) calendar days of the conference or receipt of the letter in the event of conference by letter, the Administrator will issue a written decision regarding the Order. This decision shall be made part of the Administrative Record.

XVII. ENFORCEABILITY

Violation of this Order, or failure or refusal to comply with this Order, may subject the Army to a citizen suit under RCRA for civil penalties of up to six thousand five hundred dollars (\$6,500) for each day the violation occurs, as provided in Section 7003(b) of RCRA, 42 U.S.C. § 7003(b), as amended by the Debt Collection Improvement Act of 1996, 28 U.S.C. § 2461 note.

This Order, including but not limited to its provisions related to statutory requirements, interim measures, and corrective measures, recordkeeping, reporting and schedules of compliance, shall be enforceable under citizen suits pursuant to Section 7002(a) of RCRA, 42 U.S.C. § 6972(a).

In the event of any action filed under Section 7002(a) of RCRA, alleging any violation of this Order, it shall be presumed that this Order, including those provisions which address record keeping, reporting and schedules of compliance, are requirements, standards, and conditions, and are thus enforceable under Section 7002(a) of RCRA.

XVIII. OTHER CLAIMS

Nothing in this Order shall constitute or be construed as a release from any claim, cause of action or demand in law or equity against any person, firm, partnership, or corporation, or other entity for any liability it may have arising out of or relating in any way to the generation, storage, treatment, handling, transportation, release, or disposal of any hazardous

constituents, hazardous substances, hazardous wastes, solid wastes, pollutants, or contaminants found at, taken to, or taken from the Facility.

XIX. OTHER APPLICABLE LAWS

All actions required to be taken pursuant to this Order shall be undertaken in accordance with the requirements of all applicable local, state, and federal laws and regulations. The Army shall obtain or require its authorized representatives to obtain all permits and approvals necessary under such laws and regulations.

XX. NOTICE OF NON-LIABILITY OF EPA

EPA shall not be deemed a party to any contract involving the Army and relating to activities at the Facility and shall not be liable for any claim or cause of action arising from or on account of any act, or the omission of the Army, its officers, employees, contractors, receivers, trustees, agents or assigns, in carrying out the activities required by this Order.

XXI. SUBSEQUENT MODIFICATION

A. Any reports, plans, specifications, schedules, other submissions and attachments required by this Order are, upon written approval by EPA, incorporated into this Order. Any noncompliance with such EPA-approved reports, plans, specifications, schedules, and attachments shall be considered a violation of this Order and shall subject the Army to possible enforcement action pursuant to applicable law.

B. This Order may be modified or amended. Such modifications or amendments shall be effective on the date they are signed or such other date as set by the amendment. Minor modifications, if determined to be so by the EPA Project Coordinator, may be approved by the EPA Project Coordinator.

C. No informal advice, guidance, suggestions, or comments by EPA regarding reports, plans, specifications, schedules, and any other writing submitted by the Army shall be construed as relieving the Army of its obligation to obtain written approval, if and when required by this Order, and to comply with the requirements of this Order unless formally modified by EPA.

XXII. SEVERABILITY

If any provision or authority of this Order or the application of this Order to any party or circumstance is held by any judicial or administrative authority to be invalid, the application of such provision to other parties or circumstances and the remainder of this Order shall not be affected thereby and shall remain in full force.

XXIII. NOTICE OF INTENT TO COMPLY

The Army shall notify EPA's Project Coordinator within ten (10) days from the effective date set forth in Section XXVI, "EFFECTIVE DATE," of this Order whether the Army intends to comply with this Order. Failure of the Army to provide notification to EPA's Project Coordinator of intent to comply within this time period shall be deemed a violation of this Order by the Army.

XXIV. ANTI-DEFICIENCY ACT

Nothing set forth in the Order shall require the Army to violate the Anti-Deficiency Act, 31 U.S.C. § 1341 et seq.

XXV. TERMINATION AND SATISFACTION

The provisions of this Order shall be deemed satisfied upon the Army's receipt of written notice from EPA that the Army has demonstrated, to the satisfaction of EPA, that the terms of this Order, including any additional tasks determined by EPA to be required pursuant to this Order, have been satisfactorily completed. This notice shall not, however, terminate the Army's obligation to comply with any continuing obligations.

XXVI. EFFECTIVE DATE

This Order shall become effective eleven (11) calendar days after receipt of this Order if no conference with the Regional Administrator is requested pursuant to Section XV of this Order. If the Army does not request a conference with the Administrator in the time and manner provided in Section XVI above, this Order shall become effective eleven (11) calendar days after the Army's receipt of the Regional Administrator's determination provided

pursuant to Section XVI above. If a conference with the Administrator is requested in the time and manner provided in Section XVI above, the Order shall become effective upon receipt of the Administrator's decision made in accordance with Section XVI.

IT IS SO ORDERED:

DATE: 8/27/07

BY: James J. Burke
James J. Burke, Director
Hazardous Site Cleanup Division
United States Environmental
Protection Agency, Region III

FORT GEORGE G. MEADE
RCRA § 7003 UNILATERAL ADMINISTRATIVE ORDER
ADMINISTRATIVE RECORD FILE INDEX

1. Transfer Assembly regarding transfer of 7,600 acres at Ft. George G. Meade from Army to the Department of the Interior, October 16, 1991.
2. Transfer Assembly regarding transfer of approximately 498.2 acres at Ft. George G. Meade from Army to the Department of the Interior, undated.
3. HRS Documentation Record, prepared by EPA, February 19, 1997 final revision.
4. Draft Final Focused Feasibility Study Defense Reutilization and Marketing Office (DRMO) Site (FGGM-07, OU5), Fort Meade, Maryland, authored by Arcadis for U.S. Army Corps of Engineers, Baltimore District, November 2006.
5. Draft Remedial Investigation Report, Fort George G. Meade, Closed Sanitary Landfill, Groundwater Remedial Investigation (RI), authored by EM Federal Corporation for U.S. Army Corps of Engineers, Baltimore District, August 2005.
6. Record of Decision, Clean Fill Dump (CFD), Operable Unit – 07, Fort George G. Meade, Fort Meade, Maryland, September 2000.
7. Draft Final Long-Term Monitoring Report, Groundwater Sampling September 2006, Clean-fill Dump Operable Unit, Patuxent Research Refuge-North Tract, Anne Arundel County, Maryland, authored by URS for U.S. Army Corps of Engineers, Baltimore District, February 2007.
8. Final OU-4 Remedial Investigation Workplan for the Performance Based Contract Environmental Work at Fort Meade, MD, authored by Kemron Environmental Services for U.S. Army Corps of Engineers, Baltimore District, May 2006.
9. Fort George G. Meade and Phoenix Military Reservation, FY 2006 Installation Action Plan, September 2005.
10. Final Fort George G. Meade and Phoenix Military Reservation, Army Defense Environmental Restoration Program Installation Action Plan, APR/FY06, 26 July 2006.
11. Final Remedial Investigation, Architect of the Capitol, Library of Congress Campus Facility, Fort George G. Meade, Maryland, authored by Malcolm Pimie for Fort George G. Meade and U.S. Army Corps of Engineers, Baltimore District, July 2006.

12. Draft Technical Memorandum, Architect of the Capitol, Library of Congress Campus Facility, Fort George G. Meade, Maryland, authored by Malcolm Pirnie for Fort George G. Meade and U.S. Army Corps of Engineers, Baltimore District, January 2007.
13. Final Decision Document, Ordnance Demolition Area (ODA), Patuxent Research Refuge, Anne Arundel County, Maryland, December 2005, signed by the Army on 20 January, 2006.
14. Draft Final Report, Long-Term Monitoring Report No. 4, Groundwater Sampling August-September 2006, Ordnance Demolition Area, Patuxent Research Refuge-North Tract, Anne Arundel County, Maryland, authored by URS for U.S. Army Corps of Engineers, Baltimore District, February 2007.
15. Final Historical Records Review, Fort George G. Meade, Fort Meade, Maryland, authored by Malcolm Pirnie for Fort George G. Meade and U.S. Army Corps of Engineers, Baltimore District, revised July 2006.
16. Final Site Inspection Report, Fort George G. Meade, Fort Meade, Maryland, authored by Malcolm Pirnie for Fort George G. Meade and U.S. Army Corps of Engineers, Baltimore District, April 2007.
17. Final Record of Decision, Tipton Airfield Operable Unit, Fort George G. Meade, Fort Meade, Maryland, December 1998.
18. Final Record of Decision, Tipton Airfield Parcel (TAP) Operable Unit, Fort George G. Meade, Fort Meade, Maryland, June 1999.
19. Draft Site Specific Final report, NTRC MEC Removal Action, Long Term Monitoring, Addendum No. 5, Little Patuxent River, Fort George G. Meade, Maryland, 14 September 2006.
20. Public Health Assessment, Fort George G. Meade, Fort Meade, Anne Arundel, Maryland, EPA Facility ID: MD9210020567, prepared by Federal Facilities Assessment Branch, Division of Health Assessment and Consultation, Agency for Toxic Substances and Disease Registry, November 10, 1999.
21. Fort Meade Endangerment Determination for RCRA 7003, Memorandum from Jennifer Hubbard, Toxicologist, EPA Region III Technical Support Branch (3HS41) to Bob Stroud, RPM, EPA Region III NPL/BRAC Federal Facilities Branch (3HS11), August 7, 2007.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029

Mr. Harold L. Dye, Jr.
Hazardous Waste Program Administrator
Maryland Department of the Environment
1800 Washington Blvd., Ste. 645
Baltimore, MD 21230-1719

AUG 14 2007

Re: Fort George G. Meade

Dear Mr. Dye:

As I notified you earlier this year, EPA Region III has been preparing a RCRA § 7003 unilateral order regarding the Fort George G. Meade facility. Ben Mykijewycz and Bob Stroud also have been in contact with John Fairbank and Rick Grills, respectively, concerning this proposed action. EPA Region III expects to issue this order to the Department of the Army very soon, and we will provide MDE with a copy upon issuance of the order.

The purpose of the order is to ensure that the investigation and cleanup of releases of hazardous wastes, solid wastes and/or hazardous constituents at the entire Ft. George G. Meade CERCLA NPL site, including on parcels previously transferred to the Department of the Interior/ Fish and Wildlife Service, are performed under EPA oversight and pursuant to the terms of a legally enforceable document.

The order will require that the Department of the Army notify EPA within ten days from the effective date whether or not it intends to comply with the order. The terms of the order also provide the Department of the Army an opportunity, within the same ten day period, to notify EPA of its desire to confer with the EPA Regional Administrator regarding the order. There is also a subsequent opportunity to confer with the EPA Administrator.

We will keep you informed of developments in this matter. If you have any questions, please contact me at (215) 814-3348.

Sincerely,

Henry J. Sokolowski
Associate Director
Office of Federal Facility Remediation
and Site Assessment
Hazardous Site Cleanup Division



c: John Fairbank (MDE)
Rick Grills (MDE)
Bernadette Rappold (USEPA, FFEO)
Brian Nishitani (USEPA, Region III) ✓
Robert Stroud (USEPA, Region III)



ATTACHEMENT A

RCRA FACILITY INVESTIGATION SCOPE OF WORK

PURPOSE

The purpose of this RCRA Facility Investigation ("RFI") is to determine the nature and extent of releases of hazardous wastes or hazardous constituents from regulated units, solid waste management units, and other source areas at the facility, and to gather all necessary data to support the environmental indicator determinations and a Corrective Measures Study. The RFI includes the collection of site specific data to evaluate any human health and/or ecological impacts of contamination from the site. The Respondent shall furnish all personnel, materials, and services necessary for, or incidental to, performing the RCRA facility investigation.

SCOPE

The RCRA Facility Investigation consists of four tasks:

TASK I: DESCRIPTION OF CURRENT CONDITIONS

- A. Facility Background
- B. Nature and Extent of Contamination
- C. Implementation of Interim Measures
- D. Environmental Indicator Assessment

TASK II: RFI WORKPLAN REQUIREMENTS

- A. Project Management Plan
- B. Data Collection Quality Assurance Project Plan
- C. Data Management Plan
- D. Community Relations Plan

TASK III: RCRA FACILITY INVESTIGATION

- A. Environmental Setting
- B. Source Characterization
- C. Contamination Characterization
- D. Potential Receptor Identification
- E. Risk Assessment
- F. Data Analysis

TASK IV: REPORTS

- A. Description of Current Conditions
- B. RFI Workplan
- C. RFI Report
- D. Progress Reports

TASK I: DESCRIPTION OF CURRENT CONDITIONS

The Respondent shall submit for EPA approval a report providing the background information pertinent to the facility. This report shall include information gathered during any previous investigations, inspections, interim measure activities and any other relevant data, which helps to identify potential sources of contamination and characterize the current site conditions. In addition, this report shall include an environmental indicator assessment to evaluate potential current human exposures to contamination and to assess whether any contaminated groundwater plumes are migrating.

A. Facility Background

The Respondent's report shall summarize the regional location, pertinent boundary features, general facility physiography, hydrogeology, and historical use of the facility for the treatment, storage, or disposal of solid and hazardous waste. The Respondent's report shall include:

1. Map(s) depicting the following:
 - a. General geographic location;
 - b. Property lines, with the owners of all adjacent property clearly indicated;
 - c. Topography (with a contour interval of 10 feet and a scale of 1 inch = 100 feet), waterways, all wetlands, floodplains, water features, drainage patterns;
 - d. All tanks, buildings, utilities, paved areas, easements, rights-of-way, and other features;
 - e. All solid or hazardous waste treatment, storage, or disposal areas active after November 19, 1980;
 - f. All known past solid or hazardous waste treatment, storage, or disposal areas and all known spill, fire, or other accidental release locations

regardless of whether they were active on November 19, 1980;

- g. All known past and present product and waste underground tanks or piping;
- h. Surrounding land uses (residential, commercial, agricultural, recreational); and
- i. Location of all production and ground water monitoring wells at and in the vicinity of the site. These wells shall be clearly labeled. Ground and top of casing elevations shall be included (these elevations may be included as an attachment).

All maps shall be consistent with the requirements set forth in 40 C.F.R. Section 270.14 and be of sufficient detail and accuracy to locate and report all current and future work performed at the site;

- 2. History and description of ownership and operation; solid and hazardous waste generation; and treatment, storage, and disposal activities at the facility;
- 3. Approximate dates or periods of past product and waste spills, identification of the materials spilled, the amount spilled, the location of the spills, and a description of the response actions conducted (local, state, or Federal response units or private parties), including any inspection reports or technical reports generated as a result of the response; and
- 4. Summary of past permits requested and/or received, any enforcement actions and their subsequent responses.

B. Nature and Extent of Contamination

The Respondent's report shall describe the existing information on the nature and extent of contamination.

- 1. The Respondent's report shall summarize all possible source areas of contamination. This, at a minimum, should include all regulated units, solid waste management units, spill areas, and other suspected source areas of contamination. For each area, the Respondent shall identify the following:
 - a. Location of unit/area (which shall be depicted on a facility map);
 - b. Quantities of solid and hazardous wastes;

- c. Hazardous waste or hazardous constituents, to the extent known; and
 - d. Identification of areas where additional information is necessary.
2. The Respondent shall prepare an assessment and description of the existing degree and extent of contamination. This should include:
- a. Available monitoring data and qualitative information on locations and levels of contamination at the facility;
 - b. All potential migration pathways including information on geology, soils, hydrogeology, physiography, hydrology, water quality, meteorology, and air quality; and
 - c. Potential impact(s) on human health and the environment, including demography, ground water and surface water use, and land use.

C. Implementation of Interim Measures

The Respondent's report shall document interim measures which were, or are, being undertaken at the facility. This report shall include:

1. Objectives of the interim measures: how the measure is mitigating a potential threat to human health and the environment and/or is consistent with and integrated into any long-term solution at the facility;
2. Design, construction, operation, and maintenance requirements;
3. Schedules for design, construction, and monitoring; and
4. Schedule for progress reports.

D. Environmental Indicator Assessment

The Respondent shall assess whether the current data supports achievement of EPA's Environmental Indicators. The Respondent shall complete EPA's Environmental Indicator Assessment Forms which are included as Attachment G, and identify any information needed to complete the forms.

TASK II: RFI WORKPLAN REQUIREMENTS

The Respondent shall prepare a RCRA Facility Investigation Workplan. This RFI Workplan shall include several components described below. During the RCRA Facility Investigation, it

may be necessary to revise the RFI Workplan to increase or decrease the detail of information collected to accommodate the facility-specific situation. The RFI Workplan shall include the following:

A. Project Management Plan

The Respondent shall prepare a Project Management Plan which will include a discussion of the technical approach, schedules, and personnel. The Project Management Plan will also include at a minimum:

1. a description of personnel qualifications performing or directing the RFI, including contractor personnel.
2. the overall management approach to the RCRA Facility Investigation
3. a proposed strategy to meet the Environmental Indicator goals.

B. Data Collection Quality Assurance Project Plan

The Respondent shall prepare a plan to document all monitoring procedures: sampling, field measurements, and sample analysis performed during the investigation to characterize the environmental setting, source, and contamination, so as to ensure that all information, data, and resulting decisions are technically sound, statistically valid, and properly documented.

1. The Data Collection Strategy section of the Data Collection Quality Assurance Project Plan shall include, but not be limited to, the following:
 - a. Description of the intended uses for the data and of the necessary level of precision and accuracy for these intended uses;
 - b. Description of methods and procedures to be used to assess the precision, accuracy, and completeness of the measurement data;
 - c. Description of the rationale used to assure that the data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, a process condition, or an environmental condition. Examples of factors which shall be considered and discussed include:
 - i) Environmental conditions at the time of sampling;
 - ii) Number of sampling points;

- iii) Representativeness of selected media; and
 - iv) Representativeness of selected analytical parameters.
- d. Description of the measures to be taken to assure that the following data sets can be compared to each other:
- i) RFI data generated by the Respondent over some time period;
 - ii) RFI data generated by an outside laboratory or consultant versus data generated by the Respondent;
 - iii) Data generated by separate consultants or laboratories; and
 - iv) Data generated by an outside consultant or laboratory over some time period.
- e. Details relating to the schedule of and information to be provided in quality assurance reports. The reports should include, but not be limited to:
- i) Periodic assessment of measurement data accuracy, precision, and completeness;
 - ii) Results of performance audits;
 - iii) Results of system audits;
 - iv) Significant quality assurance problems and recommended solutions; and
 - v) Resolutions of previously stated problems.
2. The Sampling section of the Data Collection Quality Assurance Project Plan shall discuss:
- a. Selecting appropriate sampling locations, depths, etc.;
 - b. Providing a statistically sufficient number of sampling sites;
 - c. Measuring all necessary ancillary data;

- d. Determining conditions under which sampling should be conducted;
- e. Determining which media are to be sampled (e.g., ground water, air, soil, sediment, etc.);
- f. Determining which parameters are to be measured and where;
- g. Selecting the frequency of sampling and length of sampling period;
- h. Selecting the types of sample (e.g., composites vs. grabs) and number of samples to be collected;
- i. Documenting field sampling operations and procedures, including:
 - i) Documentation of procedures for preparation of reagents or supplies which become an integral part of the sample (e.g., filters and adsorbing 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 devices;
 - v) Collection of replicate samples;
 - vi) Submission of field-biased blanks, where appropriate;
 - vii) Potential interferences present at the facility;
 - viii) Construction materials and techniques associated with monitoring wells and piezometers;
 - ix) Field equipment listing and sample containers;
 - x) Sampling order; and
 - xi) Decontamination procedures.
- j. Selecting appropriate sample containers;
- k. Sample preservation; and

1. Chain-of-custody, including:
 - i) Standardized field tracking reporting forms to establish sample custody in the field prior to shipment; and
 - ii) Pre-prepared sample labels containing all information necessary for effective sample tracking.

3. The Field Measurements section of the Data Collection Quality Assurance Project Plan shall discuss:
 - a. Selecting appropriate field measurement locations, depths, etc.;
 - b. Providing a statistically sufficient number of field measurements;
 - c. Measuring all necessary ancillary data;
 - d. Determining conditions under which field measurement should be conducted;
 - e. Determining which media are to be addressed by appropriate field measurements (e.g., ground water, air, soil, sediment, etc.);
 - f. Determining which parameters are to be measured and where;
 - g. Selecting the frequency of field measurement and length of field measurement periods; and
 - h. Documenting field measurement operations and procedures, including:
 - i) Procedures and forms for recording raw data and the exact location, time, and facility-specific considerations associated with the data acquisition;
 - ii) Calibration of field devices;
 - iii) Collection of replicate measurements;
 - iv) Submission of field-biased blanks, where appropriate;
 - v) Potential interferences present at the facility;
 - vi) Construction materials and techniques associated with

monitoring wells and piezometers used to collect field data;

vii) Field equipment listing;

viii) Order in which field measurements will be made; and

ix) Decontamination procedures.

4. The Sample Analysis section of the Data Collection Quality Assurance Project Plan shall specify the following:

a. Chain-of-custody procedures, including:

i) Identification of a responsible party to act as sample custodian at the laboratory facility authorized to sign for incoming field samples, to obtain documents of shipment, and to 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;

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.

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.

A performance audit may be conducted by EPA on the laboratories selected by the Respondent. If EPA requires, this audit must be completed and approved prior to the facility investigation.

- h. Preventive maintenance procedures and schedules;
- i. Corrective action (for laboratory problems); and
- j. Turnaround time.

C. Data Management Plan

The Respondent 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. The data record shall include the following:
 - a. Unique sample or field measurement code;
 - b. Sampling or field measurement location and sample or measurement type;
 - c. Sampling or field measurement raw data;
 - d. Laboratory analysis identification number;
 - e. Property or component measured; and
 - f. Result of analysis (e.g., concentration).

2. Tabular displays shall be used to present the following data:
 - a. Unsorted (raw) data;
 - b. Results for each medium, or for each constituent monitored;
 - c. Data reduction for statistical analysis;
 - d. Sorting of data by potential stratification factors (e.g., location, soil layer, topography); and
 - e. Summary data.

3. Graphical displays (e.g., bar graphs, line graphs, area or plan maps, isopleth plots, cross-sectional plots or transects, three dimensional graphs, etc.) shall be used to present the following data:
 - a. Display sampling location and sampling grid;
 - b. Indicate boundaries of sampling area and areas where more data are required;
 - c. Display levels of contamination at each sampling location for each sampling event;
 - d. Display geographical extent of contamination;
 - e. Display contamination levels, averages, and maxima;

- f. Illustrate changes in concentration in relation to distance from the source, time, depth, or other parameters; and
- g. Indicate features affecting intramedia transport and show potential receptors.

D. Community Relations Plan

The Respondent shall prepare a plan for the dissemination of information to the public regarding investigation activities and results. It shall also include a summary fact sheet for EPA to post on EPA's web site. At a minimum, Respondent shall provide EPA with an update to the fact sheet annually.

TASK III: FACILITY INVESTIGATION

The Respondent shall conduct investigations necessary to: characterize the facility (Environmental Setting); define the source (Source Characterization); define the degree and extent of contamination (Contamination Characterization); identify actual or potential receptors, and determine the impact(s) of contamination on human health and/or ecological receptors (Risk Assessment). For reporting of the ecological assessment refer to "The Risk Assessment Volume II Manual," [EPA/540/1-89/002 and 001, March 1989].

The investigation should result in data of adequate technical quality to support an environmental indicator determination and the development and evaluation of the corrective measures alternative(s) during the Corrective Measures Study.

The site investigation activities shall follow the plans set forth in Task II. All sampling and analyses shall be conducted in accordance with the Data Collection Quality Assurance Project Plan. All sampling locations shall be documented in a log and identified on a detailed site map.

The Respondent shall prepare an analysis and summary of the RCRA Facility Investigation. The report shall describe the nature and extent of contamination, potential threat(s) to human health and/or the environment, and shall support the Corrective Measures Study.

A. Environmental Setting

The Respondent shall collect information to supplement and verify existing information on the environmental setting at the facility. The Respondent shall characterize the following:

1. Hydrogeology - The Respondent shall conduct a program to evaluate hydrogeologic conditions at the facility. Such characterization typically includes, but is not limited to, the following information:

- a. Description of the regional and facility-specific geologic and hydrogeologic characteristics affecting ground water flow beneath the facility, including:
 - i) Regional and facility-specific stratigraphy: description of strata, including strike and dip, and identification of stratigraphic contacts;
 - ii) Structural geology: description of local and regional structural features (e.g., folding, faulting, jointing);
 - iii) Depositional and erosional history;
 - iv) Identification and characterization of recharge and discharge areas;
 - v) Regional and facility-specific ground water flow patterns;
 - vi) Facility-specific ground water flow patterns in the saturated soil horizon, the shallow bedrock aquifer, and the deep bedrock aquifer systems; and
 - vii) Characterization of seasonal variations in each ground water flow regime.
- b. Analysis of any topographic features that might influence the ground water flow system.
- c. Based on field data, 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);
 - ii) Lithology, grain size, sorting, and degree of cementation;
 - iii) Interpretation of hydraulic interconnections between saturated zones; and
 - iv) Attenuation capacity and mechanisms of the natural earth materials (e.g., ion exchange capacity, organic carbon content, mineral content, etc.).

- d. Based on field studies and cores, structural geology and hydrogeologic cross sections showing the extent (depth, thickness, lateral extent) of hydrogeologic units which may be part of the migration pathways, identify:
- i) Sand and gravel deposits in unconsolidated deposits;
 - ii) Zones of fracturing or channeling in unconsolidated deposits;
 - iii) Zones of high permeability or low permeability that might direct and/or restrict the flow of contaminants;
 - iv) The uppermost aquifer: geologic formation, group of formations, or part of a formation capable of yielding a significant amount of ground water to wells or springs; and
 - v) Water-bearing zones above the first confining layer that may serve as a pathway for contaminant migration, including perched zones of saturation.
- e. Based on data obtained from ground water monitoring wells and piezometers installed upgradient and downgradient of the potential contaminant source(s), a representative description of water level or fluid pressure monitoring, including:
- i) Water-level contour and/or potentiometric maps;
 - ii) Hydrologic cross-sections showing vertical 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 seasonal influences.
- f. Description of man-made influences that may affect the hydrogeology of the site, identifying:
- i) Active and inactive local water supply and production wells with an approximate schedule of pumping; and
 - ii) Man-made hydraulic structures (pipelines, french drains,

ditches, unlined ponds, septic tanks, NPDES outfalls, retention areas, etc.).

2. Soils - The Respondent shall conduct a program to fully characterize the soil and rock units at the site. Such characterization typically includes, but is not limited to, the following information:
 - a. Soil Conservation Service (SCS) soil classification;
 - b. Surface soil distribution;
 - c. Soil profile, including American Standard Test Method (ASTM) classification of soils;
 - d. Transects of soil stratigraphy;
 - e. Hydraulic conductivity (saturated and unsaturated);
 - f. Relative permeability;
 - g. Bulk density;
 - h. Porosity;
 - i. Soil sorptive capacity;
 - j. Cation exchange capacity (CEC);
 - k. Soil organic content;
 - l. Soil pH;
 - m. Particle size distribution;
 - n. Depth of water table;
 - o. Moisture content;
 - p. Effect of stratification on unsaturated flow;
 - q. Infiltration;
 - r. Evapotranspiration;

- s. Storage capacity;
 - t. Vertical flow rate; and
 - u. Mineral content.
3. Surface Water and Sediment - The Respondent shall conduct a program to characterize the surface water bodies in the vicinity of the facility. Such characterization typically includes, but is not limited to, the following 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 purpose of impoundment;
 - iii) For streams, ditches, and channels: location, elevation, flow, velocity, depth, width, seasonal fluctuations, and flooding tendencies (i.e., 100-year event); and
 - iv) Drainage patterns.
 - b. Description of the chemistry of the natural surface water and sediments (e.g. pH, total organic carbon).
 - c. Description of sediment characteristics, including:
 - i) Deposition area(s);
 - ii) Thickness profile; and
 - iii) Physical and chemical parameters (e.g., grain size, density, organic carbon content, ion exchange capacity, pH)
4. Air - The Respondent shall provide information characterizing the climate in the vicinity of the facility. Such characterization typically includes, but is not limited to, the following information:
- a. Description of the following parameters:

- i) Annual and monthly rainfall averages;
 - ii) Monthly temperature averages and extremes;
 - iii) Wind speed and direction; and
 - vi) Evaporation data.
- b. Description of topographic and man-made features which 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, bays, etc.);
 - iv) Wind breaks and forests; and
 - v) Buildings.

B. Source Characterization

The Respondent shall collect analytical data to supplement and update the description prepared pursuant to Task I.B. herein. The data shall completely characterize the wastes and the areas where wastes have been placed or released. This information shall include quantification of the following specific characteristics at each source area and documentation of the procedures used to make the determinations.

1. Source Area Characteristics:
- a. Location of unit/disposal or source area;
 - b. Type of unit/disposal area or cause of source/release;
 - c. Design features;
 - d. Operating practices (past and present);
 - e. Period of operation;
 - f. Age of unit/disposal area;

- g. General physical condition; and
- h. Method used to close the unit/disposal area.

2. Waste Characteristics:

a. Type of waste/product:

- i) Hazardous classification (e.g., flammable, reactive, corrosive, oxidizing, or reducing agent);
- ii) Quantity; and
- iii) Chemical composition.

b. Physical and chemical characteristics:

- i) Physical form and description (e.g., powder, oily sludge);
- ii) pH;
- iii) General chemical class (e.g., acid, base, solvent);
- iv) Density;
- v) Viscosity;
- vi) Solubility in water;
- vii) Cohesiveness of the waste; and
- viii) Vapor pressure.

c. Migration and dispersal characteristics of the waste/product:

- i) Sorption;
- ii) Biodegradability, bioconcentration, biotransformation; and
- iii) Chemical transformations.

C. Contamination Characterization

The Respondent shall collect analytical data on ground water, soils, surface water, sediment, and vapor contamination in the vicinity of the facility. This data shall be sufficient to define the extent, origin, direction, and rate of movement of contaminant plumes. Data shall include time and location of sampling, media sampled, concentrations found, conditions during sampling, and the identity of the individuals performing the sampling and analysis. The Respondent shall address the following types of contamination at the facility:

1. Ground Water Contamination - The Respondent shall conduct a ground water investigation to fully characterize all plumes of contamination at the facility and document the procedures used to characterize contaminant plume(s), (e.g., geophysics, modeling, pump tests, slug tests, nested piezometers). This investigation shall, at a minimum, provide the following information:
 - a. Specific origin (source) of each contaminant plume;
 - b. Description of the full horizontal and vertical extent of each immiscible or dissolved plume(s) originating from the facility;
 - c. Horizontal and vertical direction of contaminant movement;
 - d. Velocity of contaminant movement;
 - e. Horizontal and vertical concentration profiles of hazardous constituents;
 - f. Evaluation of factors influencing the plume movement; and
 - g. Extrapolation of future contaminant movement.

2. Soil Contamination - The Respondent shall conduct and document the procedures used to investigate and characterize the contamination of the soil and rock units in the vicinity of any contaminant release. The investigation shall include the following information:
 - a. Specific origin (source) of each soil contamination area;
 - b. Description of the full vertical and horizontal extent of contamination;
 - c. Description of contaminant and soil chemical properties within the contaminant source area and plume (e.g. contaminant solubility, adsorption, leachability) that might affect contaminant migration and transformation;

- d. Specific contaminant concentrations;
 - e. Velocity and direction of contaminant movement; and
 - f. Extrapolation of future contaminant movement.
3. **Surface Water and Sediment Contamination** - The Respondent shall conduct and document the procedures used to investigate and characterize contamination in surface water bodies and sediments resulting from contaminant releases at the facility. The investigation shall include, but not be limited to, the following information:
- a. Specific origin (source) of each contaminant release to surface water and sediments;
 - b. Description of likely discharge locations of any immiscible or dissolved plume(s) originating from the facility, and the extent of contamination in sediments and surface water;
 - c. Horizontal and vertical direction of contaminant movement;
 - d. Evaluation of the physical, biological, and chemical factors influencing contaminant movement;
 - e. Extrapolation of future contaminant movement; and
 - f. Description of the chemistry of the contaminated surface waters and sediments (e.g. pH, total dissolved solids, specific contaminant concentrations).
4. **Vapor Contamination** - The Respondent shall conduct and document procedures used to investigate and characterize the particulate and gaseous contaminants released into the atmosphere and gases emitted from any hazardous waste and hazardous constituents in the soils and ground water. This investigation shall provide the following information:
- a. Specific origin (source) of each contaminant release to the air;
 - b. Description of the horizontal and vertical extent and velocity of contaminant movement;
 - c. Rate and amount of the release; and

- d. Chemical and physical composition of the contaminants(s) released, including horizontal and vertical concentration profiles.

D. Potential Receptor Identification

The Respondent shall collect data describing the human populations and environmental systems that are susceptible to contaminant exposure from the facility. Chemical analysis of biological samples may be needed. Data on observable effects in ecosystems may also be obtained. The following characteristics shall be identified:

1. Local uses and possible future uses of ground water:
 - a. Type of use (e.g., drinking water source: municipal or residential, agricultural, domestic/non-potable, and industrial); and
 - b. Location of ground water users, including wells and discharge areas.
2. Local uses and possible future uses of surface waters near the facility:
 - a. Type of use(s) (e.g. domestic municipal, recreational, agricultural) (e.g., potable and lawn/garden watering); and
 - b. Location of designated use area relative to the site and the contamination.
3. Current and potential human use of or access to the facility and adjacent lands, including, but not limited to:
 - a. Types of current and potential uses (e.g. residential, commercial, zoning/deed restrictions); and
 - b. Any use restrictions relative to the site and the contamination.
4. A description of the ecology overlying and in proximity to the facility including, but not limited to:
 - a. Location and size of each identified habitat (e.g., streams, wetlands, forested areas).
 - b. Description and complete species listing of each habitat's plant and animal (both resident and transient) communities.
 - c. Non-jurisdictional delineation of any wetlands present.

- d. Database searches for the potential presence of any federal or state listed threatened, endangered, or rare species.
5. An evaluation of the pollutant impacts on the ecosystems/populations potentially exposed to contamination. This evaluation may be accomplished through the use of toxicity test (acute and chronic) population surveys and literature reviews.
6. A 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 the significance, uniqueness, or protected status of potentially exposed ecosystems.

E. Risk Assessment

The baseline risk assessment is an analysis of the potential adverse health effects caused by hazardous substance releases from a site in the absence of any actions to control or mitigate these releases (under the assumption of no action). The baseline risk assessment contributes to the site characterization and subsequent development, evaluation, and selection of appropriate response alternatives. There are several steps in the risk assessment process:

1. Human Health
 - a. Determine contaminants of concern: Data collection and evaluation involves gathering and analyzing the site data relevant to the human health evaluation and identifying the substances present at the site that are the focus of the risk assessment process.
 - b. Exposure assessment: Using the procedure outlined in Section D for determining potential receptors, estimate the magnitude of actual and/or potential human exposures, the frequency and duration of these exposures, and the pathways by which humans are potentially exposed. In the exposure assessment, reasonable maximum estimates of exposure are developed for both current and future land- and groundwater-use assumptions.
 - c. Toxicity assessment: This component of the risk assessment considers the types of adverse health effects associated with chemical exposures and the relationship between the magnitude of exposure and adverse effects.
 - d. Risk Characterization: This summarizes and combines outputs of the exposure and toxicity assessments to characterize baseline risk, both in

quantitative expressions and qualitative statements. An analysis of uncertainties that affect the level of confidence in the risk estimates should also be included. The analysis should specify the uncertainties associated with each of the four risk assessment steps, and should identify areas where a moderate amount of additional data might significantly improve the basis for selection of a remedial alternative.

2. Ecological

- a. **Problem Formulation:** The establishment of the goals, breadth, and focus of the ecological risk assessment, resulting in the ecological conceptual model. The conceptual model describes how the preliminary contaminants of concern might affect the potential ecological receptors, and identifies assessment and measurement endpoints. The problem formulation step is used both for screening purposes and to refine the baseline ecological risk assessment.
- b. **Analysis Phase:** This phase is a combination of the ecological effects assessment and the exposure assessment. The ecological effects assessment includes a final determination of the contaminants of concern, coupled with a compilation of the available toxicity information. The exposure assessment can include estimates of likely exposure scenarios for potential ecological receptors. Alternatively or in addition, the analysis phase may include field measurements of potentially affected populations compared to reference populations, and/or toxicity testing of contaminated media.
- c. **Risk Characterization:** A weight-of-evidence approach is used to interpret results of the field studies and risk estimates for the assessment endpoints. The risk characterization includes a qualitative and quantitative evaluation of the risk results and associated uncertainties.

F. Data Analysis

The Respondent shall analyze all facility investigation data outlined in this Task and prepare a report. The objective of the data analysis section is to summarize the investigation and demonstrate that a sufficient amount of data in quality (e.g., quality assurance procedures have been followed) and quantity has been collected to describe the nature and extent of contamination, potential threat to human health and/or the environment, and to support the Corrective Measures Study.

TASK IV: REPORTS

At a minimum, Respondent shall prepare a draft and final reports for the following submissions, except Progress Reports. These reports shall present the results of Tasks I through III. These reports and any others shall be submitted in accordance with the schedule contained in the Administrative Order and the RFI Workplan, upon its approval:

- A. Description of Current Conditions (Task I)
- B. RFI Workplan (Task II)
- C. RFI Report (Task III)
- D. Progress Reports

The Respondent shall, at a minimum, provide the EPA with signed, bimonthly progress reports containing:

1. Description and estimate of the percentage of the RFI and any Interim Measures completed;
2. Summaries of all findings;
3. Summaries of all changes made in the RFI or IMs during the reporting period;
4. Summaries of all contacts with representatives of the local community, public interest groups, or state government during the reporting period;
5. Summaries of all problems or potential problems encountered during the reporting period;
6. Actions being taken to rectify problems;
7. Changes in personnel during the reporting period;
8. Projected work for the next reporting period; and
9. Copies of daily reports, inspection reports, laboratory/monitoring data, etc.

ATTACHMENT B

CORRECTIVE MEASURES STUDY SCOPE OF WORK

PURPOSE

The purpose of this Corrective Measures Study (CMS) is to develop and evaluate the corrective action alternative(s) and to recommend the corrective measure(s) be taken at the facility. The Respondent shall furnish the personnel, materials, and services necessary to prepare the Corrective Measures Study, except as otherwise specified.

SCOPE

The Corrective Measures Study consists of four tasks:

TASK I: IDENTIFICATION AND DEVELOPMENT OF THE CORRECTIVE MEASURES ALTERNATIVE(S)

- A. Description of Current Situation
- B. Establishment of Media Clean Up Objectives
- C. Identification of the Corrective Measures Alternative or Alternatives

TASK II: EVALUATION OF THE CORRECTIVE MEASURES ALTERNATIVE(S)

- A. Long-term Effectiveness
- B. Reduction in the Toxicity, Mobility or Volume of Wastes
- C. Short-term Effectiveness
- D. Implementability
- E. Community Acceptance
- F. State Acceptance
- G. Cost

TASK III: JUSTIFICATION AND RECOMMENDATION OF THE CORRECTIVE MEASURE(S)

TASK IV: REPORTS

- A. Corrective Measures Report
- B. Progress Reports

TASK I: IDENTIFICATION AND DEVELOPMENT OF THE CORRECTIVE MEASURES ALTERNATIVE(S)

Based on the results of the RCRA Facility Investigation, Respondent shall identify, screen, and develop the alternative or alternatives for removal, containment, treatment, and/or other remediation of the contamination based on the media clean up objective established for the corrective action.

A. Description of Current Situation

Respondent shall submit a summary of, and if necessary 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 RCRA Facility Investigation Report. In addition to summarizing the environmental conditions, this section should describe any interim actions implemented or ongoing.

B. Establishment of Media Clean Up Objectives

Respondent, in conjunction with the EPA, shall establish site specific media clean up objectives for the corrective action. These objectives shall be based on EPA guidance, public health and environmental criteria, information gathered during the RCRA Facility Investigation, and the requirements of any applicable Federal statutes. Media clean up objectives include the following components:

1. clean up levels which are the site-specific concentrations in a given media that a final remedy must achieve for the remedy to be considered complete;
2. points of compliance which represents where the media clean up levels are to be achieved; and
3. remediation time frame which is the site-specific schedule for a remedy. It includes both the time frame to construct the remedy and estimate of the time frame to achieve the clean up levels at the point of compliance.

At a minimum, all corrective actions concerning groundwater releases from RCRA regulated units must be consistent with, and as stringent as, those required under 40 C.F.R. 264.100.

C. Identification of the Corrective Measures Alternative(s)

Respondent shall identify the corrective measure alternative or alternatives that are applicable to the facility and that will achieve the media clean up objectives. Technologies can be combined to form the overall corrective action alternative(s). The

alternative or alternatives developed should represent a workable number of option(s). These alternatives should be screened against RCRA's threshold criteria which are:

1. protection of human health and the environment;
2. attainment of media clean up objectives; and
3. controlling the sources.

Alternatives which do not meet these threshold criteria do not warrant further consideration.

TASK II: EVALUATION OF THE CORRECTIVE MEASURES ALTERNATIVE(S)

Respondent shall describe each corrective measures alternative that passes through the initial screening in Task I and evaluate each corrective measures alternative and its components relative to the following evaluation/balancing criteria: long-term effectiveness; implementability; short-term effectiveness; toxicity, mobility and volume reduction; community acceptance; state acceptance; and cost.

A. Long-term Effectiveness

Respondent shall demonstrate the expected effectiveness, reliability and risk of failure of the alternative(s). In this demonstration, Respondent should discuss the following:

1. The effectiveness of the alternative under analogous site conditions;
2. The potential impact resulting from a failure of the alternative, including failures from uncontrollable changes at the site (e.g. heavy rain storms, induced groundwater flow changes from off-site pumping wells); and
3. Estimates of the projected useful life of the overall alternative and of its component technologies.

B. Reduction in the Toxicity, Mobility or Volume of Wastes

As a general goal, EPA prefers remedies which employ techniques, such as treatment technologies, that are capable of eliminating or substantially reducing the inherent potential for the wastes in the contaminated media to cause future environmental releases or other risks to human health and the environment. There may be some situations where achieving substantial reductions in toxicity, mobility or volume may not be practical or even desirable. Examples include large, municipal-type landfills, or wastes such as

unexploded munitions which would be extremely dangerous to handle, and for which short-term risks of treatment outweigh potential long-term benefits.

To the extent practical, Respondent shall estimate how much the corrective measures alternatives will reduce the waste, toxicity, volume and/or mobility. Respondent should complete this assessment through a comparison of initial site conditions to expected post-corrective measure conditions.

C. Short-term Effectiveness

The short-term effectiveness may be particularly relevant when Respondent will be conducting remedial activities in densely populated areas, or where waste characteristics are such that risks to workers or to the environment are high and special protective measures are needed. The Respondent shall consider the following types of factors: fire, explosion, exposure to hazardous substances and potential threats associated with treatment, excavation, transportation and redisposal, or containment of waste material.

D. Implementability

Respondent shall describe the implementability of each corrective measure, including the relative ease of installation (constructability) and the time required to achieve a given level of response. Respondent should include the following type of information:

1. The administrative activities needed to implement the corrective measure alternative (e.g. permits, off-site approvals) and the length of time these activities will take;
2. The constructability, time for implementation, and time for beneficial results;
3. The availability of adequate off-site treatment, storage capacity, disposal services, needed technical services and materials; and
4. The availability of prospective technologies for each corrective measure alternative.

E. Community Acceptance

Respondent is responsible for including community involvement as an ongoing part of the corrective action. This section shall include a discussion of any concerns raised by the community during the investigation. It also shall discuss any aspects associated with an alternative, in which there is a potential for community objections.

F. State Acceptance

The Respondent shall include a discussion of how the specific corrective measures activities will be conducted in compliance with all applicable State regulations (i.e. permit requirements).

G. Cost Estimate

Respondent shall develop an estimate of the cost of each corrective measures alternative. Cost estimates shall include costs for engineering, site preparation, construction, materials, labor, sampling/analysis, waste management/disposal, permitting, health and safety measures, training, operation and maintenance etc.

TASK III: JUSTIFICATION AND RECOMMENDATION OF THE CORRECTIVE MEASURE(S)

Respondent shall justify and recommend a corrective measures alternative based on an evaluation of the balancing criteria. Such a recommendation shall include a description and supporting rationale for the proposed remedy, including how it will achieve the media clean up objectives and the proposed remedy's relationship to the decision factors discussed above. This recommendation shall include summary tables which allow the alternative or alternatives to be understood easily. The Respondent shall highlight tradeoffs among the balancing factors for the alternatives under consideration. EPA will select the corrective measures alternative to be implemented, based on the results of Tasks I and II.

TASK IV: REPORTS

A. Corrective Measures Report

Respondent shall prepare a draft and final Corrective Measures Study Report presenting the results of Tasks I through III and recommending a corrective measures alternative.

B. Progress Reports

Respondent will continue to submit bimonthly progress reports. The bimonthly progress reports shall, at a minimum contain the following information:

1. Description and estimate of the percentage of the CMS completed;
2. Summaries of all findings;
3. Summaries of all changes made in the CMS during the reporting period;

4. Summaries of all contacts with representatives of the local community, public interest groups, or state government during the reporting period;
5. Summaries of all problems or potential problems encountered during the reporting period;
6. Actions being taken to rectify problems;
7. Changes in personnel during the reporting period;
8. Projected work for the next reporting period; and
9. Copies of daily reports, inspection reports, laboratory/monitoring data, etc.

ATTACHMENT C

HEALTH AND SAFETY PLAN

The Respondent shall prepare a facility Health and Safety Plan.

1. Major elements of the Health and Safety Plan shall include:
 - a. Facility description including availability of resources such as roads, water supply, electricity, and telephone service;
 - b. Description of the known hazards and evaluations of the risks associated with the incident and with each activity conducted, including, but not limited to, on- and off-site exposure to contaminants;
 - c. List of key personnel and alternates responsible for site safety, response operations, and protection of public health;
 - d. Delineation of work area;
 - e. Description of levels of protection to be worn by personnel in work area;
 - f. Establishment of procedures to control site access;
 - g. Description of decontamination procedures for personnel and equipment;
 - h. Establishment of site emergency procedures;
 - i. Emergency medical care for injuries and toxicological problems;
 - j. Description of requirements for an environmental surveillance program;
 - k. Routine and special training required for responders; and
 - l. Establishment of procedures for protecting workers from weather-related problems.

2. The facility Health and Safety Plan shall be consistent with:
 - a. NIOSH Occupational Safety and Health Guidance Manual For Hazardous Waste Site Activities (1985);
 - b. EPA Order 1440.3 - Respiratory Protection;
 - c. EPA Order 1440.2 - Health and Safety Requirements for Employees Engaged in Field Activities;

- d. Facility Contingency Plan;
 - e. EPA Standard Operating Safety Guide (1984);
 - f. OSHA regulations, particularly in 29 C.F.R. 1910 and 1926;
 - g. State and local regulations; and
 - h. Other EPA guidance as provided.
3. The Health and Safety Plan must be revised to address any additions and/or changes in planned activities.

ATTACHED

INTERIM MEASURES SCOPE OF WORK

PURPOSE

The purpose of Interim Measures are to identify and correct any actual or potential releases of hazardous waste or hazardous constituents from regulated units, solid waste management units, and other sources or areas at the facility which may present an endangerment to human health or the environment. Interim Measures shall also be used whenever possible to achieve the initial goals of controlling the migration of contaminated groundwater and controlling current human and ecological exposure to contaminated media.

SCOPE

The Interim Measures consist of several tasks. The level of detail EPA will require in Interim Measures submittals is dependent upon the proposed activities and site conditions.

TASK I: INTERIM MEASURES WORKPLAN

- A. Interim Measures Objectives
- B. Community Relations Plan

TASK II: INTERIM MEASURES INVESTIGATIVE PROGRAM

- A. Data Collection Quality Assurance Plan
- B. Data Management Plan

TASK III: INTERIM MEASURES DESIGN PROGRAM

- A. Design Plans and Specifications
- B. Operation and Maintenance Plan
- C. Project Schedule
- D. Final Design Documents

TASK IV. INTERIM MEASURES CONSTRUCTION QUALITY ASSURANCE PLAN

- A. Construction Quality Assurance Objectives
- B. Inspection Activities
- C. Sampling Requirements
- D. Documentation

TASK V. REPORTS

- A. Interim Measures Workplan
- B. Interim Measures Report

TASK I: INTERIM MEASURES WORKPLAN

Respondent shall prepare an Interim Measures Workplan. The workplan shall include the following:

A. Interim Measures Objectives

The workplan shall specify the objectives of the interim measures, demonstrate how the interim measures will abate releases and threatened releases, and, to the extent possible, be consistent and integrated with any long term solution at the facility. The Interim Measures Workplan will include:

1. a discussion of the overall management approach;
2. a discussion of the technical approach;
3. a schedule;
4. a description of qualifications of personnel performing or directing the interim measures, including contractor personnel.

B. Community Relations Plan

Respondent shall prepare a plan for the dissemination of information to the public regarding interim measure activities and results. These activities shall include the preparation and distribution of fact sheets and participation in public meetings.

TASK II: INTERIM MEASURES INVESTIGATION PROGRAM**A. Data Collection Quality Assurance Plan**

If Respondent has not yet submitted a Quality Assurance Project Plan ("QAPP") pursuant to the RFI, Attachment B, Task II, or if EPA determines that the RFI QAPP is not applicable to the Interim Measures, EPA may require Respondent to submit a Data Collection Quality Project Plan in accordance with Attachment B, Task II.B.

B. Data Management Plan

If Respondent has not yet submitted a Data Management Plan pursuant to the RFI, Attachment B, Task II, or if EPA determines that the Data Management Plan is not applicable to the Interim Measures, EPA may require Respondent to submit a Data Management Plan in accordance with Attachment B, Task IIC.

TASK III: INTERIM MEASURES DESIGN PROGRAM

A. Design Plans and Specifications

For some Interim Measures, EPA will require Respondent to develop clear and comprehensive design plans and specifications which include, but are not limited to, the following:

1. Discussion of the design strategy and the design basis.
 - a. short and long-term objectives
 - b. methods to measure achievement of objectives
2. Discussion of the key technical factors including:
 - a. specific design features to meet short- and long-term objectives
 - b. proper management of any hazardous materials
 - c. confirmatory sampling and/or monitoring to assess effectiveness in meeting short- and long-term objectives
3. Description of assumptions made and detailed justification of these assumptions;
4. Detailed drawings of the proposed design

B. Operation and Maintenance Plan

Respondent shall prepare an Operation and Maintenance Plan to cover both implementation and long term maintenance of the interim measure(s). The Operation and Maintenance Plan shall be submitted with the Final Design Documents and shall be composed of the following types of elements:

1. Equipment start-up and operator training:

Respondent shall prepare, and include in the technical specifications governing treatment systems, contractor requirements for providing: appropriate service visits by experienced personnel to supervise the installation, adjustment, startup, and operation of the treatment systems, and training covering appropriate operational procedures once the startup has been accomplished successfully.

2. Description of normal operation and maintenance (O&M), including:
 - a. Description of tasks for operation;
 - b. Description of tasks for maintenance;
 - c. Schedule showing frequency of each O&M task; and
 - d. Common and/or anticipated remedies.
3. Description of routine monitoring and laboratory testing, including:
 - a. Description of monitoring tasks and laboratory tests;
 - b. Required QA/QC; and
 - c. Schedule of monitoring frequency and date, if appropriate, when monitoring may cease.
4. Description of equipment, including:
 - a. Equipment identification;
 - b. Monitoring components;
 - c. Maintenance of site equipment; and
 - d. Replacement schedule for equipment and monitoring components.
5. Records and reporting mechanisms required, including:
 - a. Daily operating logs;
 - b. Laboratory records;
 - c. Mechanism for reporting emergencies;

- d. Personnel and maintenance records; and
- e. Monthly/annual reports to Federal/State agencies.

The Operation and Maintenance Plan shall be submitted with the Final Design Documents.

C. Project Schedule

Respondent shall develop a detailed Project Schedule for construction and implementation of the interim measure(s) which identifies timing for initiation and completion of all critical activities. Respondent shall specifically identify dates for completion of the project and major interim milestones which are enforceable terms of this order. A Project Schedule shall be submitted simultaneously with the Final Design Documents.

D. Final Design Documents

The Final Design Documents shall consist of the Final Design Plans and Specifications (100% complete), the Final Draft Operation and Maintenance Plan, and the Project Schedule. Respondent shall submit the final documents, 100% complete, with reproducible drawings and specifications. The quality of the design documents should be such that Respondent would be able to include them in a bid package and invite contractors to submit bids for the construction project.

TASK IV: INTERIM MEASURES CONSTRUCTION QUALITY ASSURANCE PLAN

A. Construction Quality Assurance Objectives

In the CQA plan, Respondent shall identify and document the objectives and framework for the development of a construction quality assurance program including, but not limited to the following: responsibility and authority; personnel qualifications; inspection activities; sampling requirements; and documentation. The responsibility and authority of all organizations (i.e., technical consultants, construction firms, etc.) and key personnel involved in the construction of the interim measures shall be described fully in the CQA plan. Respondent must identify a CQA officer and the necessary supporting inspection staff.

B. Inspection Activities

The observations and tests that will be used to monitor the construction and/or installation of the components of the interim measure(s) shall be summarized in the CQA

plan. The plan shall include the scope and frequency of each type of inspection. Inspections shall verify compliance with all environmental requirements and include, but not be limited to, air quality and emissions monitoring records, waste disposal records (e.g., RCRA transportation manifests), etc. The inspection should also ensure compliance with all health and safety procedures.

C. Sampling Requirements

The sampling and testing activities, sample size, sample and test locations, frequency of testing, acceptance and rejection criteria, and plans for correcting problems should be presented in the CQA plan.

D. Documentation

Reporting requirements for CQA activities shall be described in detail in the CQA plan. This plan shall include such items as daily summary reports, inspection data sheets, problem identification and interim measures reports, design acceptance reports, and final documentation. Provisions for the final storage of all records shall be presented in the CQA plan.

TASK V: REPORTS

A. Interim Measures Workplan

Respondent shall submit an Interim Measures Workplan as described in this Attachment. The Interim Measures Workplan will include a list of any other required submittals (e.g., Final Design Document, Construction Quality Assurance Plan) and a schedule for submitting them to EPA.

B. Interim Measures Report

At the "completion" of the construction of the project (except for long term operation, maintenance, and monitoring), Respondent shall submit an Interim Measures Report to the Agency. The Report shall document that the project is consistent with the design specifications and that the interim measures are performing adequately. The Report shall include, but not be limited to, the following elements:

1. Synopsis of the interim measures and certification of the design and construction;
2. Explanation of any modifications to the plans and why these were necessary for the project;

3. Listing of the criteria, established before the interim measures were initiated, for judging the functioning of the interim measures and also for explaining any modification to these criteria;
4. Results of facility monitoring, indicating that the interim measures will meet or exceed the performance criteria; and
5. Explanation of the operation and maintenance (including monitoring) to be undertaken at the facility.

This report shall include the inspection summary reports, inspection data sheets, problem identification and corrective reporting data sheets, design engineers' acceptance reports, deviations from design and material specifications (with justifying documentation), and as-built drawings.

ATTACHEMENT

CORRECTIVE MEASURES IMPLEMENTATION SCOPE OF WORK

PURPOSE

This Scope of Work ("SOW") sets forth the requirements for the implementation of the design, construction, operation, maintenance, and monitoring of the corrective measure or measures pursuant to the Final Administrative Order on Consent ("Consent Order" or "Order") to which this SOW applies. The work performed under this Order will implement the corrective measures that have been selected by EPA in the Final Decision and Response to Comments ("FDRTC") and any amendments thereto. The Respondent(s) will furnish all personnel, materials, and services necessary for the implementation of the corrective measure or measures.

SCOPE

The Corrective Measures Implementation consists of four tasks:

Task I: Corrective Measures Implementation Work Plan

- A. Management Plan
- B. Community Relations Plan
- C. Sampling and Analysis Plan
- D. Corrective Measures Permitting Plan
- E. Supplemental Field Investigation Work Plan

Task II: Corrective Measure Design

- A. Design Plans and Specifications
- B. Operation and Maintenance Plan
- C. Cost Estimate
- D. Construction Quality Assurance Plan
- E. Health and Safety Plan
- F. Sampling and Analysis Plan/Performance Monitoring Plan
- G. Design Phases

Task III: Corrective Measure Construction

- A. Project Review Meetings
- B. Inspections
- C. CMI Report

Task IV: Reports

- A. Progress Reports and Corrective Measures Assessment Reports
- B. CMI Work Plan
- C. CMI Design Report (Preliminary and Final)
- D. CMI Report

Further specifications of the work outlined in this SOW will be provided in the Corrective Measures Implementation Work Plan and subsequent plans to be reviewed and approved by EPA. Variations from the SOW will be made, if necessary, to fulfill the objectives of the Corrective Measures set forth in the FDRTC and any amendments thereto.

Additional studies may be needed as part of the Corrective Measures Implementation to supplement the available data. At the direction of EPA for any such studies required, the Respondent(s) shall furnish all services, including field work, materials, supplies, plant, labor, equipment, investigations, and superintendence. Sufficient sampling, testing and analysis shall be performed to optimize the operation of the required treatment, disposal, containment and/or monitoring system.

TASK I: CORRECTIVE MEASURE IMPLEMENTATION WORK PLAN

The Respondent shall prepare a Corrective Measure Implementation ("CMI") Work Plan. The CMI Work Plan shall outline the design, construction, operation, maintenance and monitoring of all actions taken to implement the Corrective Measures as defined in the Order and the FDRTC and any amendments thereto. This CMI Work Plan will include the development and implementation of several plans, which require concurrent preparation. It may be necessary to revise plans as necessary during the performance of this Order. The CMI Work Plan shall include the following:

A. Management Plan- The Respondent shall prepare a Management Plan which will address the following items, as necessary and appropriate:

1. Documentation of the overall management strategy for performing the design, construction, operation, maintenance, and monitoring of corrective measure(s);
2. Description of the responsibility and authority of all organizations and key personnel involved with the implementation;
3. Description of the qualifications of key personnel directing the CMI, including contractor personnel;
4. Conceptual design of the treatment and/or disposal system or any corrective measures to be installed as set forth in the FDRTC;
5. An outline of proposed field activities necessary to complete the CMI Design including

proposed locations of groundwater monitoring wells and a detailed well development plan;

6. Proposed discharge options for treated groundwater, with a preferred option upon which the CMI Design will be based;
7. Proposed detailed performance criteria for groundwater treatment;
8. A description of how the conceptual design is expected to meet the technical requirements of the FDRTC and any amendments thereto; and
9. Schedule of work including sequence of activities to be performed during the CMI and proposed timing for submittals required during the CMI.

B. Community Relations Plan - The Respondent shall submit and/or revise the Community Relations Plan to include any material changes in the level of concern or information needs of the community during design and construction activities. The following activities shall be completed, as necessary and appropriate based on site-specific considerations:

1. The facility Community Relations Plan shall be revised to reflect knowledge of citizen concerns and involvement at this stage of the process, and;
2. Prepare and distribute a public notice and an updated fact sheet at the completion of engineering design, and;
3. Conduct group meetings or information sessions to convey updates on the technical status.

C. Sampling and Analysis Plan - Respondent shall submit and/or revise the Sampling and Analysis Plan describing work to be performed during Corrective Measures Design which shall be comprised of:

1. A Quality Assurance Project Plan (QAPjP) including data quality objectives for design phase activities;
2. A Field Sampling Plan describing the sample collection techniques and protocols to be used for any design phase data collection;
4. A Data Management Plan describing the steps to be followed in compiling, organizing, reviewing and reporting data collected in accordance with the Sampling and Analysis Plan, and;

5. A Supplemental Field Investigation Work Plan describing the rationale, protocols and methodologies for any additional hydrogeologic investigations or other field work that may be necessary for the proper design of the remedial systems set forth in the FDRTC. The work plan shall include an expeditious schedule for the completion and reporting of any such supplemental field work.

D. Corrective Measures Permitting Plan - Respondent shall submit a Corrective Measures Permitting Plan identifying all federal, state, interstate, regional and local permits and approvals required for the implementation of the Corrective Measures required by the Consent Order, and for the implementation of any institutional controls required by the Consent Order. The plan shall also identify all agreements or other arrangements with adjoining landowners, if any, known by Respondent to be necessary for the implementation of the Corrective Measures, including, but not limited to, site access and easement agreements. The plan shall include a schedule indicating the time needed to obtain all such approvals and permits and to enter into such agreements and arrangements. This schedule may be integrated with the design/implementation schedule items.

TASK II: CORRECTIVE MEASURE DESIGN

The Respondent shall prepare preliminary and final construction plans and specifications to implement the corrective measures at the facility as set forth in the FDRTC and any amendments thereto.

A. Design Plans and Specifications - The Respondent shall develop clear and comprehensive design plans and specifications (in both preliminary and final forms) which include, but are not limited to, the following:

1. Discussion of the design strategy and the design basis, including: (a) compliance with all applicable or relevant environmental and public health standards; (b) minimization of environmental and public health impacts, and; (c) updated schedules, if necessary, from commencement through completion of construction of the CMI.

2. Discussion of the technical factors of importance including: (a) use of currently accepted environmental control measures and technology; (b) the constructibility of the design, and; (c) use of currently accepted construction practices and techniques.

3. Description of assumptions made and detailed justification of these assumptions.

4. Detailed drawings of the proposed design including qualitative flow sheets and quantitative flow sheets.

5. Tables listing equipment and specifications;

6. Appendices including: (a) sample calculations (one example presented and explained clearly for significant or unique design calculations); (b) results of laboratory or field tests; (c) list of specifications to be provided in full in the Final Design submittal, and; (d) list (and outline/table of contents) of documents and plans to be prepared and submitted with Final Design.

B. Operation and Maintenance Plan - The Respondent shall prepare or revise the Operation and Maintenance ("O&M") Plan to cover both the implementation and long term maintenance of the corrective measure(s). The O&M Plan shall identify and describe the processes to occur, submissions required during O&M, and schedule for O&M activities consistent with remedial objectives set forth in the FDRTC and any amendments thereto. The O & M Plan shall include, but not be limited to the following elements:

1. Description of routine O&M including tasks required to operate and maintain treatment system or other components of corrective measures and a schedule showing frequency and duration of each O & M task.

2. Description of potential operating problems including the procedures to be used to analyze and diagnose potential operation problems, sources of information regarding problems, and common or anticipated trouble-shooting steps and remedies.

3. Description of routine monitoring and laboratory testing including a description of specific monitoring tasks required for the corrective measures, a description of required laboratory tests and their interpretation/reporting, a description of required QA/QC activities and, a schedule of monitoring frequency and date, if appropriate, when monitoring may cease.

4. Description of alternate O&M to be used should systems fail including alternate procedures to be used to prevent undue hazard and, an analysis of vulnerability and additional resource requirements should a failure occur.

5. Safety plan including description of precautions for specific equipment, etc., for site personnel and, safety tasks required in the event of systems failure.

6. Description of equipment including the identification, layout and installation of monitoring components, maintenance of site equipment and, replacement schedule for equipment and installed components.

7. Records and reporting mechanisms including daily operating logs, laboratory records and test results, operating and maintenance cost records, mechanism for reporting emergencies, personnel and maintenance records, and progress reports to State and Federal agencies.

An initial O&M Plan shall be submitted simultaneously with the Preliminary (30%) Design

submission, and the Final O&M Plan shall be submitted with the Final Design documents.

C. Cost Estimate - The Respondent shall develop cost estimates of the Corrective Measures set forth in the FDRTC for the purpose of assuring that the Respondent has the financial resources necessary to construct, implement and maintain the corrective measures. The cost estimate developed in the Corrective Measure Study shall be refined and updated to reflect, in current dollars, the more detailed/accurate design plans and specifications being developed. The cost estimate shall include both capital and operation and maintenance costs, as well as any necessary long term monitoring costs.

D. Construction Quality Assurance Plan - The Respondent shall identify and document the framework and components of a construction quality assurance program including, but not limited to the following: responsibility and authority; personnel qualifications; inspection and testing activities; sampling and testing requirements; and documentation and reporting.

E. Health and Safety Plan - The Respondent shall prepare a Health and Safety Plan or modify the Health and Safety Plan developed for the RCRA Facility Investigation and/or Interim Measures activities to address all work to be performed at the facility to implement the corrective measures set forth in the FDRTC.

F. Sampling and Analysis Plan/Performance Monitoring Plan - Respondent shall update the Sampling and Analysis Plan, including the QAPjP, during each phase of Design, as necessary and appropriate, to reflect changes in the following: responsibility and authority; personnel qualifications; inspection activities; sampling requirements; and, documentation and reporting. Additional revisions shall be made, or a separate document prepared (Performance Monitoring Plan) to describe the performance monitoring program that will be used to measure the effectiveness of the corrective measures set forth in the FDRTC. The performance monitoring plan shall describe all sampling, monitoring, data analysis and reporting activities that will be completed to demonstrate the effectiveness of the corrective measures.

G. Design Phases - The design of the corrective measures set forth in the FDRTC should include the phases outlined below:

1. Preliminary (30%) CMI Design

- a. The Respondent shall submit the 30% CMI Design Report when the design effort is approximately 30% complete. At this stage the Respondent shall have field verified the existing conditions of the facility. The 30% design shall reflect a level of effort such that the specifications may be reviewed to determine if the final design will provide effective, operable and usable corrective measures. Supporting data and documentation shall be provided with the design documents defining the functional aspects of the program. The 30% construction drawings shall reflect organization and clarity.

b. Correlating plans and specifications - The plans and specifications to be included in the 30% CMI Design Report shall demonstrate that the Respondent has coordinated and cross-checked the specifications and drawings and, completed the proofing of the edited specifications and required cross-checking of all drawings and specifications.

c. Equipment start-up and operator training - The Respondent shall prepare and include in the technical specifications governing treatment and/or disposal systems, contractor requirements for providing appropriate service visits by experienced personnel to supervise the installation, adjustment, startup and operation of the treatment systems, and training covering appropriate operational procedures once the startup has been successfully accomplished.

2. Final (90%) CMI Design

The Final CMI Design Report shall consist of the Final Design Plans and Specifications (90 - 100% complete), the Respondent's Final Cost Estimate, the Final Operation and Maintenance Plan, Final Construction Quality Assurance Plan, Final Project Schedule, and Final Health and Safety Plan. The quality of the design documents should be such that the Respondent could include them in a bid package and invite contractors to submit bids for the construction project.

TASK III: CORRECTIVE MEASURE CONSTRUCTION

Following EPA approval of the Final CMI Design Report, the Respondent shall implement construction in accordance with procedures, specifications, and schedules in the EPA-approved Final CMI Design Report and the EPA approved CMI Work Plan. During the Construction Phase, Respondent will continue to submit periodic progress reports. The Respondent shall also implement the elements of the approved Construction Quality Assurance Plan, Sampling and Analysis Plan, and O&M plan, as necessary and appropriate.

The Respondent shall conduct the following activities during construction:

A. Preconstruction Inspection and Meeting - The Respondent shall conduct a preconstruction inspection and meeting to:

1. Review methods for documenting and reporting inspection data;
2. Review methods for distributing and storing documents and reports;
3. Review work area security and safety protocol;
4. Discuss any appropriate modifications of the construction quality assurance plan to ensure that site-specific considerations are addressed; and
5. Conduct a site walk-around to verify that the design criteria, plans, and specifications are understood and to review material and equipment storage locations.

The preconstruction inspection and meeting shall be documented by a designated person and minutes should be transmitted to all parties.

B. Inspections

1. Respondent will conduct inspections to monitor the construction and/or installation of components of the corrective measure. Inspections shall verify compliance with all environmental requirements and include, but not limited to, review of air quality and emissions monitoring records, waste disposal records (e.g RCRA transportation manifests), etc, as applicable. Inspections will also ensure compliance with all health and safety procedures. Treatment and/or disposal equipment will be operationally tested by the Respondent. The Respondent will certify that the equipment has performed to meet the purposes and intent of the specifications. Retesting will be completed where deficiencies are revealed.

2. When all construction is complete, the Respondent shall notify EPA for the purposes of conducting a final inspection. The final inspection will consist of a walk through inspection of the project site. The inspection is to determine whether the project is complete and consistent with contract documents and the EPA approved corrective measures. Any outstanding construction items will be identified and noted. If necessary, Respondent shall notify EPA upon completion of any outstanding construction items and another final inspection consisting of a walk-through inspection of the project site to confirm all outstanding items have been resolved.

C. CMI Report - Upon completion of construction and an initial period of performance monitoring and in accordance with the schedule included in the EPA-approved CMI Workplan and the EPA-approved Final CMI Design Report, Respondent will prepare and submit a CMI Report. The CMI Report shall describe activities performed during construction, provide actual specifications of the implemented remedy, and provide a preliminary assessment of CMI performance.

TASK IV: REPORTS

The Respondent shall prepare plans, drawings, specifications, and reports as set forth in Tasks I through III to document the design, construction, operation, maintenance, and monitoring of the corrective measure. The documentation shall include, but not be limited to the following:

A. Progress Reports and Corrective Measures Assessment Reports

Quarterly - The Respondent shall provide the EPA with signed, quarterly progress reports containing:

1. A description of the work performed during the preceding monitoring interval and estimate of the percentage of the CMI completed;

2. Summaries of all findings;
3. Summaries of all changes made in the CMI during the reporting period;
4. Summaries of all contacts with representatives of the local community, public interest groups, or State government during the reporting period;
5. Summaries of system performance during the reporting period including a summary of all problems or potential problems encountered or anticipated during the reporting period;
6. Actions taken to rectify problems;
7. Changes in personnel during the reporting period;
8. Projected work for the next reporting period; and
9. Copies of daily reports, inspection reports, laboratory/monitoring data, etc.

Annual - The Respondent shall provide EPA with signed annual progress reports and/or Corrective Measures Assessment Reports (including 5 Year Assessment Report) containing:

1. A narrative summary of principal activities conducted during the reporting period;
2. Graphical or tabular presentations of monitoring data, including but not limited to average monthly system pumping rates and throughput, efficiency, groundwater levels and flow direction, and groundwater quality;
3. A schedule of sampling and field activities to be performed and reported in the following year, and
4. An O&M Evaluation or Corrective Measures Assessment Report assessing the performance of the corrective measure over time. The O & M Evaluation/Assessment Report shall include:
 - a. Summarized data representing corrective measure performance during respective two-year intervals;
 - b. Any proposed changes to the corrective measure and summary of previous changes;
 - c. Iso-concentration maps for each contaminant of concern listed in the FDRTC;
 - d. Statistical assessment of the progress of the corrective measure towards achievement of media clean-up standards; and,
 - e. When appropriate, notification that corrective action media clean-up standards have been achieved.

An Annual Progress Report shall not be required for any year in which the Respondent is required to submit a Corrective Measures Five Year Assessment Report.

B. CMI Work Plan - The Respondent shall submit a CMI Work Plan as outlined in Task I. The QAPP, included with the CMI Work Plan, will be revised, as appropriate, throughout the CMI.

C. The Preliminary (30%) CMI Design Report - The Respondent shall submit a Preliminary (30%) CMI Design Report as outlined in Task II to this SOW.

The 30% CMI Design Report shall include:

1. Draft Design Plans and Specifications reflecting 30% of design work completed to date;
2. Draft O&M Plan, Construction Quality Assurance Plan, and Health and Safety Plan;
3. A preliminary cost estimate; and
4. A revised project schedule.

D. The Final (90%) CMI Design Report - The Respondent shall submit a Final (90%) CMI Design Report as outlined in Task II of this SOW.

The 90% CMI Design Report shall include:

1. A summary of activities performed and data generated during Corrective Measure Design, including results and interpretation of treatability and/or pilot studies;
2. Draft detailed Corrective Measure Design Plans and Specifications reflecting 90% of design work completed to date;
3. Final performance criteria for the corrective measures, consistent with comments to have been provided by EPA on the conceptual design;
4. Proposal of means to evaluate system performance against media cleanup standards listed in the FDRTC and any amendments thereto;
5. A Final O&M Plan, Construction Quality Assurance Plan, and Health and Safety Plan;
6. A revised cost estimate;
7. Revision to the Sampling and Analysis Plan, including the QAPP, to address sampling and performance monitoring activities to be completed during the Corrective Measures Construction Phase, including the sampling activities, sample size, sample locations, frequency of testing, acceptance and rejection criteria, and plans for correcting problems; and,
8. Proposed changes to the Project Schedule, if appropriate, with emphasis on the short-term construction schedule.

E. CMI Report

The Respondent shall submit the CMI Reports as outlined in Task III to this SOW. The CMI Report shall describe all activities performed during construction, provide actual specifications and as-built drawings of the constructed or implemented remedy, and provide a preliminary assessment of CMI performance. The CMI Report shall include, but not be limited to, the following elements:

1. Synopsis of the corrective measure and certification of the design and construction;
2. Explanation of any modifications to the EPA-approved construction and/or design plans and why these were necessary for the project;
3. Listing of the criteria, established in the EPA-approved CMI Work Plan, for judging whether the corrective measure is functioning properly, and also explaining any modification to

these criteria;

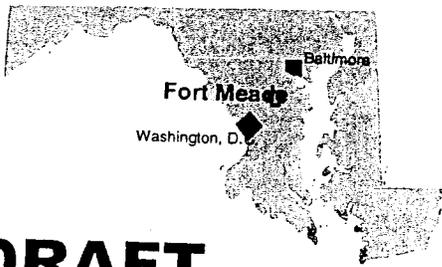
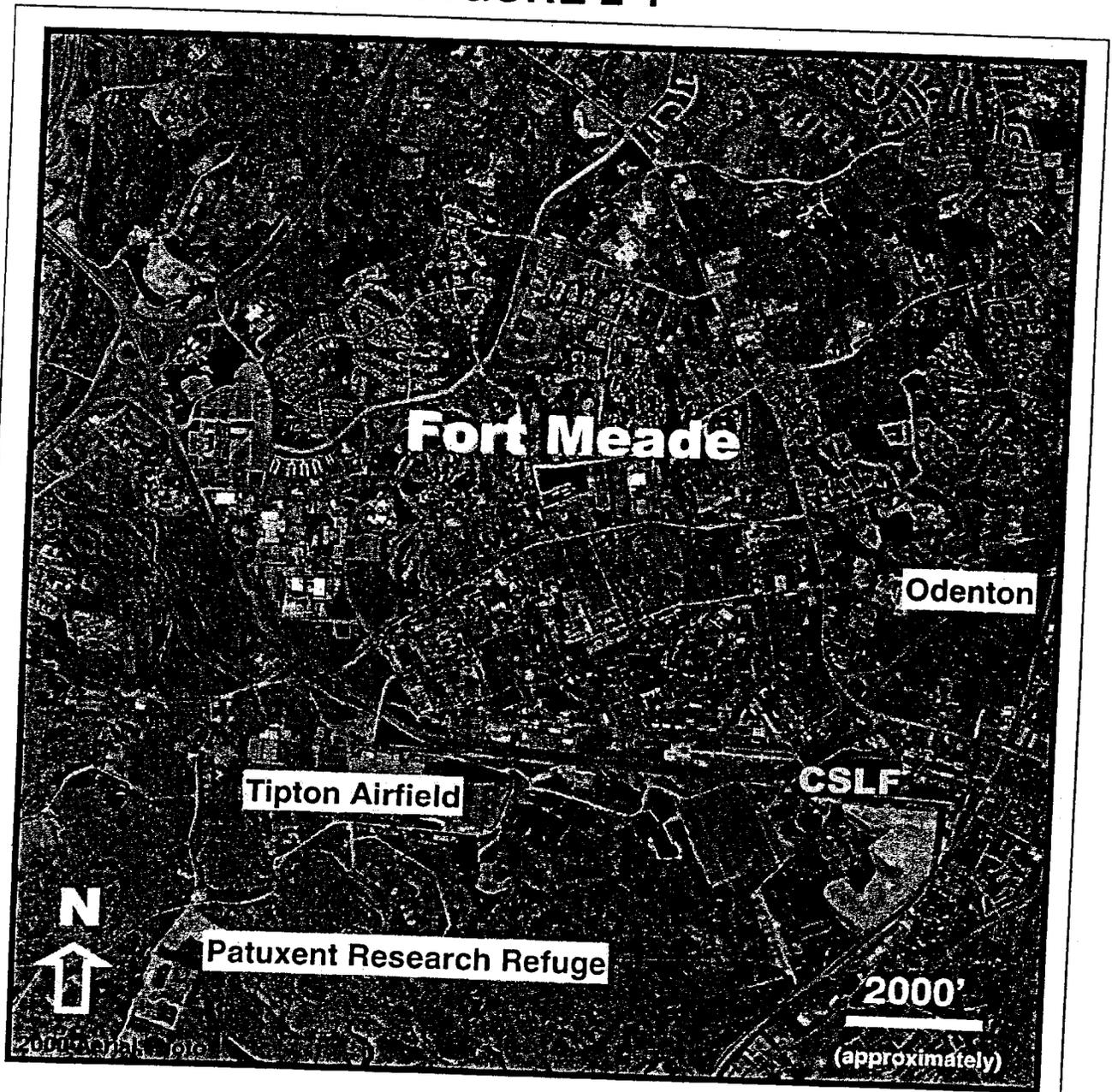
4. Certification by registered professional engineer that the construction is complete, consistent with contract documents and the EPA-approved Final CMI Design, and that the equipment performs to meet the intent of the specifications;

5. Results of Facility monitoring, assessing the likelihood (and approximate time frame) that the corrective measure will meet the media clean-up standards set forth in the FDRTC and any amendment thereto.

This report should include a summary of the daily inspection reports, inspection data sheets, problem identification and corrective measure reports, block evaluation reports, photographic reporting data sheets, design engineers' acceptance reports, deviations from design and material specifications (with justifying documentation), and as-built drawings, unless otherwise agreed to by EPA.

ATTACHMENT F

FIGURE 2-1



DRAFT

EM FEDERAL CORPORATION
Innovations in Philanthropy and Engineering Services

KB
6/16/05
FM-AP

Fort Meade
Closed Sanitary Landfill

Figure 2-1
Fort Meade Regional Location Map

ATTACHMENT

**FORT MEADE PARTNERING
SOLID WASTE MANAGEMENT UNITS
TRACKING CHART**

SWMU NO.	SWMU NAME	DATE REVIEWED	ADDITIONAL INFO NEEDED	TEAM DECISION
104	Building 6527	July 2001	Jim Gebhardt to check whether building demolition occurred before or after sampling. Surface soil samples need to be taken. Need rationale for why soil samples were taken 11 feet deep. Need rationale for sampling locations.	Further investigation required.
37	DPW Storage and Receiving Yard	July 2001	Need rationale for change in analytical suite between two sampling rounds (8 RCRA metals to 13 priority pollutant). Analysis should have included SVOCs. No downgradient samples collected, particularly around SB 9. Appears PCBs not sampled for; important since site was a storage yard in the 1950s. Need strong justification for excluding PCBs from analysis.	Further investigation required.
Non-SWMU 5, SWMUs 94 and 95	Buildings 2801, 2804, 2805	July 2001	Need groundwater data.	Further investigation required.
65 and 70	Buildings 2285 and 2290	July 2001	Need groundwater data.	Further investigation required.
143 and 144	Wash Rack & Oil/Water Separator at 4 th & Y Sts.	August 2001	None.	No further action required.
98	Building 3000	August 2001	Review sampling locations.	Further investigation required.

SWMU 10	DPW Entomology Dept., Bldg. 294	August 2001	Sampling needed for herbicides, pesticides, and PCBs. Need to ensure literature review is done to determine appropriate type of pesticides for which the samples will be analyzed or analyze for both types.	Further investigation required.
139 and 140	Wash Rack & Oil/Water Separator at Golf Course Club House; Bldg. 6800	August 2001	Need to sample for pesticides and herbicides. Need to sample in swale.	Further investigation required.
109	Dental Clinic; Bldg. 8472	August 2001		No further action required pending review of lab data analysis.
61 and 62	Bldg. 2253	August 2001	Need to re-sample same locations if possible; duplicate problem; TPH detected but no SVOCs reported.	Further investigation required.
22, 23, 24, 145	Dir. Of Office Mgmt. Complex; Bldgs. 1974, 1976, 1977, 1978	August 2001	Appears to be VOCs not related to the fuel.	Further investigation required.
68	DOL Allied Trades Vehicle Maintenance Facility; Bldg. 2287	August 2001	Fort Richie risk assessment	No further action required pending review of Fort Richie risk assessment on arsenic.
12, 13, 146	Former Building 940 and Wash Rack System	September 2001		No further action required.
38	Building 2213	September 2001		Further investigation is required. May be RCRA/Oil Control Program issue and not CERCLA.

42	Building 2220	September 2001		Further investigation is required. May be RCRA/Oil Control Program issue and not CERCLA.
75 and 76	Building 2501	September 2001	Additional CERCLA characterization is needed; samples need to be analyzed for cyanide.	Further investigation is required.
77, 78 and 79	Wash Rack System at Building 2630	September 2001		No further action required.
105, 106, 107 and 108	Building 6530 and Wash Rack System	September 2001		Further investigation is required. May be RCRA/Oil Control Program issue and not CERCLA.
141 and 142	Wash Rack System Off Dutt Road	September 2001		No further investigation is required.
151 and 152	Former Indoor Shooting Range/ Building 6522	September 2001	Other nearby buildings need to be included in additional field effort.	Further investigation is required.
15	Photo Lab Building 546	October 2001		No further investigation is required.
14,15,16, 17 and 18	Building 1007 and Wash Rack System	October 2001	Surface samples to be collected from around the former wash rack area and additional groundwater samples.	Further investigation required.
19, 20 and 21	Building 1251 and Wash Rack System	October 2001		No further investigation required.
32, 33 and 34	Buildings 2123 and 2124	October 2001		No further investigation needed.

35 and 36	Former Heavy Equipment and Generator Maintenance Shop Former Building 2128	October 2001		Further investigation required. Additional investigation would be under RCRA program and not the CERCLA program.
43, 44 and 147	Former Building 2227 and Wash Rack System	October 2001		Additional investigation would be under RCRA program and not the CERCLA program.
39 and 41	DOL Electric Shop & DPW Storage Yard, Building 2217 & Wash Rack System.	October 2001		Further investigation required. Additional investigation would be under RCRA program and not the CERCLA program.
63, 64 and 69	Building 2276 and 2288	October 2001		Further investigation required.
66 and 67	Building 2286	October 2001		Further investigation required.
74	Forensic Toxicology Drug Testing Laboratory Building 2490	October 2001	Need for detection limits to be lower and the need for additional groundwater and soil samples.	Further investigation required.
150	Former Indoor Shooting Range Building 6513	October 2001	Additional investigation should include the nearby building.	Further investigation required.
129 and 130	Water Treatment Plant Building 8688	October 2001	Determine whether sufficient sampling had been conducted and whether all grassy areas had been sampled.	Further investigation required.

45 and 46	Building 2240	October 2001	Determine the source of the PAHs and examine the log for soil boring 7 to determine if analysis was conducted for semi-volatile organic compounds.	Further investigation required.
47,48, 49, 50, 51, 52, 53 and 54	DOL Storage Service & Supply Complex. Buildings 2241, 2242, 2248, 2249	October 2001		Further investigation required.
93	Former Building 2802	October 2001	Mike Dorris will check with a Corps staff person on the radiological results.	Further investigation required.
96 and 97	Former Building 2831	October 2001		Further investigation required.
100	Building 4554	October 2001		No further investigation needed.
110 and 111	Former Wash Rack at Building 8480	October 2001		Further investigation required. Additional investigation would be under RCRA program and not the CERCLA program.
119 and 120	Building 8487	October 2001		No further investigation needed.
121, 122, 123 and 124	Building 8549 and Wash Rack System	October 2001	Need to investigate second wash rack.	Further investigation required.

127, 128, 149	Building 8557 and Wash Rack System	October 2001		Further investigation required. Additional investigation would be under RCRA program and not the CERCLA program.
138	Wastewater Treatment Plant Building 9581	October 2001		Further investigation required. Additional investigation would be under RCRA program and not the CERCLA program.
25 and 26	Building 2120C and Oil/Water Separator	November 2001	Check whether building was or is a laundry facility or just a laundry drop-off facility.	Further investigation required. Additional investigation would be under RCRA program and not the CERCLA program.
29 and 30	Former Building 2121	November 2001		No further investigation needed.
115 and 116	Building 8485 Motor Pool	November 2001		Further investigation required.
116A	Former Wash Rack near Building 8485	November 2001	May need to expedite due to possible construction in this area.	Further investigation required.
117 and 118	Building 8486 Motor Pool	November 2001		Further investigation required.

27 and 28	Wash Rack System near Building 2120C	January 2002	Need further information on water/sewer lines. Need information on comparable arsenic detections in groundwater.	Decision postponed until February meeting.
31	Former Building 2122	January 2002		No further investigation needed.
55, 56, 57, 58	DOL Vehicle Maintenance Facility; Buildings 2246/2246D and Wash Rack System	January 2002	Need to review closure records to see what has been left in place. Concern over 3 samples with high TPH exceedances out of 23 samples.	Further investigation required.
71	Kimbrough Army Hospital Building 2480	January 2002		No further investigation needed.
72	Hospital Boiler Plant Building 2482	January 2002	Need information on status of tanks and 1991 spill cleanup. Need surface soil samples, particularly along the south face of the building and additional groundwater samples.	Further investigation required.
73	Hospital Warehouse Building 2484	January 2002		No further investigation needed.
80, 81, 82, 83, 84, 85 and 86	Building 2724 and Wash Rack System	February 2002		Further investigation needed. Additional investigation would be under RCRA program and not the CERCLA program.

87, 88, 89, 90, 91, 92 and 148	Building 2728 and Wash Rack System	February 2002	Team questioned the sampling results for bromoichloromethane and detection of TPH but no SVOCs.	Further investigation needed. Additional investigation would be under RCRA program and not the CERCLA program.
99	Former Hospital Building 4411	February 2002	Detection limit above the RBC limit and surface samples were not collected. Would like to see dissolved metals for groundwater.	Further investigation required.
101 and 102	Vehicle Repair Shop Building 4587	February 2002	High concentrations of compounds detected in groundwater; additional investigation needed to determine source.	Further investigation required.
103	Gasoline Service Station Building 4680	February 2002		Further investigation required.
125 and 126	Building 8550	February 2002		No further investigation needed.
131, 132, 133, 134, 135, 136 and 137	Golf Course Maintenance Area	February 2002	Detection of 1,1,2,2-PCA	Further investigation required.
Non-SWMUs 1, 2, 3 and 4	Buildings 2454, 2455,2456,2457	February 2002		No further investigation needed.
Non-SWMU 5	Former Building 2801	February 2002		No further investigation needed.
Non-SWMU 6, 7 and 8	Former buildings 2810, 2811,2832	February 2002		No further investigation needed
Non-SWMU 9	Building 4272	February 2002		No further investigation needed
Non-SWMU 10 and 11	Buildings 4552 and 4553	February 2002		No further investigation needed.

Non-SWMU 12 and 13	Buildings 9802 and 9803	February 2002		No further investigation needed. Jim to check on historic use.
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ATTACHMENT B

ATTACHMENT H

FORT MEADE PERFORMANCE BASED CONTRACT SITES

FGGM - 05 - Troop Boiler Plant

FGGM - 07 - DRMO Drum Site

FGGM - 47 - Post Laundry Building 2250

FGGM - 83 - Trap and Skeet Range

FGGM - 86 - Former Motorpool Maintenance Facility

FGGM - 87 - Former Nike Control Site

FGGM - 88 - Former Tank Maintenance Facility Shop - 1

FGGM - 89 - Former Tank Maintenance Facility Shop - 2

FGGM - 90 - Former Tank Cleaning Supply Warehouse

FGGM - 91 - Former Missile Repair Shop

FGGM - 92 - Former Heavy Gun Cleaning/Repair

