

RFI/CMS Reports

Former Lead Furnace Area & SWMU 51 (TNT Waste Acid Neutralization Pit)

RAB Presentation
March 20, 2008

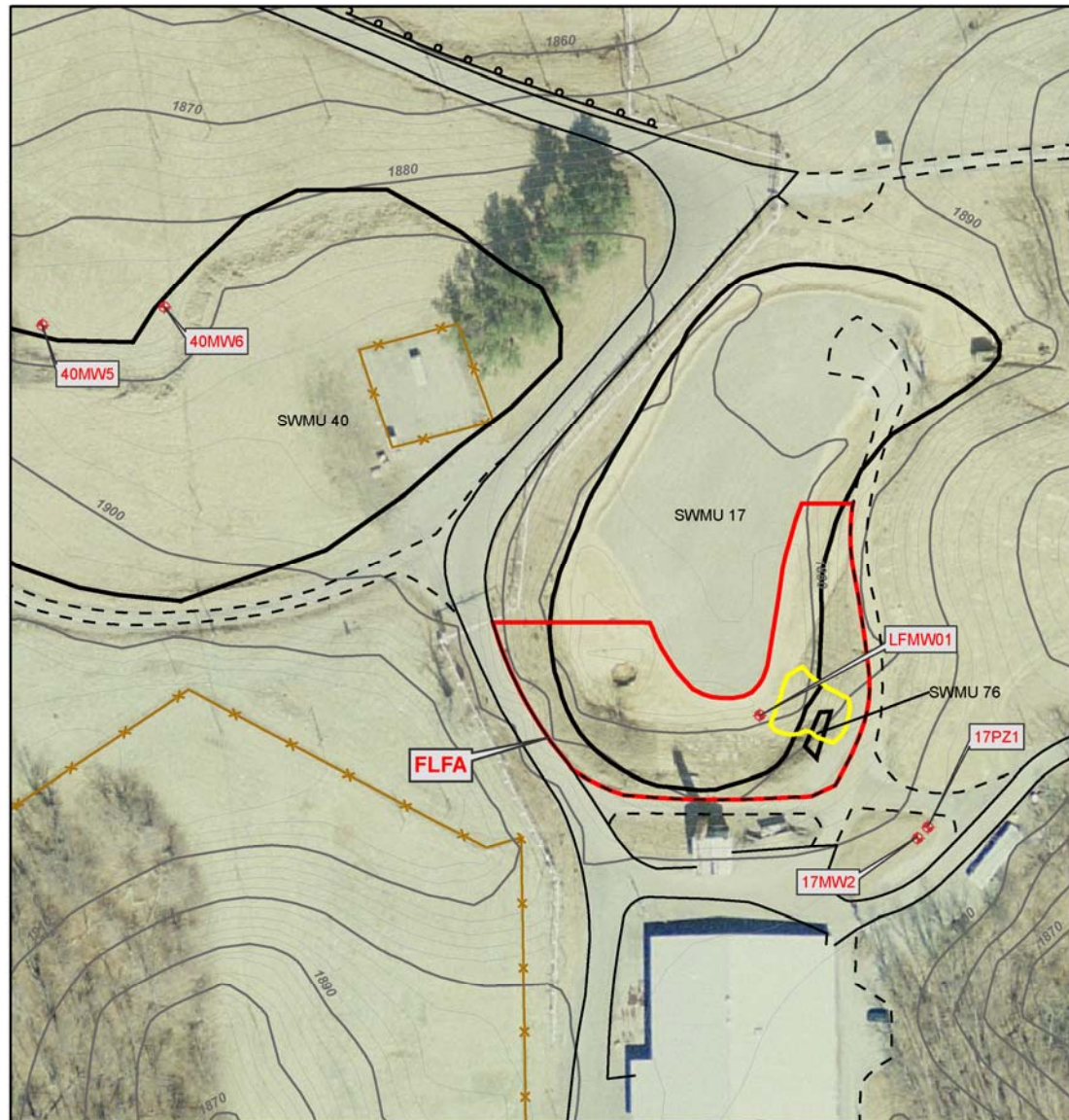
Former Lead Furnace Area (FLFA) (RAAP-040) RFI/CMS Report



FLFA Site Location



FLFA Site Map



Site Description

- Located in the south-central portion of the MMA within the footprint of SWMU 17A (an active Stage and Burn Area)
 - Both sites are within a sinkhole that is approximately 30 ft deep by 200 ft wide by 400 ft long, where a dye trace study indicated that the sinkhole was in direct communication with the New River
- The FLFA occupied a 2,280 ft² area on the steeply sloping side of the sinkhole

Site History

- Lead recovered during routine operations was melted in the furnace and cast into ingots for salvage.
- Operational during World War II, but not known how long the lead furnace was in operation.
- Lead was detected in soils during the removal of a UST (SWMU 76) that was located adjacent to the FLFA.
- Building foundations and lead-impacted soil were taken out in 1998 and replaced by clean fill.

Geology and Hydrogeology

- Overburden is fill and has been reworked several times. Bedrock is fractured limestone at the throat of a sinkhole. Solution-enhanced fractures/conduits lead to SPG3, located on the New River.
- Based on topography, surface water in the area of the FLFA would flow from the surrounding hillsides to the base of the new burn cap. This water runoff would percolate into the sink hole, ultimately discharging to the New River.

Previous Investigations

- The site was discovered in 1992 when solid lead slag was found during the removal of used oil tanks from adjacent SWMU 76.
- Investigations have been done since 1996 and included:
 - A dye trace study
 - groundwater, surface water, and sediment sampling (1996 and 2007).
 - Test pits to uncover the furnace and sample soil beneath it.
 - An XRF lead screening survey with lab confirmation samples

Contamination Assessment

- Soil
 - Metals (lead, with lesser amounts of arsenic and copper), dioxins/furans, and PCBs are the main concerns
 - Test pits in 1998 eliminated the areas with highest concentrations.
- Surface Water/Sediment
 - Metals concentrations decreased from 1995 to 2007 due to FLFA impacted soil taken out and the installation of the engineered burn cap at SWMU 17A.
 - Engineered controls have had a positive impact on spring quality and have reduced the ability of constituents to migrate through the groundwater system.
- Groundwater
 - Soil contaminants were not found at high levels in groundwater.

Human Health Risk Assessment

- Receptors evaluated included:
 - current/future maintenance worker,
 - future industrial worker,
 - future excavation worker,
 - Hypothetical future adult, child and lifetime residents.
 - off-site adult and child residents were also evaluated for potential exposures to groundwater in the unlikely event that groundwater migrating off-site in the future will be used.
- Highest risks were for hypothetical adult and child residents.
- Risk Drivers are:
 - Aroclor-1254, dioxins/furans, and arsenic.

Screening Level Ecological Risk Assessment

- Foodchain Model - Potential impacts to wildlife due to eating onsite:
 - Copper, lead, zinc, TCDD-TE, hexachlorobutadiene and aroclor-1254
- Direct Contact Model - Wildlife food supply would be reduced due to high concentrations of:
 - Arsenic, barium, copper, lead, nickel, and zinc

Corrective Measures Study

Four remedial alternatives were assessed:

1. No Further Action
2. Institutional Controls (Industrial/Commercial Use Scenario LUCs and Groundwater Monitoring)
3. Excavation of Soil with Waste in Place, Off-site Disposal, and Institutional Controls
4. Excavation of Soil for Clean Closure (Residential Use) and Off-site Disposal

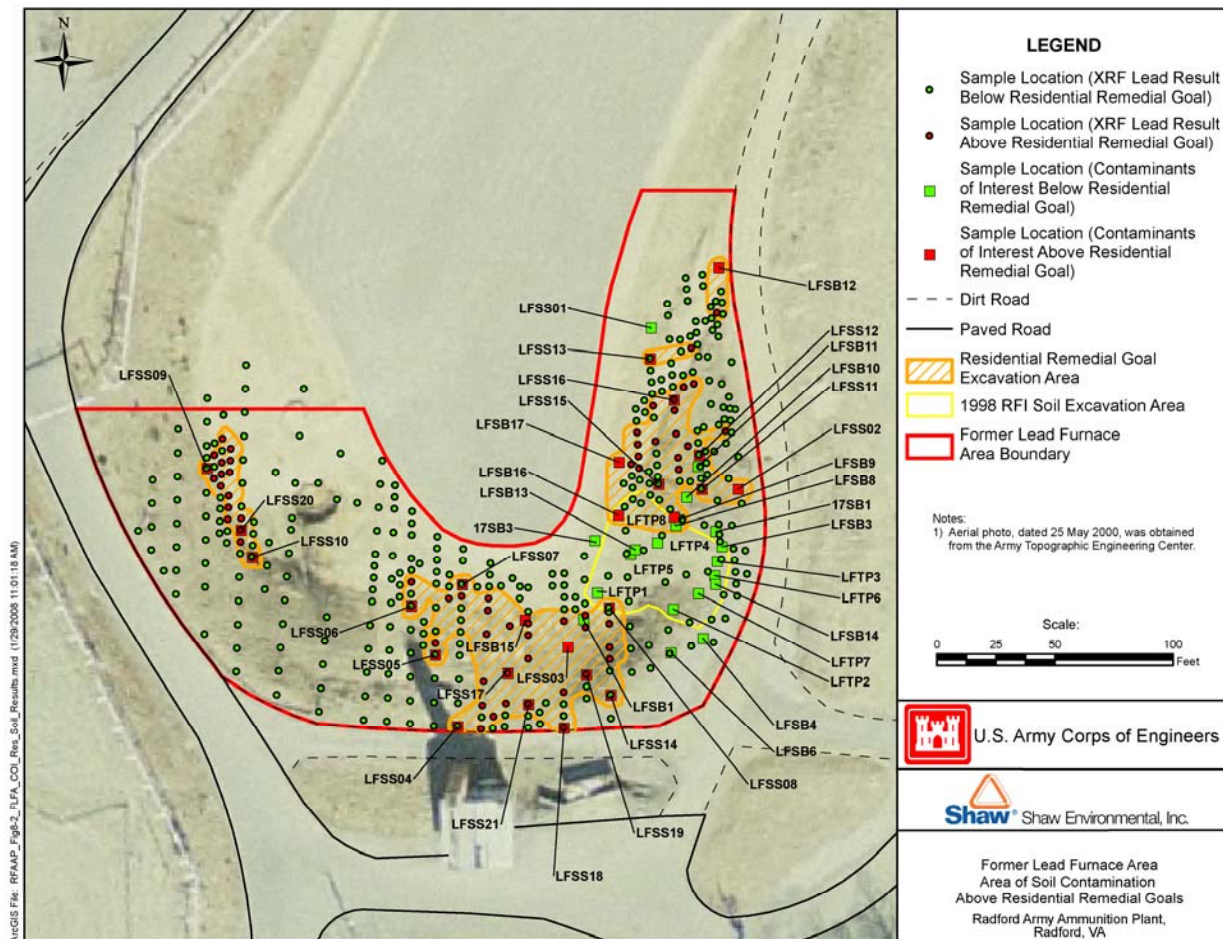
Corrective Measures Study (Continued)

Recommended alternative:

- Alternative Four: Excavation of Soil for Clean Closure (Residential Use) and Off-site Disposal
 - It is implementable and provides a greater level of protection to human health and the environment not provided by the other alternatives
 - It is the sole alternative that facilitates clean closure
 - It has a lower cost and meets Corrective Measures Objectives (CMOs)
 - This alternative can be implemented in approximately one year

Corrective Measures Study (Continued)

- Lead, copper, dioxins/furans, and Aroclor-1254 are present in surface soil at concentrations exceeding the Residential RG
 - Area of contamination = 6,790 ft² / 379 yd³
 - Depth = 1.5 ft bqs

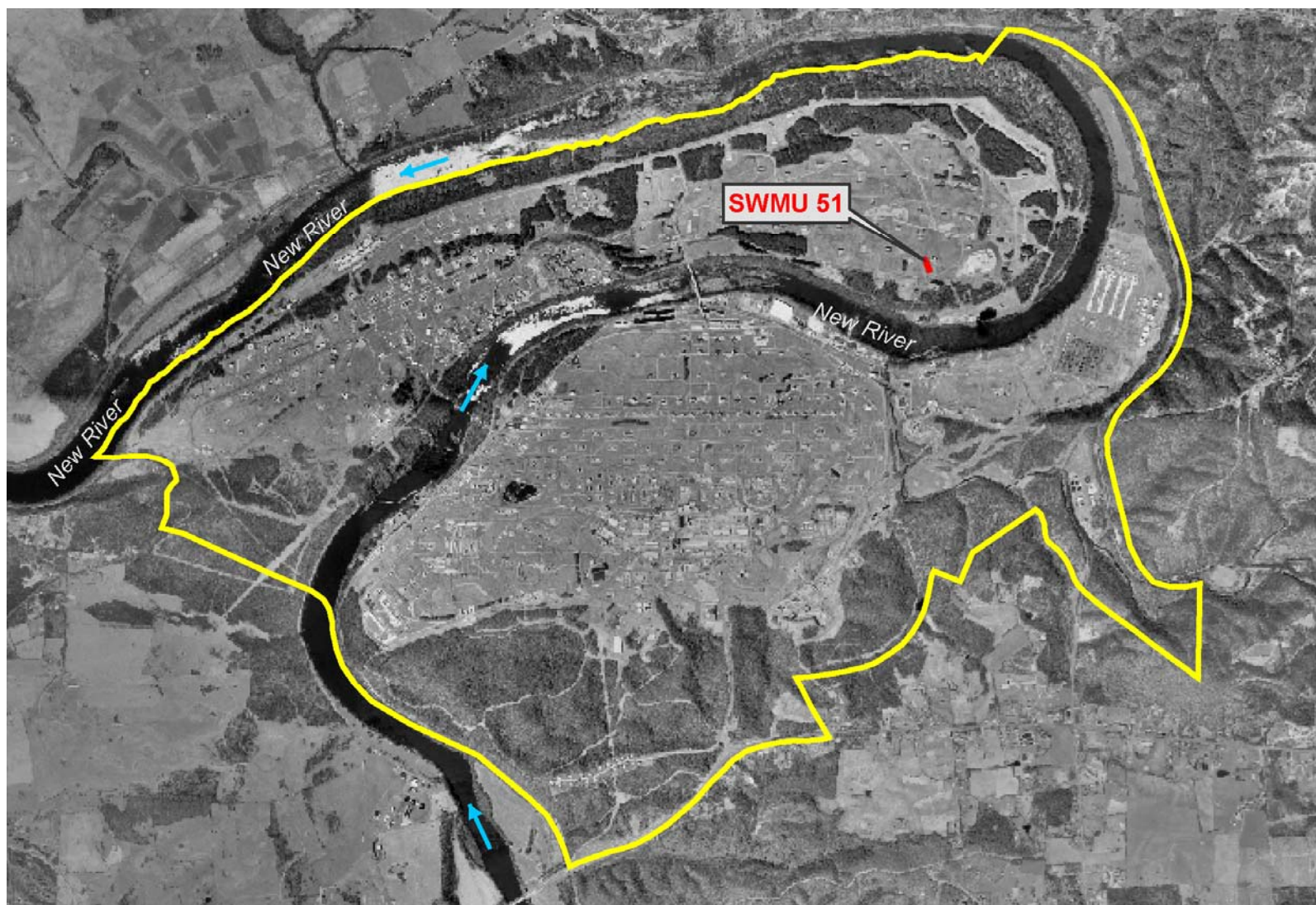


SWMU 51
TNT Waste Acid Neutralization Pit (RAAP-001)

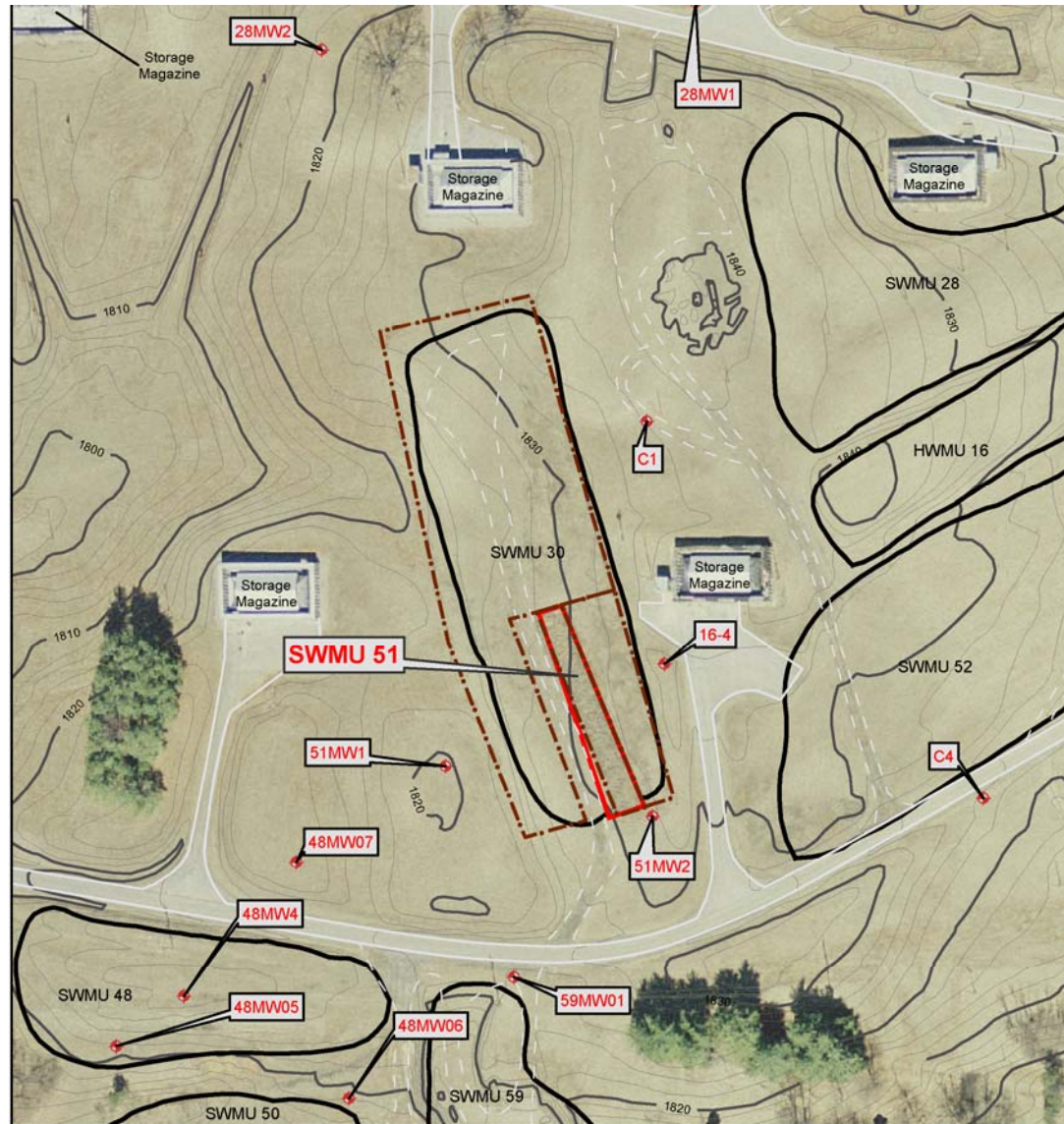
RFI/CMS Report



SWMU 51 Site Location



SWMU 51 Site Map



Site Description

- Unlined trench approximately 140 ft long by 23 ft wide in the eastern Horseshoe Area.
- Site is on a plateau and is generally flat to slightly sloping.
- The trench sludge ranges in depth from 0.5 ft bgs along the northern and southern boundaries of the trench to 14 ft bgs in the center of the trench. Thickness of the trench sludge averages 3-4 ft.

Site History

- Used for disposal of unknown quantity of TNT neutralization sludge from the treatment of red water in the 1970s.
- An estimated 10 tons of red water ash was also reportedly disposed in the trench from 1968 to 1972.
- The trench was backfilled to grade with fill material ranging from 0.5-14 ft in thickness and has since revegetated.

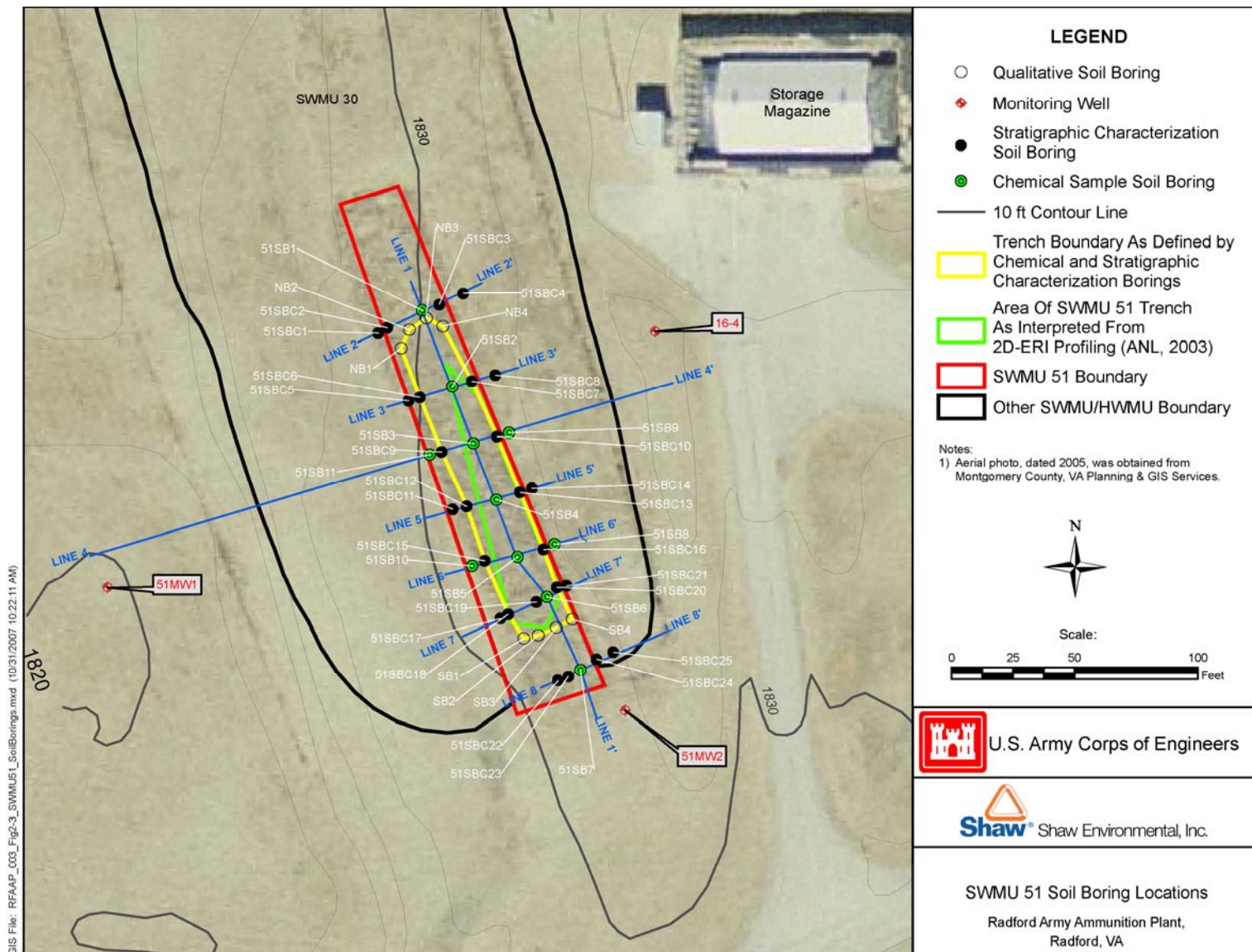
Geology and Hydrogeology

- Soil underlying the trench sludge material consists of sandy clay overlying gravel (“river jack”), saprolite, and bedrock (shale, limestone, dolomite). Depth to competent bedrock ranges from 45-55 ft bgs.
- Groundwater at the site ranges from 33 ft bgs (51MW1) to 50 ft bgs (51MW2) and flows south towards the New River.

Previous Investigations

- The site was identified in 1987
- Investigations have been conducted since 1992 and have included:
 - Historic aerial photographic analysis.
 - A geophysical survey to delineate the depth and extent of the former disposal trench.
 - 44 borings (33 stratigraphic and 11 chemical) to verify the geophysics and analyze the material in the pit.
 - Installation and sampling of groundwater wells (1992 and 2007) to see if trench materials were migrating.

2004 RFI Soil Boring Locations



Contamination Assessment

- Soil

- The main concern at the site is the trench sludge material and grossly contaminated soil immediately below the sludge material.
- Explosives (DNT and TNT), dioxins/furans and metals are the main concerns.

- Groundwater

- Explosives were not detected in any of the groundwater samples. This shows that explosives are not significantly migrating to groundwater.

Human Health Risk Assessment

- Receptors evaluated were:
 - current/future maintenance worker
 - future industrial worker
 - future excavation worker
 - Hypothetical future adult, child and lifetime residents.
- Risks were elevated for several receptors, including excavation workers and residents.

Screening Level Ecological Risk Assessment

- Foodchain Model - There are risks to wildlife from eating onsite due to metals and dioxins/furans.
- Direct Contact Model - This assessment only looks at the top 2 feet of soil (the zone used by most animals). Because the trench material is mostly below this depth, animals are not as impacted as people and the human health risks will drive the cleanup.

Corrective Measures Study

Three remedial alternatives were assessed:

1. No Further Action
2. Institutional Controls (Industrial/Commercial Use Scenario Land Use Controls, Groundwater Monitoring)
3. Excavation of Sludge and Grossly Contaminated Soil and Off-site Disposal

Corrective Measures Study (Continued)

- Recommended alternative:
 - Alternative Three: Excavation of Sludge and Grossly Contaminated Soil and Off-site Disposal
 - It is implementable and provides a greater level of protection to human health and the environment not provided by the other alternatives
 - It is the sole alternative that facilitates clean closure
 - It has a lower cost and meets Corrective Measures Objectives (CMOs)
 - This alternative can be implemented in approximately one year