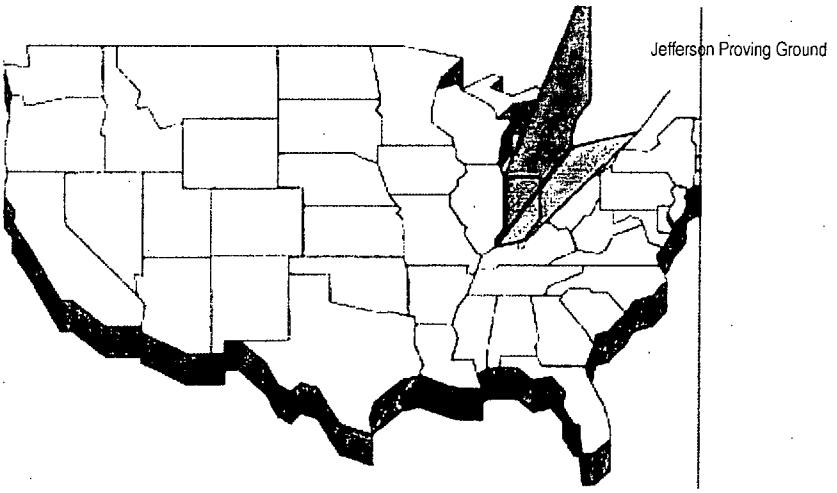
RAS 14436

ARMY EXH. #7

FINAL
ENVIRONMENTAL IMPACT STATEMENT
SEPTEMBER 1995



DISPOSAL AND REUSE OF THE JEFFERSON PROVING GROUND MADISON, INDIANA

TEMPLATE = SECY-028

SECY-02

	Table 4-11. CERFA Acres Stu Area.				
20Q-/A/L	10		o		
210-/A			o		
220-/AIL	9		o		
240-/A/L	10		o		
260-/AIL	10				
270-/A/L	10		o		
4P	3078				o
9P	8				o
11p	10				o
25P	10				o
Areas north of the firing line					
2D-X/PS/HR P /HS	130	o	o		
3D-/)UHR P	50	o	o		
4D-/)VHR P	40	o	o		
5D-/X/HR P	160	o	o		
6D-/X/HR P	40	o	o		
7D-/XIHR P	60	o	o		
8D-/XIHR P	60	o	o		
9D-/RD P R	1620	o	O		
10D-/X/HR P	210	o	O		
11 D-/X/HR P	50	o	O		
12D-/X/PR	20	o	O		
IQ-/X	47696		o		
1 CERFA Disqualified Parcel (see text for definition)					
2 CERFA Parcel with Qualifier (see text for definition)					
3 CERFA Excluded Parcel (see text for definition)					
4 CERFA Parcel (see text for definition					

Source Earth Technology Corporation, 1993

The CERFA process addresses potentially contaminated areas in terms of acres. Specific remedial actions are accomplished at smaller, more precisely defined project sites. Corrective actions are, or will be, occurring at numerous sites throughout the installation as part of the Installation Restoration Program. Individual projects are developed and funded according to various regulatory requirements and funding accounts.

In September 1992, a Draft Technical Plan was prepared to perform an RI/FS for 22 solid waste management units and three additional sites south of the firing line at the JPG. The Army conducted field work in two phases in order to maximize placement of monitoring wells. Field work was conducted in 1992 and 1993. The Final Draft RI Report was provided for review in July 1994. The Army plans to perform cleanup activities as required; however, the schedule for cleanup activities is not known. The overall objective of the Army is to provide, wherever possible, parcels that are environmentally suitable for disposal and that can be readily disposed and made available for reuse.

4.14.3 Unexploded Ordnance

Due to historical practices at the JPG, unexploded ordnance (UXO) may be found anywhere north of the firing line. South of the firing line, UXO may be found in specific places; these are being investigated either because of known ordnance activities at a site or because there is some evidence of possible ordnance activities at a site. JPG officials estimate that approximately 23 million rounds have been fired into impacts areas north of the firing line since 1941. The types of munitions tested vary from 20 millimeter small caliber cannon to 2,000 pound bombs. It is estimated that as many as 1.5 million UXO items may exist within

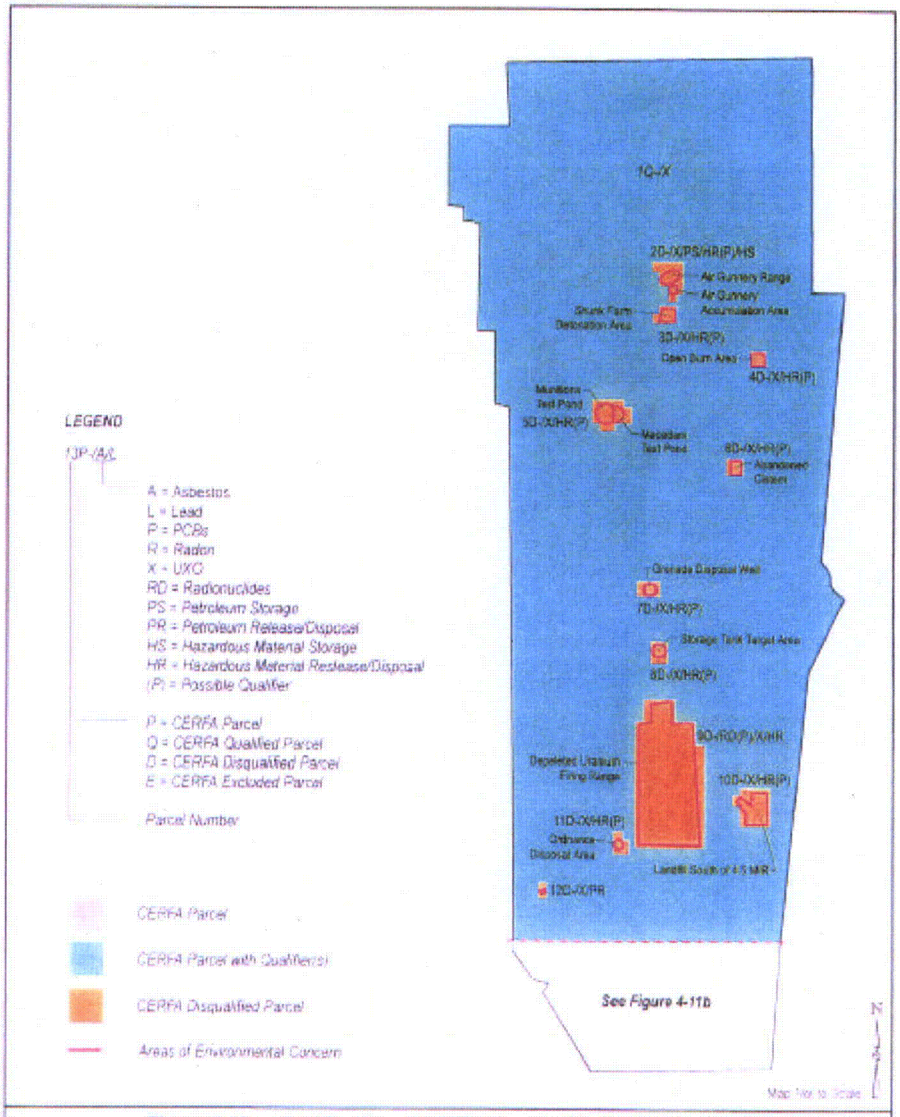


Figure 4-11a. Identification of CERFA Parcels (North of Firing Line)

the boundaries of the installation. In addition, another 7.0 million inert projectiles having live fuses or spotting charges may be present. Figure 4-12 provides information on the probable locations of UXO. The majority of these UXO items have not been recovered and remain a safety hazard in circumstances of unrestricted access (USACOE 1991).

A 1992 study analyzed methods and levels of UXO remediation, to include best, conservative, and worst case estimates. Cost per acre to clear UXO was calculated using parameters of low, medium, high, and very high UXO density, assuming clear, grassy, and tree covered lands. Additional adjustment factors took into account land area, density of UXO, and vegetation differences. Cleanup costs of UXO to soil depths of four feet and 10 feet were calculated. At four feet in bare ground terrain, the estimate ranged from $8,509/acre (best case) to $16,850/acre (worst case). Under the same

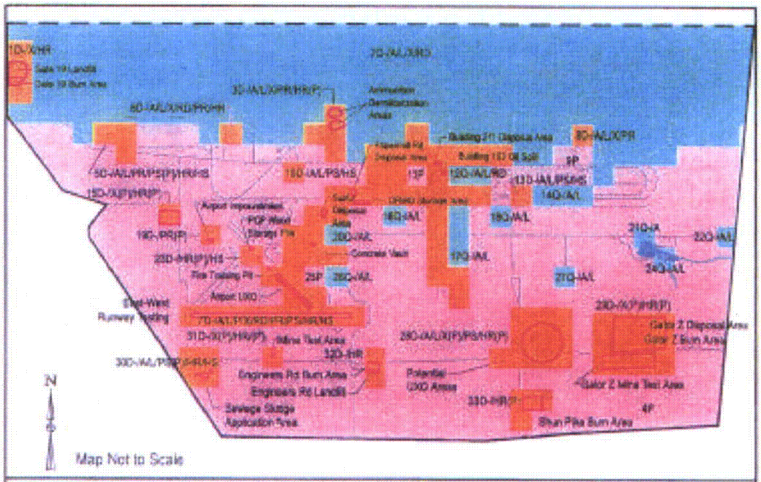


Figure 4-11b. Identification of CERFA Parcels (South of Firing Line)

conditions for depths of 10 feet, costs range from $29,782 to $58,977/acre. In terrain with tree growth, costs to clear soil to four feet ranged from $11,062 (best case) to $21,906 (worst case) per acre. Clearing soil to 10 feet in tree growth was estimated at $44,248 (best case) to $87,624 (worst case) per acre (*Cleanup and Reuse Options*, 1992). These costs are displayed in Table 4-12.

Table 4-12. UXO Cleanup Cost Estimates

Clearance Depth	Scenario	Bare Land Cost per Acre	Forested Land Cost per Acre
4'	Best Case	$8,509	$11,062
4'	Worst Case	$16,850	$21,906
10'	Best Case	$29,782	$44,248

Table 4-12. UXO Cleanup Cost Estimates			
Clearance Depth	**Scenario**	**Bare Land Cost per Acre**	**Forested Land Cost per Acre**
10'	Worst Case	$58,977	$87,624

4.14.4 Depleted Uranium

Since March 1984, more than 100,000 kilograms of depleted uranium (DU) projectiles have been fired into a three square mile DU impact area. Figure 4-13 identifies the location of the DU impact area. The presence of the DU gives rise to an encumbrance on disposal or transfer of the DU impact area portion of the JPG.Depleted uranium testing was conducted in accordance with Nuclear Regulatory Commission license number SUB 1435, approved in December 1983. This license permits testing of up to 250,000 kilograms in the DU testing area (105 millimeter and 120 millimeter tank ammunition), storage of DU in Buildings 610, 611, and M1, and storage of up to, 50 kilograms of DU for use as a collimator for a photographic x-ray machine. Semiannual cleanup activities have resulted in recovery of about 25 percent of the DU in the impact area. Although not required by license number SUB 1435, the JPG has taken actions to recover and dispose of spent DU rounds in order to extend the useful life of the impact area. A decommissioning plan is required to be submitted to the Nuclear Regulatory Commission to identify methodology for cleanup of DU contamination and closing out of the license.

In 1994, the Army's Test and Evaluation Command commissioned Los Alamos National Laboratory to study human health risks posed by DU at the JPG. The Laboratory's report, *Depleted Uranium Human Health Risk Assessment, Jefferson Proving Ground,* addresses risks associated with three scenarios: hunting or occasional use, resident farming (drinking water from uncontaminated off-site sources), and resident farming (use of on-site, presumed contaminated water). Both a steady-state model and the Department of Energy's Residual Radioactive Material Guidelines model were used to develop the risk assessment. In the hunting scenario, total dose to humans was modeled to be about 0.15 millirems per year. In the first farming scenario, total dose to human was modeled to be about 1.3 millirems per year. The final scenario, which assumed ingestion of food grown on the impact area and intake of water from a presumably contaminated aquifer, resulted in a modeled dose in years 10 through 100 of about 110 millirems per year, an amount that exceeds the exposure limit of 100 millirems per year (Los Alamos National Laboratory, 1994). To put these doses in context, it is noted that an average American's annual radiation exposure from all natural and man-made sources is 360 millirems; two packs of cigarettes daily results in exposure of about 8,000 millirems per year (polonium-210), porcelain dentures about 1,500 millirems per year (uranium), and each dental x-ray about 100 millirems (Department of Energy, 1994).

4.14.5 Asbestos, Radon, Lead-based Paint, PCBs

The JPG management of hazardous materials and waste extends not only to materials as they are used and subsequent remedial actions as required, but also asbestos, radon, leadbased paint, PCBs, and underground storage tanks (USTs). Information on these is presented below.

Asbestos. Management and disposal of asbestos at the JPG is performed in accordance with Occupational Safety and Health Administration regulations (29 CFR 1926.1101) and National Emission Standards for Hazardous Air Pollutants (40 CFR 61, Subpart M). Asbestos containing materials are present in several

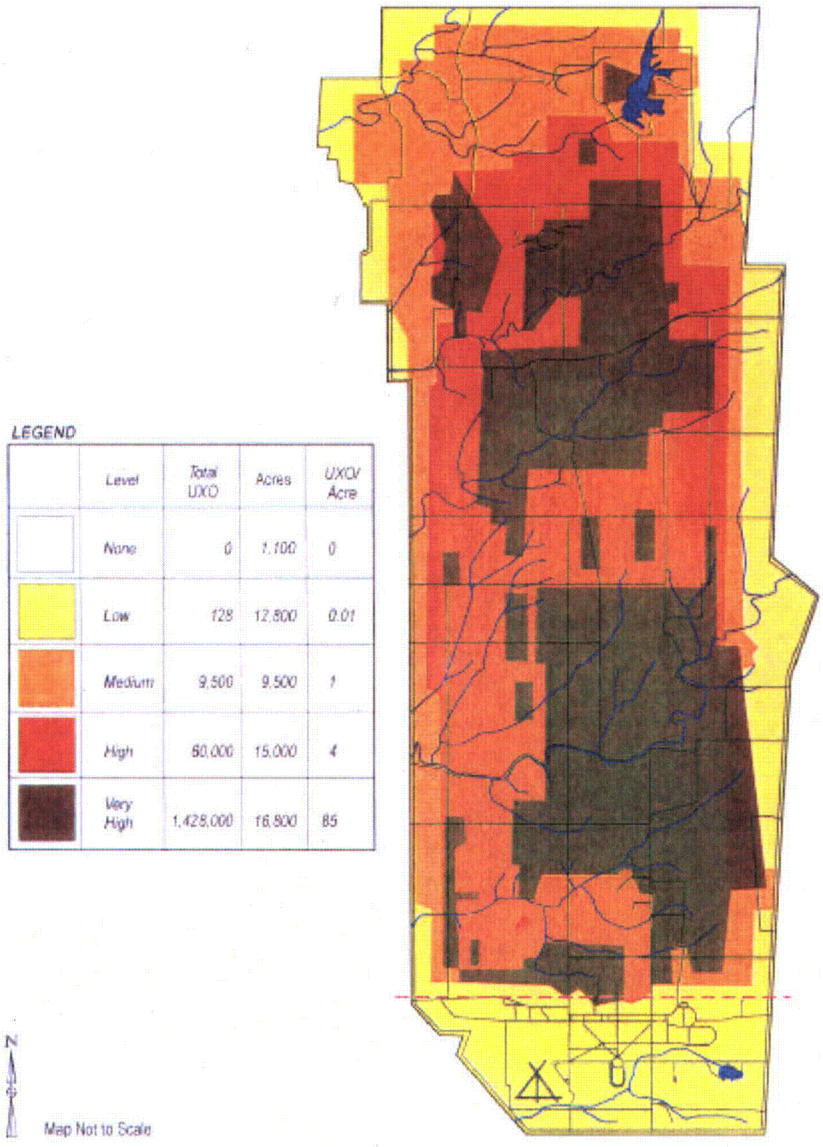


Figure 4-12. Estimated Distribution of UXO

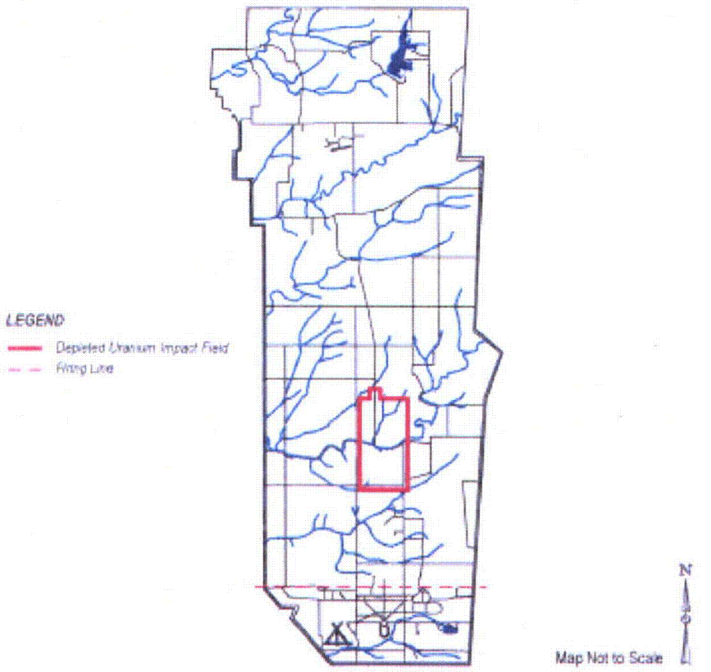


Figure 4-13. Depleted Uranium Impact Field

of the buildings at the JPG facility. Construction materials include pipe insulation, roof shingles, and siding. A preliminary survey at the JPG indicated that the total length of asbestos insulated pipe was approximately 197,000 linear feet. There is also an estimated 258,000 square feet of asbestos shingles and siding. The piping, insulation, and shingles are generally in good, bound, and nonfriable condition. However, many piping joints (unions, elbows, etc.) in many of the buildings have potential to become friable (USATHAMA 1992).

In March 1993, a comprehensive asbestos survey was completed which located, identified, and recommended appropriate abatement action for asbestos containing material. A total of 345 buildings were inspected. No buildings were found to require immediate abatement action. Minor asbestos containing material abatement actions have occurred during operation and maintenance activities. Waste asbestos containing materials resulting from these actions were double-bagged and stored in Building 305 prior to disposal at the Gate 19 landfill.

- *Radon.* Radon testing at the JPG has been performed in family quarters, building basements, and shelter tunnels throughout the facility. Testing for radon was done by 7-day, 90-day, and 12-month tests. Test results indicate radon concentrations at