UNITED STATES ARMY ENVIRONMENTAL HYGIENE AGENCY

ABERDEEN PROVING GROUND, MD 21010-5422

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SOLID WASTE MANAGEMENT SURVEY NO. 38-26-0334-90
JEFFERSON PROVING GROUND
MADISON, INDIANA
7-11 AUGUST 1989

DEPARTMENT OF THE ARMY
U. S. ARMY ENVIRONMENTAL HYGIENE AGENCY
ABERDEEN PROVING GROUND, MARYLAND 21010-5422

REPLY TO ATTENTION OF

HSHB-ME-SE (40)

24 NOV 1989

MEMORANDUM FOR Commander, U.S. Army Materiel Command, ATTN: AMCSG, 5001 Eisenhower Avenue, Alexandria, VA 22333-0001

SUBJECT: Solid Waste Management Survey No. 38-26-0334-90, Jefferson Proving Ground, Madison, Indiana, 7-11 August 1989

EXECUTIVE SUMMARY

The purpose, major conclusions and recommendations of the enclosed report follow:

a. Purpose. To evaluate Jefferson Proving Ground's solid waste management practices from generation to final disposition.

b. Conclusions. With few exceptions, the overall solid waste management program at Jefferson Proving Ground is good. The solid waste incinerator at Building No. 185 needs to be permitted by the State of Indiana. The Gate 19 construction debris (CD) landfill needs additional vegetative cover for erosion control. Waste piles at the Gate 19 CD landfill are widely dispersed over a large area of the disposal site. The installation did not have a contingency operating plan for the Gate 19 CD landfill. Wastewater treatment plant sludge is not properly stored. There is a large discrepancy between the projected solid waste quantities listed in the general refuse collection contract and the actual cubic yards collected and removed from the installation.

c. Recommendations.

(1) We recommend the following to ensure regulatory compliance: Obtain a permit to operate the solid waste incinerator at Building No. 185. Present a contingency disposal plan to the State of Indiana for the Gate 19 CD landfill. Provide adequate vegetative ground cover to facilitate erosion control at the Gate 19 CD landfill. Remove the dried sewage sludge from behind Building No. 177, and, contingent on State approval, apply to the land or dispose of in the Gate 19 CD landfill.

HSHB-ME-SE
SUBJECT: Solid Waste Management Survey No. 38-26-0334-90, Jefferson Proving Ground, Madison, Indiana, 7-11 August 1989

(2) We recommend the following to ensure good environmental engineering management practice: Confine surface disposal at the Gate 19 CD landfill to a limited area. Evaluate disposal records to determine solid waste generation quantities for the development of collection service contracts.

FOR THE COMMANDER:

Encl

PAUL R. THIES
LTC, MS
Chief, Waste Disposal Engineering Division

CF:
DA, USAEHC, ATTN: CEHSC-F (w/encl)
HQDA(ENVR-E) (w/encl)
HQDA(SGPS-PSP) (wo/encl)
Cdr, TECOM, ATTN: AMSTE-ST-E (w/encl)
Cdr, HSC, ATTN: HSCL-P (w/encl)
Cdr, JPG, ATTN: S-TEDJ-DH (2 cy) (w/encl)
Cdr, MEDDAC, Ft Knox, ATTN: PVNTMED Svc (2 cy) (w/encl)
Cdr, WRAMC, ATTN: PVNTMED Svc (w/encl)
Cdr, USATHAMA, ATTN: CETHA-TE-E (w/encl)
Cdr, USATHAMA, ATTN: CETHA-RM(TIC) (2 cy) (w/encl)
Cdr, USAEHA-N (w/encl)

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REPLY TO ATTENTION OF

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SOLID WASTE MANAGEMENT SURVEY NO. 38-26-0334-90
JEFFERSON PROVING GROUND
MADISON, INDIANA
7-11 AUGUST 1989

1. REFERENCES. See Appendix A for a list of references used in this report.

2. AUTHORITY. AEHA Form 250-R, AMC, 15 June 1988.

3. PURPOSE. To evaluate the compliance status and effectiveness of the installation's solid waste management program.

4. GENERAL.

a. Personnel Contacted. See Appendix B for a list of personnel contacted during this survey.

b. Background.

(1) Location. Jefferson Proving Ground (JPG) occupies 55,265 acres of land approximately 9 miles north of Madison, Indiana on U.S. Route 421 (refer to the Figure). Neighboring major cites include Louisville, Kentucky, 45 miles southwest; Cincinnati, Ohio, 75 miles northeast; and Indianapolis, Indiana, 85 miles north. Madison is the county seat of Jefferson County and has a population of approximately 13,000.

(2) Mission. Jefferson Proving Ground is a subcommand of the U.S. Army Test and Evaluation Command (TECOM). Their mission is to plan and complete production acceptance tests, reconditioning tests, surveillance tests, and other studies of ammunition and weapons systems as well as components of the systems. The JPG mission is also to provide advice and guidance on the evaluations to materiel developers and producers.

(3) Physiography. Jefferson Proving Ground is in the Till Plains section of the Central Lowlands physiographic province. Young till plains with no moraine features characterize the province. The southern two-thirds of JPG is flat and slopes mildly from east to west. The northern third of JPG contains gently rolling hills. Elevations range from approximately 860 feet to 970 feet above sea level within the installation boundaries. Five major drainageways with vertical banks up to 60 feet high flow across the installation. Each of

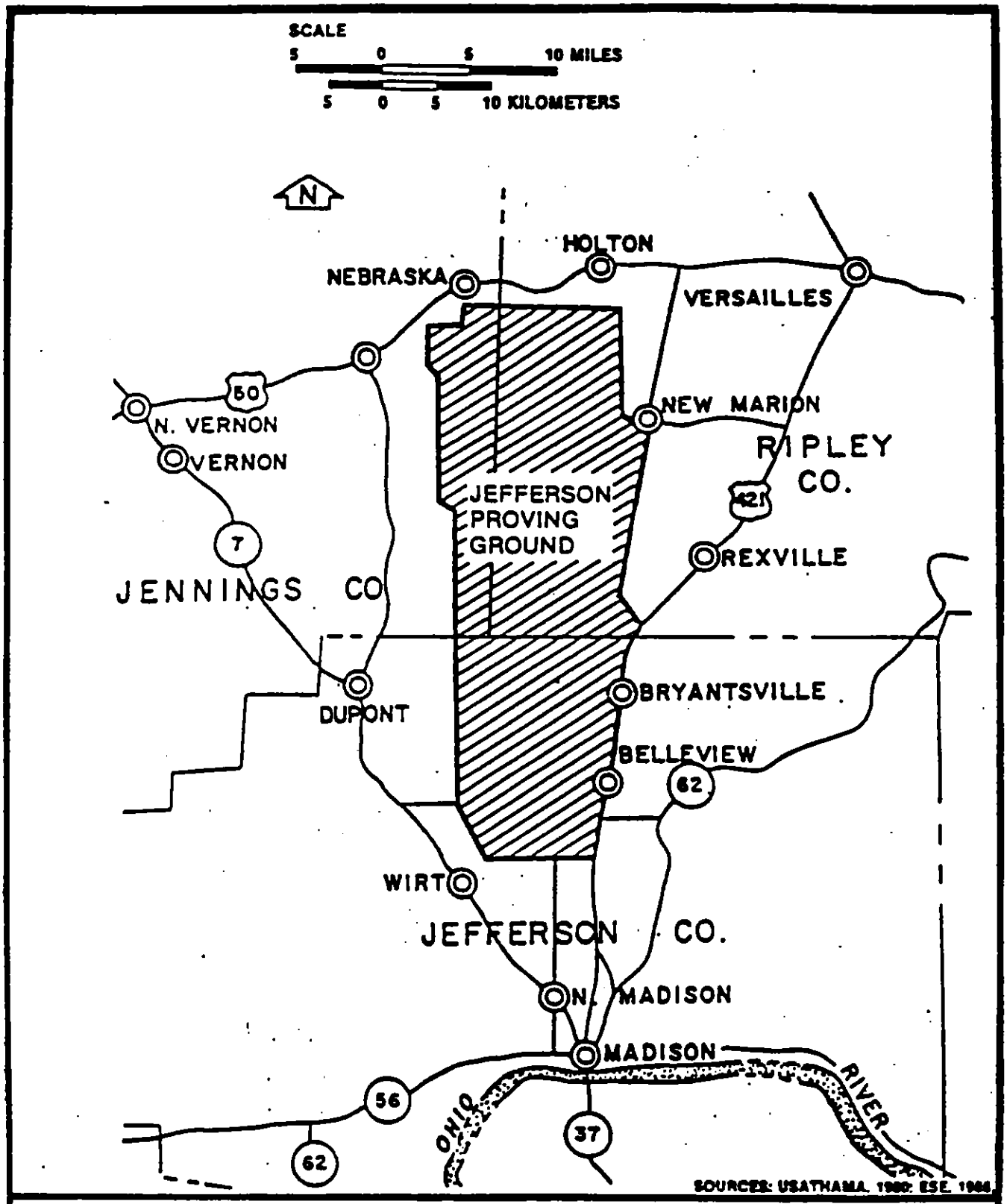

Figure
LOCATION OF JEFFERSON PROVING GROUND, MADISON, INDIANA

these creeks has several tributaries and a well developed drainage net. Surface drainage discharges into Harberts Creek from storm sewer and open ditch systems that drain the cantonment and industrial areas of the installation (reference 3).

(4) Climate. The climate in southeastern Indiana is continental with warm summers and moderately cold winters. Wide variations in temperature occur seasonally, especially during the winter months. The normal annual precipitation is approximately 45 inches, including 16 inches of snow. Most of the annual precipitation occurs between October and March ranging from 27 inches to 57 inches per year over the last 50 years.

(5) Regional Geology. Jefferson Proving Ground is underlain by a series of Ordovician, Silurian, and Devonian limestones and dolomite. Most of JPG is underlain by Silurian limestone, which is the Laurel Member of the Wayne Formation and composed of hard, light to dark gray limestone with zones of soft, porous, brown limestone. The limestone dips to the west-southwest. In general, the limestone is thinly bedded with seams of clay. It ranges in thickness from approximately 49 feet to 165 feet with a shaley member at the base of the unit. The surface geology is Illinoian age glacial till, characterized by silts and clays with minor amounts of gravel and rock fragments.

(6) Hydrogeology. Several test holes and wells exist at JPG. The water-bearing formations are normally limestones in varying degrees of weathering. The typical profile consists of up to 20 feet of clay underlain by soft weathered limestone interspersed with layers of hard, sometimes fractured, limestone. The ground-water table at JPG is variable depending on weather conditions, (i.e., precipitation and other sources of surface inflow). Shallow ground water occurs in an unconfined aquifer with water levels often near the surface depending on the season. The direction of subsurface (and surface) water flow is west-southwest, following the regional structural dip of the bedrock.

c. Regulations.

(1) State of Indiana. The Indiana Solid Waste Management Regulations, Title 329 of the Indiana Administrative Code, provides rules for storage, collection, facility permitting and solid waste disposal.

(2) Army Regulations. Army Regulation (AR) 420-47, Chapter 3, describes responsibilities, regulatory requirements, and procedures for the environmentally safe management of solid waste at Army installations.

(3) Federal. Title 40, Code of Federal Regulations (CFR), Part 257, establishes criteria for the classification of solid waste disposal facilities and practices.

5. FINDINGS AND DISCUSSION.

a. Solid Waste Generation.

(1) Waste Types. Jefferson Proving Ground's solid waste generation consists of residential refuse, cardboard projectile casings, construction debris, sewage sludge, office paper, chemically treated wood, miscellaneous metals from industrial processes, inert projectile filler, and tires. Copper, steel, brass, silver flake, aluminum and some waste concrete are recycled.

(2) Volume. The installation disposed (offpost) approximately 1,728 cubic yards of solid waste during the calendar year 1988. The Gate No. 19 construction debris landfill (CD) received 4,750 pounds (lbs) of miscellaneous debris and 1,400 lbs of asbestos waste during the period April-August 1989. Recordkeeping for the CD disposal quantities began during April 1989. Combined metals collected by the Defense Reutilization and Marketing Office (DRMO) for recycling generated 869,161 pounds during 1988. The reinforced cardboard containers for projectiles are reported to account for approximately 50 percent (by volume) of the proving ground's solid waste generation. This is attributed to the extremely rigid construction of the cylinders, which when compacted, compress only slightly.

b. Solid Waste Storage. Refuse generated in the housing area is stored in 30-gallon galvanized cans provided by the installation. Industrial refuse containers are provided by the collection contractor, Homeowners Maintenance Service. The truck-handled containers are the universal rectangular type, having 4-and 6-cubic yard capacities, and lift fittings matching standardized truck booms. The dumpsters are equipped with securely hinged 14-gage steel plate lids and clean out plugs. The contractor is responsible for the maintenance of the dumpsters. The installation stores zinc napthenate and PCP treated wood, recyclable metals, scrap wood, sewage sludge, and tires separately for appropriate collection. The DRMO segregates and stores recyclable metals at Building 189. Building 114 is a central storage location for aluminum cans. All solid waste storage areas and containers observed appeared clean and well managed.

c. Solid Waste Collection. All solid waste generated on JPG, except for the wastes segregated for special collection and/or treatment, is collected by a contractor for offpost disposal. The current general refuse collection contractor is the Homeowners Maintenance Service. The contractor collects refuse at designated pickup points varying from one to three times per week. For example, collection at the family housing area is two times per week; at the post restaurant and major maintenance and supply locations, three times per week; and at recreational facilities there is one pickup per week. These collection frequencies appeared adequate.

d. Solid Waste Disposal.

(1) Incinerators. The installation has two active solid waste incinerators located in Buildings Nos. 333 and 185. The incinerator at Building 333 is used to burn "confidential" bond paper and files once every 2 months. This unit is a Plibrico Model 489 multiple-chambered incinerator equipped with a #2 fuel oil afterburner, and is operated by one person. This incinerator is permitted by the State of Indiana (Permit No. 39-05-82-0030). The ash is landfilled in the Gate 19 CD landfill located onpost. The incinerator at Building 185 is used once a month to incinerate an inert projectile filler consisting of polyurethane, iron oxide, and sucrose. The waste material reduction achieved is reported to be 99 percent. The residue is landfilled in the Gate 19 CD. The installation should seek a permit for this solid waste incinerator from the State of Indiana. Both incinerators appear to be in good condition.

(2) Construction Debris Landfill. The Gate 19 CD landfill is located in the southwest portion of JPG near the installation boundary. The landfill is active and permitted (for asbestos and selected solid wastes) comprising a total of 12 acres, where 8 acres remain available to waste disposal. The method of operation is trench and area having individual cells 5 feet deep with 20-foot floors extending 120 feet in length. Wastes accepted are asbestos, concrete block, metal, wire and a minor amount of wood debris. Most of the bulky wastes are situated in piles. Asbestos (permitted for disposal at the Gate 19 CD landfill) is doubled-bagged, dampened, and buried in separate trenches. The buried wastes are marked and compacted with at least 2 feet of cover every 2 weeks. The landfill is operated by a manager and one heavy equipment operator. There is a telephone nearby and radios are provided for safety. Access is restricted by a locked gate and fence. There are 12 ground-water monitoring wells in the area of the landfill that are monitored quarterly (no contamination of ground water observed). Erosion control appeared to be inadequate where additional seeding of

grasses could prevent excessive soil erosion. Waste piles should be consolidated to a more limited area for easier management and savings in available disposal space. The installation reported that it did not yet have a contingency operating plan for the Gate 19 facility. For the most part, this landfill is clean and well managed, where only those wastes posted and listed in the permit are accepted.

(3) Transfer Station/Municipal Landfill. The solid waste collected by the collection contractor is transported to a transfer station in the town of Madison, where it is further compacted and transferred to the Union Town municipal landfill. There is a large discrepancy between the projected amount of solid waste collected by the contracting service and the quantities actually accepted at the transfer station. It appears that the contractor has over projected solid waste amounts for collection. The installation should review the collection contractor's proposal and the transfer station's records for a more accurate determination of solid wastes generated. Chemically treated wood products are segregated and collected separately for disposal at the Union Town sanitary landfill.

(4) Sewage Sludge. Sewage sludge generated during the last 12 months was collected from drying beds at the sewage treatment plant and deposited in a pile on the ground surface, behind Building 177. According to Federal regulation this type of storage constitutes an open dump (reference 4). This sewage sludge should be removed from the ground surface and disposed of in accordance with State of Indiana solid waste regulations. The installation is waiting for approval from the State to continue land application of sewage sludge for animal feed production.

(5) Recycling. Scrap metal including copper, steel, brass, copper wire, iron, aluminum, and silver flake are collected and separated by the DRMO at Building 189 for recycling. Aluminum cans are collected for recycling at Building 114. Concrete waste is used as rip-rap for erosion control. Scrap wood is burned at the fire training area adjacent to the airport (by permit). Waste motor pool oil (not a hazardous waste in Indiana) is recycled through the DRMO. Tires are collected by the DRMO for recycling at the Bluegrass Army Depot.

e. Recordkeeping. All required recordkeeping is performed. Jefferson Proving Ground uses DA Form 3916 (Daily Log of Truck Trips for Refuse Collection and Disposal) and DA Form 3917 (Refuse Collection and Disposal) as required by AR 420-47 (reference 1).

6. CONCLUSIONS.

a. With few exceptions, the overall solid waste management program at JPG is good.

b. The solid waste incinerator at Building No. 185 needs to be permitted by the State of Indiana.

c. The Gate 19 CD landfill needs additional vegetative cover for erosion control.

d. Waste piles at the Gate 19 CD landfill are widely dispersed over a large area of the disposal site.

e. The installation did not have a contingency operating plan for the Gate 19 CD landfill.

f. Wastewater treatment plant sludge is not properly stored.

g. There is a large discrepancy between the projected solid waste quantities listed in the general refuse collection contract and the actual cubic yards collected and removed from the installation.

7. RECOMMENDATIONS.

a. We recommend the following to ensure regulatory compliance:

(1) Obtain a permit to operate the solid waste incinerator at Building No. 185 in accordance with 329 Indiana Administrative Code (IAC) 2-20-2.

(2) Present a contingency disposal plan to the State of Indiana for the Gate 19 CD landfill [329 IAC 2-17-2(e)(6)].

(3) Provide adequate vegetative ground cover to facilitate erosion control at the Gate 19 CD landfill (329 IAC 2-14-18).

(4) Remove the dried sewage sludge from behind Building No. 177. Contingent upon State approval, apply to land or dispose of in the Gate 19 CD landfill (329 IAC 1-21).

b. We recommend the following to ensure good environmental engineering management practices:

(1) Confine surface disposal at the Gate 19 CD landfill to a limited area.

(2) Evaluate disposal records to determine projected solid waste generation quantities for the development of collection service contracts.

Wayne L. Hardcastle

WAYNE L. HARDCASTLE
Environmental Scientist
Waste Disposal Engineering
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APPROVED:

John W. Bauer

JOHN W. BAUER, P.G.
Program Manager
Ground Water and Solid Waste
Management

APPENDIX A

REFERENCES

1. AR 420-47, 1 December 1984, Solid and Hazardous Waste Management.

2. Indiana Administrative Code, Title 329, Article 1, Solid Waste Management Permit Regulations, 15 August 1974, Amended 1 July 1988; Article 2, Solid Waste Management, Adopted 11 January 1989.

3. Memorandum, USAEHA, HSHB-ME-SE, 31 October 1988, subject: Interim Final Report, Ground-Water Contamination Survey No. 38-26-0306-89, Evaluation of Solid Waste Management Units, Jefferson Proving Ground, Madison, Indiana, 8-12 August 1989.

4. Final Rule, Criteria for Classification of Solid Waste Disposal Facilities and Practices, 44 Federal Register (FR) 53461, 13 September 1979.

APPENDIX B

PERSONNEL CONTACTED

1. Entrance Briefing:
   a. Colonel Dennis O'Brian, Commander, JPG
   b. Mr. Jim Fritsche, P.E., Director, DEH, JPG
   c. Mr. Kaushik Joshi, Environmental Coordinator, JPG
2. Exit Briefing:
   a. Colonel Dennis O'Brian, Commander, JPG
   b. Mr. Jim Fritsche, P.E., Director, DEH, JPG
   c. Mr. Kaushik Joshi, Environmental Coordinator, JPG
3. Other Personnel Contacted:
   a. Mr. Bob Geisler, DRMO (OSB), JPG
   b. Mr. Phil Mann, Grounds, DEH, JPG
   c. Ms. Ann Christe, Assistant COR, Solid Waste Contracts, Building 33, JPG
   d. Mr. John Smolarsky, Operator, Solid Waste Transfer Station, Madison, Indiana