

U.S. Army Center for Health Promotion and Preventive Medicine

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INDUSTRIAL RADIATION STUDY NO. 27-MH-8260-R2-98
U.S. ARMY JEFFERSON PROVING GROUND
MADISON, INDIANA
21-23 APRIL 1998

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Command, ATTN: AMCSG, 5001 Eisenhower Avenue,
Alexandria, VA 22304-6100.

Readiness Thru Health



REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
U.S. ARMY CENTER FOR HEALTH PROMOTION AND PREVENTIVE MEDICINE
6158 BLACKHAWK ROAD
ABERDEEN PROVING GROUND, MARYLAND 21010-5422

EXECUTIVE SUMMARY

INDUSTRIAL RADIATION STUDY NO. 27-MH-8260-R2-98
U.S. ARMY JEFFERSON PROVING GROUND
MADISON, INDIANA
21-23 APRIL 1998

I. PURPOSE. This study was performed to assist in your efforts to implement the Nuclear Regulatory Commission (NRC) approved Environmental Monitoring Program (EMP) in accordance with NRC License Number SUB-1435 and its amendments. It requires the examination to the fate and transport of depleted uranium (DU) from the DU impact area at Jefferson Proving Ground.

II. CONCLUSION. A review of the EMP sampling results for April 1998 indicated the following:

A. Only one soil sample for the various sample medias in the restricted area exceeded the DU limit exposure criteria as required by the EMP.

B. The overall EMP is very sound and is being conducted IAW current regulatory requirements for radiation protection.

III. RECOMMENDATION. The following recommendation is provided to comply with regulatory requirements. Collect five follow-up samples from Grid #SOS6 to verify the depleted uranium activity reported in Appendix F, Table #4, in accordance with the Environmental Monitoring Program, NRC License Number SUB-1435. The five follow-up samples should be collected and analyzed during the next survey scheduled for October-November 1998 time period. The results of the five follow-up samples will be reported as an addendum in the next survey report.



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MADISON, INDIANA
21-23 APRIL 1998

I. REFERENCES. See Appendix A for a list of references.

II. AUTHORITY. Telephone conversation between Mr. Robert A. Aaserude, Radiation Safety Officer, U.S. Army Test and Evaluation Command (TECOM), Aberdeen Proving Ground, Maryland, and Mr. Harris Edge, Program Manager, Industrial Health Physics, U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM), March 1998.

III. PURPOSE. This study was performed to assist in your efforts to implement the Nuclear Regulatory Commission (NRC) approved Environmental Monitoring Program (EMP) in accordance with (IAW) NRC License Number SUB-1435 and amendments thereto. The NRC license requires the examination to the fate and transport of depleted uranium (DU) from the DU impact area at Jefferson Proving Ground (JPG).

IV. GENERAL.

A. An entrance interview was held with Mr. Kenneth G. Knouf, Site Manager, Department of the Army Civilian (DAC), JPG; Mr. Richard H. Herring, Physical Scientist, DAC, TECOM, Yuma Proving Ground; Mr. Billy D. McPherson, Safety Specialist, DAC, Huntsville Division, Corps of Engineers; Mr. David A. Pickett, Research Scientist, Southwest Research Institute, NRC Contractor; Mr. Patrick A. Laplante, Research Scientist, Southwest Research Institute, NRC Contractor; and Mr. Patrick Mark Moscato, Health Physicist, DAC, USACHPPM.

B. An exit briefing, to include a discussion of the sampling plan and findings, was held with Mr. Knouf and Mr. Herring.

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C. Mr. Moscato performed this study and is a qualified Health Physicist with varied expertise in radiological health issues. He has had all occupational health and safety training to include hazardous waste operations and current annual 8-hour refresher to administer a safe working environment.

D. This is the initial project for this sampling plan performed by USACHPPM. The NRC approved sampling plan that will be performed during the months of April and October.

E. Abbreviations for this study can be found in Appendix B.

V. FINDINGS.

A. General.

1. Mr. Aaserude is the Radiation Safety Officer for the U.S. Army Test and Evaluation Command (TECOM) under NRC License Number SUB-1435.

2. Mr. Herring was the point of contact for USACHPPM to assist in sample locations identified in the EMP. He implemented contamination control procedures to the sampling team for withdrawal from the DU impact area.

3. Mr. McPherson provided site safety support for the sampling team. The team was briefed with an abbreviated site safety and health plan (ASSHP) and provided a copy of the ASSHP (see Appendix C). Mr. McPherson provided explosive ordnance avoidance support throughout the project.

4. The USACHPPM's standing operating procedure (SOP) for the DU Sampling Program at JPG, effective 26 March 1998, was utilized for this project and is included in Appendix D.

5. The EMP requires biannually sampling.

B. Personnel Dosimetry Program. None required for this project.

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C. Radioactive Materials.

1. The NRC license authorizes the possession of DU only for decommissioning of DU metal and alloy located at the JPG site.

a. The NRC License Number SUB-1435. The maximum amount that the licensee may possess at any one time under this license is 80,000 kilograms.

b. The NRC approved EMP requires biannually environmental sampling which includes soil, sediment, surface water, and ground water samples.

c. Radioactive material warning signs were posted IAW regulatory requirements.

d. An ASSHP for entering the DU impact area was established and implemented.

2. Action Levels:

a. Every effort will be made to maintain radiation exposures and releases of radioactive and non-radioactive toxic metals to unrestricted areas as low as is reasonable achievable.

b. The following criteria for the restricted area will be used to limit (DU) exposure as stated in the EMP. The EMP was approved by the NRC in a letter dated July 22, 1996.

(1) Soil & Sediment:

* Perimeter and background samples:

< 35 picocurie per gram (pCi/g) - no corrective action

> 35 pCi/g - collect 5 additional samples in a 1 meter square grid

If average is still > 35 pCi/g, decontaminate to levels of 35 pCi/g

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* Sample locations along the lines of fire:

< 100 pCi/g - no corrective action

100-300 pCi/g - collect 5 additional samples in a 1 meter square grid

If average is still > 100 pCi/g, investigate to determine reason for the high level.

> 300 pCi/g is verified, investigate to determine reason for the high level and notify the NRC.

(2) Surface & Ground Water:

Depleted Uranium [Note: Title 10, Code of Federal Regulations, Part 20, Appendix B (effluent concentrations for water) limit is 3.0×10^{-1} picocurie per milliliter (pCi/ml)]:

< 1.5×10^{-1} pCi/ml - no corrective action

> 1.5×10^{-1} pCi/ml - resample: if results are > 1.5×10^{-1} pCi/ml, investigate to determine reason for the high level and notify the NRC.

3. Basis for Action. When action levels are exceeded, an evaluation of cause will be performed by the TECOM Radiation Protection Officer, (RPO). The TECOM RPO will provide a report of findings to the licensee's Radiation Control Committee. Based on their determination., recommendations to the Commander on corrective action will be made.

D. Records and Reports.

1. Records were available to show previous locations sampled as part of the EMP.

2. Instrumentation used for this project was calibrated at the required frequency (see Appendix E).

E. Survey Results.

1. Soil Samples. Previous laboratory analysis for TECOM at JPG was performed by Georgia Institute of Technology.

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The previous contractor analyzed the soil samples using the wet procedure. The USACHPPM used the dry procedure for preparing the samples for analysis. All soil sample locations and exposure results are presented in Appendix E. The soil sample number SOS6 was collected along the line of weapon fire within the impact area. The laboratory analysis for sample number SOS6 via gamma spectroscopy methodology indicated the presence of 120 ± 20 pCi/g of thorium-234 (Th-234). Assuming that the radioactive daughter of uranium-238 (U-238), Th-234, is at equilibrium with U-238, the data indicates U-238 was slightly above the contamination level authorized in the NRC approval EMP. Laboratory analysis of soil sample results are presented in Appendix F.

2. Sediment Samples. All sediment sample locations are presented in Appendix E. Analysis of the sediment samples resulted in no recommended corrective action required. Laboratory analysis of sediment sample results are presented in Appendix F.

3. Surface Water Samples. All surface water sample collection locations are presented in Appendix E. The surface water sample results indicated no corrective action required as stated in the EMP. Laboratory analysis of surface water sample results are presented in Appendix F.

4. Ground Water Samples. All ground water sample locations are presented in Appendix E. Analysis of the ground water samples resulted in no corrective action required as stated in the EMP. Laboratory analysis of sediment sample results are presented in Appendix F.

5. External Radiation Monitoring Results. Radiation exposure measurements were taken at each area where soil samples were collected; of nearby areas where ground water samples were collected and in the area where sediment samples were collected. All radiation exposure results are presented in Appendix E. The radiation exposure measurements ranged from a low of 6.5 microroentgen per hour ($\mu R/hr$) to a high of 17.1 $\mu R/hr$.

VI. DISCUSSION. Soil sample number SOS6 was obtained in the DU impact area at approximately 0.5 mile east of the intersection between C-Road and East Recovery Road. During the walk back from the sampling location, a higher exposure measurement was observed near ground level. An investigation uncovered a M833 round (DU round) for a 105 millimeter gun.

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The DU round had oxidized at both ends of the rod but not in the middle portion. The background exposure rate measurements for this area ranged from approximately 9.5 to 10 μ R/hr. The exposure rate measurement on contact of the rod maximized at 1.78 milliroentgens per hour (mR/hr). At 1 meter from the rod the exposure rate measurement was approximately 30 μ R/hr.

VII. CONCLUSION. A review of the EMP sampling results for April 1998 indicated the following:

A. Only one soil sample for the various sample medias in the restricted area exceeded the DU limit exposure criteria as required by the EMP.

B. The overall EMP was very sound and was being conducted IAW current regulatory requirements for radiation protection.

VIII. RECOMMENDATIONS. The following recommendation is provided to comply with regulatory requirements. Collect five follow-up samples from Grid #SOS6 to verify the depleted uranium activity reported in Appendix F, Table #4, in accordance with the Environmental Monitoring Program, NRC License Number SUB-1435. The five follow-up samples should be collected and analyzed during the next survey scheduled for October-November 1998 time period. The results of the five follow-up samples will be reported as an addendum in the next survey report.



PATRICK MARK MOSCATO
Health Physicist
Industrial Health Physics Program

APPROVED:



HARRIS EDGE
Program Manager
Industrial Health Physics

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Madison, IN, 21-23 Apr 98

APPENDIX A

REFERENCES

1. NRC License Number SUB-1435, amendments, and Environmental Radiation Monitoring Plan at JPG, 8 May 1998, TECOM, Aberdeen Proving Ground, Maryland.
2. Title 10, Code of Federal Regulations (CFR), 1997 rev., Part 19, Notices, Instructions and Reports to Workers; Inspection.
3. Title 10, CFR, 1997 rev., Part 20, Standards for Protection Against Radiation.
4. Title 10, CFR, 1997 rev., Part 21, Reporting of Defects and Noncompliance.
5. Title 10, CFR, 1997 rev., Part 40.42(c), Expiration and termination of licenses and decommissioning of sites and separate buildings or outdoor areas.
6. USACHPPM's SOP for DU Sampling Program at Jefferson Proving Ground, 26 March 1998.
7. ASSHP, 15 April 1998, Jefferson Proving Ground, Madison, IN.
8. ETL 385-1-2, 15 May 1995, Generic Scope of Work For Ordnance Avoidance Operations.
9. USAEHA TG No. 155, Environmental Sampling Guide, February 1993.
10. Letter, dated July 22, 1996, Nuclear Regulatory Commission, subject: Approval of the Environmental Radiation Plan and Security Plan.

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APPENDIX B

ABBREVIATIONS

ASSHP	Abbreviated Site Safety and Health Plan
DAC	Department of the Army Civilian
DU	depleted uranium
EMP	Environmental Monitoring Program
IAW	in accordance with
JPG	Jefferson Proving Ground
μ R/hr	microrentgen per hour
mR/hr	milliroentgen per hour
NRC	Nuclear Regulatory Commission
RPO	Radiation Protection Officer
SOP	standing operating procedure
TECOM	Test and Evaluation Command
USACHPPM	U.S. Army Center for Health Promotion and Preventive Medicine

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APPENDIX C
ABBREVIATED SITE SAFETY AND HEALTH PLAN

25 November 1997

ABBREVIATED SITE SAFETY AND HEALTH PLAN (ASSHP)

SITE NAME: JEFFERSON PROVING GROUND

SITE LOCATION: MADISON IN.

SITE PHONE # 812) 265-2488

DATE(S) OF VISIT: 20-24 APRIL 1998

PURPOSE OF VISIT: TO PROVIDE SAFETY OVERSIGHT
FOR SOIL SAMPLING - OE AVOIDANCE

ASSHP PREPARED BY: BILL McPHERSON

OFFICE: CEHNC-06-S-AI

ADDRESS: HUNTSVILLE AL

TELEPHONE: 256) 895-1595

DATE PREPARED: 15 APRIL 1998

SIGNATURE: Bill McPherson DATE: 15 APRIL 1998

=====

ASSHP REVIEWED/APPROVED BY:

CEHNC SAFETY OFFICE: Wayne Stalder DATE: 4/16/98

DATE: _____

NOTE: This ASSHP is to be used only for non-intrusive site visits and it must be approved by the Safety Office prior to the start of the field visit. All team members must read, sign, and comply with this document, and must attend the safety briefings. The SSO shall ensure the Safety Briefing Checklist and the Plan acceptance forms are filled out prior to the start of the visit.

I. SITE DESCRIPTION AND PREVIOUS INVESTIGATIONS: (ATTACH A SITE MAP TO THIS ASSHP)

a. SITE DESCRIPTION:

- SIZE: 55,000 ACRES
- PRESENT USAGE: (Check all that apply)

- | | | |
|---------------------------------------------|------------------------------------------------|------------------------------------------|
| <input type="checkbox"/> Military | <input type="checkbox"/> Recreational | <input type="checkbox"/> Other (specify) |
| <input type="checkbox"/> Residential | <input type="checkbox"/> Commercial | _____ |
| <input type="checkbox"/> Natural Area | <input checked="" type="checkbox"/> Industrial | _____ |
| <input type="checkbox"/> Agricultural | <input type="checkbox"/> Landfill | _____ |
| <input checked="" type="checkbox"/> Secured | <input checked="" type="checkbox"/> Active | <input type="checkbox"/> Unknown |
| <input type="checkbox"/> Unsecured | <input type="checkbox"/> Inactive | |

b. PAST USES: (Attach a summary of the historic uses of this site. Identify specific areas if possible.) IS A PROVING GROUND LISTED ON BRAC

c. SURROUNDING POPULATION:

- | | | |
|-------------------------------------|--------------------------------------|------------------------------------------|
| <input type="checkbox"/> Rural | <input type="checkbox"/> Residential | <input type="checkbox"/> Other (specify) |
| <input type="checkbox"/> Urban | <input type="checkbox"/> Industrial | _____ |
| <input type="checkbox"/> Commercial | | _____ |

d. PREVIOUS SAMPLING INVESTIGATION RESULTS:

1. OE Encountered (BE SPECIFIC): SEE ATTACHED LIST

Location:	Description:
<u>THE LOCATION OF THE</u>	<u>60MM, 81MM, 90MM, 105MM</u>
<u>OE HAS BEEN IN THE</u>	<u>155MM, MINES, GRENADES,</u>
<u>AREA SOUTH OF THE FIRING</u>	<u>BOMBS, ROCKETS</u>
<u>LINE.</u>	
_____	_____
_____	_____

2. SAMPLES (BE SPECIFIC): (AIR, WATER, SOIL, VEGETATION)

CHEMICAL:	CONCENTRATION:	MEDIA:	LOCATION:
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

II. DESCRIPTION OF ON-SITE ACTIVITIES: (CHECK ALL THAT APPLY)

- Walk-through
- Drive-through
- Other (specify) _____
- On Road
- Off Road
- On Path
- Off Path

Activities/Tasks to be performed (summarize):

TO TAKE VARIOUS SOIL SAMPLES, WATER SAMPLES FROM EXISTING WELLS, AND WATER & SEDIMENT SAMPLES FROM CREEK

III. SITE PERSONNEL AND RESPONSIBILITIES: (Provide name and other data listed below)

PROJECT MANAGER: RICHARD HEERING

OFFICE: STE. P-CD-ES

ADDRESS: YUMA PROVING GROUND

TELEPHONE: 520) 328-3786

RESPONSIBILITIES: TAKE SAMPLES

TEAM LEADER: RICHARD HERRING

OFFICE: _____

ADDRESS: _____

TELEPHONE: _____

RESPONSIBILITIES: _____

SSHO: BILL McPHERSON

OFFICE: CEHNC-OE-S-AI

ADDRESS: HUNTSVILLE AL

TELEPHONE: 256) 295-1595

RESPONSIBILITIES: PROVIDE SAFETY OVERSIGHT

FIRST AID/CPR CERTIFIED: BILL McPHERSON
(if applicable)

OFFICE: SAME

ADDRESS: _____

TELEPHONE: _____

RESPONSIBILITIES: _____

TEAM MEMBERS (Other than those listed above):

NAME	RESPONSIBILITY
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

IV. HAZARD ANALYSIS:

a. Safety and Health Hazards anticipated:

() CHEMICAL (be specific and include warning signs/symptoms of overexposure): NONE EXPECTED

() Ordnance (specify): 20LB, 100LB FRAG BOMBS, M13 BUTTERFLY BOMBLET, 60MM, 81MM, 90MM, 105MM, 2.36IN ROCKET, 4.5IN ROCKET, M108

- | | | |
|-------------------------------------------------|-----------------------------------------------------|-----------------------------------------------------|
| <input type="checkbox"/> Heat Stress | <input type="checkbox"/> Cold Stress | <input checked="" type="checkbox"/> Tripping Hazard |
| <input type="checkbox"/> Noise | <input type="checkbox"/> Electrical | <input type="checkbox"/> Falling Objects |
| <input checked="" type="checkbox"/> Foot Hazard | <input type="checkbox"/> Biological | <input type="checkbox"/> Overhead Hazard |
| <input type="checkbox"/> Radiological | <input type="checkbox"/> Confined Space | <input checked="" type="checkbox"/> Water Hazard |
| <input checked="" type="checkbox"/> Explosive | <input checked="" type="checkbox"/> Climbing Hazard | <input type="checkbox"/> Other (specify) |
| <input type="checkbox"/> Flammable | | |

DU PENETRATORS

b. OVERALL HAZARD EVALUATION:

() High Moderate () Low () Unknown

JUSTIFICATION FOR EVALUATION (provide brief justification supporting the overall rating):

OE IN THE AREA, WALKING TO SAMPLE LOCATIONS,
CLIMBING IN & OUT OF CREEK AREA, SNAKES, TICKS,
WASPS

V. ACCIDENT PREVENTION (expand as applicable on attached page(s)):

a. General Precautions: Prior to the on-site visit, all team members are required to read this ASSHP and sign the form acknowledging that they have read and will comply. In addition, the SSHO shall hold a brief tailgate meeting in which the site-specific topics regarding the days activities will be discussed. The buddy system will be enforced at all times. If unanticipated hazardous conditions arise, team members are to stop work, leave the immediate area, and notify the SSHO.

VI. STANDING OPERATING SAFETY PROCEDURES, ENGINEERING CONTROLS, AND WORK PRACTICES:

a. SITE RULES/PROHIBITIONS: At any sign of unanticipated hazardous conditions, stop tasks. Leave the immediate area and notify the SSHO. Smoking, eating, and drinking are allowed in designated areas only.

b. MATERIAL HANDLING PROCEDURES: Do not handle.

c. DRUM HANDLING PROCEDURES: Do not handle.

d. CONFINED SPACE ENTRY: Do not enter.

e. IGNITION SOURCE AND ELECTRICAL PROTECTION: Smoke in designated areas only.

f. SPILL CONTAINMENT: N/A

g. EXCAVATION SAFETY: Do not enter trenches/excavations.

h. ILLUMINATION: Work during daylight hours only.

i. SANITATION: Use existing sanitary facilities.

j. BUDDY SYSTEM: Two (2) individuals on-site maintaining constant contact with each other. This shall be adhered to at all times.

k. ENGINEERING CONTROLS: N/A

l. HEAT/COLD STRESS: Dress appropriately. Take sufficient breaks and drink plenty of fluids. Watch for signs/symptoms of cold/heat stress. Monitoring may be applicable depending on site weather conditions and types of Personal Protective Equipment (PPE) worn.

m. ORDNANCE:

1. General Information:

(A) The cardinal principle to be observed involving explosives, ammunition, severe fire hazards and/or toxic materials is to limit the exposure of a minimum number of personnel, for the minimum amount of time, to a minimum amount of hazardous material consistent with a safe and efficient operation.

(B) The age or condition of an ordnance item does not decrease the effectiveness. Ordnance that has been exposed to the elements for extended periods of time become more sensitive to shock, movement, and friction due to the fact that the stabilizing agent in the explosives may be degraded.

(C) When chemical agents may be present, further precautions are necessary. If the munition item(s) has green markings, leave the area immediately since the item(s) may contain a chemical filler.

(D) Consider ordnance that has been exposed to fire as extremely hazardous. Chemical and physical changes may have occurred to the contents which render them more sensitive than they were in their original state.

2. On-site Instructions:

(A) DO NOT touch or move any ordnance item(s) regardless of the markings or apparent condition.

(B) DO NOT visit an ordnance site if an electrical storm is occurring or approaching. If a storm approaches during a site visit, leave the site immediately and seek shelter.

(C) DO NOT use radios nor cellular phones in the vicinity of suspect ordnance items.

(D) DO NOT walk across an area where the ground can not be seen. If dead vegetation or animals are observed, leave the area immediately due to potential contamination by chemical agent.

(E) DO NOT drive vehicles into a suspected OEW area, use clearly marked lanes.

(F) DO NOT carry matches, cigarettes, lighters, nor other flame-producing devices onto an OE site.

(G) DO NOT rely on color code for positive identification of ordnance item(s) nor their contents.

(H) Approach ordnance items from the side, avoid approaching the front or rear areas.

(I) Always assume ordnance items contain a live charge until it can be ascertained otherwise.

3. Specific actions upon locating ordnance:

(A) DO NOT touch, move, or jar any ordnance item(S), regardless of its' apparent condition.

(B) Approach the item(s) cautiously. Take photographs and make a full description. Take notes of the markings or any other identifying features.

(C) DO NOT be misled by markings on the ordnance item stating "practice bomb", "dummy", or "inert". Even practice bombs contain explosive charges that are used to mark/spot the point of impact. The item(s) could also be mismarked.

(D) DO NOT roll the item over nor scrape the item to identify the markings.

(E) The location of any ordnance items found during site investigations should be clearly marked on the map so as to be easily located and avoided.

(F) CEHNC-OE-S should be notified upon location of any ordnance. See Section VIII for telephone numbers.

n. Other (specify): _____

VII. SITE CONTROL AND COMMUNICATIONS:

- a. Site Map: Attach copy.
- b. Site Work Zones: N/A
- c. Buddy System: To be adhered to at all times.
- d. Communications:

1. On-site: Verbal communications will be used among team members to communicate to each other on site. If this communication is not possible, hand signals shall be developed and used (specify) ① HANDS CLUTCHING THROAT: CAN'T BREATHE

② HANDS ON HEAD: NEED HELP ③ THUMBS UP: OK

④ THUMBS DOWN: NO ⑤ GRASP PARTNER'S WRIST: LEAVE AREA NOW

2. Off-site: Off-site communications shall be established on every site. Communications may be established by using an on-site cellular phone or by locating the nearest public or private telephone which may be readily accessible. Mark the appropriate box:

cellular phone public/private phone other: _____

3. Emergency Signals: In the case of small groups, a verbal signal for emergencies shall suffice. The emergency signal for large groups (ie: airhorn) should be incorporated at the discretion of the SSHO. Mark the appropriate box:

verbal non-verbal (specify): WHISTLE

VIII. EMERGENCY RESPONSE:

a. Team members are to be alert to the dangers associated with the site at all times. If an unanticipated hazardous condition arises, stop work, evacuate the immediate area, and notify the SSHO.

b. First Aid: A first aid kit and emergency eye wash kit (if applicable) will be located in the SSHO field car. If qualified individuals (ie: fire department, medical facility, physician) are not accessible within five minutes of the site, at least one (1) team member shall be qualified to administer first aid and CPR.

c. Emergency Telephone Numbers:

1. MEDICAL FACILITY: 812) 265-5211 911
2. FIRE DEPARTMENT: 812) 265-4326 911
3. ~~POLICE~~ ^{SHERIFF} DEPARTMENT: 812) 265-2648
4. POISON CONTROL CENTER: 404) 638-3535
5. CEHNC-OE-S OFFICE: 205-895-1582 OR 1598

(For emergencies involving the discovery of OE, contact CEHNC. Huntsville will determine the nature of the emergency and contact appropriate authorities. If there is no answer at CEHNC, contact the local law enforcement office).

6. LOCAL EOD: 43rd EOD 502) 624-5631
7. PROJECT MANAGER: GLENN FARHAT 206) 895-1577
8. OTHERS (list): _____

d. Hospital/Medical Facility Information:

Name: KING'S DAUGHTER HOSPITAL

Address: _____

Distance to Facility: 7.5 MILES

Route to Facility: SEE ATTACHED MAP

(Attach a map with the route clearly marked to the facility. If a map is not available, attach clearly written directions).

IX. MONITORING EQUIPMENT AND PROCEDURES:

a. Exposure Monitoring: For non-intrusive on-site activities such as site visits, air monitoring is typically not required; however, if the site situation dictates the need for monitoring, complete the following information on a separate page and attach to this ASSHP.

1. Monitoring Equipment to be utilized.
2. Documentation of equipment calibration and results.
3. Action levels.

b. Heat/Cold Stress: If heat stress monitoring is necessary, the monitoring criteria published in Chapter 8 of the NIOSH/OSHA/USCG/EPA "Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities" (October 1985) shall be followed. If cold stress monitoring is necessary, it shall be conducted in accordance with (IAW) the most current published American Conference of Governmental Industrial Hygienists (HCGIH) Cold Stress Standard.

X. PERSONAL PROTECTIVE EQUIPMENT:

a. General: Typically, for non-intrusive site visits, Level D is required. Hard hats shall be worn if an overhead hazard exists, safety shoes shall be worn if a foot hazard exists, and safety glasses shall be worn if an eye hazard exists. If a higher level of protection is to be used initially, or as a contingency, attach a brief discussion.

b. Non-intrusive site visit: Level of protection as follows:

Initial: ()C D ()Modified (specify) _____

Contingency: ()C D ()Modified (specify) _____

Evacuate site if higher level of protection is needed.

XI. DECONTAMINATION PROCEDURES: (If DECON is required, attach additional sheet(s) with the requirements). Decontamination procedures are not anticipated for site visits/investigations. Team members are cautioned not to walk, kneel, nor sit on any surface that indicate potential leaks, spills, or contamination.

XII. TRAINING: All site personnel shall have completed the training required by EM 385-1-1 (19 June 1997) (Safety and Occupational Health Program Management) and 29CFR 1910.120(e). The project manager shall ensure, and the SSHO shall verify, that all on-site personnel shall have completed appropriate training prior to submitting this document to the Safety Office for review and approval. Additionally, the SSHO shall inform personnel, before they enter the site, of any potential site-specific hazards or procedures.

XIII. MEDICAL SURVEILLANCE PROGRAM: The project manager shall ensure, and the SSHO shall verify, that all on-site personnel are on the Medical Surveillance Program and that they meet the requirements of 29CFR 1910.120 and ANSI Z-88.2, as appropriate, depending on the PPE and site-specific tasks.

Provide the following information on training and medical surveillance:

NAME	COURSE DATE (40 OR 8 HOUR)	PROVIDER	MEDICAL EXAM (DATE)
Bill McPherson	DEC 97	CEHNC	APR 88

XIV. LOGS, REPORTS, AND RECORD KEEPING: Site logs are maintained by the team leader. This is to include historical data, personnel authorized to visit the site, all records, standard operating procedures, the ASSHP, any air monitoring logs, and attachments to all plans.

XV. GENERAL: The number of individuals visiting the site shall be held to a minimum. No more than eight (8) individuals per SSHO shall be allowed on site. The more people on site, the greater the potential for an accident. The SSHO may modify this document if site conditions warrant, and the modification does not risk the safety nor health of the team members. This modification shall be coordinated with the team members and the SSHO shall notify OE-S of the change as the situation allows.

SAFETY BRIEFING CHECKLIST
(Check subjects discussed)

SITE NAME:

JPG

DATE/TIME:

-
- Purpose of visit
 - Identification of key personnel
 - Training and medical requirements

SPECIFIC INFORMATION

- Site description/Past uses
- Results of previous studies
- Potential site hazards
- OE safety procedures
- Site SOPs
- Site control and communications
 - Emergency hand signals
- Emergency response
 - Location of first aid kit(s)
 - Emergency phone numbers and locations
 - Location of nearest medical facility and location of map/written directions to the facility
- Personal Protective Equipment (PPE)

Stress the following during the briefing:

If an unanticipated hazardous condition arises, stop work, evacuate the immediate area, and notify the SSHO.

PLAN ACCEPTANCE FORM

ABBREVIATED SITE SAFETY AND HEALTH PLAN
FOR

JPG

(Site name and location)

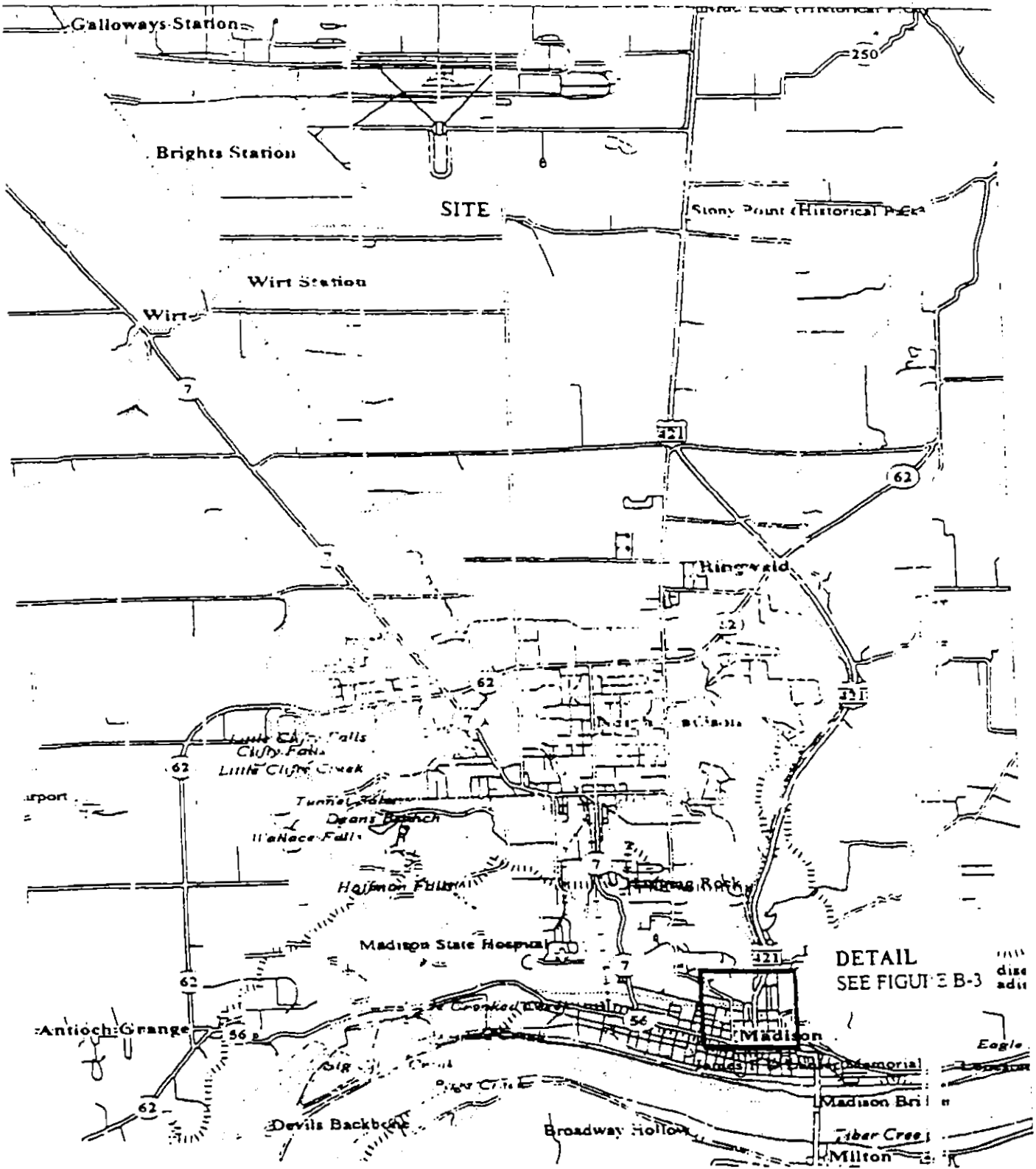
I have read and agree to abide by the contents of the Site Safety and Health Plan, and I have attended the safety briefing for the aforementioned site.

NAME (PRINT)	OFFICE	SIGNATURE	DATE
PATRICK MACK MUSCATO	USACHPPH-AMG, MD.	<i>Patrick Mack Muscato</i>	
Richard Herring	USA YPG-CD-ES	<i>Richard Herring</i>	
Patrick LaPlante	Southwest Research Inst. (NRL Contractor)	<i>Patrick LaPlante</i>	
Ker: Krouf	JPG	<i>Ker: Krouf</i>	
David Pickett	Southwest Res. Inst (NRL Contractor)	<i>David Pickett</i>	4/21/98

Person presenting the Safety Briefing:

Bill M Pherson
(Signature)

(Date)



Scale 1:62,500 (at center)

1 Miles

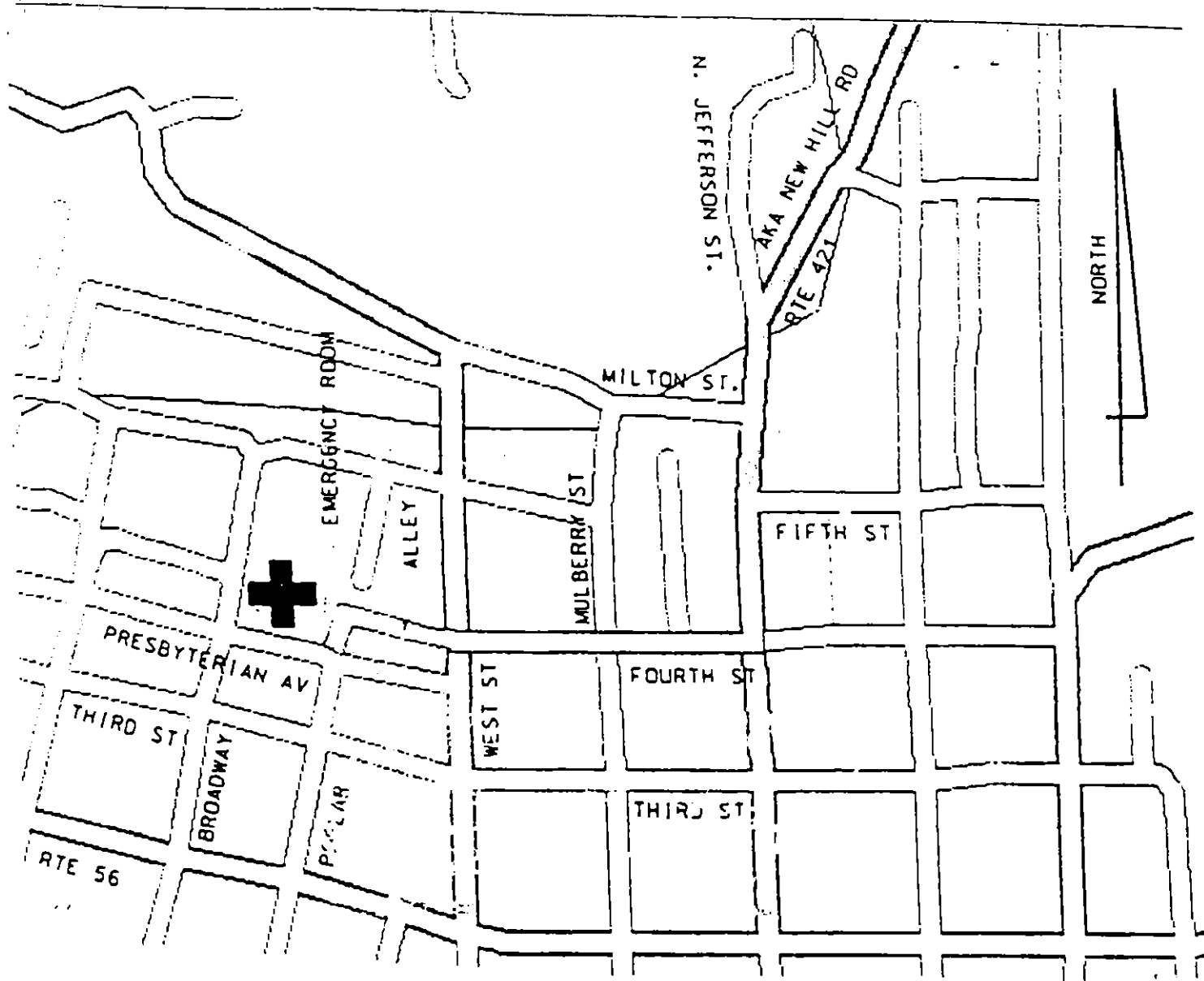
2 KM

KINGS DAUGHTERS HOSPITAL
(812)265-5211

Route to the nearest medical facility

Take US Route 421 south approximately 7.3 miles to Madison (see Figure B-3)
 Turn right on Fourth Street. Go two (2) blocks. Cross West Street.
 Proceed down an Alley to the Emergency Entrance to the Hospital

99J DeLorme Mapping



KINGS DAUGHTERS HOSPITAL
(812)265-5211

Route to the nearest medical facility

Take US Route 421 south approximately 7.3 miles to Madison (see Figure B-2)
 Turn right on Fourth Street. Go two (2) blocks. Cross West Street.
 Proceed down an Alley to the Emergency Entrance to the Hospital

FIGURE B-3

Nomenclature

Booster Tube
20 lb Frag Bomb M41A1
100 lb Frag Bomb
PD Fuze
M15 Cluster Adapter
M18 Smoke Grenade
M83 Butterfly Bomblet
60 mm Mortar
81 mm Mortar
90 mm Cartridge Case
105 mm Cartridge Case
Mortar, Subcal 22mm
PDSQ Fuze
Fuze, Bomb, Nose, M104
Ground Signal Projector
2.36" Rocket
4.5" Rocket
Slap Flares
Rifle Grenades
105 mm projo
155 mm projo
M15 AT Mine
M26 AP Mine
Gator AP/AT Mine
Mk 2 Grenades

UXB International, Inc.

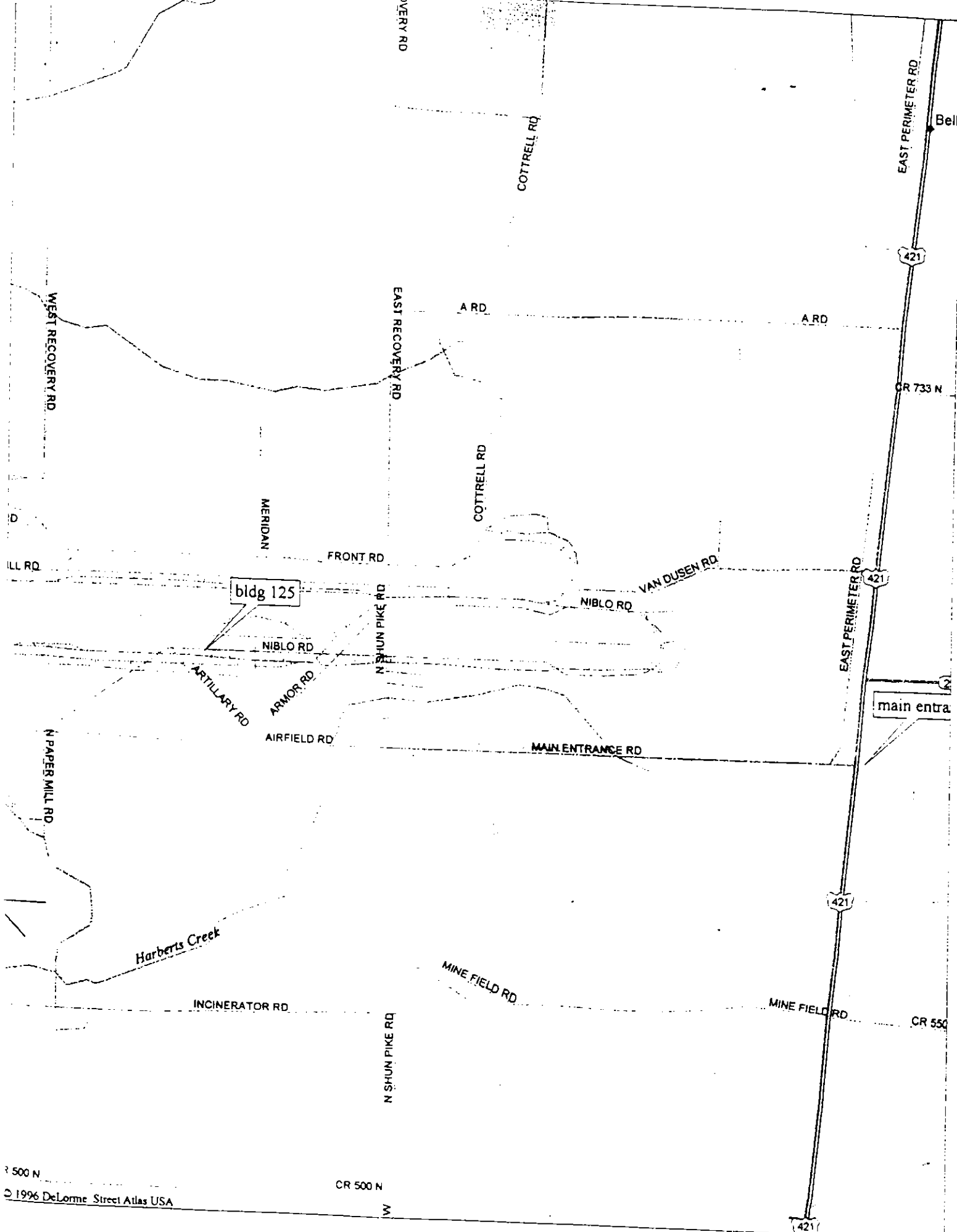
**Table 6-16
EMERGENCY TELEPHONE NUMBERS**

AGENCY	NAME	TELEPHONE NUMBER
Medical Facility	King's Daughter's Hospital	(812) 265-5211
Fire Department	<u>Ryker's Ridge Volunteer Fire Department</u>	911 (812) 265-4326 3113
Police Department	Madison Police Department	(812) 265-2648 3347
Ambulance Service		911
Environmental Agencies <ul style="list-style-type: none"> ■ Federal ■ State 	U.S. EPA Region 5 Indiana Conservation Officer	(800) 621-8431 (812) 837-9536
CIH	Steven P. Clay	(703) 330-1122
Contracting Officer	Mary Dowling	(205) 895-1150
CEHNC PM	Glen Earhart	(205) 895-1577
JPG Site Manager	Kenneth Knouf	(812) 273-2551
Army EOD	43 rd - Fort Knox	(502) 624-6426
UXB Headquarters		(703) 724-9000 1-800-805-3338 - EMERGENCY
UXB LCPM	TBD	
UXB Program Manager	<u>George Overby</u>	<u>1-800-208-2038</u>
US Army Corp. of Engineers Mandatory Center of Expertise for Ordnance and Explosive Waste		<u>REGULAR HOURS</u> (205) 895-1582, 1507, 1510 <u>OFF DUTY HOURS</u> 1(800) 627-3532 PIN# 777-2534 At beep, enter your number (including area code) and Huntsville will return your call

UXB International, Inc.

C. Local Points of Contact

AGENCY	NAME	TELEPHONE NUMBER
EMERGENCY		
Fire Department	<u>Rykers Ridge Volunteer Fire Department</u>	(812) 265-4326 3113
Police Department	<u>Madison Police Department</u>	(812) 265-2648 3347
ENVIRONMENTAL		
JPG BRAC Environmental Coordinator	<u>Paul D. Cloud</u>	1-800-392-2015 Ext. 1088
USDA District Conservation for Wetland Areas	<u>Karen Hauer</u>	(812) 273-1200
U.S. Fish & Wildlife Service: Endangered Species	<u>Scott Pruitt</u>	(812) 334-2461 ext. 217
Indiana Dept. of Natural Resources: Endangered Species	<u>Katy Smith</u>	(317) 233-3160
State of Indiana & Environmental Management	<u>John Mankey, Jr.</u>	1-800-451-6027 (317) 233-6425
MEDICAL		
Ambulance Service	No Contact Name	911
Medical Facility	<u>King's Daughter's Hospital</u>	(812) 265-5211
JEFFERSON PROVING GROUND		
JPG Site Manager	<u>Kenneth Knouf</u>	(812) 273-2551
U.S. Army		
Army EOD	<u>43rd - Fort Knox</u>	(502) 624-6426
UXB International, Inc.		
Site Office	No Contact Name	TBD (812) 265-2499
Senior UXO Supervisor	<u>James Tomiko</u>	TBD FAX-5670
FAA		
<u>Indianapolis, Indiana</u> <u>Air Route Traffic Control Center</u>	<u>No Contact name</u>	(317) 247-2201
<u>Terre Haute, Indiana</u> <u>Automated Flight Service Station</u>	<u>No Contact Name</u>	(812) 877-3555
Other		
<u>State Police Road and Weather</u>	<u>No Contact Name</u>	(812) 689-4300
<u>Madison, Indiana Airport</u>	<u>Airport Manager</u>	(812) 273-2009



IPG

Indust Radn Study No. 27-MH-8260-R2-98, JPG, Madison, IN,
21-23 Apr 98

APPENDIX D
USACHPPM's SOP FOR THE
DU SAMPLING PROGRAM
AT JPG
29 APRIL 1998

USACHPPM'S Standing Operating Procedure for DU Sampling Program
at Jefferson Proving Ground

Effective 26 March 1998
Revised 29 April 1998

Industrial Radiation Study 27-MH-8260-R#-YY

1. Environmental Sampling will be conducted biannually during the fiscal year (currently Oct & Apr) following conditions for U.S. Nuclear Regulatory Commission (NRC) License Number SUB-1435 from the Environmental Radiation Monitoring (ERM) Plan. The ERM was approved 22 July 1996 by the NRC.
2. Contact Mr. Aaserude initially for coordination of site visit.
3. Point(s) of Contact for coordination are:
 - a) U.S. Army Test and Evaluation Command, APG, Md.
Mr. Robert A. Aaserude (TECOM RPO)
Commercial: (410) 671-1308
DSN: 298-1308
Fax: (410) 278-3735
 - b) U.S. Army Test and Evaluation Command, YPG, Arizona
Mr. Richard Herring (Physical Scientist)
DSN 899-3786
 - c) Jefferson Proving Ground, Indiana
Mr. Site Management Team:
Mr. Ken Knouf, Site Manager
Mr. Phil Mann
Ms. Yvette Hayes
Commercial: (812) 273-2551/2522/6075
4. Prepare CHPPM Form 330-R-E (Request for Laboratory Services)
5. Inform Program Support Assistant (Dawn Conner) when you are scheduling this study. The report number will be identified as 27-MH-8260-R#-YY. The report designation (R#) will be R1 for October survey and R2 for April survey. YY represents the current fiscal year special study is being performed.
6. Sampling media will total 6 soil, 8 sediment, 8 surface water, and 11 ground water sample plus quality control samples. Split, duplicate and/or blank samples will be submitted as appropriate.

a) Impact Area Soil Sample Locations. Six sample locations will be located, four at the corners of the trapezoidal impact field and two near the center along the trajectory axis of the field (See Figure 1). These samples will be used to determine if weathering of expended tank penetrator projectiles is occurring. Samples will be taken semiannually, unless action level is exceeded, and quarterly as long as corrective action is required.

b) Sediment Samples. In each of the two streams (Big Creek & Middle Fork Creek), three sediment samples will be taken downstream and one upstream, as a control, from the impact area for the DU penetrator programs. (See Figure 2). These samples will be taken to determine if any DU particles have entered the stream. Samples will be taken from low spots or bends, when possible. One sample will be at the point where drainage from an impact area initially enters the stream. One sample will be from a point located midway between the initial sample and the installation boundary. The final downstream sample will be taken at the installation boundary. Samples will be taken semiannually, unless the action level is exceeded, and quarterly as long as corrective action is required.

c) Water Samples (See special instructions in section 9.

1) Surface Water. In each of the two streams (Big Creek & Middle Fork Creek), three water samples will be taken downstream and one upstream, as a control, from the impact area for the DU penetrator programs to determine the migration of soluble uranium compounds (See Figure 2). One sample will be at the point where drainage area enters the stream. One sample will be from a point located midway between the initial sample and the installation boundary. The final downstream sample will be taken at the installation boundary. Samples will be taken semiannually, unless the action level is exceeded, and quarterly as long as corrective action is required.

2) Ground Water. Eleven ground monitoring wells have been installed (See Figure 3). Ground monitoring wells are approximately 40 feet deep. If DU migrates to the ground water, it is expected to be detected in the three wells in the impact area first. The two wells located near the south perimeter are considered to be background samples because they are upstream from the impact area. Samples are collected semiannually. If action levels are exceeded, quarterly sampling will be initiated

Industrial Radiation Study No. 27-MH-8260-98, SOP DU Sampling Program, JPG, IN, 26 Mar 98

as long as corrective action is required.

6. Methodologies for sampling used for this special project will following the guidance outlined in USAEHA Technical Guide No. 155, Environmental Sampling Guide, February 1993.

Sample Contamination Management.

a) Disposable gloves and splash protective apparel (i.e., saranex aprons, eye protection) will be worn when applicable. Gloves will be changed between each sample collection.

b) Sample collection equipment will be washed with deionized or distilled water and dried between each sample. All disposable equipment will be used one time only. Equipment washing will be done over the sample collection point prior to moving to the next sample location. Disposal will be in accordance with the ERM for Jefferson Proving Ground.

7. Water monitoring wells will be purged using bailers prior to sampling. Purging and sampling operations will comply with the Environmental Radiation Monitoring (ERM) Plan for Jefferson Proving Ground. Sampling waste will be handled in accordance with the ERM.

8. Sample Analysis of all environmental samples will be performed through the U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM); Radiologic, Classic & Clinical Chemistry Division (RCCCD); Aberdeen Proving Ground, Maryland.

a) Samples will be analyzed in accordance with USACHPPM, RCCCD protocols and procedures. All environmental samples will be coordinated with the TECOM RPO for disposal instructions.

b) The QA for laboratory instruments will be performed by RCCCD, USACHPPM.

9. Inform RCCCD when shipping back of water samples. All collected samples will be placed in self-sealing containers and shipped to USACHPPM via Federal Express. **Water samples must arrive back at CHPPM no later than 4 days from sampling time** for holding time no to be exceeded. No filtering of sample or preservative will be performed in the field. RCCCD must test

Industrial Radiation Study No. 27-MH-8260-98, SOP DU Sampling Program, JPG, IN, 26 Mar 98

for dissolved DU in the water.

10. All laboratory samples will be controlled (chain-of-custody) in accordance with USAEHA TG No. 155, Appendix E.

11. Action Levels:

a) Every effort will be made to maintain radiation exposures and releases of radioactive and non-radioactive toxic metals to unrestricted areas as low as is reasonable achievable (ALARA).

b) The following criteria for the restricted area will be used to limit (DU) exposure.

1) Soil:

* Perimeter and background samples:

≤ 35 pCi/g - no corrective action

> 35 pCi/g - collect 5 additional samples in a 1 meter square grid

If average is still > 35 pCi/g, decontaminate to levels of 35 pCi/g

• Sample locations along the lines of fire:

< 100 pCi/g - no corrective action

100-300 pCi/g - collect 5 additional samples in a 1 meter square grid

If average is still > 100 pCi/g, investigate to determine reason for the high level.

> 300 pCi/g is verified, investigate to determine reason for the high level and notify the NRC.

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2) DU (Note: the 10 CFR 20, Appendix B limit is 3.0×10^{-1} pCi/ml):

(1.5×10^{-1} pCi/ml - no corrective action

) 1.5×10^{-1} pCi/ml - resample: if results are $> 1.5 \times 10^{-1}$ pCi/ml, investigate to determine reason for the high level and notify the NRC.

c) Basis for Action. If any of the action levels are exceeded, an evaluation of cause will be performed by the TECOM RPO. The TECOM RPO will provide a report of findings to the Radiation Control Committee. Based on their determination., recommendations to the commander on corrective action will be made.

Approved:

HARRIS EDGE
Program Manager
Industrial Health Physics

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Program, JPG, IN, 26 Mar 98

ENCLOSURE

Indust Radn Study No. 27-MH-8260-R2-98, JPG, Madison, IN,
21-23 Apr 98

APPENDIX E
SAMPLING LOCATIONS,
SAMPLING PARAMETERS,
&
INSTRUMENTATION

Indust Radn Study No. 27-MH-8260-R2-98, JPG, Madison, IN,
21-23 Apr 98

DU Sampling Program Jefferson Proving Ground, Indiana Soil Samples				
Sample I.D.	Sample Date	Exposure Reading ($\mu\text{R/hr}$)	Sample Location	Comments
SOS1	21 Apr 1050	9.5-11.0	Vicinity at intersection of C-Road & Wonju Road	JPG ID Code of S44 Corner DU impact area
SOS2	21 Apr 1600	10.4-11.3	Vicinity at intersection of E-Road & Morgan Road	JPG ID Code of S48 Corner DU impact area
SOS3	21 Apr 1610	8.1-8.9	0.5 miles east of intersection at C-Road & East Recovery Road	JPG ID Code of S43 Corner DU impact area
SOS4	22 Apr 1015	15.8-16.3	C-Road (Trajectory Line of Fire within impact area)	JPG ID Code of S8 (150 meters N of SOS6)
SOS5	22 Apr 1030	9.0-9.7	Corner of Morgan Road & C-Road	JPG ID Code of S47 Corner DU impact area
SOS6	22 Apr 1020	16.3-17.1	Just North of C-Road (Trajectory Line of Fire within impact area)	JPG ID Code of S6
SOS7	21 Apr 1600	10.4-11.3	Duplicate of SOS2	JPG ID Code of S48

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21-23 Apr 98

DU Sampling Program Jefferson Proving Ground, Indiana Sediment Samples				
Sample I.D.	Sample Date	Exposure Reading ($\mu\text{R/hr}$)	Sample Location	Comments
SES1	22 Apr 1525	7.2-7.8	West Perimeter Road Middle Fork Creek	JPG ID Code of M1 (exits JPG property)
SES2	21 Apr 1400	6.9-7.4	Big Creek	JPG ID Code of M2 (exits JPG property)
SES3	22 Apr 1600	9.0-9.8	Wonju Road Middle Fork Creek (enters SE corner of DU impact area)	JPG ID Code of M3 (Control Upstream)
SES4	21 Apr 1030	11.0-13.0	Big Creek (enters DU impact area)	JPG ID Code of M4 (Control Upstream)
SES5	21 Apr 1812	6.5-7.0	Bridge No. 22 Big Creek	JPG ID Code of M5 (center DU impact area)
SES6	21 Apr 1200	11.9-12.6	Line of Fire Middle Fork Creek	JPG ID Code of M6 (center of target area)
SES7	22 Apr 1440	7.2-8.0	Bridge No. 12 @ Morgan Road Middle Fork Creek	JPG ID Code of M7
SES8	21 Apr 1400	6.5-7.4	Bridge No. 13 @ Morgan Road Middle Fork Creek	JPG ID Code of M8 (exits impact area)
SES9	21 Apr 1430	6.9-7.4	Duplicate of SES2	JPG ID Code of M2

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21-23 Apr 98

DU Sampling Program Jefferson Proving Ground, Indiana Surface Water Samples				
Sample I.D.	Sample Date	Exposure Reading (μ R/hr)	Sample Location	Comments
SWS1	22 Apr 1525	7.2-7.8	West Perimeter Road Middle Fork Creek (exits JPG property)	JPG ID Code of SWBS (See M1)
SWS2	21 Apr 1400	6.9-7.4	Big Creek (exits JPG property)	JPG ID Code of SWBN (See M2)
SWS3	22 Apr 1600	9.0-9.8	Wonju Road Middle Fork Creek (enters SE corner of DU impact area)	JPG ID Code of SWSE (See M3) (Control Upstream)
SWS4	21 Apr 1030	11.0-13.0	Big Creek (creek enters DU impact area)	JPG ID Code of SWNE (See M4) (Control Upstream)
SWS5	21 Apr 1812	6.5-7.0	Bridge No. 22 Big Creek	JPG ID Code of SWM (See M5)
SWS6	21 Apr 1200	11.9-12.6	Line of Fire Middle Fork Creek	JPG ID Code of SWS (See M6)
SWS7	22 Apr 1440	7.2-8.0	Bridge No. 12 @ Morgan Road Middle Fork Creek	JPG ID Code of SWSW (See M7)
SWS8	21 Apr 1400	6.5-7.4	Bridge No. 13 @ Morgan Road Middle Fork Creek (exits DU impact area)	JPG ID Code of SWNW (See M8)
SWS9	21 Apr 1430	6.9-7.4	Duplicate of SWS2	JPG ID Code of SWBN

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21-23 Apr 98

DU Sampling Program Jefferson Proving Ground, Indiana Ground Water Monitoring Well Samples						
Sample I.D.	Sample Date	Exposure Reading ($\mu\text{R/hr}$)	Sample Location	Comments		
				pH	Temp ($^{\circ}\text{C}$)	Conductiv. (μMHOS)
GWS1	21 Apr 1000	11.0-13.0	Well @ D-Road & Wonju Road (perimeter DU impact area)	6.4	11.0	460
GWS2	21 Apr 1115	10.3-11.6	Well between C-Road & Wonju Road (perimeter DU impact area)	6.9	11.5	480
GWS3	21 Apr 1200	8.6-9.5	Well between A-Road & gate on Wonju Road (perimeter DU impact area)	7.7	13.0	500
GWS4	22 Apr 0900	8.6-9.0	Well on South Perimeter Rd. (Along south border of JPG)	7.5	11.5	400
GWS5	22 Apr 1425	7.5-8.2	Well @ D-Road & Morgan Road (across Bridge No.13) (perimeter DU impact area)	7.3	11.0	2525
GWS6	22 Apr 1050	7.8-8.5	Well @ C-Road & Morgan Road (perimeter DU impact area)	8.2	12.0	505

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21-23 Apr 98

DU Sampling Program Jefferson Proving Ground, Indiana Ground Water Monitoring Well Samples						
Sample I.D.	Sample Date	Exposure Reading ($\mu\text{R/hr}$)	Sample Location	Comments		
				pH	Temp ($^{\circ}\text{C}$)	Conductiv. (μMHOS)
GWS7	22 Apr 1140	8.0-9.5	Well @ Oakdale School House on Morgan Road (perimeter DU impact area)	7.7	11.0	500
GWS8	22 Apr 1215	10.2-11.2	Well @ Southwest Corner of JPG (Along south border of JPG)	7.9	12.5	365
GWS9	21 Apr 1745	11.5-12.4	Well @ D-Road & Wonju Road (inside DU impact area)	7.1	13.5	4400
GWS10	21 Apr 1720	8.6-9.3	Well @ D-Road and Bridge No. 22 (inside DU impact area)	7.6	12.5	510
GWS11	22 Apr 1415	10.5-12.0	Well on D-Road (inside DU impact area)	8.0	11.0	230
GWS12	21 Apr 1610	8.6-9.5	Duplicate GWS3	7.7	13.0	500

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21-23 Apr 98

☛ Exposure Rate Measurements:

Instrumentation

Ludlum Model 2350 Data Logger (SN 120599) portable
scaler/ratemeter (Last Calibrated 2 Oct 97, Due 2 Oct 98) mated
with a Ludlum Model 44-2 (SN PR133833) High Energy 1" X 1"
NaI(Tl) Gamma Scintillator

Background measurements taken 21-22 Apr 98 at building 125.
On parking lot: 6.0-8.0 μ R/hr
On grass: 9.0-10.0 μ R/hr

☛ pH Measurements:

Instrumentation

Lamoite Chemical Products, Inc.
pH Meter (SN PH3 1018 379)

Calibrated before use using Orion Certified Solution Packets
perpHect Buffer 4, perpHect Buffer 7, & perpHect Buffer 10
solutions. Certified traceable to NIST Standard Reference
Material

☛ Conductivity/Temperature Measurements:

Instrumentation

Yellow Springs Instrument Co., Inc.
Conductivity/Temperature/Salinity Meter
Model 33 (SN 15716)
Calibrated before use

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21-23 Apr 98

APPENDIX F
SURVEY RESULTS

Indust Radn Study No. 27-MH-8260-R2-98, JPG, Madison, IN,
21-23 Apr 98

DIRECTORATE OF LABORATORY SCIENCES (DLS)

FINAL ANALYTICAL REPORT

PROJECT NO. 28-MH-8260

REPORT SERIAL NO. 312687

DLS JOB ID. 8A9670

PROJECT SITE: Jefferson PG

24 June 1998

Indust Radn Study No. 27-MH-8260-R2-98, JPG, Madison, IN,
21-23 Apr 98

DIRECTORATE OF LABORATORY SCIENCES (DLS)
RADIOLOGIC, CLASSIC AND CLINICAL CHEMISTRY DIVISION
FINAL ANALYTICAL REPORT
24 JUNE 1998

CLIENT: Mr. Moscato
PROJECT SITE: Jefferson PG
PROJECT NUMBER: 27-MH-8260
DLS JOB ID: 8A9670
REPORT SERIAL NUMBER : 312687

This report shall not be reproduced except in full without the written approval of DLS. The results relate only to the specific samples identified within the report.

REPORT RELEASE AUTHORIZATION:

Signature: _____ Date: _____



NLLAP



THE DLS HOLDS ACCREDITATION FROM AIHA, AALA, COLA AND IS

An ISO9001 Registered Laboratory NLLAP,

ISO 9001 REGISTERED

TABLE 1
Results of Analyzing Water Samples

<u>Sample Identification</u>	<u>Lab Number</u>	<u>Picocuries per Liter Uranium</u>
GWS1	L7228	1
GWS2	L7229	1
GWS3	L7250	1
GWS4	L7230	1
GWS5	L7239	1
GWS6	L7240	4
GWS7	L7241	1
GWS8	L7251	1
GWS9	L7231	1
GWS10	L7232	1
GWS11	L7242	1
GWS12	L7233	1
SWS1	L7252	1
SWS2	L7253	1
SWS3	L7254	1
SWS4	L7255	1
SWS5	L7227	1

TABLE 1 (Continued)

Results of Analyzing Water Samples

<u>Sample Identification</u>	<u>Lab Number</u>	<u>Picocuries per Liter Uranium</u>
SWS6	L7256	1
SWS7	L7243	2
SWS8	L7244	1
SWS8 Duplicate	L7244	1
SWS9	L7256	1
Lower limit of Detection		0.5

TERMINOLOGY/ABBREVIATION

LA - American Association for Laboratory Accreditation.

LD - The Lower Limit of Detection.