



DEPARTMENT OF THE ARMY  
US ARMY RESEARCH, DEVELOPMENT AND ENGINEERING COMMAND  
ARMY RESEARCH LABORATORY  
ABERDEEN PROVING GROUND MD 21005-5067

December 12, 2006

Q-5  
MS-16

Office of the Associate Director for Laboratory Operations

Ms. Betsy Ullrich  
U.S. Nuclear Regulatory Commission  
Region 1  
475 Allendale Road  
King of Prussia, Pennsylvania 19406

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REGION 1  
2006 DEC 18 PM 1:12

Dear Ms. Ullrich,

04006394

Enclosed please find an update to our financial assurance documents for our SMB-141 license. The license requires a Statement of Intent and Certification of Financial Assurance documents for our depleted uranium facilities at our Aberdeen Proving Ground site in Maryland.

This update includes an increase in eventual funding requirements as reflected in the attached funding plan. Our revised cost estimate is \$8.4 million. It is anticipated that this funding amount will be needed piecemeal as the individual facilities are decommissioned, thereby spreading the impact over several years or decades.

The point of contact for questions or comments is Mr. Richard A. Markland, (410) 278-6354, electronic mail address [markland@arl.army.mil](mailto:markland@arl.army.mil).

Sincerely,

Encl

Teresa K. Kines  
Associate Director for Laboratory Operations

TO: U.S. Nuclear Regulatory Commission  
Region I  
King of Prussia, Pennsylvania 19406

**STATEMENT OF INTENT**

As Associate Director for Laboratory Operations of the US Army Research Laboratory (ARL), I exercise express authority and responsibility to request from the Department of Defense funds for decommissioning activities associated with operations authorized by U.S. Nuclear Regulatory Commission Material License No. SMB-141. This authority is established by DOD Financial Management Regulation 7000.14-R. Volume 2A, Budget Formulation and Presentation. Within this authority, I intend to request that funds be made available when necessary to decommission ARL facilities at the Aberdeen Proving Ground, Maryland. The current cost estimate to decommission ARL facilities in use at the Aberdeen Proving Ground (APG) is \$8,400,000. I intend to request these funds sufficiently in advance of decommissioning to prevent delay of required activities.



TERESA K. KINES  
Associate Director for Laboratory  
Operations

Date: DEC 12 2005

Attachment: As stated

**NONNEGOTIABLE**

Encl 1

## CERTIFICATION OF FINANCIAL ASSURANCE

**Principal:** Department of the Army, Army  
Research Laboratory, Aberdeen Proving  
Ground, Maryland 21005

**NRC License Number SMB-141,** US Army  
Research Laboratory, Aberdeen Proving  
Ground, Maryland 21005

Issued to: U.S. Nuclear Regulatory Commission

I certify that the US Army Research Laboratory is licensed to possess source material in a readily dispersible form licensed under 10 CFR Part 40 in the following amounts:

### Type of Material - Amount of Material

Natural Uranium - Metal and metal oxide - 100 kilograms  
Depleted Uranium - Metal and metal oxide - 200,000 kilograms  
Thorium - Metal and metal oxide - 199 kilograms

I also certify that financial assurance in the amount of \$8,400,000 has been provided in the form of a Statement of Intent for the purpose of decommissioning as prescribed by 10 CFR Part 40.



TERESA K. KINES  
Associate Director  
for Laboratory Operations

**DEC 12 2006**

date

**DEPARTMENT OF THE ARMY  
US ARMY RESEARCH LABORATORY  
Aberdeen Proving Ground, Maryland 21005-5066**

Reference: Nuclear Regulatory Commission Source material License Number SMB-141

**DECOMMISSIONING FUND PLAN  
November 2006**

**Prepared by: Richard A. Markland  
Radiation Safety Officer  
Health Physicist**

## **DECOMMISSIONING FUNDING PLAN**

### **US Army Research Laboratory, Aberdeen Proving Ground, Maryland**

**BACKGROUND:** The Army Research Laboratory (ARL) formerly known as the Ballistic Research Laboratory (BRL) has been performing ballistic research testing of depleted uranium munitions and armor since the early seventies. This testing, by nature, produces large quantities of contamination which must be controlled, and removed both during and after testing. Over the last thirty-plus years, ARL has used depleted uranium in several locations under the provisions of NRC License Number SMB-141. Some of these locations have become contaminated and will eventually need to be decontaminated before release for other uses. One of the sites has been decontaminated and a license amendment has been submitted to the NRC for release.

**SCOPE:** This Decommissioning Funding Plan covers ARL Facilities at APG covered by SMB-141. Specifically:

1. Experimentation Facility 9- An enclosed, full scale depleted uranium hard impact facility.
2. Experimentation Facility 14 - An enclosed, full scale depleted uranium hard impact facility.
3. Experimentation Facility 110E - An enclosed, small scale depleted uranium hard impact facility.
4. B-1103A - A target assembly/disassembly facility.
5. B-1134B - A radioactive waste handling and decontamination facility.
6. Room 138, B-390 - ARL's Counting Laboratory

**METHODOLOGY:** The Army has a large amount of experience with the decommissioning of facilities contaminated with depleted uranium. (Jefferson Proving Ground, Lake City Impact Area, Frankfort Arsenal, etc.) In addition, ARL has just finished decommissioning the Transonic Range outdoor depleted uranium hard impact area and the Army Testing Center at APG has just finished decommissioning their Bomb Throwing Device hard impact test facility.

The attached Cost Estimate Tables were prepared in consultation with the individuals responsible for the decommissioning of these facilities. Because of this recent experience with the decommissioning process it is believed that the estimates derived from the tables is as accurate as possible.

**DECOMMISSIONING COST ESTIMATES:** It is estimated that the decommissioning of these six facilities will require approximately \$8.4 million. This amount would probably not be required all at one time in that the facilities will probably be decommissioned one at a time over tens of years.

**SUMMARY:** ARL plans to decommission all ARL facilities contaminated with depleted uranium when these facilities are no longer needed for depleted uranium testing. The funding required for this effort will be obtained by whatever means necessary to provide for a timely decommissioning of the facilities.

## COST ESTIMATE TABLES

### 1. Planning and Preparation:

**TABLE 1**

#### **WORK DAYS**

| Task (Note 4)   | Supervisor |         |      | Clerical | Total | Total Cost               |
|---|------------|---------|------|----------|-------|--------------------------|
|   |            | Foreman | H.P. |          |       |                          |
| 1. Preparation of Documentation for Regulatory Agencies.  | 75         | 75      | 75   | 100      | 325   | \$155,505                |
| 2. Submittal of Decommissioning Plan to NRC when required by 10 CFR30.36(c)(2), 40.42(c)(2), or 70.38(c)(2).                                | 75         | 75      | 75   | 100      | 325   | <sup>1</sup> \$155,505   |
| 3. Development of Work Plans  | 100        | 75      | -    | 100      | 275   | \$119,800                |
| 4. Procuring of Special Equipment   | 100        | 75      | -    | -        | 175   | \$99,605                 |
| 5. Staffing   | 100        | 100     | -    | 25       | 230   | \$114,970                |
| 6. Characterization of Radiological Condition of the Facility (including soil and tailing analysis or ground water analysis, if applicable) | 400        | 400     | 800  | 100      | 1700  | <sup>2</sup> \$2,018,960 |
| 7. Other  | -          | -       | -    | -        | -     | -                        |
| 8. Total  | 850        | 800     | 950  | 425      | 3030  | \$2,664,345              |

#### NOTES:

1. Cost figure includes \$20,000 for travel and incidental expenses.
2. Cost figure includes \$1,000,000 for travel, lodging, equipment rental and laboratory analyses.
3. All columns show X 1.25 contingency growth.
4. These items are for preparation and documentation for the all the ARL impacted areas.
5. All labor rates are fully burdened.

## COST ESTIMATE TABLES

**TABLE 2**

### UNIT COST FOR WORKERS

| Position         | Basic Salaries (\$/yr.) | Overhead Rate (%) | Worker Cost/Year |
|------------------|-------------------------|-------------------|------------------|
| Supervisor       | 88,800                  | 101               | \$178,500        |
| Foreman          | 53,400                  | 101               | \$107,300        |
| Craftsman        | 61,800                  | 101               | \$124,200        |
| Technician       | 45,400                  | 101               | \$91,300         |
| Health Physicist | 90,400                  | 101               | \$181,700        |
| Laborer          | 42,500                  | 101               | \$85,400         |
| Clerical         | 26,100                  | 101               | \$52,500         |
| Other            | 36,800                  | 101               | \$74,000         |
| Senior Broker    | 85,400                  | 101               | \$171,700        |

2. Decontamination and/or Dismantling of Radioactive Facility Components\*

|              |   |                            |                       |   |                            |
|--------------|---|----------------------------|-----------------------|---|----------------------------|
| Glove Boxes  | — | <u>N/A (m<sup>3</sup>)</u> | Amount of Floor Space | — | <u>N/A (m<sup>2</sup>)</u> |
| Fume Hood    | — | <u>N/A (m<sup>3</sup>)</u> | Ventilation Ductwork  | — | <u>N/A (m)</u>             |
| Hot Cells    | — | <u>N/A (m<sup>3</sup>)</u> | Amount of Wall Space  | — | <u>N/A (m<sup>2</sup>)</u> |
| Lab Benches  | — | <u>N/A (m)</u>             | Other                 | — | <u>N/A</u>                 |
| Sink & Drain | — | <u>N/A (m)</u>             |                       |   |                            |



## APPENDIX F COST ESTIMATE TABLES

**TABLE 3**

### WORK DAYS

| Task   | Super-<br>Visor | Fore-<br>man | Tech-<br>nician | Crafts-<br>man | Lab-<br>orer | Total | Total<br>Cost            |
|--|-----------------|--------------|-----------------|----------------|--------------|-------|--------------------------|
| 1. Decon/Dismantle Major Components and/or Processing and Storage Tanks  | n/a             | n/a          | n/a             | n/a            | n/a          | -     | 0                        |
| 2. Decon/Dismantle Laboratories, Fume Hoods, Glove Boxes, Benches, etc.  | n/a             | n/a          | n/a             | n/a            | n/a          | -     | 0                        |
| 3. Decon/Dismantle Waste Areas<br>- Radwaste Areas<br>- Scrap Recovery Areas<br>- Other<br>(Note 1)  | 200             | 200          | 600             | 400            | 600          | 2000  | <sup>2</sup> \$2,318,690 |
| 4. Decon/Dismantle Service Facilities<br>- Maintenance Shop<br>- Decontamination Areas<br>- Ventilation Systems<br>- Other   | n/a             | n/a          | n/a             | n/a            | n/a          | -     | 0                        |
| 5. Decon/Dismantle Waste Treatment Facilities and Storage Areas on the Site (Including exhume and package contaminated soil and tailings, if any)<br>- Fluoride Lagoons<br>- Nitrate Lagoons<br>- CaF <sub>2</sub> Waste Recovery<br>- Ground Water Restoration<br>- Other<br>(Note 1) | 200             | 200          | 600             | 400            | 600          | 2000  | <sup>3</sup> \$1,318,690 |
| 6. Monitor for compliance, reclean and monitor, if necessary<br>(Note 1)   | 50              | 50           | 150             | 150            | 50           | 450   | \$195,710                |
| 7. Other (e.g., contractor fees)   | -               | -            | -               | -              | -            | -     | 0                        |

**NOTE:**

1. All labor rates are burdened.
2. Cost figure includes \$1,500,000 for per diem, lodging and equipment rental
3. Cost figure includes \$500,000 for per diem, lodging and equipment rental
4. This table shows X 1.25 contingency growth.

## APPENDIX F COST ESTIMATE TABLES

TABLE 4

| <u>Equipment/Supply</u>                      | <u>Quantity</u> | <u>Cost</u>        |
|--|-----------------|--------------------|
| Loader / Backhoe                             | 5               | \$33,220           |
| Bobcat                                       | 10              | \$127,200          |
| Water Truck                                  | 5               | \$59,785           |
| Drill Rigs for Bobcat                        | 10              | \$40,000           |
| Generator                                    | 5               | \$68,110           |
| Misc (all other equip-<br>ment and supplies) | -               | <u>\$1,750,000</u> |
|  | <b>TOTAL</b>    | <b>\$2,078,295</b> |

### NOTES:

1. This table shows X 1.25 contingency growth.
2. Miscellaneous equipment includes NaI detector array (est \$75k); conveyor system (est \$500k); Portable gamma spectroscopy system (est \$125k); plus other small pieces of specialized radiation detection equipment (est \$50k)

**APPENDIX F (Continued)**  
**COST ESTIMATING TABLES**

**ARMY RESEARCH LABORATORY  
DECOMMISSIONING**

**TABLE 5**

| <u>Waste Type</u> | <u>Volume (ft<sup>3</sup>)</u> | <u>No. of Containers</u> | <u>Type of Container</u> | <u>Unit Cost of Container</u> | <u>Cost of Container</u> |
|-------------------|--------------------------------|--------------------------|--------------------------|-------------------------------|--------------------------|
| depleted uranium  | 418,500 ft <sup>3</sup>        | 620                      | Intermodal               | 1000.00                       | \$ 620,000               |
| mixed DU & lead   | 0 ft <sup>3</sup>              | 0                        | Intermodal               | 1000.00                       | \$0                      |
|                   | -----                          | -----                    |                          |                               | -----                    |
| Total             | 418,500 ft <sup>3</sup>        | 620                      |                          |                               | \$ 620,000               |

**Notes:**

1. The volume figures include a 25 percent contingency factor.
2. We will reuse the intermodal containers.

**APPENDIX F (Continued)**  
**COST ESTIMATING TABLES**

**ARMY RESEARCH LABORATORY**  
**DECOMMISSIONING**

**TABLE 6**

|                        |                                   |
|------------------------|-----------------------------------|
| Distance Shipped       | <u>2000</u> (miles)               |
| Unit cost for shipment | <u>\$2.95</u> (\$/mile/truckload) |
| Additional charges     |                                   |
| Overweight             | <u>-</u> (\$/mile)                |
| Surcharge              | <u>-</u> (\$/mile)                |

| <u>Waste Type</u> | <u>No. Of Containers</u> | <u>Unit Cost for Shipping</u> | <u>Distance Shipped</u> | <u>Surcharge</u> | <u>Transportation Cost</u> |
|-------------------|--------------------------|-------------------------------|-------------------------|------------------|----------------------------|
| depleted uranium  | 620                      | \$2900 / Inter-modal cont.    | 2000                    | -                | \$1,798,000                |
| mixed waste       | 0                        | \$2900 / Inter-modal          | 2000                    | -                | \$0                        |
| Total             | 620                      |                               |                         |                  | \$7,168,800                |

**NOTE:**

1. This table shows a X 1.25 contingency growth.
2. We will transport all the project waste to Andrews County, TX, or US Ecology, ID via track and/or rail.

APPENDIX F (Continued)  
COST ESTIMATING TABLES

**ARMY RESEARCH LABORATORY  
DECOMMISSIONING**

TABLE 7

| Burial Charges                    |                          |                                    | ____\$114____    | (\$/m3)                |
|-----------------------------------|--------------------------|------------------------------------|------------------|------------------------|
| Surcharges                        |                          |                                    |                  |                        |
| Per Container                     |                          |                                    | ____ * ____      | (\$)                   |
| Disposal                          |                          |                                    | ____n/a____      | (\$/m3)                |
| <u>Waste<br/>Type</u>             | <u>Burial<br/>Volume</u> | <u>Unit<br/>Cost of<br/>Burial</u> | <u>Surcharge</u> | <u>Burial<br/>Cost</u> |
| LLRW<br>(By rail)                 | 418,500 ft3              | \$ 3.33/ft3                        | \$2,500          | \$1,396,105            |
| Mixed waste<br>(Process/disposal) | 0 ft3                    | \$10.74/ft3                        | \$2,500          | \$0                    |
|                                   |                          |                                    |                  | -----<br>\$1,136,105   |

NOTES:

1. The surcharge in this instance is a Corps of Engineers charge for OSC's use of their basic ordering agreement with Waste Control Specialists of Texas. There is no disposal site surcharge for this waste stream.
2. The tabulated waste volumes represent a 25 percent contingency over our characterization based volume estimates.

APPENDIX F (Continued)  
COST ESTIMATING TABLES

ARMY RESEARCH LABORATORY  
DECOMMISSIONING

TABLE 8

Restoration of Contaminated Areas on Facility Grounds

| Task         | Work Days  |         |      |          |       | Total<br>Cost |
|--------------|------------|---------|------|----------|-------|---------------|
|              | Supervisor | Foreman | H.P. | Clerical | Total |               |
| Seed grounds |            |         |      |          |       | \$250,000     |

NOTES:

1. Based on the characterization data, the ARL remediations will involve very limited (less than 12 inches) intrusive excavation. We, therefore, expect only limited restoration expenditures for re-seeding the impacted areas.

APPENDIX F (Continued)  
COST ESTIMATING TABLES

ARMY RESEARCH LABORATORY  
DECOMMISSIONING

TABLE 9

Final Radiation Survey

| Task                            | Supervisor | Work Days |      |          | Total | Total<br>Cost |
|---------------------------------|------------|-----------|------|----------|-------|---------------|
|                                 |            | Foreman   | H.P. | Clerical |       |               |
| Final sampling<br>& Survey Site | 160        | 160       | 640  | 200      | 1160  | \$1,063,524   |

NOTES:

1. Cost figure includes \$400,000 for per diem, lodging and laboratory analysis for the described task
2. All labor rates are burdened.
3. This table shows a X 1.25 contingency growth.

**APPENDIX F (Continued)**  
**COST ESTIMATING TABLES**

**ARMY RESEARCH LABORATORY**  
**DECOMMISSIONING**

**TABLE 10**

Site Stabilization, Long-Term Surveillance

| <u>Task</u> | <u>Supervisor</u> | <u>Work Days</u><br><u>Foreman</u> | <u>H.P.</u> | <u>Clerical</u> | <u>Total</u> | <u>Total</u><br><u>Cost</u><br>\$0* |
|-------------|-------------------|------------------------------------|-------------|-----------------|--------------|-------------------------------------|
|-------------|-------------------|------------------------------------|-------------|-----------------|--------------|-------------------------------------|

**NOTES:**

1. The Army's decommissioning objective for ARL is to release the site for unrestricted use. We, therefore, do not expect to expend any funds for site stabilization or long-term surveillance. We will continue to conduct well-water monitoring for the firing range until we have decommissioned the entire site.