NR-3605-0006

Decommissioning Funding Plan

for the American Centrifuge Plant

in Piketon, Ohio

Revision 0

Docket No. 70-7004

Information contained within does not contain Export Controlled Information

Reviewer: Original signed by RL Coriell
Date: 07/30/04

August 2004

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UPDATED LIST OF EFFECTIVE PAGES

Revision 0 – 10 CFR 1045 review completed by L. Sparks on 07/29/04 and the Export Controlled Information review completed by R. Coriell on 07/30/04.

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1.0 INTRODUCTION

USEC Inc. (USEC) hereby submits, pursuant to the provisions of the *Atomic Energy Act* of 1954, as amended, and the rules and regulations of the U.S. Nuclear Regulatory Commission (NRC), its Decommissioning Funding Plan (DFP) for the American Centrifuge Plant (ACP) in Piketon, Ohio. This DFP sets forth the information required by 10 *Code of Federal Regulations* (CFR) Part 70 regarding USEC's plans for funding the decommissioning of the ACP and disposal of depleted uranium generated as a result of ACP operations.

As indicated below, USEC presently intends to provide for decommissioning funding through a surety bond in accordance with applicable requirements of 10 CFR Part 70. However, USEC may choose to utilize alternate financial assurance funding methods. Alternate funding methods, if chosen, will be prepared using the guidance provided in NUREG 1757, Volume 3, Appendix A and will satisfy the requirements of 10 CFR Part 70. The actual funding method to be used will be executed prior to the commencement of enrichment operations. In the interim, appropriate model documentation for this funding method is provided in Appendix A and B of this plan. Upon execution of the funding instruments, USEC will supplement this portion of its application.

2.0 GENERAL INFORMATION

Plant Description: The ACP is located in the DOE reservation in Piketon, Ohio, in areas and facilities leased by USEC from the DOE.[1] The ACP encompasses the construction, start-up, operation, and maintenance of a uranium enrichment process using American Centrifuge technology that will produce 3.5 million separative work units (SWU) annually at full capacity. Chapter 1.0 of the License Application for the American Centrifuge Plant provides a description of the various facilities associated with the ACP.

Licensed Material: The License Application for the ACP seeks authorization to operate a uranium enrichment plant to enrich uranium hexafluoride (UF_6) using centrifuge technology. Uranium enriched in the ^{235}U isotope up to the licensed limit of 10 weight percent ^{235}U will be withdrawn and shipped from the plant. Material depleted in the ^{235}U isotope (UF_6 tails) will also be withdrawn and stored on site. At full capacity, the ACP generates approximately 11,920 Metric Tons (MT) of UF_6 tails annually. Therefore, pursuant to 10 CFR 70.25(a), a DFP is required.

Schedule: Construction of the ACP will commence following issuance of a license by the NRC. Based on the unique modular aspects of the centrifuge technology, capacity is brought on line in phases.

[1] Details regarding the planned operations of the ACP may be found in the License Application and the accompanying Environmental Report.

Period of Operation: The License Application seeks authorization to operate for a period of 30 years.

Decommissioning Costs: USEC has prepared a site-specific decommissioning cost estimate for the decommissioning of the ACP and disposal of the UF_6 tails. This cost estimate utilizes current information regarding the activities and associated costs of decommissioning the 3.5 million SWU plant.

The estimate and associated funding mechanisms will be adjusted over time, in accordance with the applicable provisions of 10 CFR Part 70 as described in Section 5.0 of this plan.

Decommissioning Funding: As set forth in this DFP, USEC presently intends to utilize a surety bond to provide reasonable assurance of the availability of decommissioning funds when needed. This funding mechanism is intended to satisfy the provisions of 10 CFR Part 70 with respect to decommissioning financial assurance for license applicants. However, as described in Section 1.0 of this plan, USEC may choose to utilize alternate financial assurance funding methods. As described in Section 10.10.3 of the License Application for the American Centrifuge Plant, the financial assurance for decommissioning the plant and disposal of UF_6 tails will be provided incrementally as centrifuges are installed, operated on process gas, and UF_6 tails generated. In this way, financial assurance will be made available as the decommissioning liability is incurred.

3.0 DECOMMISSIONING COST ESTIMATE

Pursuant to 10 CFR 70.25(e) and the guidance provided by the NRC in NUREG-1757, *Consolidated NMSS Decommissioning Guidance*, USEC has evaluated the estimated costs of decommissioning the ACP. The plant will be decommissioned such that the facilities may be released for unrestricted use. The estimated costs for decommissioning are patterned after NRC guidance in Appendix A of NUREG-1757 Volume 2, as set forth in the tables contained in Appendix C and D of this DFP and noted below (Note: To maintain consistent table sequence numbers with those presented in NUREG-1757, Appendix A, Tables 3.1 through 3.3 are not used):

- Facility Description Summary (Table C3.4 and Table C3.4A)
- Number and Dimensions of Facility Components (Table C3.5 and Table C3.5A)
- Planning and Preparation (Table C3.6)
- Decontamination or Dismantling of Radioactive Facility Components (Table C3.7)
- Restoration of Contaminated Areas on Facility Grounds (Table C3.8)
- Final Radiation Survey (Table C3.9)

- Site Stabilization and Long-Term Surveillance (Table C3.10)
- Total Work Days by Labor Category (Table C3.11)
- Worker Unit Cost Schedule (Table D3.12)
- Total Labor Costs by Major Decommissioning Task (Table D3.13)
- Packaging, Shipping, and Disposal of Radioactive Wastes (Table C3.14)
- Equipment/Supply Costs (Table C3.15)
- Laboratory Costs (Table C3.16)
- Miscellaneous Costs (Table C3.17)
- Total Decommissioning Costs (Table C3.18)
- Estimated Volume of Annual Depleted Uranium Generated (Table C3.19)
- Total Labor Distribution (Table C3.20)

Chapter 10.0 of the License Application for the American Centrifuge Plant describes specific features that serve to minimize the level and spread of radioactive contamination during operation that simplify the eventual plant decommissioning and minimize worker exposure. The decommissioning estimated costs are based on decontaminating the plant to the radiological criteria for unrestricted use in 10 CFR 20.1402. The total estimated cost of decommissioning the plant in 2004 dollars is $130.4 million (Table C3.18).

The following assumptions are utilized in the decommissioning cost estimate:

- No credit is taken for salvage value of equipment or materials;
- Inventories of materials and wastes at the time of decommissioning will be in amounts that are consistent with routine plant conditions and operations over the 30-year license;
- Decommissioning activities take place immediately on cessation of operations without multiyear storage-for-decay periods; and

Cost estimates to dispose of UF_6 tails generated during ACP operation are presented in Table C3.19 and are separate from the cost estimates to decommission the plant provided in Table C3.18. The ultimate disposal of UF_6 tails is to be determined. USEC intends to evaluate possible commercial uses of UF_6 tails. UF_6 tails, which are not commercially reused, will be converted to a stable form and disposed of in accordance with the USEC Privatization Act and

other applicable statutory authorizations and requirements at DOE's DUF_6 conversion facilities and/or other licensed facilities. UF_6 tails are stored in steel cylinders until they can be processed in accordance with the disposal strategy established and selected by USEC. Depending on technological developments and the existence of facilities available prior to ACP shutdown, the tails may have commercial value and may be marketable for further enrichment or other processes.

USEC provides financial assurance to incrementally fund the estimated cost of conversion and disposal of the UF_6 tails inventory as it is generated during ACP operation. The estimated cost of conversion and disposal is based on the actual accumulated depleted uranium inventory and a conservative forecast of the amount of depleted uranium to be generated for the upcoming period of operation. This funding is in addition to the funding requirements for decommissioning the ACP as described above.

At full capacity, the ACP will generate approximately 11,920 MT of UF_6 tails annually. USEC estimates that it will take approximately four years for the ACP to ramp up to the full capacity of 3.5 million SWU per year.

The current estimated cost for disposal of depleted uranium is estimated to be $3.00 per kilogram of uranium (kgU). This cost for disposal is based upon the cost in the DOE/USEC Agreement of June 30, 1998[2]. USEC has compared this cost for disposal of depleted uranium against cost information from the DOE contract for the conversion facilities currently being constructed at Piketon, Ohio and Paducah, KY as well as the proposal to build and operate the uranium hexafluoride conversion facilities for DOE, submitted by the American Conversion Services (ACS) partnership, which included USEC. This proprietary ACS proposal was based on comprehensive cost projections developed by the partnership. The ACS proposal and the DOE conversion facilities cost information support the $3.00 per kgU disposal cost for depleted uranium used in this plan. Based on the total estimated volume of depleted uranium generated over the 30-years of operation and the estimated cost for disposal, USEC's liability for disposal of depleted uranium is $662.32 million in 2004 dollars. With a 10 percent contingency, this represents a total liability of $728.55 million in 2004 dollars for 30-years of operation. Although a total liability is provided, USEC will incrementally fund the estimated costs associated with disposal of the depleted uranium inventory as the depleted uranium is generated during ACP operation.

4.0 DECOMMISSIONING FUNDING MECHANISM

USEC presently intends to utilize a surety bond to provide reasonable assurance of decommissioning funding, pursuant to 10 CFR 70.25(f). Accordingly, USEC provides with this application model documentation related to the use of the surety method of providing decommissioning financial assurance.[3] However, as described in Section 1.0 of this plan, USEC

[2] Memorandum of Agreement between the United States Department of Energy and the United States Enrichment Corporation Relating to Depleted Uranium, dated June 30, 1998.

[3] The model documentation is derived from Appendix A.9 in NUREG-1757 Volume 3, Consolidated NMSS Decommissioning Guidance, *Financial Assurance, Recordkeeping, and Timeliness,* September 2003. USEC will

may choose to utilize alternate financial assurance funding methods. Upon finalization of the specific funding instruments to be utilized and at least 90 days prior to the commencement of enrichment operations, USEC will supplement its application to include the signed, executed documentation.

As noted above, USEC presently intends to utilize a surety bond to provide financial assurance for decommissioning. The surety bond will provide an ultimate guarantee that decommissioning costs will be paid in the event USEC is unable to meet its decommissioning obligations at the time of decommissioning. A copy of a model surety bond is provided in Appendix A to this plan. USEC describes below the particular attributes it presently anticipates including in the surety bond.

With respect to the surety bond, USEC presently anticipates providing for the following attributes: First, a company that is listed as a qualified surety in the Department of Treasury's most recent edition of Circular 570 for the State where the surety was signed with an underwriting limitation greater than or equal to the level of coverage specified in the bond will issue the bond. Second, the bond will be written for a specified term and will be renewable automatically unless the issuer serves notice at least 90 days prior to expiration of intent not to renew. Such notice must be served upon the NRC, the trustee of the external or standby trust, and USEC. Further, in the event USEC is unable to provide an acceptable replacement within 30 days of such notice, the full amount of the bond will be payable automatically, prior to expiration, without proof of forfeiture.

The surety bond will require that the surety company will deposit any funds paid under its terms directly into either an external trust or a standby trust. A copy of a model standby trust is provided as Appendix B to this plan.

5.0 ADJUSTING DECOMMISSIONING COSTS AND FUNDING

Pursuant to 10 CFR 70.25(e), USEC will update the decommissioning cost estimate for the ACP and the financial assurance over the life of the plant. The modular aspect of the American Centrifuge technology allows enrichment operations to begin well before the full capacity of the plant is reached. Thus, the decommissioning liability is incurred incrementally as more centrifuge machines, and associated equipment, are added to the process, until such time as full capacity of the facility (i.e., 3.5 million SWU) is achieved. Once full capacity of the facility is achieved, the UF_6 tails are generated at a relatively constant rate throughout the life of the plant.

To ensure adequate financial assurance is in place as centrifuge machines, and associated equipment, are added to the process and placed into operation, USEC will update the cost estimates for decommissioning and UF_6 tails disposal and provide a revised funding instrument

consider this model documentation as guidance in preparing and executing funding instruments for the ACP. In the event USEC ultimately selects another form of decommissioning funding, model documentation from this volume of NUREG-1757 will also be used as guidance in the preparation of funding instruments.

to NRC prior to operation of additional incremental capacity on process gas. Once full capacity of the facility is achieved, USEC will annually adjust the cost estimate for UF_6 tails disposal and all other decommissioning costs will be adjusted periodically, and no less frequently than every three years, consistent with the requirements of 10 CFR 70.25(e) and the recent NRC final rule regarding financial assurance for materials licensees (68 FR 57327, October 3, 2003). The method for adjusting the cost estimate will consider the following:

- Changes in general inflation (e.g., labor rates, consumer price index)
- Changes in price of goods (e.g., packing materials)
- Changes in price of services (e.g., shipping and disposal costs)
- Changes in plant condition or operations
- Changes in decommissioning procedures or regulations

A record of the updating effort and results will be retained for review (see further discussion regarding record keeping below). The NRC will be notified of any material changes to the decommissioning cost estimate and associated funding levels (e.g., significant increases in costs beyond anticipated inflation or the price of goods and services). To the extent the underlying instruments are revised to reflect changes in funding levels, the NRC will be notified as appropriate.

6.0 RECORD KEEPING PLANS RELATED TO DECOMMISSIONING FUNDING

Pursuant to 10 CFR 70.25(g), USEC will keep records of information that could have a material effect on the ultimate costs of decommissioning until termination of the license. Information maintained in these records includes:

- Records of spills or other unusual occurrences involving the spread of contamination in and around the plant, equipment, or site. Records of spills or other unusual occurrences may be limited only to instances when contamination remains after any cleanup procedures or when there is reasonable likelihood that contaminants may have spread to inaccessible areas as in the case of possible seepage into porous materials such as concrete. These records will include any known information on identification of involved radionuclides, quantities, forms, and concentrations;
- As-built drawings and modifications of structures and equipment in areas where radioactive materials are used and/or stored, including locations that possibly could be inaccessible (e.g., buried pipes which may be subject to contamination); and

- A list contained in a single document that is updated every two years of the following:
  - Areas designated and formerly designated as restricted areas as defined under 10 CFR 20.1003.
  - Areas outside of restricted areas that require documentation under 10 CFR 70.25(g)(1).
  - Areas outside of restricted areas where current and previous wastes have been buried as documented under 10 CFR 20.2108.
  - Areas outside of restricted areas that contain material such that, if the license expired, USEC would be required to either decontaminate the area to meet the criteria for decommissioning in 10 CFR Part 20, Subpart E or would apply for NRC approval for disposal under 10 CFR 20.2002.
- Records of the cost estimate performed for the DFP, and records of the funding method used for assuring funds, including a copy of the financial assurance mechanism and any supporting documentation.

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Appendix A

Model Payment Surety Bond

PAYMENT SURETY BOND

Date bond executed: _____

Effective date: _____

Principal: [*Insert legal name and business address of licensee*]

Type of organization: [*Insert "proprietorship," "partnership," or" corporation"*]

State of incorporation: _____ (if applicable)

NRC license number, name and address of facility, and amount for decommissioning activities guaranteed by this bond: _____

Surety: [*Insert name and business address*]

Type of organization: [*Insert "proprietorship," "partnership," or "corporation"*]

State of incorporation: _____ (if applicable)

Surety's qualification in jurisdiction where license facility is located.

Surety's bond number: _____

Total penal sum of bond: $_____

Know all persons by these presents, that we, the Principal and Surety hereto, are firmly bound to the U.S. Nuclear Regulatory Commission (hereinafter called NRC) in the above penal sum for the payment of which we bind ourselves, our heirs, executors, administrators, successors, and assigns jointly and severally; provided that, where the Sureties are corporations acting as co-sureties, we, the Sureties, bind ourselves in such sum "jointly and severally" only for the purpose of allowing a joint action or actions against any or all of us, and for all other purposes each Surety binds itself, jointly and severally with the Principal, for the payment of such sum only as it is set forth opposite the name of such Surety; but if no limit of liability is indicated, the limit of liability shall be the full amount of the penal sum.

WHEREAS, the U.S. Nuclear Regulatory Commission, an agency of the U.S. Government, pursuant to the Atomic Energy Act of 1954, as amended, and the Energy Reorganization Act of 1974, has promulgated regulations in Title 10, Chapter I, of the Code of Federal Regulations, Part [*insert 30, 40, 70, or 72*], applicable to the Principal, which require that a license holder or an applicant for a facility license provide financial assurance that funds will be available when needed for facility decommissioning;

NOW, THEREFORE, the conditions of the obligation are such that if the Principal shall faithfully, before the beginning of decommissioning of each facility identified above, fund the standby trust fund in the amount(s) identified above for the facility;

Or, if the Principal shall fund the standby trust fund in such amount(s) after an order to begin facility decommissioning is issued by NRC or a U.S. District Court or other court of competent jurisdiction;

Or, if the Principal shall provide alternative financial assurance, and obtain NRC's written approval of such assurance, within 30 days after the date a notice of cancellation from the Surety is received by both the Principal and NRC, then this obligation shall be null and void; otherwise it is to remain in full force and effect.

The Surety shall become liable on this bond obligation only when the Principal has failed to fulfill the conditions described above. Upon notification by NRC that the Principal has failed to perform as guaranteed by this bond, the Surety shall place funds in the amount guaranteed for the facility into the standby trust fund.

The liability of the Surety shall not be discharged by any payment or succession of payments hereunder, unless and until such payment or payments shall amount in the aggregate to the penal sum of the bond, but in no event shall the obligations of the Surety hereunder exceed the amount of said penal sum.

The Surety may cancel the bond by sending notice of cancellation by certified mail to the Principal and to NRC provided, however, that cancellation shall not occur during the 90 days beginning on the date of receipt of the notice of cancellation by both the Principal and NRC, as evidenced by the return receipts.

The Principal may terminate this bond by sending written notice to NRC and to the Surety 90 days prior to the proposed date of termination, provided, however, that no such notice shall become effective until the Surety receives written authorization for termination of the bond from NRC.

The Principal and Surety hereby agree to adjust the penal sum of the bond yearly so that it guarantees a new amount, provided that the penal sum does not increase by more than 20 percent in any one year and no decrease in the penal sum takes place without the written permission of NRC.

If any part of this agreement is invalid, it shall not affect the remaining provisions that will remain valid and enforceable.

In Witness Whereof, the Principal and Surety have executed this financial guarantee bond and have affixed their seals on the date set forth above.

The persons whose signatures appear below hereby certify that they are authorized to execute this surety bond on behalf of the Principal and Surety.

Principal

[*Signatures*]
[*Names*]
[*Titles*]
[*Corporate Seal*]

Corporate Surety

[*Name and address*]

State of Incorporation: _____

Liability limit: $_____

[*Signatures*]
[*Names and titles*]
[*Corporate Seal*]

[*For every co-surety, provide signatures, names and titles, corporate seal, and other information in the same manner as for the Sureties above*].

Bond Premium: $_____

Appendix B

Model Standby Trust Agreement

STANDBY TRUST AGREEMENT

TRUST AGREEMENT, the Agreement entered into as of [*insert date*] by and between [*insert name of licensee*], a [*insert name of State*] [*insert "corporation," "partnership," or "proprietorship"*], herein referred to as the "Grantor," and [*insert name and address of a trustee acceptable to NRC*], the "Trustee."

WHEREAS, the U.S. Nuclear Regulatory Commission (NRC), an agency of the U. S. Government, pursuant to the Atomic Energy Act of 1954, as amended, and the Energy Reorganization Act of 1974, has promulgated regulations in Title 10, Chapter I of the *Code of Federal Regulations*, Part [*insert 30, 40, 70, 72*]. These regulations, applicable to the Grantor, require that a holder of, or an applicant for, a materials license pursuant to 10 CFR Part [*insert 30, 40, 70, or 72*] provide assurance that funds will be available when needed for required decommissioning activities.

WHEREAS, the Grantor has elected to use a [*insert "letter of credit," "line of credit," "surety bond," "insurance policy," "parent company guarantee," or "self-guarantee"*], to provide [*insert "all" or "part"*] of such financial assurance for the facilities identified herein; and

WHEREAS, when payment is made under a [*insert "letter of credit, "line of credit," "surety bond," insurance policy," "parent company guarantee," or "self-guarantee"*], this standby trust shall be used for the receipt of such payment; and

WHEREAS, the Grantor, acting through its duly authorized officers, has selected the Trustee to be the trustee under this Agreement, and the Trustee is willing to act as trustee;

NOW, THEREFORE, the Grantor and the Trustee agree as follows:

Section 1. Definitions. As used in this Agreement:

(a) The term "Grantor" means NRC licensee who enters into this Agreement and any successors or assigns of the Grantor.

(b) The term "Trustee" means the trustee who enters into this Agreement and any successor Trustee.

Section 2. Costs of Decommissioning. This Agreement pertains to the costs of decommissioning the materials and activities identified in License Number [*insert license number*] issued pursuant to 10 CFR Part [*insert 30, 40, 70, 72*], as shown in Schedule A.

Section 3. Establishment of Fund. The Grantor and the Trustee hereby establish a standby trust fund (the Fund) for the benefit of NRC. The Grantor and the Trustee intend that no third party have access to the Fund except as provided herein.

Section 4. Payments Constituting the Fund. Payments made to the Trustee for the Fund shall consist of cash, securities, or other liquid assets acceptable to the Trustee. The Fund is

established initially as consisting of the property, which is acceptable to the Trustee, described in Schedule B attached hereto. Such property and any other property subsequently transferred to the Trustee are referred to as the "Fund," together with all earnings and profits thereon, less any payments or distributions made by the Trustee pursuant to this Agreement. The Fund shall be held by the Trustee, IN TRUST, as hereinafter provided. The Trustee shall not be responsible nor shall it undertake any responsibility for the amount of, or adequacy of the Fund, nor any duty to collect from the Grantor, any payments necessary to discharge any liabilities of the Grantor established by NRC.

Section 5. Payment for Required Activities Specified in the Plan. The Trustee shall make payments from the Fund to the Grantor upon presentation to the Trustee of the following:

(a) A certificate duly executed by the Secretary of the Grantor attesting to the occurrence of the events, and in the form set forth in the attached Certificate of Events, and

(b) A certificate attesting to the following conditions;

(1) that decommissioning is proceeding pursuant to an NRC-approved plan;

(2) that the funds withdrawn will be expended for activities undertaken pursuant to that plan; and

(3) that NRC has been given 30 days prior notice of [*insert name of licensee*]'s intent to withdraw funds from the escrow fund.

No withdrawal from the Fund for a particular license can exceed 10 percent of the remaining funds available for that license unless NRC written approval is attached.

In addition, the Trustee shall make payments from the Fund as NRC shall direct, in writing, to provide for the payment of the costs of required activities covered by this Agreement. The Trustee shall reimburse the Grantor or other persons as specified by NRC from the Fund for expenditures for required activities in such amounts as NRC shall direct in writing. In addition, the Trustee shall refund to the Grantor such amounts as NRC specifies in writing. Upon refund, such funds shall no longer constitute part of the Fund as defined herein.

Section 6. Trust Management. The Trustee shall invest and reinvest the principal and income of the Fund and keep the Fund invested as a single fund, without distinction between principal and income, in accordance with general investment policies and guidelines which the Grantor may communicate in writing to the Trustee from time to time, subject, however, to the provisions of this section. In investing, reinvesting, exchanging, selling, and managing the Fund, the Trustee shall discharge its duties with respect to the Fund solely in the interest of the beneficiary and with the care, skill, prudence, and diligence under the circumstances then prevailing which persons of prudence, acting in a like capacity and familiar with such matters, would use in the conduct of an enterprise of a like character and which like aims; except that:

(a) Securities or other obligations of the Grantor, or any other owner or operator of the

facilities, or any of their affiliates as defined in the Investment Company Act of 1940, as amended (15 U.S.C. 80a-2(a)), shall not be acquired or held, unless they are securities or other obligations of the Federal or a State government;

(b) The Trustee is authorized to invest the Fund in time or demand deposits of the Trustee, to the extent insured by an agency of the Federal government, and in obligations of the Federal government such as GNMA, FNMA, and FHLM bonds and certificates or State and Municipal bonds rated BBB or higher by Standard & Poor's or Baa or higher by Moody's Investment Services; and

(c) For a reasonable time, not to exceed 60 days, the Trustee is authorized to hold uninvested cash, awaiting investment or distribution, without liability for the payment of interest thereon.

Section 7. Commingling and Investment. The Trustee is expressly authorized in its discretion:

(a) To transfer from time to time any or all of the assets of the Fund to any common, commingled, or collective trust fund created by the Trustee in which the Fund is eligible to participate, subject to all of the provisions thereof, to be commingled with the assets of other trusts participating therein; and

(b) To purchase shares in any investment company registered under the Investment Company Act of 1940 (15 U.S.C. 80a-1 et seq.), including one that may be created, managed, underwritten, or to which investment advice is rendered, or the shares of which are sold by the Trustee. The Trustee may vote such shares in its discretion.

Section 8. Express Powers of Trustee. Without in any way limiting the powers and discretion conferred upon the Trustee by the other provisions of this Agreement or by law, the Trustee is expressly authorized and empowered;

(a) To sell, exchange, convey, transfer, or otherwise dispose of any property held by it, by public or private sale, as necessary to allow duly authorized withdrawals at the joint request of the Grantor and NRC or to reinvest in securities at the direction of the Grantor;

(b) To make, execute, acknowledge, and deliver any and all documents of transfer and conveyance and any and all other instruments that may be necessary or appropriate to carry out the powers herein granted;

(c) To register any securities held in the Fund in its own name, or in the name of a nominee, and to hold any security in bearer form or in book entry, or to combine certificates representing such securities with certificates of the same issue held by the Trustee in other fiduciary capacities, to reinvest interest payments and funds from matured and redeemed instruments, to file proper forms concerning securities held in the Fund in a timely fashion with appropriate government agencies, or to deposit or arrange for the deposit of such securities in a qualified central depository even though, when so deposited, such

securities may be merged and held in bulk in the name of the nominee or such depository with other securities deposited therein by another person, or to deposit or arrange for the deposit of any securities issued by the U.S. Government, or any agency or instrumentality thereof, with a Federal Reserve Bank, but the books and records of the Trustee shall at all times show that all such securities are part of the Fund;

(d) To deposit any cash in the Fund in interest-bearing accounts maintained or savings certificates issued by the Trustee, in its separate corporate capacity, or in any other banking institution affiliated with the Trustee, to the extent insured by an agency of the Federal government; and

(e) To compromise or otherwise adjust all claims in favor of or against the Fund.

Section 9. Taxes and Expenses. All taxes of any kind that may be assessed or levied against or in respect of the Fund and all brokerage commissions incurred by the Fund shall be paid from the Fund. All other expenses incurred by the Trustee in connection with the administration of this Trust, including fees for legal services rendered to the Trustee, the compensation of the Trustee to the extent not paid directly by the Grantor, and all other proper charges and disbursements of the Trustee shall be paid from the Fund.

Section 10. Annual Valuation. After payment has been made into this standby trust fund, the Trustee shall annually, at least 30 days before the anniversary date of receipt of payment into the standby trust fund, furnish to the Grantor and to NRC a statement confirming the value of the Trust. Any securities in the Fund shall be valued at market value as of no more than 60 days before the anniversary date of the establishment of the Fund. The failure of the Grantor to object in writing to the Trustee within 90 days after the statement has been furnished to the Grantor and NRC shall constitute a conclusively binding assent by the Grantor, barring the grantor from asserting any claim or liability against the Trustee with respect to the matters disclosed in the statement.

Section 11. Advice of Counsel. The Trustee may from time to time consult with counsel with respect to any question arising as to the construction of this Agreement or any action to be taken hereunder. The Trustee shall be fully protected, to the extent permitted by law, in acting on the advice of counsel.

Section 12. Trustee Compensation. The Trustee shall be entitled to reasonable compensation for its services as agreed upon the writing with the Grantor. (See Schedule C).

Section 13. Successor Trustee. Upon 90 days notice to NRC and the Grantor, the Trustee may resign; upon 90 days notice to NRC and the Trustee, the Grantor may replace the Trustee; but such resignation or replacement shall not be effective until the Grantor has appointed a successor Trustee, the successor accepts the appointment, the successor is ready to assume its duties as Trustee, and NRC has agreed, in writing, that the successor is an appropriate Federal or State government agency or an entity that has the authority to act as a trustee and whose trust operations are regulated and examined by a Federal or State agency. The successor Trustee shall

have the same powers and duties as those conferred upon the Trustee hereunder. When the resignation or replacement is effective, the Trustee shall assign, transfer, and pay over to the successor Trustee the funds and properties then constituting the Fund. If for any reason the Grantor cannot or does not act in the event of the resignation of the Trustee, the Trustee may apply to a court of competent jurisdiction for the appointment of a successor Trustee or for instructions. The successor Trustee shall specify the date on which it assumes administration of the trust, in a writing sent to the Grantor, NRC, and the present Trustee, by certified mail 10 days before such change becomes effective. Any expenses incurred by the Trustee as a result of any of the acts contemplated by this section shall be paid as provided in Section 9.

Section 14. Instructions to the Trustee. All orders, requests, and instructions by the Grantor to the Trustee shall be in writing, signed by such persons as are signatories to this Agreement or such other designees as the Grantor may designate in writing. The Trustee shall be fully protected in acting without inquiry in accordance with the Grantor's orders, requests, and instructions. If NRC issues orders, requests, or instructions to the Trustee these shall be in writing, signed by NRC or its designees, and the Trustee shall act and shall be fully protected in acting in accordance with such orders, requests, and instructions. The Trustee shall have the right to assume, in the absence of written notice to the contrary, that no event constituting a change or a termination of the authority of any person to act on behalf of the Grantor or NRC hereunder has occurred. The Trustee shall have no duty to act in the absence of such orders, requests, and instructions from the Grantor and/or NRC, except as provided for herein.

Section 15. Amendment of Agreement. The Agreement may be amended by an instrument in writing executed by the Grantor, the Trustee, and NRC, or by the Trustee and NRC if the Grantor ceases to exist. All amendments shall meet the relevant regulatory requirements of NRC.

Section 16. Irrevocability and Termination. Subject to the right of the parties to amend this Agreement as provided in Section 15, this trust shall be irrevocable and shall continue until terminated at the written agreement of the Grantor, the Trustee, and NRC, or by the Trustee and NRC if the Grantor ceases to exist. Upon termination of the trust, all remaining trust property, less final trust administration expenses, shall be delivered to the Grantor or its successor.

Section 17. Immunity and Indemnification. The Trustee shall not incur personal liability of any nature in connection with and act or omission, made in good faith, in the administration of this trust, or in carrying out any directions by the Grantor or NRC issued in accordance with this Agreement. The Trustee shall be indemnified and saved harmless by the Grantor or from the trust fund, or both, from and against any personal liability to which the Trustee may be subjected by reason of any act or conduct in its official capacity, including all expenses reasonably incurred in its defense in the event the Grantor fails to provide such defense.

Section 18. This Agreement shall be administered, construed, and enforced according to the laws of the State of [*insert name of State*].

Section 19. Interpretation and Severability. As used in this Agreement, words in the singular include the plural and words in the plural include the singular. The descriptive headings for each

section of this Agreement shall not affect the interpretation or the legal efficacy of this Agreement. If any part of this agreement is invalid, it shall not affect the remaining provisions which will remain valid and enforceable.

IN WITNESS WHEREOF the parties have caused this Agreement to be executed by the respective officers duly authorized and the incorporate seals to be hereunto affixed and attested as of the date first written above.

[*Insert name of licensee (Grantor)*]
[*Signature of representative of Grantor*]
[*Title*]

ATTEST:
[*Title*]
[*Seal*]

[Insert name and address of Trustee]
[Signature of representative of Trustee]
[Title]

ATTEST:
[*Title*]
[*Seal*]

Schedule A

This Agreement demonstrates financial assurance for the following cost estimates or prescribed amounts for the following licensed activities:

U.S. NUCLEAR REGULATORY COMMISSION LICENSE NUMBER(S)	NAME AND ADDRESS OF LICENSEE	ADDRESS OF LICENSED ACTIVITY	COST ESTIMATES FOR REGULATORY ASSURANCES DEMONSTRATED BY THIS AGREEMENT

The cost estimates listed here were last adjusted and approved by NRC on [*insert date*].

Schedule B

DOLLAR AMOUNT _____
AS EVIDENCED BY _____

Schedule C

[*Insert name, address, and phone number of Trustee.*]
Trustee's fees shall be $_____ per year.

Model Specimen Certificate of Events

[*Insert name and address of trustee*]

Attention: Trust Division

Gentlemen:

In accordance with the terms of this Agreement with you dated _____, I, _____, Secretary of [*insert name of licensee*], hereby certify that the following events have occurred:

1. [*Insert name of licensee*] is required to commence the decommissioning of its facility located at [*insert location of facility*] (hereinafter called the decommissioning).

2. The plans and procedures for the commencement and conduct of the decommissioning have been approved by the United States Nuclear Regulatory Commission, or its successor, on _____ (copy of approval attached).

3. The Board of Directors of [*insert name of licensee*] has adopted the attached resolution authorizing the commencement of the decommissioning.

_____
Secretary of [*insert name of licensee*]

_____
Date

Model Specimen Certificate of Resolution

I, _____, do hereby certify that I am Secretary of [*insert name of licensee*], a [*insert State of incorporation*] corporation, and that the resolution listed below was duly adopted at a meeting of this Corporation's Board of Directors on _____, 20_____.

IN WITNESS WHEREOF, I have hereunto signed my name and affixed the seal of this Corporation this _____ day of _____, 20_____.

_____
Secretary

RESOLVED, that this Board of Directors hereby authorizes the President, or such other employee of the Company as he may designate, to commence decommissioning activities at [*insert name of facility*] in accordance with the terms and conditions described to this Board of Directors at this meeting and with such other terms and conditions as the President shall approve with and upon the advice of Counsel.

Model Letter of Acknowledgment

STATE OF _____

To Wit: _____

CITY OF _____

On this___day of _____, before me, a notary public in and for the city and State aforesaid, personally appeared _____, and she/he did depose and say that she/he is the [*insert title*] of _____[if applicable, insert "*,national banking association*" or "*, State banking association*"], Trustee, which executed the above instrument; that she/he knows the seal of said association; that the seal affixed to such instrument is such corporate seal; that it was so affixed by order of the association; and that she/he signed her/his name thereto by like order.

_____

[*Signature of notary public*]

My Commission Expires: _____

[*Date*]

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APPENDIX C

DECOMMISSIONING COST ESTIMATE TABLES

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Table C3.4 Facility Description Summary

NRC license Numbers and Types (i.e., Part 30, 40, 70, or 72)
- 10 CFR Part 70 - To construct and operate a uranium enrichment facility
Types and Quantities of Materials Authorized Under the Licenses Listed Above
- 300,000 Metric Tons of UF_6 (Uranium Hexafluoride)
Description of How Licensed Materials Are Used
- Uranium is fed to the plant, where it is enriched to the desired ^{235}U assay. The enriched product is withdrawn and transferred to customer cylinders. The enriched product is shipped to fuel fabricators for further processing and will ultimately be used to generate electricity in nuclear power plants around the world. Tails (uranium depleted in ^{235}U isotope) will be stored on-site without undue risk. Final disposition of depleted material will be determined pending a future evaluation of the number of existing and potential uses for this material.
Description of Facility, Including Buildings, Rooms, Grounds, and Description of Where Particular Types of Materials Are Used
- X-3001 and X-3002 Process Buildings - Buildings that house the centrifuge machines and auxiliary process equipment. - X-3012 Process Support Building - Area that houses the Area Control Room, maintenance shops and stores, and other support areas. - X-3346 Feed and Customer Services Building - Area that houses the equipment necessary to supply UF_6 to the process buildings. - X-3346A Feed and Product Shipping and Receiving Building - Area that houses the equipment necessary to receive UF_6 feed material from previous process manufacturers and to liquid sample UF_6 product cylinders, and transfer and prepare this UF_6 material for shipment to customers. - X-3356 Product and Tails Withdrawal Building - Area that houses the equipment necessary to withdraw UF_6 from the process buildings in its enriched and depleted concentrations. - X-7725 Recycle/Assembly Facility - A large, multiple level building where material and components are received, components or subassemblies are inspected or tested, and centrifuge machines are assembled. This facility also stores wrecked contaminated centrifuges not handled for failure analysis. - X-7726 Centrifuge Training and Test Facility - Initially, the area where material and components are received; components or subassemblies are inspected and tested; components are assembled into centrifuge machines; final assembled machine is evacuated and leak checked; and limited repairs are performed to the machine or subassemblies. As the X-7725 facility becomes available, these functions will transfer to the X-7725 and X-7726 facilities utilization will wane. - X-7727H Interplant Transfer Corridor - Area that provides an enclosed throughway from the X-7725 or X-7726 facilities to the X-3001 and X-3002 buildings. - X-7746N, S,E,W; X-7756S and X-745G-2 - Cylinder Storage Yards - Areas that provide UF_6 (Feed, Tails, or Product) cylinder (empty or full) and overpack storage; and allows cylinder handling equipment access.
Quantities of Materials or Waste Accumulated Before Shipping or Disposal
- See table 3.4 (A)

Table C3.4(A) Quantities of Materials or Waste Accumulated Before Shipping or Disposal

Category	Description	Estimated Quantity
Centrifuges [1,2]	Internals: Rotor Assemblies, Motors, Suspensions, and Mounts (classified)	12,000
Service Modules [2]	Structural Components	0
Piping	Less than 1 in. Process Piping length (Lft) Includes Tubing [3]	0
	1-10 in. Process Piping length (Lft)	168,100
Pumps	Vacuum Pumps (Evacuation/Purge)	246
Ventilation	Ductwork; Misc. Gulper Ducting (ft^3) [3]	118
Surfaces	Building Floors, Yards, Equipment (ft^2) [4]	1,736,492
Valves	Process Valves (excluding Sheetmetal)	7,250
	Miscellaneous Valves	652
Process Equipment	Feed Ovens, Autoclaves, Cold Boxes	78
Cranes	Ridge Mast (RMC), Bridge, Wall and Jib Cranes	0
Scales	Process Weighing Equipment	6
Compressors	Process Gas Compressors	12
Heat Exchangers	Machine Cooling Water HX, Freezer/Sublimers, Train Coolers	16
Traps	Chemical Traps (8 banks of 4); Cold Traps, Roughing Filters, Misc. Traps	111
Tanks	Mixing, Holdup, Surge, and Dump Tanks	15
Cylinders	Tails (14, 10 Ton)	26,178
Cylinders	Tails, Parent (2.5 Ton)	1,000
Other Equipment	UF_6 Portable Carts; Buffer Storage Stands; and Gas Test Stand Equipment (Valve boxes)	66
Decontamination Equipment	Centrifuge Transporter [5]	3
	Cranes (RMC) [5]	8
	Cranes, Bridge X-7725 [5]	2
	Centrifuge Mobile Equipment [5]	4
	Centrifuge Dismantling Equipment (X-7725 Assembly Stands)	6
	Cutting Machines	2
	Degreasers	2
	Decontamination Tanks	4
	Wet Blast Cabinets	2
	Crusher	1

[1] Amount includes 11,520 operational units plus contaminated spare centrifuges.
[2] Centrifuge casings and service module structural steel is not considered waste. These items are to be removed, disassembled, decontaminated to NRC 'Free Release' criteria, and stored for later disposition.
[3] Piping <1" (assumed to be instrument piping/tubing), ventilation ductwork, and heat exchanger are assumed to not be internally contaminated. Therefore, these components can be externally decontaminated and remain as part of the building Balance of Plant (BOP).
[4] Amount of wall ft^2 not given because it is not anticipated to need decontamination at the time of decommissioning.
[5] Equipment re-utilized from operational phase (not new or purchased).

Table 3.5 Number and Dimensions of Facility Components (Total Volume)						
COMPONENT	**Number of Components**	**Dimensions of Component (specify units)**	**Total Volume (ft^3)**	**Compacted Factor (Volume Remaining)**	**Total Compacted Volume (ft^3)**	**Level of Contamination**
X-3001 and X-3002						
Centrifuges Casings	12,000 units	~30" dia x 45'	2,650,725			High Alpha
Service Modules – Structure	576 units	~45' x 6' x 13'	2,021,760			High Alpha
Service Modules – Piping	129,600 Lft	~45' x 3" dia x 5 runs	6,362	0.2	1,272	High Alpha
Vacuum Pumps	224 ea	2' x 5' x 2'	4,480	1.0	4,480	High Alpha
Chemical Traps	32 ea	8" dia x 10'	112	0.2	22	High Alpha
Building Headers	12,000 Lft	6" & 10" dia	6,545	0.2	1,309	High Alpha
Misc. Piping	12,000 Lft	1", 2", & 4" dia	1,047	0.2	209	High Alpha
Piping <1"; Tubing	640,000 Lft	<1" dia	3,491			High Alpha
Heat Exchangers	16 ea	4' x 4' x 7'	1,792			Low Alpha
HVP Ductwork	6,000 Lft	4' x 3'	72,000			Low Alpha
Valves	6,000 ea	0.4 ft^3	2,400	1.0	2,400	High Alpha
Valves, Miscellaneous	640 ea	0.4 ft^3	256	1.0	256	High Alpha
Carts	30 ea	3' x 5' x 4'	1,800	0.5	900	Low Alpha
X-3012						
HVAC Ductwork	1,225 Lft	2' x 1'	2,450			Low Alpha
X-3346						
Electric Feed Ovens	30 ea	22' x 6' x 6'	23,760	0.5	11,880	High Alpha
Autoclaves	18 ea	22' x 6' x 6'	14,256	0.5	7,128	High Alpha
Piping	1,000 Lft	24" dia	3,142	0.2	628	High Alpha
Piping <1"; Tubing	24,000 Lft	<1" dia	131			High Alpha

Table 3.5 Number and Dimensions of Facility Components (Total Volume)						
COMPONENT	**Number of Components**	**Dimensions of Component (specify units)**	**Total Volume (ft^3)**	**Compacted Factor (Volume Remaining)**	**Total Compacted Volume (ft^3)**	**Level of Contamination**
Valves	625 ea	0.4 ft^3	250	1.0	250	High Alpha
Freezer Sublimers	4 ea	67" dia x 78"	637	0.5	318	High Alpha
Chemical Traps	8 ea	8" dia x 96"	22	0.2	4	High Alpha
Cold Traps	4 ea	22' x 6' x 6'	3,168	0.2	634	High Alpha
Roughing Filters	4 ea	3' dia x 4'	113	0.2	23	High Alpha
Mixing Tanks	2 ea	3' dia x 7'	99	0.5	49	High Alpha
Holdup Tanks	2 ea	8' dia x 14'	1,407	0.5	704	High Alpha
Surge Drums	4 ea	8' dia x 14'	2,815	0.5	1,407	High Alpha
Gulper System Ducting	300 Lft	6" dia	59	0.1	6	High Alpha
Vacuum Pumps	6 ea	3' x 3' x 3'	162	1.0	162	High Alpha
HVAC Ductwork	3500 Lft	3' x 2'	21,000			High Alpha
Tails Cylinders	26,178 ea	139 ft^3	3,638,680			High Alpha
Tails Parent Cylinders	1,000 ea	108.9 ft^3	108,900			High Alpha
X-3356						
Cold Boxes	30 ea	22' x 6' x 6'	23,760	0.5	11,880	High Alpha
Compressors	12 ea	6' x 5' x4'	1,440	1.0	1,440	High Alpha
Compressor Train Coolers	12 ea	4' dia x 4'	603	0.5	302	High Alpha
Surge Tanks	5 ea	10' x 6' dia	1,414	0.5	707	High Alpha
Dump Drums	2 ea	26 ft^3	52	0.5	26	High Alpha
Chemical Traps	10 ea	8" dia x 96"	28	0.2	6	High Alpha
Cold Traps	45 ea	10' x 1' dia	353	0.2	71	High Alpha
Piping	6,000 Lft	6" dia	1,178	0.2	236	High Alpha
Gulper System Ducting	300 Lft	6" dia	59	0.1	6	High Alpha
Vacuum Pumps	6 ea	2' x 5' x 2'	120	1.0	120	High Alpha

Table 3.5 Number and Dimensions of Facility Components (Total Volume)						
COMPONENT	**Number of Components**	**Dimensions of Component (specify units)**	**Total Volume (ft^3)**	**Compacted Factor (Volume Remaining)**	**Total Compacted Volume (ft^3)**	**Level of Contamination**
HVAC Ductwork	750 Lft	3' x 2'	4,500			High Alpha
Piping <1"; Tubing	24,000 Lft	1" dia	131			High Alpha
Valves	625 ea	0.4 ft^3	250	1.0	250	High Alpha
X-2232C						
IPP (3 loops)	7,500 Lft	10" dia	4,091	0.2	818	High Alpha
X-7725						
Buffer Storage Stands	24 ea	5' x 25' x 1.5'	4,500	1.0	4,500	Low Alpha
Traps, Gas Test Stand	8 ea	8" dia x 96"	22	0.8	18	Low Alpha
HVAC Ductwork	3,800 Lft	3' x 2'	22,800			Low Alpha
Vacuum Pumps	10 ea	2' x 5' x 2'	200	1.0	200	Low Alpha
Valves Miscellaneous	12 ea	0.4 ft^3	5	1.0	5	Low Alpha
Gas Test Stand Equ't (Valve boxes)	12 ea	2' x 5' x 1'	120	1.0	120	Low Alpha
X-7727H						
HVAC Ductwork	23 units	3' x 1' x 50'	3,450			Low Alpha
Total Component Volume			8,662,895		**54,746**	

Assumptions: Centrifuge casings and service module structural steel is not considered waste. These items are to be removed, disassembled, decontaminated to NRC 'Free Release' criteria, and stored for later disposition. Centrifuge machine internals are considered for waste and accounted for in table C3.14.
Total Component Volume does not include the centrifuge casing, service modules (structure), piping <1", HVAC ductwork, some heat exchangers, and Tails cylinder component volume in this volumetric calculation; the piping, HVAC ductwork, and heat exchangers are essentially decontaminated to a 'free release' criteria, remain in the buildings; the centrifuge casings and service module structure are decontaminated to a 'free release' criteria and are stored for later disposition. Tails cylinders are considered to be part of the Tails classified waste disposal costs calculated by a different means in table C3.19 elsewhere.
X-7725 facility Manufacturing areas/items were excluded from the estimate.

Table C3.5(A) Number and Dimensions of Facility Components (Total Area)

Component	Number of Components	Dimensions of Component (specify units) [1]	Total Area (ft^2) [1]	Level of Contamination
X-3001 and X-3002		416' x 730'		
Cranes (RMC)	4 Buildings	~650' x 2' x 2 rails	20,800	Low Alpha
Floors	2 Buildings	303,680 ft^2	607,360	Low Alpha
X-3012		240' x 201'		
Maintenance Shop	3 (floors only)	100' x 39'	11,700	Low Alpha
Work Bench	5	3' x 5'	75	Low Alpha
Small Parts	Misc.	Varied	11	Low Alpha
Floors (~60%) [2]	1 Building	28,950 ft^2	28,950	Low Alpha
X-3346		488' x 352'		
Scales	2 ea	11' x 6'	132	Low Alpha
Cranes	3 ea	~1,000' x 2' x 2 rails	12,000	Low Alpha
Floors	1 Building	154,000 ft^2	154,000	Low Alpha
X-3346A		100' x 190'		
Cranes	2	~200' x 2' x 2 rails	1,600	Low Alpha
Floors	1 Building	19,000 ft^2	19,000	Low Alpha
X-3356		200' x 200'		
Scales	4 ea	11' x 6'	264	Low Alpha
Cranes	2 ea	~200' x 2' x 2 rails	1,600	Low Alpha
Floors	1 Building	36,000 ft^2	36,000	Low Alpha
Cylinder Storage Yards				
X-745G-2	1 lot	245' x 550'	135,057	Low Alpha
X-745H[3]	1 lot	486' x 2178'		Low Alpha
X-7746N	1 lot	584' x 241'	136,553	Low Alpha
X-7746E	1 lot	530' x 137'	75,732	Low Alpha
X-7746S	1 lot	197' x 163'	32,968	Low Alpha
X-7746W	1 lot	796' x 166'	132,543	Low Alpha
X-7756S	1 lot	71' x 201'	14,277	Low Alpha

Table C3.5(A) Number and Dimensions of Facility Components (Total Area) (Cont.)

Component	Number of Components	Dimensions of Component (specify units) [1]	Total Area (ft^2) [1]	Level of Contamination
X-2232C		2500' x 5'		
Housing	1 Equivalent Area	12,500 ft^2	12,500	Low Alpha
X-7725		540' x 820'		
Cranes, Bridge (Trolley)	3 ea	~250' x 2' x 2 rails (shared)	1,000	Low Alpha
Cranes, Bridge	48 ea	~100' x 2' x 2 rails	19,200	Low Alpha
Cranes, Wall	5 ea	~50' x 2' x 2 rails	1,000	Low Alpha
Buffer Storage (~75%) [2]	1 lot	~208' x 283'	45,000	Low Alpha
South Bldg Floors	1 lot	536' x 272'	145,792	Low Alpha
X-7725B		125' x 120'		
Floors	1 Building	15,000 ft^2	15,000	Low Alpha
X-7726		286' x 84'		
Cranes	4 ea	~50' x 2' x 2 rails	800	Low Alpha
Floors (multiple levels)	1 Building	49,500 ft^2	49,500	Low Alpha
X-7727H		~750' x 30'		
Floors	1 Building	26,078 ft^2	26,078	Low Alpha
Total Area			1,736,492	

[1] Actual areas were determined by AutoCAD and may vary somewhat from a given straight area calculation (1xw).

[2] Percentages/Areas listed are realistic probability of floor space needing potential Decontamination.

[3] Future yard listed with area depicted, but not considered in estimate.

Highlighted light-yellow rows represent items/equipment to remain in-place and have been decontaminated to a 'Free Release' criteria.

Table C3.6 Planning and Preparation (Work Days)

Group		Type	# Men	Dur (#m)	#w/m	#d/w	Total (md)
Supervision		Salary	1	24	4.33	5	520
Engineering		Salary	3	24	4.33	5	1,559
Operations		Salary	1	24	4.33	5	520
		Hourly	2	24	4.33	5	1,039
Maintenance		Salary	1	24	4.33	5	520
		Hourly	2	24	4.33	5	1,039
Support	Plant Support	Salary	1	24	4.33	5	520
		Hourly	3	24	4.33	5	1,559
	Production Support	Salary	0	24	4.33	5	0
		Hourly	0	24	4.33	5	0
	Central	Salary	1	24	4.33	5	520
Total			15				7,794

Assumptions:
Anticipated duration = 24 months
weeks/month = 4.33; #days/week = 5
Constant $ Pay

Table C3.7 Decontamination or Dismantling of Radioactive Facility Components (Work Days)

Group		Type	# Men	Dur (#m)	#w/m	#d/w	Total (md)
Supervision		Salary	3	60	4.33	5	3,897
Engineering		Salary	6	60	4.33	5	7,794
Operations		Salary	1	60	4.33	5	1,299
		Hourly	2	60	4.33	5	2,598
Maintenance		Salary	6	60	4.33	5	7,794
		Hourly	40	60	4.33	5	51,960
Support	Plant Support	Salary	1	60	4.33	5	1,299
		Hourly	4	60	4.33	5	5,196
	Production Support	Salary	2	60	4.33	5	2,598
		Hourly	10	60	4.33	5	12,990
	Central	Salary	2	60	4.33	5	2,598
Total			77				100,023

Assumptions:
Anticipated duration = 60 months
weeks/month = 4.33; #days/week = 5
Constant $ Pay

Table C3.8 Restoration of Contaminated Areas on Facility Grounds (Work Days)

Group		Type	# Men	Dur (#m)	#w/m	#d/w	Total (md)
Supervision		Salary	0	24	4.33	5	0
Engineering		Salary	0	24	4.33	5	0
Operations		Salary	1	24	4.33	5	520
		Hourly	2	24	4.33	5	1,039
Maintenance		Salary	0	24	4.33	5	0
		Hourly	0	24	4.33	5	0
Support	Plant Support	Salary	0	24	4.33	5	0
		Hourly	4	24	4.33	5	2,078
	Production Support	Salary	0	24	4.33	5	0
		Hourly	0	24	4.33	5	0
	Central	Salary	0	24	4.33	5	0
Total			7				3,637

Assumptions:
Anticipated duration = 24 months
weeks/month = 4.33; #days/week = 5
Constant $ Pay
1 person cleans approximately 600-900 ft^2/d

Table C3.9 Final Radiation Survey (Work Days)

Group		Type	# Men	Dur (#m)	#w/m	#d/w	Total (md)
Supervision		Salary	0	32	4.33	5	0
Engineering		Salary	0	32	4.33	5	0
Operations		Salary	0	32	4.33	5	0
		Hourly	0	32	4.33	5	0
Maintenance		Salary	0	32	4.33	5	0
		Hourly	0	32	4.33	5	0
Support	Plant Support	Salary	0	32	4.33	5	0
		Hourly	0	32	4.33	5	0
	Production Support	Salary	2	32	4.33	5	1,386
		Hourly	8	32	4.33	5	5,542
	Central	Salary	0	32	4.33	5	
Total			10				6,928

Assumptions:
Anticipated duration = 32 months
weeks/month = 4.33; #days/week = 5
Constant $ Pay

Table C3.10 Site Stabilization and Long-Term Surveillance (Work Days)

Group		Type	# Men	Dur (#m)	#w/m	#d/w	Total (md)
Supervision		Salary	0	32	4.33	5	0
Engineering		Salary	1	32	4.33	5	693
Operations		Salary	1	32	4.33	5	693
		Hourly	1	32	4.33	5	693
Maintenance		Salary	0	32	4.33	5	0
		Hourly	1	32	4.33	5	693
Support	Plant Support	Salary	0	32	4.33	5	0
		Hourly	0	32	4.33	5	0
	Production Support	Salary	0	32	4.33	5	0
		Hourly	0	32	4.33	5	0
	Central	Salary	0	32	4.33	5	9
Total			4				2,771

Assumptions:
Anticipated duration = 32 months
weeks/month = 4.33; #days/week = 5
Constant $ Pay

Table C3.11 Total Work Days by Labor Category

Task	Labor Category Supervision (S)	Labor Category Eng. (S)	Labor Category Operations (S)	Labor Category Operations (H)	Labor Category Maint. (S)	Labor Category Maint. (H)	Labor Category Support (S)	Labor Category Support (H)
Planning and Preparation	520	1,559	520	1,039	520	1,039	1,039	1,559
Decontamination &/or Dismantling of Radioactive Facility Components	3,897	7,794	1,299	2,598	7,794	51,960	6,495	18,186
Restoration of Contaminated Areas of Facility Grounds	0	0	520	1,039	0	0	0	2,078
Final Radiation Survey	0	0	0	0	0	0	1,386	5,542
Site Stabilization and Long-Term Surveillance	0	693	693	693	0	693	0	0

Assumptions: Individual tables describe other assumptions; this table is a summation of previous information.
Constant $ Pay
Some efficiency gained across phases or tasks.

Table C3.14 Packaging, Shipping, and Disposal of Radioactive Wastes (Excluding Labor Costs)

Waste Type	[A] Disposal Volume (ft^3)	[B] Number of Containers	Type of Container	[C] Unit Cost ($/$ft^3$)	[D] Shipping Cost ($/Container)	[E] Total Disposal Costs
Misc Total Compacted Equ't Waste from Table 3.5	54,746	608	B-25 Box	$28	$1,650	$2,536,562
Total	54,746	608	B-25 Box	$28	$1,650	$2,536,562

Assumptions: Unclassified, Low-Level Contaminated waste
[A] = Total Compacted Volume (Table C3.5) – nonconsidered items
One B-25 Box = 90 ft^3 = 2.7 m^3
[C] = $28/$ft^3$ (Current scrap metal disposal cost); $989.4/$m^3$
[D] = $1,650/B-25 Box (Packaging, Radiological Assessment for Shipment, and Transportation Fees)
E=AC+BD; B=A/90

Waste Type	[F] # of Centrifuges	[G] Classified Wt/Mach	[H] Container Limit	[J] Number of Containers	[K] Unit Cost ($/lb)	[M] Total Classified Waste Disposal Costs
Classified Waste	12,000	1,000	5,000	2,400	$4.47	$ 53,640,000
Total	12,000	1,000	5,000	2,400	$4.47	$ 53,640,000

Assumptions: Classified, Contaminated Waste
[G] = 1,000 lb. Classified weight per centrifuge (2,000 lb) – Casing (1,000 lb) [unclassified, stored]
[H] = B-25 Box container weight limit = 10,000 lb; compressed volume limit = 5,000 lb
[K] = $4.36/lb (Current classified disposal cost) + $0.11/lb (Transportation and Brokerage Costs) = $4.47/lb
J=FG/H; M=FGK

Table C3.15 Equipment/Supply Costs

Equipment/Supplies	Quantity	Unit Cost	Total Equ't/Supply Cost
Centrifuge Dismantling Equipment	6	$25,000	$150,000
Cutting Machines	2	$25,000	$50,000
Degreasers	2	$15,000	$30,000
Decontamination Tanks	4	$25,000	$100,000
Wet Blast Cabinets	2	$25,000	$50,000
Crushers	1	$250,000	$250,000
B-25 Containers	3,008	$700	$2,105,802
TOTALS	3,025		$2,735,802

Table C3.16 Laboratory Costs

Activity	Total Cost
Planning & Preparation	$21,840
Demolition & Dismantling	$2,615,335
Restoration of Facilities	$280,980
Final Radiation Surveys	$338,100
TOTALS	$3,256,255

Assumptions:
samples =(# men/phase * freq + Recall % + Incident %)* # yr * ($/sample)
Approximately $ 105/sample

Table C3.17 Miscellaneous Costs

Cost Item	Total Cost
NRC Staff Review & Approval DFP	$ 80,000.00
Miscellaneous Material for DeCon[1]	$ 2,500,000.00
Total	$ 2,580,000.00

[1] Estimate based upon percentage of total cost.

Table C3.18 Total Decommissioning Costs

Task	Calculated Costs	Percentage
Planning and Preparation	$ 2,868,940	3%
Decontamination and/or Dismantling of Radioactive Facility	$ 32,457,645	31%
Restoration of Contaminated Areas of Facility Grounds	$ 1,101,261	1%
Final Radiation Survey	$ 2,163,864	2%
Site Stabilization and Long-Term Surveillance	$ 1,004,615	1%
Packaging, Shipping, and Waste Disposal Costs	$ 56,176,562	54%
Equipment/Supply Costs	$ 2,735,802	3%
Laboratory Costs	$ 3,256,255	3%
Miscellaneous Costs	$ 2,580,000	2%
Subtotal	$ 104,344,945	100%
Contingency (25%)	$ 26,086,236	
Total Decommissioning Cost Estimate	$ 130,431,181	

Table C3.19 Estimated Volume of Annual Depleted Uranium Generated

Calendar Year	[Q] # Machines		[R] DUF_6 Generated [1,000 MT]	[S] DUF_6 Accumulated [1,000 MT]	[T] DU Accumulated [1,000 MT]	[U] Tails Disposal Cost [$M, 2004]	[V] # Tails Cylinders
2006	240		0	0	0	$0.00	0
2007	120	*	0.124	0.124	0.084	$0.25	10
2008	5760		5.96	6.08	4.03	$12.09	478
2009	10165		10.52	16.60	7.11	$21.33	843
2010	11520		11.92	28.52	8.06	$24.18	956
2011-2036	11520		298.01	326.53	201.49	$604.47	23,891
Total			326.53	326.53	220.77	$662.32	26,178

* - based upon Lead Cascade potential Interim Production that can produce waste material and number of machines considered

Assumptions:
Operational life = 30 years (from 2006 – 2036)
Tails Output during Operation (@ 3,500 MTSWU/yr) = 3,000 lb UF_6/hr
Operation = 24 hr/day; 365 days/yr
Weight Conversion Factor = 0.45359 kg/lb; Tails Material Conversion Factor = 0.30668 kg/lb
UF6; Tails Purity = 0.67612 gU/g
U disposal cost = $3/kg U
R=Q/11,520*3,000*24*365*number of years; T=R*0.67612; U=T*3
V=s*10,000,00/0.45359/27,500
Approximately 26,178 Tails cylinders generated; 27,500 lb UF_6 fill weight = 1,000 generated parent cylinders (@ EOL)

Table C3.20 Total Labor Distribution

Group		Type	Job/Personnel Descriptions
Supervision		Salary	Program Manager, Project Manager, Office Manager
Engineering		Salary	Design Engineer, Field Support, NCS Engineer, Nuclear Safety
Operations		Salary	Shift Manager, Operations FLM
		Hourly	Chemical Operations, UMH, Laundry
Maintenance		Salary	Supervisor, FLM, Scheduler-Planner
		Hourly	Mechanic, Laborer, Field Service Technician
Support	Plant Support	Salary	HP FLM
	Production Support	Salary	Waste Engineer, RMDC, QC, Material, Trainer, Procedure Writer, Safety, Respirator
	Central	Salary	Finance, Payroll, HR
	Plant Support	Hourly	HP Technician, Protection Forces
	Production Support	Hourly	Laboratory Technician, ANT Technician, Waste Handler

APPENDIX D

DECOMMISSIONING COST ESTIMATE TABLES

The information contained in this appendix is being submitted to the NRC under separate cover in accordance with the requirements of 10 CFR 2.390

Information contained within
does not contain
Export Controlled Information

Reviewer: Original signed by RL Coriell
Date: 07/30/04