



## International Isotopes Inc.

August 12, 2011

ATTN: Document-Control Desk  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555-0001

NRC Docket No. 40-9086

Subject: Submittal of Responses to Requests for Additional Information (RAI)  
TAC L32739

To Whom it May Concern,

The following documents are provided as a response to the US Nuclear Regulatory Commission RAIs pertaining to the International Isotopes Fluorine Products Inc. December 30, 2009 application to license a depleted uranium hexafluoride de-conversion and fluorine extraction process facility.

- (1) Response to Second Follow-up Request for Additional Information to Support the IIFP License Application– Financial Assurance (Public)
- (2) Response to Second Follow-up Request for Additional Information to Support the IIFP License Application– Financial Assurance (Non-Public)

An affidavit is also included to withhold Enclosure (2) as proprietary information.

Please contact me by phone at 208 524-5300 or email at [jjmiller@intisoid.com](mailto:jjmiller@intisoid.com) if you have any questions regarding this letter or require additional information.

Sincerely,

John J. Miller, CHP  
Radiation Safety Officer

JJM-2011-45

Enclosures as Stated

cc: Dr. Matthew Bartlett  
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# International Isotopes Inc.

## Affidavit Declaring Confidential Information Submitted Under 10 CFR 2.390 Proprietary - Commercial and Financial Information

Document: Enclosure (2) of JJM-2011-45  
Company Officer: Laurie McKenzie-Carter  
Title: Chief Financial Officer  
Company: International Isotopes Inc. (INIS)  
Declaration: Enclosures (2) of JJM-2011-45, *Response to Second Follow-up Request for Additional Information to Support the IIFP License Application- Financial Assurance* contains detailed cost estimates for the de-conversion of depleted uranium hexafluoride that if made publically available could limit our ability to negotiate de-conversion service contracts with potential clients.

Laurie McKenzie-Carter CFO

8/12/11

Date

## Response to Second Follow-up Request for Additional Information to Support the IIFP License Application

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*Request #1: Related to Follow-up Question RAI FA-F1-1*

*Clarify the basis for Converting the residual DUF<sub>6</sub> Inventory (NUREG-1757, Volume 3, Appendix A.3.1)*

*The referenced guidance states that "the labor estimates, materials costs, and other factors of the cost estimate should have a clear and reasonable basis." Table 10-18 states that the estimated cost to de-convert the DUF<sub>6</sub> inventory to Depleted Uranium Oxide is \$ . It does not appear that INIS provided a basis for this estimated cost. Please provide addition information as to how this figure was determined (e.g., labor hours and unit costs, utilities, insurance, taxes, fees, etc.).*

**RESPONSE TO REQUEST #1:** As stated and explained in the previously submitted response to "Follow-up Question RAI FA-F1-1", INIS, at its IIFP Facility, intends to make final disposition of any DUF<sub>6</sub> remaining on-site at the time of a decommissioning decision by processing all the residual inventory through the normal operating plant process resulting in depleted uranium oxide. The uranium oxide will be disposed at a licensed off-site in the same manner that IIFP utilized for disposal of depleted uranium oxide during its normal years of operation.

The basis for estimating the cost of processing the residual inventory of DUF<sub>6</sub> and the disposal of the resulting oxide is discussed below:

1. The amount of residual DUF<sub>6</sub> inventory to be processed for the purposes of allocating the associated costs to the decommissioning and financial assurance plan is based on a DUF<sub>6</sub> average inventory of 25 cylinders at the time of the decommissioning decision. IIFP is not a long-term DUF<sub>6</sub> storage facility. The IIFP Facility during its years of operation would have been processing the contents of DUF<sub>6</sub> cylinders within a few days of when cylinders were received, inspected and accepted. The 25 remaining cylinders would contain a total of approximately 687,500 pounds of DUF<sub>6</sub>.
2. The residual inventory of DUF<sub>6</sub> will be converted to boron trifluoride (BF<sub>3</sub>) product and waste depleted uranium oxide. For purposes of the financial assurance cost estimates, no credit is taken for any sales of the BF<sub>3</sub> product.
3. A thirty (30)-day period is required (calculated) for processing the residual DUF<sub>6</sub> inventory and is based on the plant normal production rates of BF<sub>3</sub> at 255 pounds per hour using an 85% on-stream (i.e., 15 % average downtime for maintenance). The total processing time of 30 days is based on operating 24 hours per day and 7 days per week and consists of approximately 25 days operating at normal production rate with an allowance of 5 days total of partial production (ramp-up) for cold-startup and for the equipment shut down at the end of the period. This BF<sub>3</sub> production rate and on-stream time consumes an approximate average of 25,050 pounds per day of DUF<sub>6</sub> and generates about 19,215 pounds per day of depleted uranium oxide for disposal during the 25 day full production period. An additional 61, 250 pounds of DUF<sub>6</sub> is estimated to be converted during the short start-up (ramp-up) period with an additional 46, 980 pounds of uranium oxide being generated for disposal.

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4. As discussed in the response to previously submitted RAI response FA-F1-1, the cost estimate for processing the residual DUF<sub>6</sub> inventory is based on the IIFP facility operating cost for converting the DUF<sub>6</sub> to product BF<sub>3</sub> and the waste depleted uranium oxide. However, the labor cost for the pre-decommissioning work is based on using a third-party contractor. These labor costs are estimated by taking the normal facility operating direct wages and applying the third-party contractor fringe benefits, overheads and profits (See explanation of third-party contractor labor cost basis in the Financial Assurance RAIs Official Responses, Revision B, 6/20/11, RAI # FA-1.A and FA-1.B).
5. The Table 1 below identifies and explains the basis for the operating costs to process the subject residual DUF<sub>6</sub> inventory and ready it for disposal as uranium oxide. Costs for shipping and disposal of the oxide are included in the "Transportation and Disposal" cost line of the IIFP License Application Chapter 10 Revision B, Table 10-18 (also in Financial Assurance RAIs Official Responses Revision B, dated 6/20/2011). The shipping and disposal costs for just the uranium oxide generated (2825 cubic feet) as of a result of processing the residual DUF<sub>6</sub> inventory are \$130,724 and \$653,621, respectively. Any packaging costs (mostly labor) is part of the operating costs (shown below) for processing the residual DUF<sub>6</sub> inventory; essentially the same cost as those would be for normal packaging during the IIFP Facility production years. *The dollar per day cost expressed in Table 1 is derived from the IIFP financial model estimate for one year of normal full production and then divided by days in the year to obtain the average per day cost.* In this manner, the plant indirect and overhead costs are included as well as the variable costs of an average day conversion of DUF<sub>6</sub> and producing BF<sub>3</sub>.

**Table 1. Basis for Operating Cost to Process Residual DUF<sub>6</sub> Residual Inventory of the IIFP Facility at the Time of Decommissioning**

Cost Area	Per Day Cost	30-day Cost	Comments
Raw Materials	\$	\$	B <sub>2</sub> O <sub>3</sub> raw material at \$1.50 /lb. and on-site generated H <sub>2</sub> gas at \$2.39/lb. are the only raw materials required to process the DUF <sub>6</sub> inventory.
Treating Agents			Includes KOH and Ca(OH) <sub>2</sub> used for scrubbing process off-gas and treating/removing fluorides from scrubber solutions and recycling the water.
Electrical Power			Based on operating the DUF <sub>6</sub> reaction vessel, two BF <sub>3</sub> production lines of pre-heaters and rotary calciners and all the general plant indirect electrical usage.
Liquid Nitrogen (LN2)			LN2 is used for pre-condenser and cold traps for collecting BF <sub>3</sub> product; the resulting nitrogen gas is reused for seal purges and purging equipment prior to maintenance. The cost is based on estimated LN2 usage for collecting the amount of BF <sub>3</sub> product from de-conversion of the residual DUF <sub>6</sub> inventory.
Other utilities; steam, plant air, water			Mainly steam for vaporizing DUF <sub>6</sub> in the autoclave room, but does include the average "other" utilities costs for the general plant indirect areas as well as for the variable direct costs of

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			converting DUF <sub>6</sub> and producing BF <sub>3</sub> .
Maintenance materials and operating supplies			Based on the normal annual maintenance material and operating supply usage for the entire facility. Does not include maintenance labor cost as that is in the Labor Cost line. The maintenance material cost is likely to be conservatively high because during the brief 30-day operating period only maintenance would be done that involved safety, regulatory requirements and corrective maintenance to keep the facility operating for the short term as it will be decommissioned.
Miscellaneous waste disposal			Includes transport and disposal cost for any RCRA, sanitary, and miscellaneous LLW (other than uranium oxide). Based on the estimate waste generated per year as described in the IIFP Environmental Report (ER) and any updated ER RAI responses. Unit cost for miscellaneous LLW is the same transport and disposal rate as that used for uranium oxide as defined in previously submitted RAI response FA-5.
Insurance and fees			Based on a rate of 1% of the plant direct fixed-capital investment (Reference: "Plant Design and Economics for Chemical Engineers", K.D. Timmerhaus, fifth edition, McGraw-Hill Publishers). This insurance does not include "workers compensation" as it is included as part of the Labor Cost.
Labor			Based on using third-party contractor with fringes, overhead and profits applied as defined in RAI response FA-1 B. The third-party contractor fringes, overhead and profits are applied to IIFP normal direct wage rates to obtain the third-party labor costs. The IIFP salary employee wage rate is derived from a salary surveys conducted by job position. A New Mexico Department of Workforce Solutions hourly wage survey was used for operators, craft and laborers by job category. The direct wage unit cost (without benefits and overheads) used is an average of \$ 22.74/hour for operators, craft and laborers at regular rate with hourly-wage employees working regular time hours during the 30-day operating period. Also, the hourly-wage employees are estimated to work approximately an additional over-time hours during the period at a 1.5 times premium wage rate equating to \$34.10/ hour. The direct unit cost for salary employees used is an average of approximately \$5020 per 30-day month. For the 30-day period to process the DUF <sub>6</sub> residual inventory a workforce of salary staff ( hours total) is required. The direct wages were then multiplied by 2.128 for applying the third-party contractor fringes, overheads and profits.
<b>Total (Shown in Table 10-18 of RAI FA-1 response)</b>	<b>\$</b>	<b>\$</b>	The costs are estimated in year 2009 dollars and include third-party contractor labor with fringes, overheads and profits. This total does not include the 25% contingency but it is applied in the Table 10-18 response to "Financial Assurance RAIS Official

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			Response, Revision B, 6/20/11 and is referenced in RAI FA-1.A. (Note the \$784,345 transportation and disposal costs for the waste depleted uranium oxide is not included in this operating cost total but is included in the Table 10-18, line 6 "Transportation and Disposal" cost.)
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**License Documentation Impact Request #1:** None. This response is being provided as follow-up clarification to FA RAI responses that have already been submitted to NRC.

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*Request #2: Related to Follow-up Question RAI FA-F1-7*

*40.36(d) requires that INIS provide certification of financial assurance along with the decommissioning funding plan (at the time the license is issued). Since INIS has requested to provide the financial assurance instruments 6 months prior to startup and fund them 21 days before operations, you will need an exemption to the applicable portion of 40.36(d). The exemption can be combined with the incremental funding exemption, if you decide to make that request. Otherwise it will need to be its own exemption request. The exemption will need to meet the requirements in 40.14 (for example see, Section 1.2.4 of the AREVA Eagle Rock SAR - ML091210638). If possible, the request should be incorporated into the license application (Generally in Chapter 1 in a section entitled – Special Exemptions of Special Authorizations).*

*The following information would need to be incorporated into the exemption request: To be consistent with the license application, the exemption should request to delay providing a financial instrument until sometime before licensed material is at the site. With respect to delaying the instrument, the request should also clarify whether any material, including contamination of equipment or structures, will be present at the site during the time that no financial instrument is in place.*

**RESPONSE TO REQUEST #2:** IIFP will request an exemption from §40.36(d) to provide financial assurance instruments 6 months prior to startup and to fund the financial assurance instruments 21 days prior to start-up. Submitting the financial assurance instruments to the NRC six months prior to operations provides a sufficient amount of time for NRC to review the financial assurance instruments before operations are scheduled to commence. Funding these instruments 21 days prior to operations minimizes the costs associated with funding the financial assurance instruments at a time when there is no decommissioning liability.

All structures associated with the facility will be constructed on site and will not become potentially contaminated with radioactive materials prior to licensed operations. Radioactively contaminated equipment obtained from the Sequoyah Fuels facility will be decontaminated prior to transfer to the construction site. If radioactive contamination associated with Sequoyah Fuels equipment cannot be decontaminated to unrestricted use levels, then the financial assurance for decommissioning will be funded in full or in part sufficient to cover the decommissioning costs associated with equipment containing residual radioactive contamination.

**License Documentation Impact Request #2:** A new section, 1.5 *Special Exemptions and Special Authorizations* will be included in Revision B to the License Application. The new section replaces the IIFP License Application Chapter 1 section 1.6 which will be renumbered to be 1.7. All ensuing sections of the Chapter 1 will be sequentially renumbered, accordingly. The following exemption request will be added to the 1.5 section and will read as follows :

#### **1.5 Special Exemptions and Special Authorizations**

In accordance with 10 CFR §40.14 (CFR, 2011), "Specific exemptions," IIFP requests an exemption from certain provisions of 10 CFR 40.36 (CFR, 2011), "Financial assurance and recordkeeping for decommissioning," paragraph (d). Specifically, 10 CFR 40.36(d) requires that "...the

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decommissioning funding plan must also contain a certification by the licensee that financial assurance for decommissioning has been provided in the amount of the cost estimate for decommissioning...."

As stated in Section 1.2.2 *Financial Qualification* of the License Application; "IIFP presently intends to utilize a surety bond and Standby Trust Fund method to provide reasonable financial assurance of decommissioning funding will be available at the time of decommissioning the facility. At least six months prior to startup of the Phase 1 facility, IIFP will provide NRC the financial assurance instrument that IIFP intends to execute. Upon finalization of the specific funding instrument to be used and at least 21 days prior to the commencement of operations, IIFP will supplement its application to include the signed, executed documentation."

The justification to provide the financial assurance instruments to the NRC 6 months prior to operations and to fund the instruments 21 days prior to operations is to allow issuance of the license so construction can commence without accruing costs associated with funding the financial assurance mechanism while at the same time providing the NRC with a sufficient amount of time to review the financial assurance instruments before licensed material would be brought on site.

Radioactively contaminated equipment obtained from the Sequoyah Fuels facility will be decontaminated prior to transfer to the construction site. If radioactive contamination associated with Sequoyah Fuels equipment cannot be decontaminated to unrestricted use levels, then the financial assurance for decommissioning will be funded in full or in part sufficient to cover the decommissioning costs associated with equipment containing residual radioactive contamination.

Therefore, IIFP specifically requests an exemption from the 10 CFR 40.36(d) (CFR, 2011) requirement that the "decommissioning funding plan must also contain a certification by the licensee that financial assurance for decommissioning has been provided in the amount of the cost estimate for decommissioning and a signed original of the financial instrument obtained to satisfy the requirements of paragraph (e) of this section"; and alternatively that IIFP can provide the financial assurance instruments to the NRC 6 months prior to operation and to fund these instruments 21 days prior to the commencement of licensed operations.

Consistent with §40.14(a);

Granting the exemption is authorized by law;

The decommissioning liability associated with a site that does not possess licensed material, as would be the case during construction, should be considered zero. This is consistent with the Prepayment funding mechanism described in §40.36(e)(1) which states (emphasis added); "*Prepayment is the deposit prior to the start of operation into an account segregated from licensee assets and outside the licensee's administrative control...*". This method of funding is also consistent with International Isotope Inc. License SUB-1587 Amendment 1 (Docket No. 40-9058) Block 17.

Granting the exemptions will not endanger life or property or the common defense and security;



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Delaying the funding of financial assurance until licensed operations with radioactive materials commences does not endanger life or property or the common defense and security because the cost associated with decommissioning the facility during the construction phase is considered zero. Financial assurance for decommissioning will be in place prior to licensed operations when the decommissioning liability costs would be assured.

Granting the exemptions is otherwise in the public interest;

Requiring funds to be set aside for the cost of decommissioning the facility prior to licensed operations presents an undue financial burden on IIFP. The decommissioning liability associated with the IIFP facility during the construction phase is considered to be zero. The cost associated with maintaining financial assurance instruments during the construction phase of the project is not warranted, these costs could be allocated toward construction activities which provide employment opportunities to the local community which is in the public interest.

Granting the exemption meets the categorical exclusion criteria cited in §51.22(c)(25)(vi)(H) and (I) and therefore does not require a revision to the Environmental Report submitted with the License Application or a standalone environmental review.