

# ORDER FOR SUPPLIES OR SERVICES

PAGE OF PAGES

1 11

IMPORTANT: Mark all packages and papers with contract and/or order numbers.

BPA NO.

1. DATE OF ORDER 02/24/2012		2. CONTRACT NO. (if any) NRC-HQ-11-C-04-0012		6. SHIP TO:	
3. ORDER NO. NRC-HQ-11-T-04-0001		4. REQUISITION/REFERENCE NO. RES-11-260 dated 08/05/2011 FAIMIS: RES-C11-301		a. NAME OF CONSIGNEE U.S. Nuclear Regulatory Commission	
5. ISSUING OFFICE (Address correspondence to) U.S. Nuclear Regulatory Commission Div. of Contracts Attn: Adellis M Rodriguez, 301-492-3623; <u>Adellis.Rodriguez@nrc.gov</u> Mail Stop: TWE-01-B10M Washington, DC 20555				b. STREET ADDRESS 11555 Rockville Pike Attn: Mekonen Bayssie; 301-251-7489; <u>Mekonen.Bayssie@nrc.gov</u> Mail Stop: CSB-2-A7	
7. TO:		c. CITY Rockville		d. STATE MD	e. ZIP CODE 20852
a. NAME OF CONTRACTOR DADE MOELLER & ASSOCIATES, INC. MOELLER, DADE				f. SHIP VIA N/A	
b. COMPANY NAME				8. TYPE OF ORDER	
c. STREET ADDRESS 1835 TERMINAL DR STE 200				<input type="checkbox"/> a. PURCHASE <input checked="" type="checkbox"/> b. DELIVERY Except for billing instructions on the reverse, this delivery order is subject to instructions contained on this side only of this form and is issued subject to the terms and conditions of the above-numbered contract.	
d. CITY RICHLAND	e. STATE WA	f. ZIP CODE 993544958			
9. ACCOUNTING AND APPROPRIATION DATA Please transfer \$100,000.00 from the base contract NRC-HQ-11-C-04-0012 to this task order. (Details below)				10. REQUISITIONING OFFICE RES	

11. BUSINESS CLASSIFICATION (Check appropriate box(es))				12. F.O.B. POINT Destination	
<input type="checkbox"/> a. SMALL	<input checked="" type="checkbox"/> b. OTHER THAN SMALL	<input type="checkbox"/> c. DISADVANTAGED	<input type="checkbox"/> d. WOMEN-OWNED	<input type="checkbox"/> e. HUBZone	
<input type="checkbox"/> f. SERVICE-DISABLED VETERAN-OWNED <input type="checkbox"/> g. WOMEN-OWNED SMALL BUSINESS (WOSB) <input type="checkbox"/> h. ECONOMICALLY DISADVANTAGED WOMEN-OWNED SMALL BUSINESS (EDWOSB)					
13. PLACE OF		14. GOVERNMENT B/L NO.	15. DELIVER TO F.O.B. POINT ON OR BEFORE (Date)		16. DISCOUNT TERMS
a. INSPECTION Destination	b. ACCEPTANCE Destination	N/A	N/A		N/A

## 17. SCHEDULE (See reverse for Rejections)

ITEM NO. (a)	SUPPLIES OR SERVICES (b)	QUANTITY ORDERED (c)	UNIT (d)	UNIT PRICE (e)	AMOUNT (f)	QUANTITY ACCEPTED (g)
	<b>ACCOUNTING INFORMATION:</b> Move \$100,000.00 from base contract, NRC-HQ-11-C-04-0012, under JCN N6851 to this Task Order, NRC-HQ-11-T-04-0001, under JCN V6101: -Deobligate \$100,000.00 from N6851 -Decommit \$100,000.00 from N6851 -Commit \$100,000.00 on V6101 -Obligate \$100,000.00 on V6101 (funds will retain FY11 designation) B&R: 2011-60-11-7-184 JCN: V6101 BOC: 252A APPR: 31X0200.160 NAICS: 541690 PSC: R421 DUNS: 928304120  <b>Title:</b> Developing the Technical Bases for Draft Regulatory Guide, "Soluble Uranium Exposure Criteria for Integrated Safety Analyses"  <b>Estimated Cost:</b> \$173,406.27 <b>Fixed Fee:</b> \$10,404.38 <b>Total CPFF:</b> \$183,810.65  <b>Period of Performance:</b> 03/01/2012 - 02/28/2014  <b>See Attachment #1 for Statement of Work</b>					

SEE BILLING INSTRUCTIONS ON REVERSE	18. SHIPPING POINT		19. GROSS SHIPPING WEIGHT		20. INVOICE NO.		17(h) TOTAL (Cont. pages)  17(i). GRAND TOTAL
	21. MAIL INVOICE TO:						
	a. NAME Department of Interior / NBC NRC Pavments@nbc.gov						
	b. STREET ADDRESS (or P.O. Box) Attn: Fiscal Services Branch - D2770 7301 W. Mansfield Avenue						
	c. CITY Denver	d. STATE CO	e. ZIP CODE 80235-2230				

22. UNITED STATES OF AMERICA  
BY (Signature)

23. NAME (Typed)  
Jennifer A. DeFino  
Contracting Officer  
TITLE: CONTRACTING/ORDERING OFFICER

TEMPLATE - ADM001

SUNSI REVIEW COMPLETE

ADM002

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## A.1 GENERAL TASK ORDER TERMS

In accordance with Section G.3, Task Order Procedures, of Contract No. NRC-HQ-11-C-04-0012 this definitizes Task Order No. NRC-HQ-11-T-04-0001. The effort shall be performed in accordance with Attachment #1: Statement of Work.

The Contractor agrees that the personnel proposed for this Task Order under Dade Moeller, Inc's proposal dated 02/14/2012 shall not be removed from the effort under the Task Order without compliance with Contract Clause H.2 Key Personnel.

The issuance of this Task Order does not amend any terms or conditions of the subject contract.

Your contacts during the course of this Task Order are:

Technical Matter: Mekonen Bayssie  
Project Officer  
Email: [Mekonen.Bayssie@nrc.gov](mailto:Mekonen.Bayssie@nrc.gov)  
Phone: 301-251-7489

Gregory Chapman  
Technical Monitor  
Email: [Gregory.Chapman@nrc.gov](mailto:Gregory.Chapman@nrc.gov)  
Phone: 301-492-3106

Contractual Matters: Adelis M. Rodriguez  
Sr. Contract Specialist  
Email: [Adelis.Rodriguez@nrc.gov](mailto:Adelis.Rodriguez@nrc.gov)  
Phone: 301-492-3623

## A.2 TASK/DELIVERY ORDER PERIOD OF PERFORMANCE (AUG 2011)

This order shall commence on 03-01-2012 and will expire on 02-28-2014.

## A.3 CONSIDERATION AND OBLIGATION--COST-PLUS-FIXED-FEE (AUG 2011) ALTERNATE I (AUG 2011)

(a) The total estimated cost to the Government for full performance of this task order is \$183,810.65, of which the sum of \$173,406.27 represents the estimated reimbursable costs, and of which \$10,404.38 represents the fixed-fee.

(b) There shall be no adjustment in the amount of the Contractor's fixed fee.

(c) The amount currently obligated by the Government with respect to this task order is \$100,000.00, of which the sum of \$94,000.00 represents the estimated reimbursable costs, and of which \$6,000 represents the fixed-fee.

(d) It is estimated that the amount currently obligated will cover performance through the first 6 months.

(e) This is an incrementally-funded task order and FAR 52.232-22 - "Limitation of Funds" applies.

(f) In accordance with FAR 52.216-8 - Fixed Fee, it is the policy of the NRC to withhold payment of fee after payment of 85 percent of the fee has been paid in order to protect the Government's interest. The amount of fixed-fee withheld from the contractor will not exceed 15 percent of the total fee or \$100,000, whichever is less. Accordingly, the maximum amount of fixed-fee that may be held in reserve is \$1,560.66.

#### A.4 CONTRACTOR ACCEPTANCE OF TASK ORDER NRC-HQ-11-T-04-0001

Acceptance of Task Order No. NRC-HQ-11-T-04-0001 should be made by having an official, authorized to bind your organization, execute two copies of this document in the space provided and return one copy to the Contracting Officer. You should retain the other copy for your records.

By signing this document, your organization agrees to the following:

1. As a condition to the award of Task Order NRC-HQ-11-T-04-0001 under contract NRC-HQ-11-C-04-0012, your organization agrees that it will not provide advice or recommendations to any organization regulated by the NRC in the area of toxicology related to uranium or toxicology involving hydrogen fluoride (including dermal exposure to hydrogen fluoride) while concurrently performing work contemplated under Task Order NRC-HQ-11-T-04-0001 under contract NRC-HQ-11-C-04-0012.
2. As a condition to the award of Task Order NRC-HQ-11-T-04-0001 under contract NRC-HQ-11-C-04-0012, your organization agrees not to support any NRC applicant or licensee in the development of an ISA while concurrently performing work contemplated under Task Order NRC-HQ-11-T-04-0001 under contract NRC-HQ-11-C-04-0012.

Accepted Task Order No. NRC-HQ-11-T-04-0001:

Carl Shaw/ Contract Specialist  
Printed Name & Title

Carl Shaw  
Signature

2-24-12  
Date

#### A.5 PACKAGING AND MARKING (AUG 2011)

(a) The Contractor shall package material for shipment to the NRC in such a manner that will ensure acceptance by common carrier and safe delivery at destination. Containers and closures shall comply with the Surface Transportation Board, Uniform Freight Classification Rules, or regulations of other carriers as applicable to the mode of transportation.

(b) On the front of the package, the Contractor shall clearly identify the contract number under which the product is being provided.

(c) Additional packaging and/or marking requirements are as follows:

#### A.6 BRANDING (AUG 2011)

The Contractor is required to use the official NRC branding logo or seal on any publications, presentations, products, or materials funded under this contract, to the extent practical, in order to provide NRC recognition for its involvement in and contribution to the project. If the work performed is funded entirely with NRC funds, then the contractor must acknowledge that information in its documentation/presentation.

Access the following websites for branding information and specifications:  
<http://www.internal.nrc.gov/ADM/branding/> and Management Directive and Handbook 3.13 -

(internal NRC website): <http://www.internal.nrc.gov/policy/directives/toc/md3.13.htm>

(external public website): <http://pbadupws.nrc.gov/docs/ML1122/ML112280190.pdf>

#### **A.7 ELECTRONIC PAYMENT (AUG 2011)**

The Debt Collection Improvement Act of 1996 requires that all payments except IRS tax refunds be made by Electronic Funds Transfer. Payment shall be made in accordance with FAR 52.232-33, entitled "Payment by Electronic Funds- Central Contractor Registration".

To receive payment, the contractor shall prepare invoices in accordance with NRC's Billing Instructions. Claims shall be submitted on the payee's letterhead, invoice, or on the Government's Standard Form 1034, "Public Voucher for Purchases and Services Other than Personal," and Standard Form 1035, "Public Voucher for Purchases Other than Personal - Continuation Sheet." The preferred method of submitting invoices is electronically to the Department of the Interior at [NRCPayments\\_NBCDenver@nbc.gov](mailto:NRCPayments_NBCDenver@nbc.gov). If the contractor submits a hard copy of the invoice, it shall be submitted to the following address:

Department of the Interior  
National Business Center  
Attn: Fiscal Services Branch - D2770  
7301 West Mansfield Avenue  
Denver, CO 80235-2230

#### **A.8 COMPLIANCE WITH U.S. IMMIGRATION LAWS AND REGULATIONS (AUG 2011)**

NRC contractors are responsible to ensure that their alien personnel are not in violation of United States immigration laws and regulations, including employment authorization documents and visa requirements. Each alien employee of the Contractor must be lawfully admitted for permanent residence as evidenced by Permanent Resident Form I-551 (Green Card), or must present other evidence from the U.S. Department of Homeland Security/U.S. Citizenship and Immigration Services that employment will not affect his/her immigration status. The U.S. Citizenship and Immigration Services provides information to contractors to help them understand the employment eligibility verification process for non-US citizens. This information can be found on their website, <http://www.uscis.gov/portal/site/uscis>.

The NRC reserves the right to deny or withdraw Contractor use or access to NRC facilities or its equipment/services, and/or take any number of contract administrative actions (e.g., disallow costs, terminate for cause) should the Contractor violate the Contractor's responsibility under this clause.

#### **A.9 SECURITY REQUIREMENTS RELATING TO THE PRODUCTION OF REPORT(S) OR THE PUBLICATION OF RESULTS UNDER CONTRACTS, AGREEMENTS, AND GRANTS (AUG 2011)**

##### **Review and Approval of Reports**

(a) Reporting Requirements. The contractor/grantee shall comply with the terms and conditions of the contract/grant regarding the contents of the draft and final report, summaries, data, and related documents, to include correcting, deleting, editing, revising, modifying, formatting, and supplementing any of the information contained therein, at no additional cost to the NRC. Performance under the contract/grant will not be deemed accepted or completed until it complies with the NRC's directions. The reports, summaries, data, and related documents will be considered draft until approved by the NRC. The contractor/ grantee agrees that the direction, determinations, and decisions on approval or disapproval of reports, summaries, data, and related documents created under this contract/grant remain solely within the discretion of the NRC.

(b) Publication of Results. Prior to any dissemination, display, publication, or release of articles, reports, summaries, data, or related documents developed under the contract/grant, the contractor/grantee shall submit them to the NRC for review and approval. The contractor/ grantee shall not release, disseminate, display or publish articles, reports, summaries, data, and related documents, or the contents therein, that have not been reviewed and approved by the NRC for release, display, dissemination or publication. The contractor/grantee agrees to conspicuously place any disclaimers, markings or notices, directed by the NRC, on any articles, reports, summaries, data, and related

documents that the contractor/grantee intends to release, display, disseminate or publish to other persons, the public, or any other entities. The contractor/grantee agrees, and grants, a royalty-free, nonexclusive, irrevocable worldwide license to the government, to use, reproduce, modify, distribute, prepare derivative works, release, display or disclose the articles, reports, summaries, data, and related documents developed under the contract/grant, for any governmental purpose and to have or authorize others to do so.

(c) Identification/Marking of Sensitive Unclassified Non-Safeguards Information (SUNSI) and Safeguards Information (SGI). The decision, determination, or direction by the NRC that information possessed, formulated or produced by the contractor/grantee constitutes SUNSI or SGI is solely within the authority and discretion of the NRC. In performing the contract/grant, the contractor/grantee shall clearly mark SUNSI and SGI, to include for example, OUO-Allegation Information or OUO-Security Related Information on any reports, documents, designs, data, materials, and written information, as directed by the NRC. In addition to marking the information as directed by the NRC, the contractor shall use the applicable NRC cover sheet (e.g., NRC Form 461 Safeguards Information) in maintaining these records and documents. The contractor/grantee shall ensure that SUNSI and SGI is handled, maintained and protected from unauthorized disclosure, consistent with NRC policies and directions. The contractor/grantee shall comply with the requirements to mark, maintain, and protect all information, including documents, summaries, reports, data, designs, and materials in accordance with the provisions of Section 147 of the Atomic Energy Act of 1954 as amended, its implementing regulations (10 CFR 73.21), Sensitive Unclassified Non-Safeguards and Safeguards Information policies, and NRC Management Directives and Handbooks 12.5, 12.6 and 12.7.

(d) Remedies. In addition to any civil, criminal, and contractual remedies available under the applicable laws and regulations, failure to comply with the above provisions, and/or NRC directions, may result in suspension, withholding, or offsetting of any payments invoiced or claimed by the contractor/grantee.

(e) Flowdown. If the contractor/grantee intends to enter into any subcontracts or other agreements to perform this contract/grant, the contractor/grantee shall include all of the above provisions in any subcontracts or agreements.

#### **A.10 WHISTLEBLOWER PROTECTION FOR NRC CONTRACTOR AND SUBCONTRACTOR EMPLOYEES (AUG 2011)**

(a) The U.S. Nuclear Regulatory Commission (NRC) contractor and its subcontractor are subject to the Whistleblower Employee Protection public law provisions as codified at 42 U.S.C. 5851. NRC contractor(s) and subcontractor(s) shall comply with the requirements of this Whistleblower Employee Protection law, and the implementing regulations of the NRC and the Department of Labor (DOL). See, for example, DOL Procedures on Handling Complaints at 29 C.F.R. Part 24 concerning the employer obligations, prohibited acts, DOL procedures and the requirement for prominent posting of notice of Employee Rights at Appendix A to Part 24 entitled: "Your Rights Under the Energy Reorganization Act".

(b) Under this Whistleblower Employee Protection law, as implemented by regulations, NRC contractor and subcontractor employees are protected from discharge, reprisal, threats, intimidation, coercion, blacklisting or other employment discrimination practices with respect to compensation, terms, conditions or privileges of their employment because the contractor or subcontractor employee(s) has provided notice to the employer, refused to engage in unlawful practices, assisted in proceedings or testified on activities concerning alleged violations of the Atomic Energy Act of 1954 (as amended) and the Energy Reorganization Act of 1974 (as amended).

(c) The contractor shall insert this or the substance of this clause in any subcontracts involving work performed under this contract.

#### **A.11 GREEN PURCHASING (JUN 2011)**

(a) In furtherance of the sustainable acquisition goals of Executive Order 13514, "Federal Leadership in Environmental, Energy, and Economic Performance" products and services provided under this contract/order shall be energy- efficient (Energy Star or Federal Energy Management Program (FEMP) designated), water-efficient,

biobased, environmentally preferable (e.g., Electronic Product Environmental Assessment Tool (EPEAT) certified), non-ozone depleting, contain recycled content, or are non-toxic or less toxic alternatives, where such products and services meet agency performance requirements. <http://www.fedcenter.gov/programs/eo13514/>

(b) The contractor shall flow down this clause into all subcontracts and other agreements that relate to performance of this contract/order.

#### **A.12 USE OF AUTOMATED CLEARING HOUSE (ACH) ELECTRONIC PAYMENT/REMITTANCE ADDRESS (AUG 2011)**

The Debt Collection Improvement Act of 1996 requires that all Federal payments except IRS tax refunds be made by Electronic Funds Transfer. It is the policy of the Nuclear Regulatory Commission to pay government vendors by the Automated Clearing House (ACH) electronic funds transfer payment system. Item 15C of the Standard Form 33 may be disregarded.

**STATEMENT OF WORK**

Contract No. NRC-HQ-11-C-04-0012; Task Order No. NRC-HQ-11-T-04-0001 (JCN: V6101)  
Developing the Technical Bases for Draft Regulatory Guide,  
"Soluble Uranium Exposure Criteria for Integrated Safety Analyses"

**I. BACKGROUND**

In 2007, the fuel cycle industry, through the Nuclear Energy Institute (NEI), recommended to the U.S. Nuclear Regulatory Commission (NRC) to form a working group to reconsider quantitative soluble uranium (U) intake criteria used in Integrated Safety Analyses (ISAs). According to NEI, new and additional data existed that warranted this reconsideration. The primary bases for NEI's recommendation is contained in the following report that it sponsored:

"Katheren, R. Acute Chemical Toxicity of Uranium with Application to 10 CFR 70.61, May 22, 2009"

The NRC, in conjunction with NEI, formed a working group which included technical staff from the NRC, NEI and industry. The focus of the working group was to review NEI's report and any other data that could affect quantitative intake criteria used for soluble uranium in ISAs that were not required by regulation; namely criteria used for a worker that may be impacted by a high and intermediate consequence accident sequence and a member of the public that may be impacted by an intermediate consequence accident.

The working group reviewed and commented upon various draft versions of the Katheren report. These comments were discussed in meetings that were open to the public. Considering all available information on the toxicological impacts of soluble U on humans, the NRC staff has determined that, at this time, it would be appropriate to develop a Draft Regulatory Guide (DRG) containing a standard set of soluble uranium's chemically toxic exposure criteria for use in ISAs. These may or may not be different than what is currently being applied to existing ISAs. The criteria will take into consideration all potential exposure pathways and any potential exposures to hazardous substances other than soluble uranium, such as HF (hydrofluoric acid), that may be produced as a result of an accident sequence involving a release of soluble uranium.

**II. WORK SCOPE FOR THIS TASK**

Under this task order, the contractor shall develop the technical bases for the DRG.

i. **Task 1 – Kickoff for Developing the Technical Bases**

Upon award of this task order, the contractor's technical lead and contributing technical staff shall participate (via phone or in person) in a kickoff meeting with the appropriate NRC staff. At the meeting, the NRC technical lead will describe the important issues related to developing the DRG.

Within five (5) working days of the kickoff meeting, the contractor shall provide a kick-off meeting summary to the NRC Project Officer (PO) and NRC Task Manager (TM), that summarizes the outcomes of this meeting, including clarification of its understanding of the work to be done. The NRC staff will provide timely review, comment, and approval of this summary.

ii. **Task 2 – Draft Technical Bases for DRG**

Uranium is both radioactive and, as a heavy metal, chemically toxic. At low enrichments, the chemical toxicity of uranium in soluble form surpasses its radiotoxicity. As summarized in Table 1 below, 10 CFR 70.61 contains explicit numerical radiological dose criteria for the protection of workers and members of the public from uranium and other radionuclide exposures resulting from credible high consequence and intermediate consequence accidents analyzed in Integrated Safety Analyses. However for chemical exposures, the only explicit numerical dose criterion provided in 10 CFR 70.61 is the 30 milligram limit for a member of the public exposed to uranium in soluble form as a result of a high consequence accident. All other chemical exposure criteria are qualitative.



Table 1. Summary of exposure criteria contained in 10 CFR 70.61

Accident type	Worker		Public	
	Acute chemical exposure criteria	Acute radiological dose criteria	Acute chemical exposure criteria	Acute radiological dose criteria
High consequence	Could endanger life	>100 rem	Intake > 30 mg sol U Could lead to irreversible or long-lasting health effects	>25 rem
Intermediate consequence	Could lead to irreversible or long lasting health effects	>25 rem	Could cause mild transient health effects	> 5 rem

In accordance with 10 CFR 70.65, licensees and applicants that possess or plan to possess quantities of material capable of such acute chemical exposures are required to propose appropriate quantitative numerical standards where these are expressed qualitatively in 10 CFR 70.61 as health effects. For chemicals, the NRC has found acceptable application of various protective action concentration criteria as quantitative standards, such as the Emergency Response Planning Guidelines (ERPGs), Acute Exposure Guideline Levels (AEGLs), Temporary Emergency Exposure Limits (TEELs), and Immediately Dangerous to Life or Health (IDLH).

For uranium in soluble form, to date, most licensees and applicants have proposed, and the NRC has found acceptable, quantitative intake standards as presented in Table 2.

Table 2. Quantitative limits used for ISAs

	Worker	Public
High Consequence	40 mg [NUREG-1391]	30 mg [70.61(b)(3)]
Intermediate Consequence	$40 \text{ mg} \leq \text{CD} \leq 10 \text{ mg}$	10 mg [NUREG-1391]

The bases for the intake levels in Table 2 are largely contained in the following two documents:

- "Chemical Toxicity of Uranium Hexafluoride Compared to Acute Effects of Radiation, NUREG-1391, U.S. Nuclear Regulatory Commission, February 1991"
- Uranium Hexafluoride Public Risk, PNL-10065, Richland: Pacific Northwest Laboratory, August 1, 1994"

The Katheren report referenced above indicates that based on new data and the updated ICRP inhalation uptake model for soluble uranium, the three levels of health effects put forth in 10 CFR 70.61, namely, life endangerment, irreversible or other serious long lasting health effects, and mild transient health effects from renal damage, would result from soluble uranium inhalation intakes of 500 milligrams (mg), 100 mg and 30 mg, respectively. The report also provides criteria for soluble uranium for the ingestion pathway. However, renal effects from inhalation of soluble uranium is more limiting than any other toxic effects of soluble uranium via the ingestion or inhalation pathways. Therefore, at this time, there is no need to have soluble uranium intake criteria for the ingestion pathway presented in the Katheren report reviewed and assessed.

According to NEI's recommendation, the soluble uranium intake criteria for the inhalation pathway used for ISAs should be revised to values provided in Table 3 below:

Table 3. Soluble uranium inhalation criteria proposed by NEI (Katheren 2009)

	Worker	Public
High Consequence	500 mg [NEI]	100 mg [NEI] <sup>1</sup>
Intermediate Consequence	100 mg [NEI]	30 mg [NEI]

The contractor shall independently review the bases for NEI's recommendation in the Katheren report to raise the inhalation intake criteria for soluble uranium used for ISA's. Specifically, for a worker, the contractor shall determine the adequacy of using the 500 mg criterion for a high consequence accident, and 100 mg criterion for an intermediate consequence accident. For a member of the public, the contractor shall determine the adequacy of using the 30 mg criterion for an intermediate consequence accident. If the contractor determines any of these values to be inappropriate, then an alternative value shall be recommended with the appropriate bases.

In addition to independently assessing the adequacy of the soluble uranium intake criteria for the inhalation pathway, exposure to, reactive forms of uranium such as UF<sub>6</sub>, and HF on the skin of a worker, shall also be assessed. Included in this assessment will be potential exposure to HF generated as a result of dermal UF<sub>6</sub> contact. It is noted that the Katheren report does not address dermal exposure of UF<sub>6</sub> or potential HF exposures that may result from a release of UF<sub>6</sub>.

The technical bases document must propose text suitable for preparation of the DRG. The contractor shall review the three documents mentioned above along with their references, any other relevant documents, relevant technical standards including ICRP publications on uptakes and exposures, and NRC regulations, as appropriate. The draft technical bases for the DRG will be issued for public comments.

### iii. Task 3 – Support for Meetings and Preparation of Final Technical Bases for DRG

The contractor shall prepare slides or other briefing material and attend advisory committee or public meetings as requested. The contractor shall also respond to comments from advisory committees and public meetings as requested. The contractor shall revise the technical bases as a result of advisory committee or public comments as requested and submit to the NRC a final technical bases document.

The activities in Task 3 will typically be performed after Task 2 is completed.

## III. DELIVERABLES

The contractor shall provide monthly letter reports, due within 15 days after the beginning of the following month, summarizing accomplishments, expenditures, and any problems encountered by the contractor.

Within five working days after the kickoff meeting (Task 1), the contractor shall provide the P O and TM with a meeting summary which reflects the contractor's understanding of the issues and approach for developing the technical bases for the DRG.

<sup>1</sup> For a high consequence accident, the regulations provide a numerical value of 30 mg as the intake limit for a member of the public. As such, the process for modifying this criterion can only be achieved by changing the regulations.

The contractor shall document the technical bases in the following reports:

Table 4. Technical Bases Reports

Task Number	Document	Completion Date
2	Technical Bases Report	Within 6 months of the kick-off meeting
2	Revised Task 2 Technical Bases Report	Within 9 months of the kick-off meeting
3	Final Technical Bases Report	Within 3 months of receiving advisory committee and public comments

#### IV. REQUIRED EXPERTISE

Technical staff proposed for this project shall have recognized knowledge of the:

1. toxicological hazards of uranium and HF including potential health effects;
2. application of the latest ICRP and other uptake models; and
3. general requirements of Subpart H of 10 CFR Part 70 and in particular the performance requirements of 10 CFR 70.61.

As a minimum, the proposed staff shall have appropriate experience in researching, studying, and assessing toxicological impacts of hazardous substances on humans. Part of this experience shall be in addressing exposure pathways and health effects related to soluble uranium and HF. One method to demonstrate experience or familiarity with health effects from soluble and HF exposures is through publications of topics in the field and/or advanced formal education directly related to the subject matter above.

#### V. MATERIALS PROVIDED

"Katheren, R., Acute Chemical Toxicity of Uranium with Application to 10 CFR 70.61, May 22, 2009"

"Evaluation of Radiological Versus Chemical Toxicity Limits for Varying Enrichments of Uranium for Department of Energy Facilities," U.S. Department of Energy, Operational Radiation Safety, Vol. 98, No. 2, February 2010

"Chemical Toxicity of Uranium Hexafluoride Compared to Acute Effects of Radiation, NUREG-1391, U.S. Nuclear Regulatory Commission, February 1991"

"Uranium Hexafluoride Public Risk, PNL-10065, Richland: Pacific Northwest Laboratory, August 1, 1994"

"Guide of Good Practices for Occupational Radiological Protection in Uranium Facilities, DOE-STD-1136-2009, U.S. Department of Energy, July 2009"

Summaries of public meetings between NRC and NEI on the subject matter

Correspondence between NRC and NEI on the subject matter