

INTERAGENCY AGREEMENT		IAAG NO	PAGE	OF	
		NRC-HQ-60-15-1-0005/M0007	1	16	
2. ORDER NO.		3. REQUISITION NO.	4. SOLICITATION NO.		
		RES-16-0320			
5. EFFECTIVE DATE		6. AWARD DATE	7. PERIOD OF PERFORMANCE		
08/03/2016		08/03/2016	09/25/2013 TO 09/30/2018		
8. SERVICING AGENCY		9. DELIVER TO			
US ENVIRONMENTAL PROTECTION		TERRY BROCK			
ALC: 3903R		US NUCLEAR REGULATORY COMMISSION			
DUNS: 029128894 +4:		TWO WHITE FLINT NORTH			
OFFICE OF RADIATION AND INDOOR AIR		11545 ROCKVILLE PIKE			
ARIEL RIOS BUILDING		MAIL STOP TWFN-10B58			
1200 PENNSYLVANIA AVE NW		ROCKVILLE MD 20852			
WASHINGTON DC 206460					
POC Mike Boyd					
TELEPHONE NO. 202-343-9395					
10. REQUESTING AGENCY		11. INVOICE OFFICE			
ACQUISITION MANAGEMENT DIVISION		US NUCLEAR REGULATORY COMMISSION			
ALC:		ONE WHITE FLINT NORTH			
DUNS: 040535809 +4:		11555 ROCKVILLE PIKE			
US NUCLEAR REGULATORY COMMISSION		MAILSTOP 03-E17A			
ONE WHITE FLINT NORTH		NRCPAYMENTSNRGGOV			
11555 ROCKVILLE PIKE		ROCKVILLE MD 20852-2738			
ROCKVILLE MD 20852-2738					
POC Aracelis Perez-Ortiz					
TELEPHONE NO. 301-415-0085					
12. ISSUING OFFICE		13. LEGISLATIVE AUTHORITY			
US NRC - HQ		Energy Reorganization Act of 1974			
ACQUISITION MANAGEMENT DIVISION					
MAIL STOP TWFN-5E03					
WASHINGTON DC 20555-0001					
		14. PROJECT ID			
		V6434			
		15. PROJECT TITLE			
		TECHNICAL SUPPORT TO FEDERAL RADIATION GUIDANCE			
16. ACCOUNTING DATA					
See Schedule					
17. ITEM NO.	18. SUPPLIES/SERVICES	19. QUANTITY	20. UNIT	21. UNIT PRICE	22. AMOUNT
	Master IAA: N/A				
	The purposes of this modification are to: (1) revise the statement of work; (2) increase the authorized ceiling by \$719,000.00, from \$1,784,848.00 to \$2,503,848.00; and (3) providing incremental funding in the amount of \$300,000.00, thereby increasing the obligated amount from \$1,753,848.00 to \$2,053,848.00.				
	Accordingly:				
	Statement of Work, Revision 1 is hereby deleted				
	Continued ...				
23. PAYMENT PROVISIONS		24. TOTAL AMOUNT			
		\$300,000.00			
25a. SIGNATURE OF GOVERNMENT REPRESENTATIVE (SERVICING)		25b. SIGNATURE OF GOVERNMENT REPRESENTATIVE (REQUESTING)			
<i>Francis B. ...</i>		<i>Sharlene M. McCubbin</i>			
25d. NAME AND TITLE		25c. DATE		26c. DATE	
Francis B. ...		8/4/16		8/3/2016	
		26b. CONTRACTING OFFICER			
		SHARLENE M. MCCUBBIN			

TEMPLATE - ADM001

SUNSI REVIEW COMPLETE

AUG 25 2016

ADM002

in its entirety and replaced with the attached
Statement of Work, Revision 2.

Accounting data for this modification is as
follows:

NEW ACCOUNTING CODE ADDED:

2016-X0200-FEEBASED-60-60D003-11-6-213-1044-253A

Amount: \$200,000.00

NEW ACCOUNTING CODE ADDED:

2016-X0200-FEEBASED-60-60D003-17-6-161-1061-253A

Amount: \$55,000.00

NEW ACCOUNTING CODE ADDED:

2016-X0200-FEEBASED-60-60D003-34-6-155-1044-253A

Amount: \$45,000.00

All other terms and conditions of the Interagency
Agreement remain the same.

STATEMENT OF WORK FOR INTERAGENCY AGREEMENTS

INTERAGENCY AGREEMENT NUMBER: NRC-HQ-60-13-I-0005
Revision 2

PROJECT TITLE: TECHNICAL SUPPORT TO FEDERAL RADIATION PROTECTION
GUIDANCE

JOB CODE: V6434

SERVICING AGENCY: U. S. Department of Energy /
Oak Ridge National Laboratory

PRINCIPAL INVESTIGATOR: Richard Leggett
P. O. Box 2008, MS-M6.1
Oak Ridge, TN 37831-6480
(865) 574-6251

EPA PROJECT MANAGER: Michael Boyd
U. S. Environmental Protection Agency /
Office of Radiation and Indoor Air
Ariel Rios Building
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460
(202) 343-9395

NRC TECHNICAL MONITOR: Terry Brock
U.S. Nuclear Regulatory Commission /
Office of Nuclear Regulatory Research
Mail Stop T-10B58
Washington, DC 20555
(301) 415-1793

B&R NUMBER: 2013-60-34-6-155

BOC: 253A

APPROPRIATION SYMBOL: 31x0500.660

PERIOD OF PERFORMANCE: 09/25/2013 - 09/30/2018

ESTIMATE OF COST: The total NRC contribution is estimated to be
\$2,503,848 for this project. The total EPA
contribution is estimated to exceed this amount.

BACKGROUND

Under this Interagency Agreement (IAA), the US Environmental Protection Agency's (EPA) Office of Radiation and Indoor Air (ORIA) and the U.S. Nuclear Regulatory Commission's (NRC) Office of Nuclear Regulatory Research (RES) are jointly sponsoring work at Oak Ridge National

Laboratory (ORNL) for the purpose of developing technical information on radiation protection and its practices. This work includes technical support for revision of Federal Guidance reports on radiation protection and supporting and monitoring the development of new dose coefficients based on International Commission on Radiological Protection (ICRP) Publication 103. Federal Guidance reports were initiated in the mid-1980s for the purpose of providing Federal agencies with the technical information needed to implement radiation protection programs. Currently applicable reports in this series are Federal Guidance Report 11 (FGR11, 1988), which provides limiting values of radionuclide intake and air concentrations for workers; Federal Guidance Report 12 (FGR12, 1993), which provides dose coefficients (estimates of radiation dose per unit exposure) for irradiation of the body from external sources; and Federal Guidance Report 13 (FGR13, 1999), which provides cancer risk coefficients (estimates of cancer risk per unit exposure) for public exposure to environmental radionuclides. These three reports were prepared by ORNL dosimetry research team for the EPA's ORIA. The NRC provided part of the funding for preparation of FGR13 through a previously executed IAA between NRC and EPA.

Much of the technical information and many of the radiation protection models used in the EPA's current Federal Guidance reports, particularly FGR11 and FGR12, were developed in the 1970s and 1980s for application to a reference adult. In recent years there have been significant improvements in the biokinetic and dosimetric models used in radiation protection. For example, age-specific biokinetic and dosimetric models have been developed and applied in documents of the ICRP on doses to the public from environmental exposure to certain radionuclides. The ICRP is further updating its models and will soon publish new models and dose coefficients for occupational intake of radionuclides in a series of five reports (called the OIR reports) and for environmental intake of radionuclides in one or two separate reports (called the EIR reports). Also, on the basis of a recent review by the National Academy of Sciences on the Biological Effects of Ionizing Radiation on radiogenic cancer risk (the "BEIR VII" report), the EPA's ORIA is updating the radiation risk models used in FGR13. In view of the recent changes in radiation risk models and recent and forthcoming changes in the ICRP's biokinetic and dosimetric models, it is efficient and worthwhile at this point to initiate revisions of Federal Guidance reports based on such models.

ORNL has been a key source of models and methods applied in current ICRP documents on occupational or environmental intake of radionuclides and in ICRP documents now in preparation. The software package DCAL, developed at ORNL with support from EPA, was previously applied in FGR13 and is the best available software for implementing these generally complex models. Under an earlier IAA, several tasks relevant to this IAA have been completed. The nuclear decay data used in dosimetric calculations has been updated in a joint effort with the Japan Atomic Energy Agency (JAEA), formerly Japan Atomic Energy Research Institute, and ORNL under a cooperative agreement between JAEA and EPA. This database has been released in ICRP Publication 107. The recently published book "MIRD Radionuclide Data and Decay Schemes" addresses radionuclides of interest in nuclear medicine. The DCAL software has been updated to use the decay data files of ICRP Publication 107. Thus, ORNL is in a unique position to implement these models in Federal Guidance reports.

ICRP and Federal Guidance reports contain essential technical information for NRC regulations in 10 CFR Part 20 and 10 CFR Part 50, as well as those established by other Federal agencies. The NRC staff has been developing technical basis information for possible revision of 10 CFR Part 20 and 10 CFR Part 50 to align with the most recent methodology and terminology for dose

assessment, as recommended in ICRP Publication 103. The work conducted under this IAA directly supports this NRC regulatory activity.

OBJECTIVE

Pursuant to the authority contained in the Energy Reorganization Act of 1974, as amended, and the EPA/NRC Memorandum of Understanding dated March 16, 1992, entitled "Guiding Principles for EPA/NRC Cooperation and Decisionmaking", the NRC and EPA desire to enter into this follow-on agreement for the NRC to jointly participate and provide funding to EPA in support of a project at ORNL, EPA #DW8992324901 (DOE Project # DE-AC05-00OR22725). This project will provide needed technical information for revision of Federal Guidance reports on radiation protection, supporting and monitoring the development of new dose coefficients based on ICRP Publication 103, and the development of documents and analytical tools for implementation by EPA. The work conducted under this project directly supports the development of technical information for various NRC radiation protection regulations to use updated dosimetric and biokinetic models consistent with ICRP Publication 103.

SCOPE OF WORK

The specific tasks to be performed by ORNL under this IAA are outlined below.

Task 1: Quality Assurance

The purpose of this ongoing task is to ensure that all project deliverables are of high quality and that all computations have undergone sufficient checks to ensure their accuracy and reproducibility. A general Quality Assurance Project Plan (QAPP) establishing applicable requirements of ORNL's quality assurance program was completed and delivered to the Project Manager in a previous phase of this project. ORNL's QA efforts will follow the guidelines established in the QAPP. The QAPP was reviewed and approved by EPA. The NRC has a copy of the QAPP for use in this project.

Task 1a. Quality Assurance Documents

The existing QAPP will be updated in the present phase of the project based on EPA specifications for the tasks contained in this amended SOW, with technical input from the NRC Technical Monitor. The NRC Technical Monitor will be sent copies of draft revisions of the QAPP for review and input to the EPA in order to address additional NRC quality assurance requirements, if any, for its deliverables under this project. The revised QAPP should be sent to NRC by May 30, 2016.

EPA will submit to the NRC Technical Monitor the ORNL quality assurance document developed for Federal Guidance Report 15 for review. The NRC staff will review this report and the NRC Technical Monitor will provide comments to the EPA Project Manager. This quality assurance document should be sent to NRC by June 30, 2016.

Task 2: Maintenance of a dedicated website for the Center for Radiation Protection Knowledge

In 2010, a Memorandum of Understanding between the Department of Energy, Department of Defense, Environmental Protection Agency, Nuclear Regulatory Commission, and Occupational Health and Safety Administration designated the ORNL dosimetry research program as a national center for radiation protection information called the Center for Radiation Protection Knowledge (CRPK). In 2015, these federal agencies, plus the Department of Health and Human Services, extended the MOU for an additional five years. The purpose of the CRPK is to serve as a common resource to assist participating agencies in the development and application of a common set of radiation dosimetry and risk assessment methodologies based on the best available scientific information.

A dedicated website for the CRPK (<http://crpk.ornl.gov>) was created in an earlier phase of this project. This website gives Federal agencies and the scientific community quick access to biokinetic and dosimetric data, models, computer software, publications, and training material maintained by the Center. The purposes of this ongoing task are the maintenance of this website and timely updates and expansion of site contents.

NRC deliverables prepared under this project have been posted on the CRPK website to serve as a useful tool for sharing preliminary and interim data and reports for review. ORNL security requirements for sites hosted by ORNL should be maintained for the NRC portion of the CRPK website.

Task 3: Maintenance of DCFPAK Software

A software and data package called DCFPAK (Dose Coefficient Package) previously developed by the ORNL dosimetry research group allows electronic access to compilations of dose coefficients, risk coefficients, and other data used in radiation protection. This task provides ongoing support for DCFPAK including resolution of reported issues with DCFPAK software, data library, and/or user guide.

Task 4: Release of an update of the CRPK radiation dosimetry software

The purpose of this ongoing task is to maintain and, as needed, update CRPK's radiation dosimetry software to allow application of the ICRP's latest radiation protection guidance and biokinetic and dosimetric models, and EPA's latest radiation risk models, in the calculation of dose and risk coefficients for radionuclides. For the present phase of the project, the objective is to develop a single software package that implements the primary radiation protection guidance of ICRP Publication 103, the nuclear decay data of ICRP Publication 107, the biokinetic and dosimetric models adopted, or expected to be adopted; for use in the ICRP's OIR and EIR series, and the radiation risk models described in the 2011 version of the EPA's Blue Book.

ORNL will inform the NRC Technical Monitor by September 30, 2016, of the preferred technical approach for either updating the DCAL software package or further developing an alternative calculation tool developed by ORNL for interim NRC deliverables submitted in fiscal year 2015.

The NRC will receive a copy of this software, the documentation describing its use, and will be offered the opportunity to attend training on the updated software provided by ORNL and/or EPA staff.

Task 5: Biokinetic model development

The ICRP is updating its biokinetic models for occupational and environmental intake of radionuclides. It is desirable to use the ICRP's updated models in the derivation of the cancer risk coefficients to be tabulated in the revision of FGR13 described in Task 6b below, as well as in technical support for NRC reports indicated in Task 8 below. The ORNL Principal Investigator leads the development of the ICRP's biokinetic models for workers and members of the public. Thus, ORNL is in a unique position to coordinate the development of biokinetic models to be used in the present project with those used in upcoming ICRP documents. The purpose of this ongoing task is to develop new biokinetic models for radionuclides for use in the present project as well as in the ICRP's occupational and environmental series of reports.

The NRC will receive draft and final copies of reports documenting biokinetic model development provided to EPA by ORNL, and will receive summary information sheets of the biokinetic, as requested.

Task 6: Revision of Federal Guidance Reports

Task 6a: Revision of Federal Guidance Report 12

The original FGR12 provides dose coefficients for external irradiation of an adult member of the public resulting from radionuclides distributed in the environment. A final draft of a revision of FGR12, called Federal Guidance Report 15 (FGR15), has been completed and is currently under review by Federal agencies. FGR15 provides age- and sex-specific external dose coefficients for the 825 radionuclides addressed in FGR12, plus 427 additional radionuclides for which nuclear decay data are now available in ICRP Publication 107. The purpose of this task is to develop a final version of FGR15 based on review comments from the Federal agencies.

Data and dosimetry methods used to calculate FRG15 values are also used to prepare NRC deliverables under this project. Accordingly, the NRC Technical Monitor may request additional technical analyses of data contained in FGR15 for NRC deliverables.

Task 6b: Revision of Federal Guidance Report 13

The purpose of this task is to update the cancer risk coefficients tabulated in FGR13 and expand the list of radionuclides to the 1252 radionuclides addressed in ICRP Publication 107. ORNL is developing new systemic biokinetic models for use by the ICRP and U.S. Federal agencies (Task 5). Also, updated versions of the ICRP's respiratory and alimentary tract models are now available for use in the revision of FGR13. As part of this task, a joint effort by the ORNL dosimetry team and EPA's ORIA has led to improved estimates of the relative biological effectiveness (RBE) of low-energy photons and electrons, and the results of this effort will be reflected in the updated cancer risk coefficients. Specific absorbed fractions (SAFs) will be based on age-specific voxel dosimetric phantoms developed at the University of Florida (UF) (see Task 7).

The revision of FGR13 (called Federal Guidance Report 16, or FGR16) will provide characterizations of uncertainty in risk coefficients for a representative set of radionuclides for the cases of inhalation and ingestion and for selected external exposure scenarios. The characterizations of uncertainties in risk coefficients will reflect uncertainties associated with the following underlying models or quantities: biokinetic models; specific energies relating emissions from source organs to energy deposition in target organs; risk model coefficients representing the risk of cancer per unit absorbed dose to sensitive tissues from low-LET radiation at high dose and high dose rate; the tissue-specific dose and dose rate effectiveness factor (DDREF); and RBE of alpha-particles or low energy photons or electrons. The ORNL dosimetry team will provide preliminary characterizations of uncertainties for selected risk coefficients, but final characterizations for inclusion in FGR13 or in a separate report will be a joint effort by the ORNL team and EPA's ORIA.

A preliminary version of FGR16 will address approximately 100 radionuclides for inhalation or ingestion scenarios and 1252 radionuclides for external exposure scenarios. The final version of FGR16 will address the same 1252 radionuclides for external exposure scenarios and approximately 925 radionuclides (the subset of the 1252 radionuclides having a half-life of at least 10 minutes) for internal exposure scenarios.

Data and dosimetry methods used to calculate FGR16 values are also used to prepare NRC deliverables under this project. Accordingly, the NRC Technical Monitor may request additional technical analyses of data contained in FGR16 for NRC deliverables.

Task 6c: Preparation of an update to Federal Guidance Report 11

The original Federal Guidance Report 11, "Limiting Values Of Radionuclide Intake And Air Concentration And Dose Conversion Factors For Inhalation, Submersion, And Ingestion," was published in 1988, and provided occupational data that is widely used in the radiation protection community. This task is to update FGR11 with updated information on DACs, ALIs and other radiological quantities, in both traditional and SI units, using the ICRP Publication 103 methods and data described in Task 8 and other tasks of this project. The data contained in the revision of FGR11 could be obtained from other deliverables prepared for this project.

A date for submitting a preliminary draft report will be established by the EPA Project Manager in consultation with the NRC Technical Monitor.

Task 7: External dose coefficients for the adult pregnant female

The ICRP recently adopted a series of reference dosimetric phantoms representing the newborn, 1-year, 5-year, 10-year, and 15-year male and female based on new generation hybrid phantoms developed at the UF. UF has developed a preliminary set of age-specific photon and electron specific absorbed fractions (SAF) based on these phantoms for a wide array of source/target organ combinations. The full set of electron and photon SAFs were provided to ORNL in August of 2014 in ongoing efforts to assess age-dependent dose coefficients for consideration by the federal agencies in their federal guidance documents and rulemaking activities. SAFs are used to convert time-dependent activity of radionuclides in the body to estimates of radiation dose. SAFs are required in the derivations of radiation dose rates

or dose coefficients used in Tasks 6 and 8 of this SOW. Task 7 focuses on extending the dose coefficient library in the revision of FGR12 to include the adult pregnant female. Various gestational ages will be considered: 0, 4, 8, 10, 15, 20, 25, 30, 35, and 38 weeks post conception, with the absorbed dose to the uterine wall used as a surrogate target tissue for the conceptus (0 weeks) and embryo (4 weeks). In this study, the methodologies employed within the revised FGR12 will be adopted with minimal change so that the results are internally consistent with those for post-natal phantoms of the University of Florida series presently used by ORNL.

Since the development of the UF set of preliminary SAFs, some modifications have been made to the reference voxel phantoms derived from the UF hybrid series as adopted by ICRP. These changes have included (1) improvement of some representations of walled organs, where the representation of the wall covering of the lumen was incomplete (small intestines), (2) revisions to the lymphatic node models, and (3) revisions to the skeletal muscle models. The earlier UF hybrid phantoms did not explicitly include separate models of skeletal muscle and adipose tissue, but instead included their homogeneous combination, a treatment similar to that used in the stylized models of the ORNL phantom series created several years ago.

The changes to the UF voxel phantoms necessitate revisions to UF SAF dataset. The work is divided into three tasks. The first task is the calculation and quality assurance checks of SAFs for internal photon sources. This task was completed by UF in September 2015. The work involved development of a final set of photon SAFs for the ICRP pre-adult phantom series, consisting of reference persons of the following ages: newborn, 1 y, 5 y, 10 y, and 15 y.

One of the two ongoing tasks is the calculation and quality assurance checks of SAFs for internal electron sources that are being calculated by UF. Quality assurance of the final dataset will be performed through selective and duplicate calculations of electron SAFs between UF and the CRPK. All calculations will be performed with the final ICRP pediatric reference phantoms.

The second ongoing task is the calculation and quality assurance checks for internal alpha particle sources that will be developed by the CRPK. Alpha particle transport will be performed in the pre-adult phantoms developed by UF.

Task 8: Technical Support to Develop NRC Documents

The purpose of this task is to develop technical basis information and supporting documents for various NRC radiation protection regulations and guidance to use updated dosimetric and biokinetic models consistent with ICRP Publication 103. Work on this task (8) is subject to availability of NRC funds and shall continue based on funding availability.

The schedule for completion of these deliverables is September 30, 2017, with interim deliverables by September 30, 2016. The scope of technical support includes, but is not limited to, the following items:

(1) A complete revised set of ALI and DAC values for occupational exposure (10 CFR Part 20, Appendix B Table 1) consistent with ICRP's Occupational Intakes of Radionuclides publications. Two sets of dose limits should be used for calculating ALIs and DACs: one set based on 50 mSv (5 rem) stochastic and 500 mSv (50 rem) deterministic, and a second set based on 20

mSv (2 rem) stochastic and no deterministic limit. Updated ICRP analyses for airborne noble gases in finite room sizes should be included in the calculations, in addition to the methods described in EPA FGR15. The NRC Technical Monitor may request additional calculations for alternative annual effective and equivalent dose limits, as technical basis information for revision of NRC radiation protection regulations.

(2) A complete revised set of effluent concentration limits for public exposure (10 CFR Part 20, Appendix B Table 2). Calculations should be based on public dose coefficients using the six ICRP age groups, the DOE "per-capita" methodology, or other NRC-approved methodology. The corresponding annual dose limit that should be applied for calculating effluent concentration limits are 0.5 mSv (50 mrem) air, 0.5 mSv (50 mrem) water, and 1 mSv (100) mrem air and 1 mSv (100 mrem) water. Separate Excel worksheets should be provided for each dose limit.

(3) A complete revised set of sewerage monthly average concentration limits for public exposure (10 CFR Part 20, Appendix B Table 3). Calculations should be based on public dose coefficients using the six ICRP age groups, the DOE "per-capita" methodology, or other NRC-approved methodology. The corresponding annual dose limit that should be applied for calculating effluent concentration limits is 5 mSv (500 mrem).

(4) Development of a coherent set of age-specific dose coefficients to possibly support a future revision of 10 CFR 20 Appendix B or 10 CFR Part 50, Appendix I. Calculations should be based on public dose coefficients using the six ICRP age groups, the DOE "per-capita" methodology, or other NRC-approved methodology. ORNL should provide technical support on specific topics of interest, as requested by the NRC Technical Monitor in support of this task, such as analyses previously described in Summary Sheets for Technical Information Needs submitted to NRC in October 2015.

(5) Development of bioassay data and methods to implement updated biokinetic models, for use in the revision of NUREG/CR-4884. The technical support for these items will include a description of the dosimetric models used to develop the above deliverables.

All data sets will be provided as electronic files that can be read, saved, or imported into ASCII or Excel formats. All quantities will be provided in SI and traditional units. Scientific methods and assumptions used to estimate the delivered dosimetric quantities will be detailed, along with associated quality assurance verifications.

For external exposure scenarios, the report due in September 2017 will contain the radionuclides considered in EPA FGR15. For internal exposure scenarios, deliverables will contain the radionuclides listed in 10 CFR 20 Appendix B, 10 CFR Part 50, Appendix I, and others the NRC Technical Monitor identifies as necessary for the NRC deliverables. The latter report is due in September 2017.

Task 9: Technical Assistance

The purpose of this ongoing task is to advise the EPA Project Officer and NRC Technical Monitor on developments in the field of radiation protection that may be of interest to the US Federal agency community. For example, these developments may be learned through contact with members of committees and working groups of the ICRP, NCRP, or other radiation protection bodies.

A quarterly letter report will be submitted to the EPA Project Officer and NRC Technical Monitor on these matters. Particularly critical issues will be promptly reported. In coordination with the EPA Project Officer, the NRC Technical Monitor may request technical assistance from ORNL staff on radiation dosimetry topics.

PROJECT PERSONNEL

ORNL staff expected to be assigned to this project include Rich Leggett (PI), Michael Bellamy, Shaheen Dewji, Nolan Hertel (joint appointment), Pat Scofield, Derek Jokisch (joint appointment), Scott Schwahn, Matthew Williams, and Kenneth Veinot. Subcontractors are expected to include Keith Eckerman, Clay Easterly, Richard Ward, Kent Campbell, Debra Stuart, and Wes Bolch (University of Florida).

REPORTING REQUIREMENTS

Reporting requirements shall be consistent with the ORNL contract. The NRC Technical Monitor shall be placed on distribution for quarterly administrative reports, all technical letter reports, and final draft reports from ORNL. Copies shall be sent to the NRC Technical Monitor and NRC Acquisition Management Division at ContractsPOT.Resource@nrc.gov.

In addition, each quarter, EPA shall submit a brief letter status report which summarizes the expenditure of NRC funds. This report shall address the following categories: (1) staff effort; (2) travel; (3) equipment and supplies; and (4) subcontract costs. Each report shall include by category: (a) costs of the previous quarter; (b) cumulative costs and uncosted obligations to date; and (c) projections by quarter for the remainder of the NRC obligated funds.

EPA shall develop, in conjunction with ORNL, within one month of receipt of NRC funds in fiscal year 16, an enhanced cost accounting system that clearly differentiates NRC and EPA costs in the quarterly status reports. This accounting system shall be in the first quarterly report after receipt of NRC funds in fiscal year 16. The first quarterly report shall provide the initial projections, and subsequent reports shall either indicate revised projections or indicate "no change in the cost and uncosted expenditure projection".

EPA shall submit seven copies of final reports to Terry Brock at the following address:

U. S. Nuclear Regulatory Commission
ATTN: Terry Brock
Mail Stop: T-10B58
Washington, DC 20555-0001
Phone: (301) 415-1793

Fax: (301) 415-6671
Email: Terry.Brock@nrc.gov

Express mail should be sent to:
U. S. Nuclear Regulatory Commission
ATTN: Terry Brock
Mail Stop: T-10B58
11555 Rockville Pike
Rockville, MD 20852-2738

ESTIMATE OF COST AND OBLIGATION OF FUNDS

The total share of NRC's participation is estimated to be \$2,503,848, as follows by fiscal year:

- FY 13: \$200,000.00
- FY 14: \$909,848.40
- FY 15: \$643,999.60
- FY 16: \$300,000.00
- FY 17: \$250,000.00
- FY 18: \$200,000.00

For purposes of project management and accounting control, this work should be identified by using the following control numbers on all correspondence and vouchers:

B&R NUMBER: 2013-60-34-6-155
BOC: 253A
APPROPRIATION SYMBOL: 31x0500.660
Job Code No.: V6434

It should be noted that the NRC has no-year appropriations, and monies provided under this agreement can be spent in future years.

Any capital equipment or FIP resources purchased by EPA with NRC funds shall be retained or disposed of by EPA upon the expiration or termination of this agreement.

BILLING INSTRUCTIONS

To receive reimbursement under this agreement, EPA shall follow standard OPAC procedures or forward to NRC an original and three copies Standard Form 1081 in accordance with the Treasury Fiscal Requirements Manual, Bulletin No. 78-09.

Reimbursement requests should be sent to the following address:

U.S. Nuclear Regulatory Commission
Office of the Controller
Division of Accounting and Finance
Financial Operations Branch
Mail Stop: T-9 E2
Washington, DC 20555

MEETINGS AND TRAVEL

EPA will review and approve any travel associated with this project. Annual, semi-annual, and bi-monthly project meetings between EPA, NRC and ORNL staffs are anticipated under this IAA. The meeting locations will be the Washington, DC area or Oak Ridge, TN.

Servicing agency personnel will be authorized travel expenses consistent with the Federal Travel Regulation (FTR) and the limitation of funds specified within this agreement/order. All travel requires prior written approval from the COR.

Foreign travel for the servicing agency personnel requires a 60-day lead time for NRC approval. For prior approval of foreign travel, the servicing agency shall submit to the COR an NRC Form 445, "Request for Approval of Official Foreign Travel." NRC Form 445 is available in the MD 11.7 Documents library and on the NRC Web site at: <http://www.nrc.gov/reading-rm/doc-collections/forms/>. All foreign travel requires prior written approval from the NRC Executive Director for Operations (EDO).

ORGANIZATIONAL CONFLICT OF INTEREST DISCLOSURE

The Servicing Agency recognizes that Section 170A of the Atomic Energy Act of 1954, as amended, requires that NRC be provided with disclosures on potential conflicts when NRC obtains technical, consulting, research and other support services. The Servicing Agency further recognizes that the assignment of NRC work to another Agency must satisfy NRC's conflicts standards. Accordingly, when NRC enters into an agreement with another Servicing Agency to perform work for NRC, and during the life of the agreement, the Servicing Agency shall review and promptly disclose its current work, planned work and where appropriate, past work for the Servicing Agency and others (meaning, organizations, in the same/similar technical area as the NRC project scope of work), e.g. (included but not limited to), NRC licensees, vendors, industry groups or research institutes that represent or are substantially comprised of nuclear utilities) for work in the same or similar technical area as the proposed NRC project. Disclosures for current or planned work for the Servicing Agency or others in the same or similar technical area as the proposed work, re to include (1) the name of organization; (2) dollar value; (3) period of performance of the work identified; and (4) statements of work for the projects. NRC shall then determine whether a conflict would result and, if one does, determine, after consultation with the Servicing Agency, the appropriate action NRC or the Servicing Agency should take to avoid the conflict, or when appropriate under the NRC procedures, waive the conflict. If the Servicing Agency determines there is no applicable work in the same or similar technical area, it should be stated in its proposal.

CONSIDERATIONS FOR DEVELOPING SYSTEMS

Technical direction for the development of hardware systems and software is the responsibility of the EPA Project Manager.

ACQUIRED MATERIAL, EQUIPMENT, OR SOFTWARE (PROPERTY)

The Servicing Agency's proposal must include a description of the property required for project performance that has an estimated acquisition cost of \$500 or more. The proposal must also identify the potential development of funded software with a useful life of 2 years or more and a development cost of \$500 or more during the project. Any questions regarding the acquisition of property or the development of software will be addressed with the laboratory during negotiations.

The Servicing Agency shall submit a written request for approval to develop additional software or purchase additional property with an estimated acquisition cost of \$500 or more after work initiation. The EPA project manager shall approve or disapprove the acquisition or development of any additional items in writing. The Servicing Agency shall report property, including software, with an acquisition cost of \$500 or more in the monthly letter status report in the month the property or software was acquired.

APPROPRIATE USE OF GOVERNMENT FURNISHED INFORMATION TECHNOLOGY (IT) EQUIPMENT AND/ OR IT SERVICES/ ACCESS (APRIL 2003)

As part of contract performance, the Servicing Agency may be provided with information technology (IT) equipment and IT services or IT access as identified in the statement of work or subsequently as identified in the project. Government furnished IT equipment, or IT services, or IT access may include but is not limited to computers, copiers, facsimile machines, printers, pagers, software, phones, Internet access and use, and email access and use. The contractor (including the contractor's employees, consultants and subcontractors) shall use the furnished IT equipment, and/or IT provided services, and/or IT access solely to perform the necessary efforts required under the contract. The Servicing Agency (including the contractor's employees, consultants and subcontractors) are prohibited from engaging or using the furnished IT equipment and government provided IT services or IT access for any personal use, misuse, abuses or any other unauthorized usage.

The Servicing Agency is responsible for monitoring its employees, consultants and subcontractors to ensure that furnished IT equipment and/or IT services, and/or IT access are not being used for personal use, misused or abused. The EPA and NRC reserve the right to withdraw or suspend the use of its government furnished IT equipment, IT services and/ or IT access arising from contractor personal usage, or misuse or abuse; and/or to disallow any payments associated with contractor (including the contractor's employees, consultants and subcontractors) personal usage, misuses or abuses of IT equipment, IT services and/or IT access; and/or to terminate the project arising from violation of this provision.

TECHNICAL DIRECTION AND TECHNICAL MONITORING

Technical direction for the ORNL project will be provided by the EPA Project Manager, Michael Boyd, who can be reached at:

U. S. Environmental Protection Agency / Office of Radiation and Indoor Air
William Jefferson Clinton Building
ATTN: Michael Boyd
1200 Pennsylvania Avenue, N. W.
Mail Code: 6608J
Washington, DC 20460
Phone: (202) 343-9395
Fax: (202) 343-2304
Email: boyd.mike@epa.gov

The NRC Technical Monitor for this IAA is Terry Brock, who can be reached at:

U. S. Nuclear Regulatory Commission
ATTN: Terry Brock
Mail Stop: T-10B58
Washington, DC 20555-0001
Phone: (301) 415-1793
Fax: (301) 415-6671
Email: Terry.Brock@nrc.gov

SECURITY CLASSIFICATION CLAUSES

In the performance of the work under this project, the Servicing Agency shall assure that the Servicing Agency shall mark and protect all documents, material, and equipment originated, generated, or received by the performing organization in accordance with the provisions of Section 148 of the Atomic Energy Act of 1954, as amended, its implementing Servicing Agency regulations, and the Servicing Agency agreements and guidance.

PRIVACY

52.224-1 Privacy Act Notification

As prescribed in 24.104, insert the following clause in solicitations and agreements/contracts, when the design, development, or operation of a system of records on individuals is required to accomplish an agency function:

Privacy Act Notification (Apr 1984)

The Contractor will be required to design, develop, or operate a system of records on individuals, to accomplish an agency function subject to the Privacy Act of 1974, Public Law 93-579, December 31, 1974 (5 U.S.C. 552a) and applicable agency regulations. Violation of the Act may involve the imposition of criminal penalties.

52.224-2 Privacy Act Notification

As prescribed in 24.104, insert the following clause in solicitations and agreements/contracts, when the design, development, or operation of a system of records on individuals is required to accomplish an agency function:

Privacy Act (Apr 1984)

(a) The Agency/Contractor agrees to—

(1) Comply with the Privacy Act of 1974 (the Act) and the agency rules and regulations issued under the Act in the design, development, or operation of any system of records on individuals to accomplish an agency function when the agreement/contract specifically identifies—

(i) The systems of records; and

(ii) The design, development, or operation work that the Agency/Contractor is to perform;

(2) Include the Privacy Act notification contained in this agreement/contract in every solicitation and resulting subcontract and in every subcontract awarded without a solicitation, when the work statement in the proposed subcontract requires the redesign, development, or operation of a system of records on individuals that is subject to the Act; and

(3) Include this clause, including this paragraph (3), in all subcontracts awarded under this agreement/contract which requires the design, development, or operation of such a system of records.

(b) In the event of violations of the Act, a civil action may be brought against the agency involved when the violation concerns the design, development, or operation of a system of records on individuals to accomplish an agency function, and criminal penalties may be imposed upon the officers or employees of the agency when the violation concerns the operation of a system of records on individuals to accomplish an agency function. For purposes of the Act, when the agreement/contract is for the operation of a system of records on individuals to accomplish an agency function, the Agency/Contractor is considered to be an employee of the agency.

(1) "Operation of a system of records," as used in this clause, means performance of any of the activities associated with maintaining the system of records, including the collection, use, and dissemination of records.

(2) "Record," as used in this clause, means any item, collection, or grouping of information about an individual that is maintained by an agency, including, but not limited to, education, financial transactions, medical history, and criminal or employment history and that contains the person's name, or the identifying number, symbol, or other identifying particular assigned to the individual, such as a fingerprint or voiceprint or a photograph.

(3) "System of records on individuals," as used in this clause, means a group of any records under the control of any agency from which information is retrieved by the name of the individual or by some identifying number, symbol, or other identifying particular assigned to the individual.