Nevada Risk Assessment/Management Program (NRAMP) – Phase 2

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Quarterly Progress Report
October 1, 2006 through December 31, 2006

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1.0 Radiological Source Characterization and Radiological Source Release Terms (PI: E.J. Bentz, E.J. Bentz & Associates)

1.1 Progress – Summary

Work conducted in this initial period consisted of work start-up (technical, administrative, contractual), and interviewing/site visits with DOE NVO staff (and support contractors) and HRC staff to quickly ascertain current technical activities and priorities as related to the scope of this task.

Since much of the technical work scope builds on previous technical work, it was considered critical to determine the changes (programmatic, technical, and regulatory) that have occurred over the past several years that directly relate to the scope. It was also equally important to determine the technical and programmatic priorities that have been established in the interim.

1.2 Progress – Technical Work

Information Searches: Technical information searches were conducted of each of the specific topics identified in the scope of work (e.g. MLLW, LLW, PA). The purpose of the searches was to identify technical and programmatic updates to the existing database.

Telephone Interviews: The use of these searches enabled the researchers to develop a "short list' of technical questions to be used in interviewing DOE/NVO staff, in person or via telephone. Telephone interviews were then conducted with most of the DOE/NVO staff in the scope area. Frank DiSanza, Jhon Carilli, and Ken Small facilitated the identification of people to call.

On-Site Visits: Following the telephone interviews, plans were established to conduct more detailed follow-up discussions during an on-site visit. The visit was conducted December 11 - 15, 2006. The visit consisted of 7 meetings (NVO and HRC), and was used to acquire the specific information identified in the information searches and telephone interviews. In addition to information provided by DOE on-site, additional information lists (and requests for computer model license authorizations) were developed with DOE for them to send after the holiday break; examples include provision of detailed permit language of the Pit 3 facility; model license user agreement; database information on MLLW from the waste acceptance system.

Follow-ups: Following the on-site visit, technical reviews were initiated of the received materials, and future communications needed.

1.3 Findings

One key objective of the initial first phase effort is the development of the specific research activities in consultation with DOE, and consistent with their priorities.

The immediate finding of consultations with DOE was that there are more desired activities than there is time or funding. For this reason, multiple discussions were held to develop a **priority list** of their top specific research activities within the scope of this task. Draft topical lists were developed and discussed on-site in a series of meetings described above. These topical lists built on previous work performed in NRAMP 1 and researched prior to the meetings, as described above. Specific topics targeted for investigation include:

- MLLW disposal forecast at the NTS Pit 3 Facility
- Investigation of a ground water monitoring exemption at the NTS Pit 3 Facility
- Disposition of Fernald Silos 2 and 3 Class B and C low level waste at NTS (waste is currently encapsulated and in storage at the WCS facility in Texas)
- Multiple PA and closure–related supporting investigations (including impact of deterministic-based regulation on current probabilistic-based PA analysis; standardization of Complex-wide institutional control assumptions on PA intruder scenario assumptions; DAS-related regulatory issues - DOE Orders 5400 vs. 435.1; and closure-related concerns and issues for Areas 3 and 5).

At the end of these discussions, DOE volunteered to provide a written confirmation priority list of activities by mid-January ‘07.

Another immediate interim finding was that the review of current MLLW forecasts revealed that earlier (2002) concerns on generator forecast uncertainty were confirmed by the recent September 2006 workshop meeting held at NVO for HQ and all DOE MLLW generators (based on the written minutes of the meeting distributed in November 2006).

2.0 Evaluation of Cap Subsidence due to Waste Package Degradation (PI: Moses Karakouzian, UNLV Department of Civil Engineering)

2.1 Subsidence Modeling Approach: Activities and Status

- Gathered technical literature on subsidence issues.
- Gathering details of models for the various mechanical and chemical mechanisms of subsidence.
- Requested a meeting with NTS personnel to discuss data they have and to take a look at their present modeling (anticipated in early 2007).
- Ongoing work on our strategy for comprehensive modeling and uncertainty analysis of subsidence predictions.

2.2 Probabilistic Subsidence Model: Activities and Status

- The GoldSim software to be used on the task was ordered.
- Prof. Karakouzian (PI) attended GoldSim training.

3.0 Radionuclide Behavior in Tank Waste (PI: Ken Czerwinski, UNLV Department of Chemistry)

3.1 Activities and Status

- Research areas were identified. Focus will be on the basic solution study range.
- Key radionuclide species were identified for investigation.
- Experimental design was discussed with Los Alamos National Laboratory.

4.0 Environmental Behavior of Technetium and Evaluation of Stable Analogs for Actinide Elements in Tracer Experiments (PI: Ken Czerwinski, UNLV Department of Chemistry)

4.1 Progress of Technical Work

Literature searches were conducted on the basic chemistry and environmental interactions of Tc, Re, U, Pu, Np, V, and W. Suitable homologs for the actinides were identified. A decision was made to base actinide behavior on oxidation state.

Technicians, analyst and task technical lead had meetings to discuss planning and implementing the initial experiments. Eh/pH diagrams were made using JChess while waiting for Geochemists Workbench to arrive.

4.2 Progress of Equipment Acquisitions/Laboratory Modifications

The High Performance Liquid Chromatograph (HPLC), the Ion Chromatograph (IC) and the Electrospray Ionization Mass Spectrometer (ESI-MS) and Inductively Coupled Plasma-Mass Spectrometer (ICP-MS) were ordered. Laboratory modifications were begun to accommodate the new instruments.

A new balance was ordered, received and calibrated. The DI Water system was ordered and is awaiting installation.

The HPLC and IC instruments were installed and personnel were trained by Dionex on the use of the instruments. The ESI-MS has been received but installation is pending waiting on installation of a 220V electrical line.

Geochemists Workbench has been ordered but not received.

5.0 Evaluation of Radon Release and Transport from Actinide-Bearing Waste Forms (PI: Gary Cerefice, UNLV Harry Reid Center)

5.1 Activities

- The Radon detector system for this task was acquired.

6.0 Review and Evaluation of Disposal Facility Performance Assessments (PI: Anthony Hechanova, UNLV Harry Reid Center)

6.1 Activities

- The "Addendum 2 to the Performance Assessment for the Area 5 Radioactive Waste Management Site at the Nevada Test Site, Nye County, Nevada: Update of Performance Assessment Methods and Results," dated June 2006 was received and will be reviewed next quarter.