PLANS FOR MANAGING HANFORD REMOTE-HANDLED TRANSURANIC WASTE

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ABSTRACT

The current Hanford Site baseline and life-cycle waste forecast predicts that approximately 1,000 cubic meters of remote-handled transuranic (RH-TRU) waste will be generated by waste management and environmental restoration activities at Hanford. These 1,000 cubic meters, comprised of both transuranic and mixed transuranic (TRUM) waste, represent a significant portion of the total estimated inventory of RH-TRU to be disposed of at the Waste Isolation Pilot Plant (WIPP).

A systems engineering approach is being followed to develop a disposition plan for each RH-TRU/TRUM waste stream at Hanford. A number of significant decision-making efforts are underway to develop and finalize these disposition plans, including: development and approval of a RH-TRU/TRUM Waste Project Management Plan, revision of the Hanford Waste Management Strategic Plan, the Hanford Site Options Study ("Vision 2012"), the Canyon Disposal Initiative Record-of-Decision, and the Hanford Site Solid (Radioactive and Hazardous) Waste Program Environmental Impact Statement (SW-EIS). Disposition plans may include variations of several options, including 1) sending most RH-TRU/TRUM wastes to WIPP, 2) deferrals of waste disposal decisions in the interest of both efficiency and integration with other planned decision dates and 3) disposition of some materials in place consistent with Department of Energy Orders and the regulations in the interest of safety, risk minimization, and cost.

Although finalization of disposition paths must await completion of the aforementioned decision documents, significant activities in support of RH-TRU/TRUM waste disposition are proceeding, including Hanford participation in development of the RH TRU WIPP waste acceptance criteria, preparation of T Plant for interim storage of spent nuclear fuel sludge, sharing of technology information and development activities in cooperation with the Mixed Waste Focus Area, RH-TRU technology demonstrations and deployments, and interface with EM Integration activities.

HANFORD RH-TRU WASTE DESCRIPTION

The current Hanford Site baseline and life-cycle waste forecast predicts that approximately 1,000 cubic meters of RH-TRU waste will be generated by waste management and environmental restoration activities at Hanford. These 1,000 cubic meters, comprised of both TRU and TRUM waste, represent a significant portion of the total estimated inventory of RH-TRU to be disposed at WIPP.

The current inventory of stored RH-TRU waste at Hanford is approximately 200 cubic meters volume and includes waste in a variety of forms and containers. Included in the inventory are high dose wastes generated from fuel experiments and examination stored in underground caissons, large boxes and failed equipment from process lines and hot cells (Figure 1), unique waste forms like glassified waste produced as part of research and development activities, and various sludges currently contained in tanks or basins.

Fig. 1. Failed RH-TRU Equipment and Debris Stored in Shielded Boxes

Additional (forecasted) waste will be produced throughout Hanford cleanup activities. Retrieval of waste from existing burial grounds (e.g. 618-11 Burial Ground, Figure 2), tank farm operations and disposition of long-length equipment from single-shell tanks, facility disposition activities, and ongoing laboratory activities are expected to result in the generation of a total of approximately 1,000 cubic meters of RH-TRU wastes.

Fig. 2. 618-11 Burial Ground, Expected to Contain RH-TRU/TRUM Waste

Hanford RH-TRU Program Development

The current baseline for management of Hanford Site RH-TRU wastes involves the retrieval, treatment and shipment of the waste to WIPP over the next 30-40 years. This baseline is currently being revisited, and a number of significant decision-making efforts are underway to develop and finalize disposition plans. These decision-making efforts include:

- Development of the "Hanford Site Options Study (Vision 2012)". This analysis is reexamining Hanford budgets, priorities and stakeholder values and developing an overall site strategy for management and environmental restoration (including strategies for RH-TRU waste management).
- Development of the "Canyon Disposal Initiative Record-of-Decision (ROD)". This ROD will determine the path forward for disposition of the U Plant Canyon (and set precedence for the 4 other canyons). The disposition path forward for the canyons could have significant influence on projected RH-TRU waste volumes and may influence RH-TRU disposal options.
- Completion of the Hanford Site Solid (Radioactive and Hazardous) Waste Program Environmental Impact Statement (SW-EIS) and ROD. This National Environmental Policy Act (NEPA) document and associated ROD may have significant influence on RH-TRU retrieval and disposal decisions. The draft document currently includes options for in place disposal of some RH-TRU wastes.
- Development of WIPP RH-TRU Waste Analysis Plans and Waste Acceptance Criteria. These requirements will drive the activities required to prepare RH-TRU wastes for disposition at WIPP, and thus will drive facility and process requirements at Hanford. Hanford personnel are participating in the process to develop these requirements.
- Development and approval of a "Project Management Plan for Transuranic and Transuranic Mixed Waste" and revision of the "Hanford Waste Management Strategic Plan". These documents will provide the basis for implementing the RH-TRU management program, and will incorporate the outcomes of the previously mentioned decision documents.

Disposition plans may include variations of several options including 1) sending most RH-TRU/TRUM wastes to WIPP, 2) deferrals and/or acceleration of RH-TRU waste disposal decisions in the interest of both efficiency and integration with other planned decision dates, and 3) disposition of some materials in-place consistent with Department of Energy Orders, NEPA, and other regulations in the interest of safety, risk minimization, and cost.

Ongoing Activities

In addition to the development of the previously mentioned documents and RH-TRU program elements, several other activities are proceeding to prepare for the disposition of Hanford RH-TRU wastes. These preparatory activities are common to most program alternatives, and therefore it is prudent and necessary to proceed with them at this time.

Movement of RH-TRU Sludge and T Plant Preparation- Preparations are underway to move the RH TRU sludge from the Hanford spent nuclear fuel storage basins (K Basins) to a centralized facility (T Plant) for interim storage while treatment capabilities are developed. This interim storage approach allows the spent nuclear fuel program schedule to proceed and provides compliant storage for the sludge in a facility that is very likely to become the location for process operations to treat the sludge and prepare it for disposal at WIPP.

Significant strides have been made in preparing the T Plant facility for sludge receipt, including safety basis upgrades and physical preparation for sludge storage (storage area clean-up and preparation). These activities not only have supported the eventual movement of sludge to the facility, but have also verified the viability of T Plant for the RH-TRU processing/treatment mission. A significant area of the T Plant canyon deck has been cleared of equipment and stored wastes in Fiscal Year 2000 in anticipation of sludge receipt and storage (Figure3.).

Fig. 3. T Plant Canyon Deck Cleanup in Support of RH-TRU Sludge Storage

Technology Development, Demonstration and Deployment- Hanford is also an active participant in the Mixed Waste Focus Area (MWFA) to assure that information on RH TRU/TRUM waste management at other Department of Energy sites is shared (avoid duplication of effort and optimize schedule) and emerging technologies incorporated into our planning basis. Various studies of RH handling/size reduction technologies in support of Hanford have been funded by the MWFA in the past and additional studies are planned in Fiscal Year 2001. A demonstration/deployment activity for size reduction of large TRU equipment has been funded in cooperation with the MWFA and the National Energy Technology Laboratory (NETL). A demonstration of remote size reduction technology will be conducted this year,

and will serve the secondary purpose of assisting the clean-off of the T Plant canyon deck. Two PUREX towers will be sized reduced as part of the project (Figure 4.)

Fig. 4. PUREX Tower in T Plant Canyon.

Integration with Other Sites- Hanford is an active participant in the EM Integration effort, and participates in Complex Wide transportation issue discussions and small quantity site alternative studies (addressing RH TRU issues). Outcomes of these discussions are valuable input to the Hanford program.

CONCLUSIONS

In conclusion, Hanford has an active program to develop a path forward for RH TRU/TRUM waste. A number of key decision are underway which will modify/solidify the path forward for disposition of RH-TRU/TRUM wastes. The most notable near-term decision document is the Solid Waste EIS, which should result in a record-of-decision in late 2002. Significant activities in support of the RH-TRU/TRU disposition path forward are ongoing, including participation in development of the RH-TRU WIPP waste acceptance criteria, preparation of T Plant for interim storage of spent nuclear fuel sludge, sharing of technology information and development activities in cooperation with the Mixed Waste Focus Area, and interface with EM Integration activities.

BIBLIOGRAPHY

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