

**ELEVENTH TECHNICAL INFORMATION EXCHANGE WORKSHOP  
SESSION XVII: STEWARDSHIP PANEL SESSION  
JOHN C. STEWART, CHAIR**

**LAS VEGAS, NEVADA  
OCTOBER 27, 1999**

*Meeting Summary*

**Introduction: John Stewart, DOE-HQ**

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- The purpose of the TIE Stewardship Panel Session was to discuss the current status of stewardship planning across the complex and share information. Additionally, this session was designed to allow the audience to provide input to the Long-term Stewardship Settlement Study, however it was *not* a scoping meeting for the stewardship settlement study.
- Stewardship is a crosscutting function that was discussed in many of the TIE sessions. Comprehensive stewardship includes all activities that occur at sites after closure including LTSM, institutional controls, long-term funding, etc..
- Key issues with respect to stewardship in this session included:
  - ▶ Stewards and organizational responsibility - who will be the steward at sites where EM is not the landlord?
  - ▶ Land use - on-site planners need to be considering land use, and coordination with local (non-DOE) planners is necessary.
  - ▶ Monitoring, maintenance and operation, and technology - new technological findings may affect stewardship
  - ▶ Information management - this is a very important issue; information must be stored and retrievable in future generations.
  - ▶ Funding - states are becoming increasingly concerned about DOE's commitment to stewardship after cleanup has been completed.
- The presenters of this session have diverse backgrounds related to stewardship, which is a broad topic that covers many issues. The topics discussed in this session included:
  - ▶ The Long-term Stewardship Settlement Study
  - ▶ ALO/Environmental Restoration Long-term Stewardship Approach and Lessons Learned
  - ▶ Regional Land Use Planning Coordination: A Survey of On-Site and Off-Site Planners
  - ▶ Lessons Learned on Long-term Surveillance and Maintenance
  - ▶ Long-term Stewardship: Of the People, By the People, For the People
  - ▶ The Role of Science and Technology in Stewardship

**The Long-Term Stewardship Settlement Study - An Update: Steven Livingstone, DOE-HQ and Robert Hegner, ICF Consulting**

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- The evolution of DOE's cleanup strategies, from the inception of the EM Program through Paths to Closure, was discussed. Originally, Congress and the public assumed DOE was cleaning up sites for unrestricted use, however perceptions shifted in 1995 when the *Baseline Environmental Management*

*Report* (BEMR) suggested that site cleanup strategies were closer to “brownfields” than to “greenfields.” As the result of this realization, stewardship has been receiving increased attention within DOE.

- Several reports have begun to outline long-term stewardship (LTS) responsibilities and issues. The EM Office of Strategic Planning and Analysis (EM-24) recently released the first stewardship study performed by DOE, *Moving from Cleanup to Stewardship*. This document provides a high-level, introductory view of what stewardship is and it is a companion document to *Accelerating Cleanup: Paths to Closure*.
- A brief history of the Programmatic Environmental Impact Statement (PEIS) Settlement was provided, because the PEIS Settlement was the genesis for the LTS Settlement Study. The December 1998 settlement reached by DOE and NRDC avoided further litigation by mandating that DOE take three major actions to enhance public understanding of the cleanup program; one of the major actions was to conduct a study on LTS for DOE sites.
- Within the National Defense Authorization Act Report, Congress directed DOE to prepare a second study (separate from the LTS Study) that would report on existing and anticipated LTS responsibilities for DOE sites for which cleanup is expected to be completed by the end of calendar year 2006. As opposed to the LTS Settlement Study which is programmatic in nature, this study will be at the site level and will require data collection from the sites. Therefore, DOE-HQ will be working with the field to describe sites (or portions of larger sites) that cannot or are not anticipated to be cleaned up to unrestricted use standards; the study will include a discussion of LTS responsibilities and cost estimates. DOE-HQ is presently working with the sites to determine the data requirements. This study is due to Congress by October 1, 2000.
- Regarding the LTS Settlement Study, the PEIS Settlement requires DOE to follow the National Environmental Policy Act (NEPA) process for public scoping, however the study will not be an Environmental Impact Study (EIS). DOE is in the early phases of developing the scoping and public review process.
- **QUESTION:** What are the milestones for the LTS Settlement Study? Answer: The PEIS Settlement does not specify dates. DOE recognizes that the study must be completed as soon as possible, therefore a draft document is planned for release in Spring 2000.
- The LTS Settlement Study will: 1) inform decision-makers about the LTS issues and potential resolutions; 2) describe DOE’s LTS responsibilities; 3) analyze the national issues that DOE needs to address in planning for and conducting LTS activities; and 4) promote information exchange between DOE and its stakeholders. The LTS Settlement Study will not: 1) be a NEPA document; 2) identify or address site-specific issues; and 3) address issues specific to nuclear stockpile stewardship, other activities related to national security, or the Central Internet Database required by the PEIS Settlement.
- DOE-HQ is interested in getting everyone’s opinions for the LTS Settlement Study. Hence, a web site has been developed to accept comments at: <http://www.em.doe.gov/lts>. The web site also contains all of the stewardship information that DOE-HQ has collected to date.
- **QUESTION:** Are there any plans to provide a listserv option? Answer: No, however it is a good idea.

- **QUESTION:** What is the status of the data call for the Congressional study? Answer: The study and associated data call are in their infancy. This week and next will be devoted to working with the sites to determine the data requirements and the process for collecting the data. Once the data requirements are defined, the corporate databases will be evaluated to determine what information is already available. Hopefully, this will be more of a data validation exercise. A data call will be developed for the missing information.

### **Albuquerque Operations Office - LTS Overview and Lessons Learned: Deborah Griswald, DOE-AL**

- A brief overview of the Albuquerque organizational structure was provided. Environmental stewardship activities are housed within the Office of Environmental Operations and Services along with the environmental restoration projects at Los Alamos National Laboratory, Kansas City Plant, Sandia National Laboratories, and Pantex Plant, and other programs such as community transition, surplus facilities, and Title X. Surplus facilities are listed as a separate program, because Albuquerque will have to deactivate and decommission some non-EM facilities.
- Except for the Inhalation Toxicology Laboratory, none of the Albuquerque sites have EM as the landlord. Defense Programs (DP) is the Programmatic Secretarial Office at all other sites.
- With respect to planning and reporting, LTS approaches are driven by site-specific assumptions at the site level, and the baselines for each site incorporate LTS to 2070. For *Paths to Closure*, LTS costs are located in the project baseline summaries. Other LTS information is located in the geographic site level. On a national level, Albuquerque participates in the LTS Working Group led by DOE-HQ, is preparing a white paper on LTS at operational facilities to accompany the LTS Settlement Study, and is assisting in the Congressional study. One of the key issues with the Congressional study is achieving a balance between the need for data and the cost of providing that data.
- Integration is critical, because Albuquerque has several facilities. Integration is occurring with the Area Offices, Albuquerque LTS Work Group, and by establishing an advisory committee. The Area Offices are responsible for working with their respective stakeholders; the citizens advisory boards (CABs) are very interested in stewardship and want to be involved in stewardship planning. The Albuquerque LTS Work Group consists of Area Offices, laboratories, and plants and is serves as a forum for sharing knowledge, ensuring consistency and completeness, and addressing technical, programmatic, and institutional issues. Finally, a National LTS Advisory Committee is being established with non-EM landlord facilities. The new national security organization will impact this committee and Albuquerque in general, but it is unclear how or how much at this point.
- The cost of LTS requires a continued effort to improve technologies; Albuquerque is using matrixed resources to address technology needs. Albuquerque's two national laboratories are also positioned to support stewardship technology needs across the Department.
- All Albuquerque sites are under the Resource Conservation and Recovery Act (RCRA), therefore they have a lot of regulatory interaction. All Albuquerque sites have a closeout plan. Area Offices have the lead on regulatory interaction. In New Mexico, there is also a Senior Steering Committee and a Management Implementation Group, with representatives from the regulatory agencies, DOE, and the laboratories that address issues.
- There are several LTS activities beyond specific Environmental Restoration projects' responsibilities including legacy site status, cultural/historical resource management, and natural resource

management. Legacy sites are sites where DOE had previous operations but does not have any operations currently. Cultural/historical resource management is a significant issue at Los Alamos due to their Manhattan Era buildings and proximity to several Native American pueblos.

- Albuquerque has identified lessons learned from UMTRA, which include: 1) take individual projects to full completion as remediated; 2) know your regulator and develop a good working relationship; 3) expect a changing regulatory environment; and 4) overly prescriptive guidance documents are a detriment. Lessons learned from other projects include: 1) early planning, regulator involvement, and end-point definition are critical; 2) gather process knowledge now; 3) articulate and track programmatic risks; and 4) clearly document how sites are left and institutionalize the record keeping.
- **QUESTION:** Have closeout plans had stakeholder involvement? Answer: Kansas City probably has, and Pantex may have, but the others are still in the draft stage. All of them will be available to the public after undergoing internal and regulatory review.
- **NOTE:** The closing message was “we do not leave this earth to our children, we borrow it from them.”

### **Regional Land Use Planning Coordination - A Survey of On-Site and Off-Site Planners: Michael Greenburg, CRES**

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- The Consortium for Risk Evaluation with Stakeholder Participation (CRES) is made up of social scientists and is funded by a grant from DOE. CRES has three skill areas related to stewardship: land use, economic simulation, and survey research. The land use skill-base includes three people with PhDs in urban planning. Economic simulation involves an analysis of the impact on regions by shifting budgets (i.e., how a budget increase at Savannah River would affect Hanford). Survey research involves polling the communities (e.g., what are your future use expectations?).
- CRES has prepared a land use planning study for EM that focused on land use planning and how on-site planners interact with off-site planners. The findings were the focus of this presentation.
- DOE sites can have large regional impacts, particularly at rural sites. Many DOE sites are a major part of the local economy and an important part of regional economic development planning. They also place constraints on surrounding land use and impact roads, schools, and infrastructure.
- DOE has never been a “land management” agency. In the past, DOE implemented a “facilities-based” approach, but this is shifting to view the entire land resource and all of its potential values and uses in a comprehensive way. This shift requires a different set of skills, with specialists trained in professional planning, socioeconomic analysis, conflict resolution, mapping, etc.
- The land use planning study was conducted during the summer of 1999. It involved a follow-up with 21 of the off-site planners from the 1996 CRES survey and included a survey of on-site planners at 13 major DOE sites. The survey questions were: 1) What is currently happening regarding planning for future land use at the sites? and 2) To what degree is there interaction between on- and off-site planners? A variety of sites were included in the study.
- The findings from the survey of site planners include: 1) land use planning is not performed consistently across sites; 2) land use planning is not necessarily tied to policy and program decisions; 3) no points of contact for planning are trained planners; 4) land use planning may not be supported at

DP sites; 5) there are too many different initiatives, leading to confusion or a lack of a clear mandate; 6) there is little direct communication between on- and off-site planners; and 7) interaction is done “as needed.”

- The findings from the survey of off-site planners include: 1) off-site planners’ concerns range from minimal to very extensive; 2) DOE should identify excess property that could be put toward beneficial reuse; 3) communities should be assured against future contamination problems; 4) local governments are not prepared to assume LTS responsibilities; 5) there is little direct communication between on- and off-site planners; 6) meaningful involvement was reported at Hanford; 7) some feel that the local community officials have less status than other stakeholders; and 8) there is no faith that DOE would incorporate local input. As a note, 2 is in conflict with 4 above.
- The study found that there is significant confusion regarding the definition of stewardship. People need to know what stewardship means to know how to participate.
- The recommendations of the study were presented. People have difficulty talking to others outside of their disciplines, therefore land use planning should be supported at all sites by specialists. Land use planning should be integrated with stewardship and realistic scenarios should be applied. A communication mechanism with off-site planners needs to be developed; this mechanism does not have to be formal. DOE needs to be forthright with communities about excess lands and contamination levels to build trust. Stewardship cannot be done alone; other federal agencies are faced with the same problems, so DOE should consider forming a multi-agency task force.
- **QUESTION:** How many land use planners are on the CABs? Answer: Dr. Greenburg is familiar with three CABs, and none of them have land use planners. Many sites have off-site organizations separate from the CABs that are involved with land use planning. This creates a problem, because there are two distinct off-site groups interested in land use planning which do not necessarily communicate.
- Comment: For the Hanford land use plan, the community was only interested in the best parcels of land. Response: This scenario will likely be seen more around the complex.
- **QUESTION:** Do communities really believe that DOE could clean up to unrestricted use? Answer: DOE and communities are two different cultures, and there are disconnects. Some communities do not realize the complexities involved with cleanup.
- **QUESTION:** What are the differences between DoD and DOE land use planning? Answer: Dr. Greenburg has been primarily involved with chemical weapons sites that must totally destroy all weapons by 2007. These sites are much closer in location to the communities, have had more contact with the communities, and have moved more rapidly with respect to stewardship.
- In conclusion, the value of DOE sites as production facilities and job producers is greatly diminished. At the same time, their value as land that can serve multiple functions can now be emphasized and enhanced. To achieve this emphasis, new thinking, skills, and processes will need to be developed.

### **Lessons Learned on Long-term Surveillance and Maintenance: Russel Edge, GJO**

- The Grand Junction Office (GJO) Long-term Surveillance and Maintenance (LTSM) Program is the only fully functioning stewardship program in DOE. The GJO LTSM Program was established in

1988 and is responsible for all post-closure activities (currently 25 sites).

- GJO believes that stewardship is not in the future, but the future is now. Thus, the time to consider stewardship is during environmental restoration. When considering stewardship, it is important to note that the definition of stewardship is not as important as how it is executed. Also, communities do not typically want the long-term responsibility of stewardship.
- GJO LTSM Program tasks fit into six topical areas: technical, administrative, regulatory, stakeholder involvement, records management, and technology transfer.
- The mission of the GJO LTSM Program is to fulfill DOE's responsibility to implement all activities necessary to ensure regulatory compliance and to protect the public and the environment from long-lived wastes associated with the nation's nuclear energy, weapons, and research activities. It is important that DOE leave flexibility in stewardship planning to return to the sites when new technologies are available.
- Lessons learned with respect to disposal cell covers include: 1) disposal cell covers change with age; 2) design considerations must anticipate an increase in cover conductivity, degradation of cover materials, and natural succession of plants; and 3) nature will win, don't fight it.
- Maintenance lessons learned include: 1) DOE wastes are very long-lived, therefore they will outlive the cells and 2) nature and people are creative destroyers. An example of the second item is the destruction of signs by gunfire, which is common in the Midwest. A second example is that local farmers often allow their livestock to graze on DOE lands and must be told to remove them.
- A document prepared by the Oak Ridge End Use Work Group was discussed. The document was very well thought out and is highly recommended. It defines three types of stewards: implementing, oversight, and regulatory.
- GJO firmly believes that site-specific stewardship plans should be developed; well-defined plans will receive more stewardship funding. The plans contain important information that will be passed from generation to generation. The Nuclear Regulatory Commission was very forward-thinking when they required Uranium Mill Tailings Remedial Action (UMTRA) sites to complete plans. All of the UMTRA plans are on the Web.
- Lessons learned with respect to stewardship plans include: 1) define responsibilities of long-term custodian; 2) specify required monitoring of site surface conditions; 3) specify required groundwater monitoring; 4) describe final site conditions; and 5) outline contingency actions and emergency responses. Moreover, the plan needs to be flexible and must accommodate quick modifications .
- Records management is imperative; lessons learned include: 1) follow NARA; 2) provide for electronic retrieval (not necessarily a high-powered database); 3) include site history and legal descriptions; 4) support FOIA and litigation requests; and 5) share technical expertise.
- The GJO LTSM Program approach is to develop a site-specific stewardship plan, develop a transition plan from environmental restoration to stewardship, and implement the plan and transfer the site to GJO.
- The level of stewardship is commensurate with site-specific requirements. Several examples were

provided including UMTRA, Pinellas and Monticello, and Site A/Plot M. However, it should be noted that no site has zero maintenance requirements.

- In closing, GJO can be used as a resource for stewardship. GJO has experienced staff in geology, hydrology, botany, and range science; civil, chemical, and mechanical engineering; and project management and stakeholder relations.

### **Long-term Stewardship: Of the People, By the People, For the People: Gordon Bilyard, Pacific Northwest National Laboratory**

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- LTS is a dynamic cycle. Sites define, attain, verify, assess integrity, and re-evaluate the cleanup end state continuously until the site can be released for unrestricted use, and LTS ends. New science, technology, and knowledge play a large role in this cycle and help reach the end of LTS faster.
- LTS is a life-cycle management process for maintaining adequate protection of human health and the environment from hazards. The LTS life-cycle management process must include stakeholders and the public if LTS activities are to be sustained through time.
- Pacific Northwest National Laboratory interprets LTS as a life-cycle management process due to political, economic, and institutional challenges that make LTS difficult over very long time horizons. Politically, short terms and regional interests make it difficult to keep LTS “on the screen.” Considering economic challenges, the Federal budget does not guarantee continuity; often when changes are slow or not apparent, the budget is reduced. Finally, institutions change, and existing community engagement processes and tools are less than optimal.
- Many problems span multiple generations of stakeholders and the public, are long-lived and have no clear technical solution, and will require multiple cleanup actions with intervening periods of stewardship.
- The Life-Cycle Management System (LCMS) was developed to allow sites to walk through the LTS dynamic cycle to ensure that they are not missing anything. The LCMS includes: 1) policy development and analysis; 2) planning; 3) implementation and operation; 4) checking and corrective action; and 5) management review. As a note, the public is primarily involved with step 1 of the cycle above. The public wants to make sure that health and safety and environmental concerns are being addressed.
- Problem types can be broken into four categories: 1) solvable now; 2) solvable near-term; 3) solvable long-term; and 4) appear unsolvable. The need for research and development increases corresponding to the more intractable the problem is.
- Problems that are not solvable now require that hazards be kept within the “zone of acceptability” over long periods of time. The zone of acceptability is much smaller than just technical acceptability and includes legal and regulatory acceptability, community values, and economic feasibility. The trajectory of materials, wastes, or contaminants may lie outside the zone of acceptability (e.g., Hanford contaminated groundwater moving toward the Columbia River). In addition, the zone of acceptability may change with changes in laws, regulations, community values, etc.

- The LCMS provides an acceptable platform for long-term management that considers laws and regulations, economics, community values, institutional process, and technical acceptability. The LCMS requires good communication and the involvement of all interested parties (internal and external) for optimal results.
- All elements of the LCMS must be undertaken. Several examples were provided where failure resulted from not having adequate technical and community input.
- To start the process, one must choose an LCMS that is appropriate for the problem type and understand what the system life-cycle looks like. A team must be assembled where a point of contact represents every element of the LCMS process. Expert help (e.g., universities) in public engagement should be sought, and a process should be in place. Then, the public and stakeholders should be invited to participate. Finally, rules of engagement, roles and responsibilities, and decision processes for the system need to be developed. Established decision processes are particularly important in situations when a final decision is not widely favored by participants.
- Continuing the process, every point of contact, stakeholder, and the public must be involved throughout the entire process. Everyone's input should be valued – questions that seem superficial to engineers are not so to the general public. In addition, these questions will recur during the entire process if not resolved.
- In conclusion, institutionalizing an LCMS offers the best hope for protecting health and the environment from long-lived hazards. The LCMS process encourages the identification of small initial steps that will eliminate the need for major activities in the future. Developing a partnership and involving all stakeholders allows knowledge to be passed from generation to generation and provides continuity that transcends political, economic, and social changes.

### **The Role of Science and Technology in Stewardship: John Lehr, DOE-HQ**

- Stewardship planning must begin during site characterization, where the types and concentrations of contaminants will be determined. Stewardship criteria will determine what remedial action is selected. DOE must work with regulators and stakeholders to determine the acceptable end state(s) for sites.
- Ongoing actions required for implementation of stewardship include: 1) short- and long-term monitoring; 2) stabilization, maintenance, and visual or other inspection; 3) remedy maintenance and validation; 4) data management and analysis; 5) record keeping; and stakeholder involvement/information dissemination. Decision-making is needed to make stewardship implementation a reality.
- EM recognizes the importance of stewardship, which is illustrated by the creation of the Long-Term Stewardship Office within the Office of Science and Technology (OST) and the various stewardship studies being performed.
- An ongoing study by the National Research Council/National Academy of Sciences (NRC/NAS) looks at long-term site disposition. The study is much broader than stewardship and includes decontamination and source removal, containment and migration management, and institutional management (e.g., technical, regulatory, stakeholders, economics). A final report is due by the end of the Fiscal Year.

- The NRC/NAS study examines the processes being used to develop controls, the compatibility of controls with objective, time period, and future land use, and technology needs for the controls to function as designed/planned.
- OST recognizes that today's technologies are not optimized. For example, DOE is using 30-year caps on 1,000-year problems. Additionally, new scientific findings may affect site closure and/or stewardship (e.g., cleanup levels change as a result).
- OST activities in support of stewardship include long-term barrier/cover systems like the one being tested at Sandia National Laboratories, interagency coordination on dense non-aqueous phase liquids, global sampling network, laser induced fluorescence, and robotics and intelligent machines.

### **Open Discussion**

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- **QUESTION:** Fernald is planning to do an LTS plan. What would be a good estimate for the time and cost to complete a plan? **Answer:** For UMTRCA, the plans were straightforward and cost \$15-\$20k. There will not simply be a plan; databases and other record storage will need to be developed. In short, the plan is very site-specific, but it requires a small percentage of time and cost of the overall effort. The intent of the plan is to explain to stakeholders and regulators what hazards remain, what the pathways are, and who the potential receptors are.
- **QUESTION:** What are the regulatory drivers for stewardship? **Answer:** The regulatory drivers are dispersed among a number of laws and regulations. The NRC requires RCRA post closure permits. EPA Region 4 requires that a stewardship program be put in place and that institutional controls be written into RODs. The Comprehensive Environmental R C Liabilities Act (CERCLA) requires that remedy effectiveness be demonstrated every five years (note: EPA implementation guidance for five-year reviews is expected in April 2000). The Waste Isolation Pilot Plant requirements have the ten commandments for LTS, which would be a good starting point for determining requirements.