

Site Transitions – Moving from Cleanup to Long-Term Stewardship – 14276

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ABSTRACT

The US DOE Office of Legacy Management (LM) was established in 2003 to manage sites that no longer had ongoing missions. At that time, LM inherited 33 sites in 17 states. Since then, 57 sites have transitioned into the LM program, with the transition of another 39 sites anticipated over the next 10 years. While the basic guidance remains the same as when LM began, the transition process used to bring remediated sites into the LM program has evolved and been refined. Before a site can officially transition into LM, months or years of work are required to ensure a smooth and successful transition. Transition activities depend on the regulatory driver, the size of the site, the complexity of regulatory agreements, and the type of activities that are to continue long-term.

Regulatory drivers include CERCLA/RCRA, FUSRAP, the Uranium Mill Tailings Radiation Control Act (UMTRCA), and others. While the regulatory driver has a major impact on how a transition occurs, many of the steps to transition a site are similar regardless of the regulatory driver. Common to all site transitions is the importance of (1) establishing effective working relationships with LM site personnel or the site owner, appropriate regulators, and site contractors, and (2) gaining a good understanding of contractual requirements, site regulatory drivers, established agreements and expectations of regulators, and local community expectations. When the transition process begins, roles and responsibilities are defined, a transition schedule is developed, and the project management tools for the transition effort are developed. Project management tools include the integrated transition matrix and Responsibility Transition Packages (RTPs).

There are 17 categories covered during transition, including regulatory agreements, Natural and Cultural Resource Management, disposal facilities, Information Management, Real Property, Records, and Stakeholder Relations. The integrated transition matrix is developed early on and is based upon these categories. This matrix is an iterative tool that evolves throughout the transition. Representatives from the US DOE Office of Environmental Management (EM), the EM contractor, LM, and the LM contractor are asked to define and populate the matrix for their respective area(s) and to provide status reports and updates at review meetings. The integrated transition matrix is ultimately used to derive RTPs for each of the 17 areas. The RTPs support the integrated transition matrix by providing detailed transition information. They also document the completion of stages of preparation for the transition of a site from EM to LM.

The Fernald, Ohio, Site offers a specific example of the transition process with a CERCLA site. The Fernald site is a good representation of how the transition occurred for other well-known sites, such as the Rocky Flats, Colorado, Site; the Weldon Spring, Missouri, Site; and the Mound, Ohio, Site. The process to transition the Fernald site to LM occurred between April 2004 and December 2006.

INTRODUCTION

After environmental remediation is completed at a site where there is no continuing mission, responsibility for the site is transferred to LM for post-closure management. For sites where residual hazards remain (e.g., disposal cells, groundwater contamination), active long-term surveillance and maintenance (LTS&M) is required to ensure protection of human health and the environment.

Sites that are to be transferred to LM will follow a transition process. This transition process is defined as the passage of a site, after remedial action has been taken to mitigate environmental and human health risks, to the next phase where residual risks are maintained in a sustainable and safe condition to allow beneficial use. The primary US DOE orders related to the transition process are US DOE Order 430.1B, which specifies the requirements of real property and asset management, including the disposition and transition of the real property and assets; and US DOE Order 413.3B, which specifies a disciplined process for project management using the Critical Decision process. Following the formation of LM in December 2003, transition guidance was established for remediated sites that will be transferred to LM for LTS&M, specifically the *Terms and Conditions for Site Transition*, the *Site Transition Plan Guidance*, and the *Site Transition Framework*. These guidance documents form the basis for all transitions.

Before Transition

Sites that transition into LM fall under a range of regulatory drivers, primarily UMTRCA Title I and Title II, FUSRAP, or CERCLA/RCRA. Figure 1 is a map of sites currently in the LM program and identifies each site's regulatory driver. Depending upon the regulatory driver, the sites have different transferring organizations and levels of complexity that are factored into the transition process.

LM maintains the *Site Management Guide* (also known as the “Blue Book”) as a regularly updated reference document for LM and its contractor(s) that provides accurate and consistent information across the LM organization. The Blue Book contains the official list of sites currently in the LM program as well as a list of sites planning to transfer to LM during fiscal year (FY) 2013–FY 2050. The Blue Book makes current and accurate site count data available for the core functions of planning, budget formulation, budget execution, and evaluation.

The Blue Book also designates a category for each site, which is important for understanding what will be required when transitioning a site into LM. Each site is designated as belonging to one of three categories based on the actual or anticipated LTS&M activities associated with that site. Category 1 site activities typically include records-related activities and stakeholder support only. Category 2 site activities are more involved than Category 1, and typically include routine inspections, site monitoring and maintenance, records-related activities, and stakeholder support. Category 3 sites are the most complicated, with activities that typically include operation and maintenance of active remedial action systems, routine inspections, site monitoring and maintenance, records-related activities, and stakeholder support. Figure 1 identifies the category for each site.



Fig. 1. This map shows LM sites through 2013 that require LTS&M.

As stated above, Category 3 sites are the most complex, so they require a longer lead time to transition as well as more resources. While there are exceptions, FUSRAP sites are typically Category 1, UMTRCA sites are Category 2, and CERCLA/RCRA sites are Category 3. While 90 percent of the sites that LM currently manages fall within the Category 1 and Category 2 designations, Category 3 sites account for approximately 65 percent of the LTS&M budget.

Transition Of Sites To LM

Regardless of the regulatory driver or the designated category, all sites go through an established transition process, as mentioned above, that provides guidance for remediated sites that will be transferred to LM for LTS&M. There are seven fundamental steps followed during the transition process that ensure a successful transfer to LM. These steps are (1) notification, (2) site transition planning, (3) LTS&M requirements, (4) communication and outreach, (5) budget and authority documentation, (6) verification of readiness, and (7) transfer. Each step is described below.

Notification – Notification is an ongoing, active dialogue between the responsible agency and LM to start the process of transition. Depending upon the regulatory driver, LM communicates and coordinates with US ACE, EM, or private transferring organizations. For many of the sites, notification of 4 to 6 months prior to completion is often adequate, while for the larger, more complex sites (e.g., the Fernald site, the Mound site; and the Rocky Flats, Colorado, Site),

notification of 2 years or longer is necessary to ensure a smooth transition. One of the first steps of transition activities is for LM to conduct a readiness assessment of the site to determine that site's capability to be closed and transitioned.

Site Transition Planning – Transition planning identifies and guides the execution of the actions needed to move the site to a point where responsibility can be transitioned. This planning takes different forms depending upon the regulatory driver. Contingent upon the regulatory driver, the site transition planning may be contained in existing documents, such as federal laws and Memorandums of Understanding (MOUs), or they may be contained in a Site Transition Plan (STP) that is written by LM and the transferring organization for a specific site. The *Site Transition Framework* guidance is used extensively to develop STPs.

The *Site Transition Framework* defines site conditions, documentation, and LTS&M aspects that must be addressed. While it does not prescribe a transition process, it is a tool that helps facilitate a smooth transition from remediation to LTS&M, providing a systematic process for affected parties to utilize in analyzing the baseline. This allows for understanding and management of the actions from EM-mission completion through a site's transition into LTS&M. While it was originally developed to accommodate transitions specifically between EM and LM, it is a high-level guide that provides a good reference to all transitions in general. It is the basis for developing STPs and other site-specific tools that will be discussed in further detail below.

LTS&M Requirements – Post-closure activities are identified and clearly documented in an LTS&M plan. The LTS&M plan includes those actions required to maintain the protection of the remedy (e.g., remedy performance monitoring, groundwater pump-and-treatment); manage the natural, cultural, and historical resources; and involve and inform the public. The level of detail and complexity depends upon the regulatory driver.

Communication and Outreach – Communication with the site's stakeholders and regulatory agencies builds on existing communication and outreach efforts. One goal of the transition process is to ensure that stakeholders and regulators are aware of the plan to transition and participate in the development of the LTS&M plan.

Budget and Authority Documentation – Cost estimates are developed for the post-closure management of each site. In order to develop a solid cost estimate, a good understanding of the LTS&M post-closure requirements is necessary.

Verification of Readiness – This is a final assessment of the site's readiness to transfer. This final assessment can take many forms, but its purpose is primarily to document the completion of the site's mission and validate the successful execution of the transition plan.

Transfer – It should be noted that even after a site has been transferred, there may be some activities that the transferring organization must still complete. These would be documented between LM and the site owner.

Transition Of UMTRCA Title I And Title II, FUSRAP, And CERCLA/RCRA Sites

Approximately 75 percent of the sites that have transferred to LM are UMTRCA Title I and Title II, FUSRAP, and CERCLA/RCRA sites. While all sites go through the transition process, the way in which the seven steps are accomplished varies. Each of these site types are detailed below.

UMTRCA Sites

Congress enacted UMTRCA to provide for the disposal, long-term stabilization, and control of uranium mill tailings in a safe and environmentally sound manner, and to minimize or eliminate radiation health hazards to the public. This act established two programs to protect the public and the environment from uranium mill tailings and also specified that US DOE would be the long-term custodian for sites cleaned up under Title I or Title II of that legislation.

LM and the U.S. Nuclear Regulatory Commission (NRC) meet quarterly to discuss regulatory issues for UMTRCA sites that are in transition or already assigned to LM for long-term stewardship. LM communicates directly with the regulator and licensee leads to coordinate transition activities.

For UMTRCA Title II sites, transition planning follows the specific steps identified in the *Process for Transition of Uranium Mill Tailings Radiation Control Act Title II Disposal Sites to the U.S. Department of Energy Office of Legacy Management for Long-Term Surveillance and Maintenance*. The typical transition for UMTRCA sites takes approximately 6 months, but can take up to 2 years. The transition process begins before the anticipated date of termination of the specific mill license, and the goal is to complete LM preparations as NRC is ready to concur that reclamation is final.

The transition process involves meeting with licensee and regulator representatives to plan the transition process; capturing and managing site knowledge and information; developing a technical basis to concur with site closure; ensuring conformance with applicable laws, regulations, and US DOE orders, guidance, and policy; evaluating real property requirements against existing conditions; compiling transition actions into a site-specific action list; consulting with NRC and the agreement states on site-transfer boundaries, deficiencies, regulatory compliance, and the long-term care fee; developing a Long-Term Surveillance Plan (LTSP), webpage, and fact sheet; and conducting appropriate stakeholder outreach and support.

Transition activities are initiated by an agreement among the licensee, the regulators, and LM specifying that license termination can be achieved at the end of the transition period. All parties monitor site conditions and the regulatory closure process to determine when transition activities should begin. LM monitors site status through communication with licensees and state regulators, as applicable, as well as through regular meetings with NRC.

An LTSP is written to describe how US DOE, as the long-term steward of the land, will comply with applicable federal, state, and local regulations. The LTSP, including any subsequent revisions, is submitted to NRC for approval. The LTSP is based upon LM's *Guidance for*

Developing and Implementing Long-Term Surveillance Plans for UMTRCA Title I and Title II Disposal Sites. Because the transfer is between private license organizations and US DOE, an STP and a Critical Decision 4 (CD-4) package are not required steps in the transition process. A CD-4 package is a formal determination that addresses commitments to be met before a project is allowed to be designated as completed.

LM also generates task plans for multiple years and these plans are managed using approved change-control processes. Changes reflect refinement of scope, schedule, and budget as more site-specific information becomes available.

FUSRAP Sites

Many sites remediated under FUSRAP were remediated to a condition that allows unrestricted use of the site following cleanup and these sites pose no unacceptable risk for any possible future land use. For these Category 1 sites, US DOE LTS&M activities consist of responding to questions or concerns from stakeholders and managing site records so future custodians can readily answer questions or concerns about the site. At a few FUSRAP sites, residual contamination was left in place and some site uses must be restricted. At those locations, US DOE monitors land use to ensure protection of human health and the environment. US DOE conducts site surveillance and monitoring activities in accordance with approved site-specific plans. Sites scheduled for transition in the future may have Category 2 LTS&M requirements, which could include site inspections and reporting, maintenance of institutional controls, environmental monitoring, records and data management, and responses to stakeholder concerns.

A 1999 MOU between US ACE and US DOE defined the roles of each agency in administering and executing FUSRAP. US DOE assumed responsibility for 25 sites cleaned up between 1981 and 1997 and, beginning in 2004, LM is responsible for surveillance, operation, and maintenance of the sites, including monitoring and enforcement of any institutional controls imposed on the sites. Since 2002, five additional FUSRAP sites have been transitioned by US ACE to US DOE. Institutional controls typically depend on some legal order, such as zoning ordinances, laws, and deed restrictions to protect public human health and the environment from hazardous substances left in place at a site, or to ensure the effectiveness of the remedy.

In 1997, US ACE assumed responsibility for cleanup of the remaining 21 of the 46 sites that US DOE identified in the original assessment. Since then, eight additional sites have been added to FUSRAP for remediation and LTS&M.

In accordance with the MOU, there is a three-step process for transferring completed sites to LM. The first step begins with the signing of the Record of Decision (ROD), at which point LM receives a copy of the ROD, a general description of the site and remedial action plans, an estimated remedial action schedule, anticipated land-use controls, as well as operations and maintenance requirements. The second step occurs after the site closure report is completed and a declaration of completed action has been signed. LM receives dates for when short-term maintenance starts and ends, an estimate of annual out-year cost requirements, a general description of the remedial goals, and any restrictions remaining on the property. At this point, US ACE retains responsibility for surveillance, operation, and maintenance at a site for 2 years

after site closeout, defined as the completion of cleanup and publication of a notice in accordance with the provisions of CERCLA, the National Contingency Plan, and US ACE procedures. The third step begins when US ACE has completed all remedial activities at the site and 90 days before the end of the 2-year short-term operations and maintenance. At this point, US ACE notifies LM of the effective date of transfer to LM for long-term operations and maintenance.

LM developed a *Long-Term Surveillance and Maintenance Requirements for Remediated FUSRAP Sites* document that serves as the LTS&M Plan for the FUSRAP sites that can be released for unrestricted use, based on the final radiological conditions for the sites. For these sites, LTS&M activities consist of preserving site records and responding to stakeholder inquiries. This document also identifies some sites that will require use restrictions. For those sites, US DOE develops a site-specific LTS&M Plan that establishes a program of post-closure care that maintains protectiveness.

CERCLA/RCRA

These sites were radiologically and/or chemically contaminated by federal milling, processing, research, and/or weapons manufacturing operations. Sites are remediated in accordance with CERCLA and/or RCRA and then transferred to LM. For these sites, US DOE LTS&M activities consist of the operation and maintenance of remedial action systems, environmental monitoring, routine inspection and maintenance, records-related activities, and stakeholder support.

For most CERCLA/RCRA sites, notification of 2 years or longer is necessary to ensure a smooth transition. The notification allows enough time for both organizations to work jointly on the transition and for LM to engage in remediation considerations that may impact LTS&M costs and effectiveness. In addition, EM and LM communicate quarterly about projected dates for completion of environmental remediation at a site. A readiness assessment is conducted to determine that a site is ready to begin the transition process.

An STP is jointly developed and executed by EM and LM. The STP is an internal US DOE management tool and serves as the transition/closeout planning document; it is based on the *Site Transition Framework* guidance established by LM. The *Site Transition Framework* guidance identifies transition requirements in 10 functional areas and is used to verify that all appropriate steps have been taken or will be taken to close out the site, as well as to identify necessary actions by both EM and LM organizations to transfer the site to LM. For CERCLA/RCRA sites, the LTS&M Plan can meet the requirements of the Operations and Maintenance Plan and include the enforceable activities to be administered under a post-closure agreement. LM requires support from EM but leads the development of the LTS&M Plan.

EM and LM work together to ensure appropriate cost estimates are developed for the post-closure management of the site. This requires cost estimates for LTS&M, contractor pensions and benefits, and other costs that are needed for post-closure management. Prior to the expected transfer of the site, US DOE will prepare a program budget decision document, which is signed concurrently with the preparation of the President's request for the FY in which LM is expected to receive the site. The document is the official notification that US DOE intends to transfer budget and scope from EM to LM. A CD-4 package, which includes a final assessment of the

site readiness to transfer, and which represents agreement between EM and LM on the conditions of the site and associated activities at the time of transfer, is also prepared.

Once the budget request has been approved by Congress and the CD-4 package is signed, the site is officially transferred from EM to LM. Even though the site has been transferred, there may be some activities that remain for EM to complete. If so, these are documented in the approved CD-4 package.

The Example

Taking a detailed look at the Fernald Closure Project (FCP) transition provides a unique perspective and facilitates a better understanding of the level of complexity and time that is required to transition a site into LM. The Fernald Preserve is located on the site of the former Fernald Feed Materials Production Center, a uranium processing facility that produced high-purity uranium metal products as the first step in America's nuclear weapons production cycle. The site's production mission began in 1951 and continued until 1989, when production operations ceased and the Fernald site's mission changed to environmental remediation. Comprehensive environmental remediation and ecological restoration of the site was completed in 2006 at a cost of \$4.4 billion. Figure 2 shows the FCP at the end of remediation.



Fig. 2. The Fernald Closure Project at the end of remediation in 2006.

As one of the first steps of the transition, LM conducted a readiness assessment of the site in March 2004 to determine the site's capability to be closed and transitioned as scheduled in 2006. The LM assessment team met with both EM and site contractor personnel. The assessment was conducted around the LM *Site Transition Framework* that, as mentioned previously, describes

the requirements for acceptance of a site around 10 functional areas. A report was issued that detailed the assessment team's state of readiness, observations, key actions, and key milestones for each of the functional areas. This assessment helped to officially kick off the Fernald site transition process.

LM and EM jointly developed the FCP STP, which was approved by the Assistant Secretary for Environmental Management (EM-1) and the Director of LM (LM-1) in March 2005. The STP detailed the actions required by EM and LM to verify that all appropriate steps had been, or would be, taken in order to affect programmatic transfer of the site from EM to LM. The STP included milestones and mitigation strategies for programmatic risks that served as tools to measure progress in completing work assigned to EM and LM organizations. The EM and LM project managers recognized that the schedule of action items in the STP did not need to be, and was not, complete in identifying all items significant toward measuring project completion or transfer, and that the STP was a living document that should be responsive to any issues that might develop. As such, quarterly progress reports were submitted to EM-1 and LM-1 against all STP milestones and programmatic risks and served as the configuration management tool for STP milestone due dates. An addendum was later issued to document what milestones had changed since the STP had been approved.

The EM contractor issued a Declaration of Physical Completion (DPC) in October 2006 and EM provided its contractor with a written determination of reasonableness (DOR) of the DPC in November 2006. The final Terms and Conditions for Site Transition stated that the budget responsibilities for the site were to remain with EM until the beginning of the fiscal year following cleanup completion. Contractual and financial closeout of all remaining administrative matters was completed by the EM Consolidated Business Center, following US DOE's acceptance of the EM contractor's DPC. In January 2007, EM-1 granted approval for the EM contracting officer to accept physical completion of work required from their contractor.

In addition to the STP, EM and LM both created and shared internal tools that were devised early in the transition and used extensively throughout the transition process. These were "living" tools that the teams updated and revised routinely, even weekly, at the height of the transition.

The first tool to be developed was the Comprehensive Exit and Transition Plan, which was a deliverable required under the EM contractor's closure contract. The plan's purpose was to assist US DOE in analyzing that the site was ready for transfer into long-term stewardship and that the contractor had satisfactorily completed the closure contract statement of work elements.

LM maintained two main tools that proved useful during transition—the Fernald Integrated Transition Matrix (Matrix) and the RTPs. The first tool, the Matrix, was the primary tool used to document and communicate the functions to be transferred, actions to facilitate the transfer, and status of the transfer. The Matrix, as a living document, was updated and distributed frequently to ensure that personnel involved with the project were working to the same data set. The second tool created was the RTPs. The RTPs supported the Matrix by providing detailed transition information and documenting successful preparation for the transition of the Fernald site from EM to LM. The information in the RTPs also supported transition elements of the Fernald CD-4. The RTPs were living documents and were revised as necessary to document the most current

planning information associated with transition of this function. There were 17 RTPs, each focusing upon a specific area or activity (for maintaining the site post-closure) that was transitioning from EM to LM. Each RTP included documentation of all the key elements associated with function transfer, the decisions made along the way, the basis for these decisions, assumptions made (as necessary) upon which the planning was based, and finally the specific steps and associated considerations for completing the responsibility transfer at the appropriate time. These RTPs were signed by both EM and LM. Figure 3 identifies all of the RTPs used to transition the Fernald site.

The 17 RTPs were:

1. Aquifer Restoration and Water Treatment Facility
2. CERCLA
3. Federal and State Regulatory Agreements
4. Integrated Environmental Monitoring Plan
5. Information Management
6. Natural and Cultural Resource Management
7. On-Site Disposal Facility
8. Permits and Programs – State
9. Permits and Programs – Federal
10. Personal Property Management
11. Programmatic Infrastructure
12. Real Property
13. Records
14. Stakeholder Relations
15. Utilities
16. Waste Management
17. Worker Benefits Program

Fig. 3. The 17 Fernald Responsibility Transition Packages agreed upon by both EM and LM.

The month prior to the actual transition was designated as the transitional window. The transitional window was a crucial period during the transitions when EM and LM conducted activities that were considered vital components to ensure an effective and uneventful transition of the operational responsibility of the Fernald site. Two weeks prior to the EM contractor's DPC, EM or LM or both rechecked resources that the Stoller LMS Team had identified and put in place to operate the site, finalized the task order set up for funding, conducted a gap analysis against the Internal Readiness Review that was held earlier, and issued a letter to the U.S. Environmental Protection Agency regarding the upcoming transfer of operational responsibility for the site from EM to LM and the change of prime contractors. At DPC, EM and LM started the review process of EM's contractor DPC letter and LM accepted operational responsibility for the Converted Advanced Wastewater Treatment (CAWWT) operating system, including all infrastructure to the aquifer restoration. Between the DPC and the DOR, EM and LM conducted the final certification walk downs, documented the completion of applicable RTPs (as defined above), checked the accuracy of the Operational Project Plan, completed transfer forms for those elements that transfer at physical completion, and issued a joint news release.

Final documentation of the transition was completed with submittal of the final Fernald Matrix and the complete 17-piece set of the RTPs. The Matrix contained over 1,200 actions, most of which were the responsibility of LM. All LM actions were completed in accordance with the approved schedule in the Matrix. Non-LM actions that were still pending were tracked to verify completion.

As part of the Fernald site transition process, lessons learned from two previous transitions (i.e., the Weldon Spring site and Rocky Flats site) were implemented. One key lesson learned from the Rocky Flats site transition process was that sites should phase the transition as much as possible. To this end, Fernald site operations were transitioned in two main phases. The first was transfer to LM of the CAWWT operating system and ecological restoration in October 2006. The second was the final transfer that occurred in November 2006 when all remaining activities were transferred to LM, including environmental monitoring and site access. Both of these transitions were executed without incident, following an approved MOU between EM, LM, and the contractors.

CONCLUSIONS

Over the years, US DOE and their contractors have been working toward the transition of sites to long-term stewardship. Each of the sites that have made this transition from active missions, to remediation, and finally to long-term stewardship, have done so by developing a number of key documents and tools that guided their transition path. These living documents and tools were used throughout the transition process and were refined as the transition date grew closer and more information became available. While the documents and tools were based on LM guidance, the guidance allows for flexibility, recognizing that each site often has its own unique set of requirements that need to be addressed or incorporated prior to transition. As seen with the Fernald site example, developing the Matrix and the RTP tools was crucial so that all parties to the transition knew the schedule, scope, and responsibilities to ensure a successful transition.

After a successful remediation and a smooth transition, the Fernald site has come full circle, fulfilling the commitment to make the Fernald property a community asset. The site is open to the public, offering 7 miles of trails that provide access to the site's varied habitats, including tallgrass prairies and one of the largest man-made wetlands in Ohio. The site also offers an award-winning visitors center that tells the story of the Fernald site's evolution. Figure 4 shows the Fernald site as it appears today.



Fig. 4. This figure shows the 7 miles of trails available to the public at the Fernald Preserve as of October 2013.