LONG TERM STEWARDSHIP CHALLENGES AT THE ST. LOUIS FUSRAP SITES

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ABSTRACT

Non-Federally owned radioactively contaminated sites in St. Louis, Missouri are currently being remediated by the St. Louis District Corps of Engineers under the Formerly Utilized Sites Remedial Action Program (FUSRAP). When FUSRAP remediation is complete, inaccessible soils which have levels of contamination greater than unrestricted use standards, will remain. The purpose of this paper is to document the initial challenges facing the project team during its development of the Long Term Stewardship plan for the management of these soils. These soils are located under buildings, roads, railroads and bridges. The Long Term Stewardship plan for the majority of the sites is being developed simultaneously with the remedy selection process. A living document, it will ultimately document the remedial action end state and location of inaccessible soils and implement the plan for ensuring these soils are not a threat to human health and the environment. Although these soils are protective in their current configuration, at some point in time, when activities such as maintenance, utility or property improvement occur, the soils will become accessible and need to be addressed by the federal government. Up until that point in time they will need to be effectively managed to ensure they remain protective. The St. Louis District is in the process of collaboratively developing this plan with its regulators, affected stakeholders and interested parties.

INTRODUCTION

This paper addresses progress regarding the site specific issues and innovations and programmatic challenges relating to Long-Term Stewardship (LTS) of three sites being remediated under the Formerly Utilized Sites Remedial Action Program (FUSRAP) in St. Louis, Missouri. These sites, currently in the remedy selection process, are undergoing removal actions under interim authority by the FUSRAP Field Office, St. Louis District, United States Army Corps of Engineers (USACE), and in accordance with the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA).

Definition of LTS

In order to understand the ramifications of the LTS processes and challenges, it is important to understand the USACE definition of LTS, purpose of FUSRAP and some specifics about the sites.

The USACE defines LTS with respect to "the physical controls, institutional controls, information and other mechanisms needed to ensure protection of people and the environment, both in the short and long term, after the cleanup of the FUSRAP contamination is considered complete." At FUSRAP sites, where LTS will be a joint federal responsibility, this definition is consistent with the Department of Energy (DOE) definition of LTS which "refers to all activities required to protect human health and the environment from hazards remaining after cleanup is considered complete.". In sum, LTS develops and implements the specific controls stated in the site Record of Decision (ROD). Additionally, it ensures that protectiveness of human health and the environment are maintained for areas that have concentrations of contaminants requires specific controls to ensure future protectiveness. These controls are typically: non-engineered instruments such as administrative / legal controls, used in lieu of treatment or containment, used previously during remedial action and implemented in layers to provide assurances of protectiveness. Typically, the controls placed on specific pathways, such as the ingestion of contaminated water or crops or preclude activities such as construction that would result in exposures that would not otherwise occur.

Background

The Department of Energy (DOE) established FUSRAP in 1974, to address contamination generated by activities of the Manhattan Engineer District (MED) and the Atomic Energy Commission (AEC) during development of atomic weapons in the 1940's and 50's. In Fiscal Year 1998 Congress, in the Energy and Water Development Appropriations Act, transferred the responsibility of the FUSRAP radioactive waste cleanup program from the Department of Energy (DOE) to the United States Army Corps of Engineers (USACE). (After the transfer of FUSRAP, an inter- governmental Memorandum of Understanding (MOU) was developed between the USACE and DOE. The MOU clarified agency roles and responsibilities for the execution of the FUSRAP mission. The MOU states that the USACE will develop and execute the remedy and be responsible for LTS for two years after completion of the remedial actions. After this timeframe the DOE will assume responsibility for LTS until site completion.). The Corps of Engineers Operations Order for program transfer gave the St. Louis District responsibility for five sites. These sites consisted of a site in Madison, Illinois, the St. Louis Downtown Site (SLDS), the St. Louis Airport Site (SLAPS), the Latty Avenue Properties, consisting primarily of the Hazelwood Interim Storage Site (HISS) and the FUTURA Coatings property (FUTURA) and associated vicinity properties. SLAPS, HISS and FUTURA are on the National Priorities List (NPL) and subject to remediation pursuant to the CERCLA. These discussions are specifically limited to these NPL sites and their vicinity properties, collectively referred to as the St. Louis North County Site.

Prior to discussing site specific challenges, it is important to note that the St. Louis District is currently working on a Record of Decision to establish the final remedy selection for the St Louis North County Site. The St Louis North County Site remediation generally consists of the removal (and replacement with better material) of approximately 600,000 insitu cubic yards of soil. Although it is expected that most site soils will be remediated to unrestricted release criteria such that minimal Long-Term Stewardship issues will remain, it is necessary nonetheless to implement an LTS plan for those soils not achieving such criteria. All three sites and associated vicinity properties are in the process of being addressed in one Record of Decision (ROD). The SLAPS is a 21.7 acre tract located north of Lambert International Airport, bounded by major roads to the north and south and Coldwater Creek to the west. It was used from 1946 until 1966 to store residues from uranium processing activities conducted at the SLDS. In 1966 ore processing residuals were sold by the AEC to a private contractor, some of the residues were removed and three feet of fill was placed on the site. The site, placed on the NPL in 1989, is owned by the Airport Authority and is currently not being used for any activity. The HISS and FUTURA sites total 11 acres. The HISS was used to store the uranium processing residues, which were purchased and transferred from the SLAPS site, in 1966 and 67. These residues were stored at the HISS and later shipped for disposal or recycling. Both properties on this 11-acre site were also placed on the NPL in 1989. The SLAPS and HISS are located approximately 1.5 miles apart. The St. Louis Airport Site Vicinity Properties (SLAPS VP's) consist of 78 properties owned by residential, commercial, industrial and state interests who use the land for those respective purposes. These properties are contiguous to SLAPS, along the haul roads used to transfer the residues from SLAPS to HISS, or along Coldwater Creek. Contamination was dispersed to these properties either through direct migration from SLAPS, by air or water, or through vehicular distribution along the roadways. Based on the contiguous location of of the sites and contamination, common elements exist. First, the contaminants of concern within the St Louis North County Site consist of those normally associated with the residue from uranium processing, specifically radium-226, thorium-230 and uranium-238. Second, each site is currently being remediated to unrestricted use criteria derived from UMTRCA (5 pCi/g Ra-226 and Th-230 in the first six inches and 15 pCi/g of each to depth and 50 pCi/g from surface to depth for U-238) under an approved Engineering Evaluation / Cost Analysis (EE/CA). Third, the United States Environmental Protection Agency – Region VII and Missouri Department of Natural Resources, regulate all of the areas within the St Louis North County Site. Additionally, the St. Louis Oversight Committee, a broadly based representative body of concerned citizens, affected property owners, utility companies and representatives from St. Louis City and County formed in September 1994 to identify and evaluate remedial action alternatives for the cleanup and disposal of radioactive waste materials at the St. Louis FUSRAP sites, receives monthly progress briefings from the Corps staff. Finally, and most importantly, as currently planned, these sites are expected to have soils with residual radioactivity requiring radiological restrictions under roads, railroads, bridges and buildings after the USACE CERCLA response

is completed. Issues regarding the maintenance, monitoring and ultimate disposition of these soils are the focus of the process and challenges of LTS.

Site specific LTS process

The site-specific LTS process, for which no precedence currently exists in the USACE FUSRAP program, is to establish and develop a collaborative, LTS plan with the input and assistance of all stakeholders. At the limited number of public meetings on the issue that have been conducted to date, several site specific challenges have become apparent for the St. Louis North County Site. These include: defining the criteria where institutional controls and long-term stewardship are appropriate; identifying each specific area for which long-term stewardship is required; establishing and implementing appropriate and effective land use controls; implementing a program to monitor the existence of controls to ensure their effectiveness into the distant future; developing an appropriate monitoring program for impacted media to include inaccessible soils, air, ground water and/or surface water; and the management of residual contamination as it becomes available to remediate or is excavated as a result of utility support activities.

Defining the criteria above which institutional controls and long-term stewardship are appropriate is the first issue. Supplemental standards have been derived for the North County Sites pursuant to Title 40 Code of Federal Regulations, Part 192 Subpart C for a special circumstance. The supplemental standard is for material under buildings, roads, bridges and railroads in conjunction with the use of institutional controls. The remainder of the site will be remediated to the unrestricted criteria for radiological tailings sites established using the USEPA standards for remedial actions at inactive uranium processing sites in Title 40 CFR Part 192 Subpart B.. Although Subparts B and C of 40 CFR 192 are site ARARS, , there is some disagreement with respect to the criteria above which institutional controls are necessary. This disagreement is related, in part, on promulgation of state laws limiting the radioactive concentration of soils that may be disposed of in the state of Missouri to background. This has resulted in a position by the Missouri Department of Natural Resources that all soils exceeding site background (1 to 2 picocuries per gram for Ra-226, Th-230 and U-238 for the North County Sites) are subject to state regulation, institutional controls and long-term stewardship if the calculated risk exceeds 1E-06. In addition, the specific scenario (e.g. resident farmer) used to assess residual site risk must be agreed upon with regulators and specific exposure pathways must be assessed with respect to their potential impact. As an example, if ground water is not usable as a drinking water source, the drinking water pathway would not apply. Until all pathways are agreed closed, IC's and LTS are appropriate.

Once the criteria for LTS is established, those areas requiring controls will be bound by the analysis of historical site data and conditions, supplemented by investigative borings to further define the nature and extent of contamination and defined by a Multi Agency Radiation Survey and Site Investigation Manual (MARSSIM) compliant final status survey. The results of the final status survey will determine the nature of the controls to be imposed. (Currently, the St. Louis North County Site is being remediated to a 5/15/50, for Ra, Th and U respectively. These concentrations, in conjunction with residual site risk assessments, constitute an unrestricted use standard. This standard was derived pursuant to 40 CFR 192 for Radium and pursuant to the Nuclear Regulatory Commission process for developing remediation goals for radionuclides to be consistent with Radium limits prescribed in 40 CFR 192. The NRC's 10 CFR 40, Appendix A, Criterion 6(6) was used to develop the standards for uranium. Those soils which exceed this criteria will be defined and appropriate land use controls (LUC's) for these areas will be established to limit access to or restrict certain activities from or warn of a hazard on the property. LUC's are envisioned to primarily consist of governmental and proprietary, or a combination of both mechanisms. Government controls such as zoning, siting and groundwater restrictions will be used to limit land access, control land use and protect the land resources and be imposed by state and local governments. Proprietary controls, private contractual mechanisms contained in a deed, such as easements, covenants and revisionary interests will be used to restrict and control land access, prohibit land disturbance and bind subsequent owners. The key to the success in the establishment of these controls is to create an actionable interest on the property. These must be integrated with St. Louis County's and affected municipalities land use control system. This establishes an integrated community based LTS solution. The creation of this interest through a series of mutually reinforcing, layered controls, along with the identification of those with implementation responsibilities is the purpose of the LTS plan. This actionable interest will be created for each area that exceeds the ROD

criteria and cannot currently be remediated and therefore subject to assessment as to the best combination of land use controls controls to ensure continued protectiveness. The selection of specific actionable institutional controls requires full consideration of the willingness of local governmental bodies to implement and manage such controls and layering to assure that adequate controls are maintained. Upon selection of institutional controls to be implemented as part of the Long-Term Stewardship program, legal action must be taken to implement the applicable controls. This action involves real estate and legal personnel and a number of specific issues such as assessing the value of certain controls. The common element is that the success of these actions is tied to the implementation of arrangements with public and private owners.

In implementing and developing an appropriate LTS program to monitor impacted media, one must begin with the end in mind. The end point for the North County Site LTS program is to control contamination mobility / migration pending remediation at a future date, That implies a time in the undefined future, when the LTS program, established to protect the integrity of the remedy is discontinued and is deemed by the stakeholders to have been effective in limiting land use activities. The start point for the process is to assess the actual performance of the remedial action and determine if all the legal requirements outlined in the ROD are met. From this baseline LTS point at the North County Sites, the program would address the data needed in areas where contamination above remedial goals remains after cleanup is complete. The first step would be to develop future land use limitations and controls which would ensure that the roads, bridges and railroads will remain viable transportation corridors and that buildings will remain in place without subsurface maintenance unless Federal agency support is provided. These core responsibilities of the site stewards are critical and must be clearly established. Annual and five-year reviews must assure that such controls are effective and remain in place. Of key concern in this program are the identification and execution of financial and enforcement responsibilities. Consensus on the performance objectives and dose standards must be obtained. The methods, locations and frequency of monitoring must be determined). Finally, communicate to the stakeholders when threshold criteria are exceeded. Actions to be taken when a pathway is closed must also be clearly delineated. This LTS program will also outline the monitoring performance standards, thereby providing a decision-making basis for increasing or decreasing the scope of the monitoring program over time (number of locations, frequency and analytical parameters).

Technical Planning Process

Technical Planning Process (TPP) is another tool, which will be utilized in the development of an appropriate monitoring program. The TPP premise is that the stakeholders contributing to the LTS execution will be fully considered in the final output. The ultimate goal is the development of a comprehensive and systematic process that will produce the type and quality of data for site specific decision making. In short, it ensures the efficient and cost effective progress to the site closeout. The stakeholder team will develop a monitoring program that incorporates the perspectives of the decision-makers, data users and data implementers based on the site regulatory compliance issues and environmental conditions. The process will be to identify LTS activities, determine data needs, develop data collection options and finalize the data collection program which is supported by Data Quality Objective statements. This program must demonstrate protectiveness and sustainability, yet be flexible enough to adjust to technology advances in the future. Decision points will trigger need for action, either increasing, decreasing or eliminating areas under LTS. This process has been implemented, with the participation of the stakeholders at a separate St. Louis District FUSRAP site for well sampling. The TPP team developed a sampling protocol which, rather than testing each well for every constituent of concern wells are tested based upon their historical or a series of sampling events. This initiative has resulted in savings of over $500,000 for the 2 plus years it has been in existence without loss of required monitoring information. The current process, modified for lessons learned and sites specific considerations will serve as a template for future well monitoring at these sites. The addition of a mechanism to periodically review the effectiveness of the plan and will create opportunities for improved efficiency. These should be an integral part of regulatory and technical requirements of CERCLA five-year reviews. Five-year reviews must also identify technologies that will improve the performance and predictability of land use controls.

Lessons Learned

One current innovation at the North County Sites has been management and minimization of contamination that has been determined to be inaccessible, due to its location, during the cleanup process. These locations will not be remediated under the proposed final remedy for the North County Sites as excavation under heavily trafficked roads, bridges, railroads and operational buildings is currently technically or economically unfeasible. However, the district recognized that occasionally, planned and unplanned, opportunities arose where a portion of this contamination, considered inaccessible, could be addressed or further defined while the project is in the cleanup phase. The soils could be addressed during federal, state, local and private property development, and improvement and emergency utility response events. Providing support to these entities provides the district with: valuable data on the concentrations of inaccessible soils, an opportunity to remediate previously inaccessible soils and an opportunity to perform multi agency response actions that is exportable to the LTS process. By capitalizing on these opportunities, LTS requirements are not only lessened on the affected stakeholders in the future, but policies and procedures that have a proven reliable track record for years can be implemented with confidence into the LTS process.

To implement this strategy, the St. Louis District has developed a collaborative Utility response policy and developed and maintained a responsive relationship with local utility companies and provides affected property owners and tenants with updated contacts for assistance. Initially, the USACE met with Utility Companies over their health concerns for response workers working in known areas of contamination. Out of that concern a Utility Response Policy was developed, receiving the signature of the utility companies and USACE which described the policies and procedures for supporting both routine and emergency utility response work. As the policy is a "living document" the parties meet bi-annually to discuss, propose changes or inform the USACE of planned or programmed work. The crux of the policy is that it enables USACE to address planned and unplanned responses during intrusive activities in areas suspected or known to be contaminated with residual radioactivity. The utility companies are provided a map of suspected areas with contamination and inform the district when a response action is pending. USACE supports the utility company workers with radiological scans and remediation if necessary and reports back to the utility companies on the radiological results. To take this one step further, the district is currently working with a state agency, the Missouri Department of Transportation, on an upcoming highway interchange project. As the contractor nears areas of suspected contamination, USACE will support their efforts. These are two examples of forging partnerships in the present that will allow for the current responsive relationship to mature and progress into the future. The bottom line is that as contaminated material becomes accessible, it can be remediated more cost effectively by a on-site USACE contractor.

Another method of coordinating with and becoming familiar to property owners, tenants and state and local governments has been the issuance of a "Friendly Neighbor" letter whereby property owners are reminded that FUSRAP contamination exists on their property and USACE will assist them in any property development or improvement efforts. As the federal government owns none of the property at these sites, a real estate interest, a right of entry, is required for all work. Finally, the district has positioned itself to minimize inaccessible soils in the future with the St. Louis County Traffic and Highways Division. Upon undertaking operations at the SLAPS, permits were only granted by St. Louis County to remediate soils up to the shoulder of roads. As contamination extends under the roadway the district met with the Division and requested and received permission to excavate up to the edge of pavement – an additional 9 feet. Not only will this action reduce future LTS actions such as response in the future for road widening or support for a utility, it will be done more cost effectively by a contractor that is on site.

As the challenge of managing residual contamination for long periods of time is unprecedented, the success of management of the remaining contamination hinges not only on the ability of the stakeholders to integrate land use management with the LTS program but for the USACE, and the DOE to establish and maintain LTS stakeholder relationships and begin the development of LTS response and procedures when opportunities arise to address inaccessible soils. We have been able to demonstrate now that integrated land use management allows for timely, cost effective response at the period in time when the contamination becomes accessible. The development of a workable system is a work in progress that is not linked with established systems such as building permits. The district efforts in the management and

minimization of inaccessible soils are paying big dividends. By establishing long-term relationships, developing response policies and procedures and cost effectively removing inaccessible soils now, we are further minimizing future management, liability and cost.

In St. Louis, the establishment of the LTS plan process has been a work in progress with good participation from the site stakeholders. It was initiated by the LTS team, consisting of the USACE, DOE, Regulators, affected Property Owners and the general public to begin the process of ensuring a smooth transition from the cleanup endpoint to long term stewardship. The LTS strategic planning goal of this group is to develop integrate and coordinate an umbrella document, the LTS plan, for post clean up activities. A series of public LTS meetings have been held with the team for up front coordination and development of the LTS plan. The purpose of these meetings was twofold. First, to ensure everyone understood that the cleanup end state for USACE is to, through the CERCLA process, reduce and control FUSRAP contamination to levels that are protective for the current and future anticipated land use. As soils become disturbed in the future, the LTS mechanism and associated institutional controls are required to ensure the future protectiveness of site soils exceeding unrestricted release criteria. Second, these meetings are intended to allow the stakeholders to collaboratively develop realistic expectations for technical, managerial and financial planning (the first of these three sites is currently estimated to be complete in 2008) and to collaboratively develop realistic expectations of the plan. In its short duration, the LTS plan process has identified programmatic challenges, all of which are consensus nationwide LTS issues. They include funding, enforcement and information communication.

Funding

Funding in support of LTS efforts is a major concern of the stakeholders, largely due to the lack of precedence and a strong reluctance from state and local governments to be subject to annual allocations from Congress over decades. The District approach is currently to incorporate participants into the annual allocation process. This will be done by identifying and quantifying LTS considerations up front in the remedy selection process. By defining the activities and level of effort, future Congressional-funding requirements will be supportable and easier to define. Although this is the preferred USACE approach, , the perception of the stakeholders is that until financial assurances are received for the period of time over which LTS is expected to continue, LTS will not be successful. Available alternative assurances that have been implemented at other sites to sustain and maintain LTS activities include the aforementioned annual allocation process, a federal trust fund set aside as a one time appropriation (based upon the LTS costs for the selected remedy) and site specific funds that would be available without further legislative action at the federal and state levels. One issue with the last two options is that no obvious tax source exists. As stated above, FUSRAP currently participates in the annual allocation process, with the annual allocation of $140 million being distributed by Headquarters USACE to the field sites. Under the MOU with the DOE, USACE will perform the LTS function for two years after cleanup, it is anticipated that the annual allocation process will be used to fund LTS activities. After this timeframe, the DOE will accomplish the LTS mission and annual allocation process. Two years of operation by USACE ensures that the DOE can prepare and submit funding requests in the appropriate budget cycle and obtain funding to ensure a smooth transition for the Long Term Stewardship mission at the North County Sites. Once financial assurances have been made, it is imperative that the LTS team manage those resources efficiently by utilizing an LTS Work Breakdown Structure set up to budget and track costs. These costs would be linked to a life cycle cost estimate and ultimately be used to accurately forecast out year funding needs. Other important aspects of the LTS funding include provisions for changes to funding or dissolution (based upon a non-continuing effort), and a change control plan to address additions or withdrawals. Finally, the federal, state and local agencies need to agree up front in the LTS process on which aspects of LTS are paid for with federal funds and what is not allocable to the LTS funding source.

Enforcement

Enforcement is an issue that is tied to the funding concern in that state and local entities are looking for assurances that they will be paid for their role in LTS. Enforcement is best defined as the required resultant activity when a responsible entity is not doing what is required under the LTS plan. The federal government, USACE and the DOE, will retain significant responsibility for the long-term enforcement of

the ARARs in the North County Sites ROD. These ARARS will continue to be applied to subsequent remediation of soils, as they become accessible in North County. The provisions for assuring future compliance with such ARARs, in the form of LUC's, must be agreed upon with the LTS stakeholders and incorporated into the LTS plan. Enforcement is anticipated to be a byproduct of scheduled and unscheduled events. Scheduled events such as periodic reviews, sampling and monitoring events mandated by the LTS plan will be conducted by the agency to assure that required land use and institutional controls are effective and maintained. Unscheduled events, typically phone notifications or observing unauthorized activities by a site steward, will be acted upon as received. In the context of FUSRAP, the lead agency is that federal or state organization designated in the LTS plan, pursuant to CERCLA, with responsibility for monitoring, maintenance and enforcement. This lead agency would need to have the authority and the ability to take appropriate legal action as necessary to assure that required institutional controls are maintained. In addition the lead agency would ensure real estate rights of entry are maintained, updated and obtained as necessary to evaluate land use controls and to implement necessary response / remediation activities. The lead agency for Long-Term Stewardship would also generally be the authority notified by other site stewards in the case of non-compliance. In such non-compliance cases, the lead agency would assess potential violations of institutional controls and take programmatic and/or legal action in coordination with USEPA (when necessary) to assure that required controls are maintained. The relative roles and responsibilities for lead and support agencies can vary significantly depending on ability, resources and legal authorities.

Data Management

Finally, the LTS plan's most important aspect is its ability to manage intergenerational data so as to best share the LTS decisions made today with future generations' LTS decision-makers. It begins with the identification and retention of all information that is critical to maintaining the corporate history of the site. Upon assumption of FUSRAP in St. Louis, three different contractors maintained three different document management systems, one of, which was proprietary. After retrieval of the proprietary system, the district began development of the St. Louis FUSRAP Document management system to ensure the survival of the historic record. The goal in the development of the system was to establish an effective and cost efficient system (one that will find documents in minutes rather than days) that is compliant with legislative directives (Administrative Files, Administrative Record, etc..) and can be expected to trackin documentation regardless of physical location or format, assuring compatibility with previous systems, all through the establishment of intellectual controls. The result, a hybrid system created on a meta database which establishes a standardized form to be filled out for the capture and standardization of data collected from the contractors, seven of which, from Total Environmental Restoration Contractors to Woman Owned Small Businesses who have worked on the sites. This system will have a subset for LTS documentation to ensure that LTS information is available in the future when needed. A large amount of information is generated daily at the North County Sites, yet only a portion will be critical for LTS. By developing the framework for and defining the standard methods for describing and referencing critical information, the district is again testing a system that has applications into the future for LTS. This information includes, but is not limited to, site specific locations of residual contamination above unrestricted use criteria; specific institutional controls required at the site to assure continued protectiveness; monitoring and sampling information as determined necessary in the LTS plan, and points of contact for interim actions until such contamination is protectively remediated. Additionally, it conforms to the national standards - the National Archives and Records Administration (NARA) criteria.

In addition to the system, the success of LTS information communication is the ability of information to be provided in redundant forms (paper, electronic file, CD, microfiche) and be maintained and updated in multiple locations (offices, libraries, Administrative Record, websites, computers) to ensure availability when needed. As an example, required information may be retained by city, county and state governmental offices with a copy of all such information also provided in a single file with a local library or similar facility. By identifying the critical information needs and information dissemination to support LTS, the team will further develop the tools and processes for collecting the information and procedures for preserving and accessing critical information. Our efforts to date have alleviated, to the extent possible, information being lost, destroyed or maintained in formats that may be unusable in the future. Up front

identification and preservation of critical LTS data, storage and archiving, retrieval of records and public access is a process where significant progress has been made for the future.

CONCLUSION

In conclusion, although site specific issues and programmatic challenges relating to the execution of Long Term Stewardship at the St. Louis Sites remain, the District has undertaken many upfront initiatives to reduce the burden of LTS on the site stakeholders. The development of a comprehensive, collaborative LTS plan with the stakeholders is a work in progress that is intended to define the framework that will ensure protection of human health and the environment in the years to come. In the meantime the District will continue to use its best management practices, lessons learned and higher headquarters guidance to develop a viable LTS plan for generations to execute.