Lessons Learned from a Complex FUSRAP Site - Sylvania Corning FUSRAP Site - 12269

Ann Ewy*, David Hays*
*United States Army Corps of Engineers, Kansas City, Missouri, 64106

ABSTRACT

Since its addition to the Formerly Utilized Sites Remedial Action Program (FUSRAP) in 2005, the Sylvania Corning FUSRAP Site (the Site) in Hicksville, New York, has provided challenges and opportunities from which to gain lessons learned for conducting investigation work at a complex multi-contaminant FUSRAP Site. The United States Army Corps of Engineers (USACE) and its contractors conducted a Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Remedial Investigation (RI) and are currently in the Feasibility Study (FS) phase at the Site. This paper presents the planning, execution, and reporting lessons learned by USACE during the RI/FS.

The Site, operated from 1952 to 1967 for the research, development, and fabrication of nuclear elements under the Atomic Energy Commission, and other government and commercial contracts. Previous investigations performed by the New York State Department of Environmental Conservation (NYSDEC) and the current property owner have identified uranium, thorium, nickel, and chlorinated solvents, as Site contaminants [1]. The property owner is currently under two separate voluntary agreements with NYSDEC to investigate and remediate the Site. USACE's work at the site has been independent of this voluntary agreement and has moved on a parallel path with any work the property owner has completed.

The project at the Site is complex because of the radiological and chemical concerns in both soils and groundwater, high hydraulically conductive soils, lack of a shallow aquiclude/aquitard, and a principal water table aquifer underlying the site. Contaminants are migrating from the Site and may potentially impact local drinking water supplies (municipal wells).

During the RI/FS process the project team has encountered many issues and has thus developed many resolutions. The issues are organized into three categories: Planning and Contracting, Execution, and Reporting. Planning and Contracting lessons learned include: how to incorporate an overwhelming volume of historical data; how to manage a complex team of three prime contractors innovatively, and how to implement a project under an Award Fee task order. Execution lessons learned include: characterization of investigation derived wastes, and proper approach to radiological scanning of direct-push borings and soil cores. Reporting lessons learned include: coordinating multiple phase (iterative) reporting, large dataset presentation, and the National Priorities List (NPL) designation.

The goal of this paper is to provide a resource for other project delivery teams that encounter similar situations on their projects to optimize cost savings, realization of efficiency, shorten schedules, or simply ensure higher quality deliverables.

INTRODUCTION

The Sylvania Corning Formerly Utilized Sites Remedial Action Program (FUSRAP) Site was added to the FUSRAP in 2005. The United States Army Corps of Engineers (USACE) began working through the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process and has produced Preliminary Assessment and Remedial Investigation (RI)/ Baseline Risk Assessment reports. RI field work was conducted in a phased approach but resulted in a document that addressed both soils and groundwater on site as a single operable unit. The team is currently conducting off-site field investigations in support of producing a Feasibility Study and Proposed Plan.

SITE HISTORY AND DESCRIPTION

The Sylvania Site operated from 1952 to 1967 for the research, development, and fabrication of nuclear elements. Some of this work was performed under Atomic Energy Commission contracts, leading to the Site's eligibility in FUSRAP. However, work was also performed for other government and commercial contracts. The Sylvania site is a 4.25-hectare area located in Hicksville, Nassau County, New York, in the west-central portion of Long Island, approximately 48 kilometers east of lower Manhattan. It is currently divided into three separate but contiguous properties: 140 Cantiague Rock Road (140 property), 100 Cantiague Rock Road (100 property), and 70 Cantiague Rock Road (70 property; [1].

Fig. 1. Sylvania Corning FUSRAP Site layout aerial with historic building footprints [1].

The area immediately surrounding the site includes industrial, commercial, and public properties surrounded by residential areas. Cantiague Park is a county park immediately east of the site that includes a golf course, driving range, swimming pool, ice rink, and miniature golf. The site is bordered on the north by the Nassau County Department of Public Works (NCDPW), on the south by a hazardous waste site (General Instruments) that is currently under remediation and being used for commercial activities, on the west by Cantiague Rock Road, and on the east by the driving range portion of the Cantiague Park golf course. Site topography is relatively flat,

generally sloping to the south. The Hicksville Water District public water supply wells located at Plant 5 (Well Nos. 5-2 and 5-3) are located 1.6 kilometers downgradient of the site [1].

The current property owner of the 140 and 70 properties and lessee of the 100 property is a potentially responsible party (PRP). The PRP and has entered into two voluntary cleanup agreements with NYSDEC to investigate and remediate the soils at the site to allow unrestricted future use of the site. The agreements were signed on April 7, 1999, and January 6, 2003. The voluntary cleanups included investigations (soil and groundwater) as well as partial remediation of soils at the site [1]. Other than completion of existing tasks, the PRP's investigation and remedial work has primarily ceased since the site has been included in the FUSRAP program.

The results of the USACE RI present the Site contaminants of potential concern (COPCs) as nickel, tetrachloroethylene (PCE), trichloroethylene (TCE), uranium-234 (U-234), U-235, U-238, thorium-228 (Th-228), Th-230, Th-232, and radium-228.

LESSONS LEARNED

For this paper, lessons learned will be divided into three groups:

- Planning and Contracting
- Execution
- Reporting

Planning and Contracting Lessons Learned

The planning activities on a long-term project, such as Sylvania, continue throughout the project lifecycle and are not confined to the initial project work. Technical planning for field work and planning for contractual reasons both must be continually assessed.

Prior to the start of USACE RI activities, the PRP had collected a large amount of recent usable data to support the characterization of the site. It was determined during the planning stages that the soil data would be used to directly support the RI and only confirmation and supplemental sampling of soils would be needed across significant portions of the site. This allowed for a reduction in effort and cost. USACE also decided to use groundwater data that had been collected as guidance towards that portion of the investigation so that USACE activities could be more focused and efficient.

The contracting mechanism for the initial task order award on this project was Cost Reimbursable plus Award Fee. Although not a new contracting mechanism, the Kansas City District Hazardous Toxic Radiological Waste branch did not have much experience working with it. The Indefinite Delivery Indefinite Quantity Base contract award for this task order mandated the use of Award Fee. Award Fee task orders are intended to motivate the contractor by offering a Base Fee to work as well as an additional Award Fee that is distributed based on an Award Fee Plan negotiated at task order award. Overall, the Cost Plus Award Fee mechanism was highly disliked by the project team, both USACE and the contractor, and felt to be too subjective for both sides (high ratings by contractor and low ratings by USACE). The system resulted in additional labor costs related to developing the Award Fee Plan and the regular Award Fee Evaluations that were required. The motivation was not apparent to the contractor

as they felt the entire process was time consuming and cumbersome. The feedback provided by the contractor was that they are much more motivated by the potential opportunity for new work and performance evaluation ratings. Overall the Award Fee application did not offer much variance, either to the government or contractor's benefit, in terms of the amount of overall fee earned. The team, as a whole, would not recommend this contracting mechanism (Award Fee) for this type of work.

A unique aspect of this project included the use of American Recovery and Reinvestment Act (ARRA) funds. Due to contract capacity limitations of the initial contractor, a second task order for field investigations was awarded for this project using these funds. The USACE project team had never encountered the contract and reporting requirements associated with ARRA funds. Field work was completed efficiently resulting in unplanned additional ARRA funds available to complete more work. Due to the limitations of the funding type, those ARRA funds were not able to be re-distributed to another contract for this project. The funds were efficiently and effectively used, however, contracting limitations due to funding type were encountered.

Another unique aspect of this project is the involvement of the Department of Justice (DOJ). The DOJ has been involved in the Sylvania Corning Site due to property owner costs on the project related to their voluntary agreement with the NYSDEC and their desire to recover some of those costs from the Government. In addition, the site owner was interested in the government assume all responsibilities for the Site. The government is addressing the Site under the FUSRAP but is not a party to the voluntary cleanup agreements between the property owner and NYSDEC. The team has had heavy involvement with DOJ since 2008 and has provided significant technical support in terms of cost estimates, project planning, negotiations and evaluation of previous work conducted at the site. Doing this work for DOJ forced the team to look forward early in the CERCLA process to items we would not have likely addressed until much later phases. This process provided the project team a better overall understanding of the overall site history and kept the team focused on CERCLA milestones.

The Site was added to the FUSRAP in 2005. Although not on the National Priorities List (NPL), the team approached the project with the mindset of a potential listing in the future. Although documents were not submitted to the United States Environmental Protection Agency (EPA) for review, the team evaluated FUSRAP projects that are on the NPL and considered some of the requirements those projects have faced. It was important to approach this project so that if it was added to the NPL, actions and documents would be compliant with EPA and CERCLA protocols. The project was included in a Federal Register announcement in March 2011 for public comment on addition to the NPL and the site was officially added to the NPL in September 2011.

Technical project planning has spanned the life of this project and will continue as we move through the CERCLA process. The majority of the groundwater wells installed were planned for clusters of three with a shallow, intermediate, and deep well to characterize the full extent of vertical contamination, necessitated by the high hydraulic conductivity of the aquifer and the deep nature of contaminants (greater than 90 meters) beneath the site. Sonic drilling techniques were used because drilling needed to reach depths of up to 182 meters. Groundwater profiling was conducted to the full depth of the deep wells and this screening level data was used to determine screen placement for all wells in the cluster. Deep wells were constructed in the groundwater profile borings. In order to have the data available to determine screen placement for the deep well, quick turnaround sample analysis was required at the deeper profile intervals. In most cases, all profiling was completed and deep wells were

installed before moving on to intermediate and shallow wells. Having the full column of profile data before placing all the wells allowed the team to adjust the program based on real-time data which resulted in a significant cost savings by eliminating some of the planned shallow and intermediate wells where the profile data indicated they were not necessary.

The groundwater investigation began upgradient of the site in an area that was not impacted by site activities. This upgradient sampling was completed to evaluate background conditions and monitor the potential for migration of contaminants onto the site from any potential upgradient sources. Deep profiles were completed in upgradient areas to 90 meters (the greatest depth expected for profiling on site based on data previously collected by the PRPs). As the onsite work progressed downgradient across the Site, contaminants were found to be at greater depths than expected (up to 121 meters). In order to properly evaluate the upgradient portions of the Site, this area had to be revisited to complete profiles and install monitoring wells to match the maximum depths sampled onsite. This was not the most efficient manner to complete this work. . Although generally a good practice to begin investigations in non-source areas, ultimately the breadth of the study area had not been established.

Execution Lessons Learned

In the field, the project team applied dual gamma scanning for increased accuracy of the assessment of the vertical extent of soil contamination. The soil core and the borehole were scanned with a gamma scintillator; both readings were correlated to ensure samples were taken from the area with the highest scan reading. PVC was inserted into each boring after collection of soil cores to hold the borehole open and allow the down-hole scanning to be completed. This method takes only slightly more time in the field to complete and provides a more complete picture of the soils surrounding each sample. Comparison of down-hole scanning versus soil core scanning allows for accurate measurement as soil cores often can be compressed or have poor recovery and do not provide a representative sample because of geology or drilling method capabilities.

The characterization approach used during soil investigations provided increased efficiency in terms of investigation-derived waste (IDW) handling and disposal. Field sample data and intermediate containers (55-gallon drums) were used to segregate waste types as soon as the waste was generated. The soil cutting waste from each boring was closely tracked so the contents of each drum were known. The tracking allowed for segregation of waste that was not suitable for disposal at the contracted waste disposal facility (Energy Solutions). The results of samples from each borehole were used to characterize the water in each drum. This field sample data may have been conservative since the sampling program was designed to collect the most contaminated portions found in each soil boring and, theoretically, the greatest portions of contaminants were removed as the sample.

Historic records indicated the use and presence of enriched uranium at the site. Segregation of the waste into drums, instead of roll off containers, allowed USACE to say with confidence that 90% of the waste could be shipped as natural uranium. Had the waste been grouped into larger containers, such as a roll-off containers, sample results could have indicated that the entire contents of the containers could have been treated as special nuclear material. Utilizing drum characterization versus sample data provided an alternative method for disposal. IDW management in drums versus bulk provided efficiency and cost savings. The project team highly recommends planning field investigations keeping the waste's disposal methods in mind.

Reporting Lessons Learned

Collecting the data for the RI and placing it into report format was challenging. The supporting field investigations were conducted over a four-year period prior to report preparation. To make writing the report more manageable, summary reports were completed that documented the results and general conclusions of each phase of work. These reports allowed USACE to tailor each succeeding field program based on results of the previous investigation. This work helped identify and reduce the amount of data gaps at the conclusion of the RI. These reports also aided in the preparation of the final RI report because much of the data had already been organized and analyzed. The iterative document writing process was a beneficial tool for this long-term project.

The study area for this RI is large and, thus, a large volume of data was generated. For example, the PRP analyzed more than 30,000 soil samples during characterization and remediation efforts. As mentioned, much of this data was used to support the USACE RI. Data is typically presented in reports using summary tables to present results for each sample to allow for a basis of evaluation. Given the large data set, it would have been too cumbersome to present the data, particularly soil data, in this manner. A searchable database using Microsoft Access was created and included in the RI report on a DVD to present the data and allow for a quick evaluation by the reader. A summary table presenting a statistical analysis of each analyte was presented in the report for quick reference. The database, coupled with a statistical summary table, allowed the authors to quickly search through data while writing the report and allowed the reader an easier way to review the data.

The USACE team worked very closely with the contractor and implemented near real-time review of the RI report sections to meet a very demanding schedule. This allowed reviewers to comment on and discuss each section of the report as it was being completed, which ultimately reduced the periods between review and response. USACE's review involvement also extended to levels beyond the Districts to include the mandatory Environmental & Munitions Center of Expertise reviews. This significantly changed the timeline and quality of the documents from an outside perspective. The reviewers were involved in the initial document writing to help ensure the document would meet quality standards and reduce draft-to-final iterations.

This project's regulator is NYSDEC. NYSDEC has Low Level Radioactive Waste (LLRW) reporting requirements that were new to most of the team members working on this project. Under CERCLA, the USACE follows substantive requirements, but not necessarily all procedural requirements. This ensures the intent of the requirements is met. When asked to complete LLRW reporting for NYSDEC, the New York and Kansas City District USACE team first reached out to other USACE districts working with NYSDEC to understand how they should approach this reporting requirement. The team also consulted with HQ USACE to avoid setting precedence for future reporting. It is important to recognize that there may be state-specific requirements that need to be evaluated for each project and evaluation of impacts should begin early on in the project.

CONCLUSION

Each FUSRAP project is unique but there are many lessons we can apply to each site to gain efficiency and work more effectively. The Sylvania Corning FUSRAP site is a complex site with both soils and groundwater contamination, contamination to depths of 182 meters, and a highly

politically charged environment of PRP involvement. Many of the lessons the project team has learned during the life of the project to date are being shared with others as well as being applied back to this project for future work.

REFERENCES

[1] United States Army Corps of Engineers (USACE), Final Remedial Investigation for the Sylvania Corning FUSRAP Site, Hicksville, New York. September 2010.