UTILIZING GOVERNMENTAL AGENCIES AND UNIVERSITIES AT MIXED WASTE FACILITIES - A WELDON SPRING SITE CASE STUDY

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ABSTRACT

The Weldon Spring site is a mixed waste remedial action project funded by the U.S. Department of Energy (DOE). The site consists of four separate operable units - the Chemical Plant/Raffinate Pits, Quarry Bulk Wastes, Quarry Residuals and Groundwater, and Chemical Plant/Raffinate Pits Groundwater. The environmental documentation processes for the quarry bulk wastes removal and the chemical plant/raffinate pits are complete with signed records of decision in place and remedial action underway. The quarry residuals and chemical plant/raffinate pits groundwater remedial investigations are in the planning stages.

The Weldon Spring Site Remedial Action Project (WSSRAP) has utilized several Federal and State agencies and local universities to support both the Remedial Investigation/Feasibility Study process and the routine environmental monitoring required by DOE Orders. These include the U.S. Geological Survey; the Missouri Department of Natural Resources - Division of Geology and Land Survey; the University of Missouri - Rolla; St. Louis University; Southern Illinois University - Edwardsville; and Lindenwood College. Each of these entities has played a useful role, generally supplying high quality results and supporting the overall project mission while, in many cases, accomplishing independent research. The range of topics addressed includes groundwater/surface water interaction, regional hydrogeology, geochemical influences on contaminant fate and transport, ecological studies, and potential seismic affects. Benefits of extramural involvement include specialized expertise on sensitive issues, more constructive reviews of site documents, greater public trust, and development of a "team" attitude among the stakeholders.

These arrangements require critical attention to ensure mutual benefit. Areas requiring particular attention include: 1) clearly defining the scope and deliverables of the desired effort, 2) incorporating quality control and quality assurance provisions, 3) carefully defining schedules and tracking progress, 4) maintaining close communication, and 5) recognizing the value of the true research aspects of the work. Persistent challenges associated with these efforts include the early scoping of the study, timely delivery of results, and obtaining adequate quality assurance documentation for analytical results.

INTRODUCTION/HISTORY

The Weldon Spring site is a DOE surplus facility located approximately 30 miles west of St. Louis in St. Charles County, Missouri. From 1941 to 1944, the U.S. Department of the Army operated the Weldon Spring Ordnance Works for the production of trinitrotoluene (TNT) and dinitrotoluene (DNT). During this operation, small areas of the 17,000-acre site were contaminated by TNT process materials.

In 1954, 220 acres of the ordnance works property were transferred to the U.S. Atomic Energy Commission (AEC). From 1957 to 1966, the AEC operated a uranium processing facility on the site. During the operation of the uranium feed materials plant, the buildings, equipment, and some areas of the plant became contaminated with radionuclides in the uranium transformation series.

In 1958, the AEC acquired title to the Weldon Spring Quarry from the Department of the Army. The Weldon Spring Quarry had been used earlier by the Department of the Army for disposal of TNT-contaminated rubble during the operation of the Weldon Spring Ordnance Works. The AEC used the Weldon Spring Quarry as a disposal area for a small amount of thorium residue, but most of the material disposed of there consisted of uranium and radium- contaminated rubble and soils from the demolition of a uranium ore processing facility in St. Louis.

After closure by the AEC, the feed materials plant was reacquired by the Army in 1967. The Army partially decontaminated the buildings, dismantled some of the equipment, and began to convert the facilities for the production of herbicides. In 1969, prior to becoming operational, the herbicide project was canceled. The site was placed in caretaker status until 1985 when the custody of the chemical plant was transferred from the Army to the DOE. In conjunction with this transfer, the WSSRAP was created as DOE Major Project Number 182.

WSSRAP CASE STUDY

Following the establishment of the WSSRAP as a major system acquisition in 1984, the DOE initiated preparation of an Environmental Impact Statement (EIS) to satisfy the decision-making requirements of the National Environmental Policy Act (NEPA). Investigations and document preparations continued within the DOE until 1987 when a draft EIS (DEIS) was issued for public and agency review. This review represented the first significant involvement by the public, the U.S. Environmental Protection Agency (EPA), and the Missouri Department of Natural Resources (MDNR). At a public hearing held on April 10, 1987, and in written comments, the adequacy of the DEIS was questioned by the EPA, the MDNR, and the public. Serious questions were raised regarding the suitability of the site for long-term disposal as well as the completeness of the DOE's characterization.

As a result of these questions and comments, the DOE decided to comply with the requirements of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) (as amended) and prepare an integrated NEPA/CERCLA document. During planning and scoping efforts, external agencies began expressing the desire to

collaborate on the planned investigations. Due to their public credibility and the technical expertise of these agencies, they were integrated into the characterization efforts.

Scope Of Investigations

Investigations at the WSSRAP have been performed by two governmental agencies (external to the DOE system) and four universities. The scope of each entities' work is described in the following sections.

United States Geological Survey

The Unites States Geological Survey (USGS) has been involved in groundwater and surface water investigations in the Weldon Spring area since the early 1940's. Prior to 1986, the USGS performed several studies at the request of the Department of the Army and the AEC. They also independently initiated studies looking at water quality surrounding the Weldon Spring Quarry and raffinate pits. These independent studies generated conclusions that DOE investigations either did not evaluate or did not support.

Since 1986, the USGS has performed numerous studies in cooperation with the DOE. Areas evaluated have included: regional and shallow groundwater flow and water quality, surface water hydrology and quality, geochemistry and contaminant transport mechanisms, and background water quality studies.

Missouri Department of Natural Resources

The MDNR has a unique role at the WSSRAP. They have oversight authority for Clean Water Act issues, are involved in the decision-making process, and are involved in surface water and groundwater studies. The MDNR - Division of Geology and Land Survey (DGLS) has extensive experience in evaluating groundwater/surface water interactions. The WSSRAP has integrated MDNR - DGLS investigations into the remedial investigation process. Specific tasks have included performing dye traces in both groundwater and surface water, stream gauging, and hydrology studies.

Saint Louis University

From the initial public meeting and throughout the remedial investigation process, the issue of seismic stability repeatedly resurfaced. Experts in seismic design reviewed available information and prepared an evaluation of the potential for and the potential impact of earthquakes on the WSSRAP. These reports were not readily accepted by the public because the documents were prepared by out-of state seismic experts. As a result of this, the services of a local seismic expert at St. Louis University were retained and the issue revisited. The conclusions corroborated the original study and the issue faded.

Southern Illinois University at Edwardsville

During 1991, the Aquatic Biological Screening Investigation was scoped and ready to begin the first year of a three-year investigation. The focus of the study was to provide characterization data per DOE Order 5400.1 requirements and to determine whether uranium losses from the Weldon Spring site had any effect on aquatic habitats. Southern Illinois University at Edwardsville (SIUE) was sole-sourced for this investigation for several reasons. SIUE provided a professor who was a recognized expert in the field of aquatic biology, having completed a number of aquatic studies in the midwest, and also had past radiochemistry experience. There was a great amount of interest among graduate and undergraduate students in participating in a research project of this type.

University of Missouri - Rolla

The University of Missouri - Rolla has been involved in several studies and assessments at the WSSRAP. The Civil Engineering Department collaborated with the USGS on a geochemical study evaluating factors controlling contaminant transport. The Geological Engineering Department has prepared a geomorphological assessment of the WSSRAP and has assisted with embankment stability assessments.

Lindenwood College

Over the past few years, a number of Lindenwood professors have expressed interest in conducting research projects at the WSSRAP. In order to support an ecological risk assessment under CERCLA, a small mammal population and biouptake analysis was planned. This project would complete the requirements for establishing baseline risk assessments for biota residing on or near the WSSRAP. When the opportunity arose for this project, Lindenwood College provided the experience, resources, and motivation to successfully complete the small mammal study.

Lessons Learned

Many universities and some governmental agencies (such as the USGS) are very research-oriented. This mission type is not consistent with the DOE's environmental restoration mission. As these entities are involved in characterization and/or monitoring programs at DOE sites, the requirements imposed and demands made can create friction. The lessons learned at the WSSRAP will help others wanting to involve similar entities.

Scope Definition

The scope of work must be clearly defined and understood when involving agencies and universities in mixed waste projects. These entities are often involved in esoteric research which may not be consistent with the streamlined approach desired for environmental restoration projects today. Solicited and unsolicited proposals submitted may be vague and provide only sketchy details. A mutually agreed-upon and clearly defined scope of work with appropriate milestones and deliverables is critical to a successful relationship.

QA/QC

Subcontractors, including Government agencies and universities, that perform work for the Weldon Spring site, must comply with established Federal, corporate, and site-specific QA/QC standards. These standards are necessary to properly document work and ensure high quality products that, if necessary, can stand up under litigation. These organizations must follow standard operating procedures, collect quality control samples, implement the appropriate site quality assurance programs and plans, and participate in audits. Quality control/quality assurance requirements must be clearly defined and understood by all parties to ensure that data and results are of adequate and documented quality for their intended purpose.

Schedules

Given the potential cost implications associated with schedule delays, it is very important that government agencies and universities understand the consequences of missing

deadlines. Establishing realistic schedules and attaining agreement from all parties involved up front should minimize delays. Agencies and Universities may not understand that missed deadlines could negatively impact project activities by delaying the progress of other work packages or causing additional time and effort to be spent making up lost time in order to get back on schedule. These delays can have serious schedule and budget implications that can be avoided through proper communication of schedules constraints.

Communication

Open lines of communication must be established and maintained throughout the length of the assignment. This can be effectively done through a combination of some or all of the following: logbook entries, progress reports, field sheets, telecons, and correspondence. It is important to document in writing all conversations which relate to the assignment, such as changes in the schedule or deviations from methods or scope. Be sure that communication lines are not only open and documented, but that the appropriate channels are used, such as the subcontract administrator or contracting officer for that project. If communication lines are successfully maintained, then unwelcome surprises and embarrassments can be avoided in the end.

Integration

In order to properly integrate the information provided by agencies and universities, all of the above issues must be addressed. If the scope is clearly defined, the quality assurance and quality control measures implemented, communication lines kept open, and schedules met, then the final product should fulfill the requirements driving the study. The integration of external investigations should be clearly discussed in the scoping process to attain agreement. Integration of results into other activities should then occur smoothly.

Contracting Strategy

Several types of contracting strategies have been used to involve Governmental agencies and universities at the WSSRAP. The services of USGS have been acquired utilizing interagency agreements, while MDNR's participation is funded via a direct grant through the DOE. The services of universities have been directly procured by the Project Management Contractor. Each strategy has distinct advantages and disadvantages. Grants are easier to implement, require less preparation time, and are better for research-oriented activities which may have a vague or changing scope. Disadvantages include the lack of control over deliverables and schedules and potential problems associated with contractor/grantee interface. Subcontracts deliver more control at the cost of preparation and procurement time.

Benefits/Summary

Involving Governmental agencies and universities in environmental restoration projects has benefits extending beyond getting the job done. Stakeholders become involved early in the investigation process and are more knowledgeable when decisions must be made. A team spirit can also be developed, reducing conflicts and encouraging cooperation and understanding.

Public trust and support can also be gained through these efforts. Independent agencies and universities are generally viewed as open, honest, and independent. Involving them allows environmental restoration projects to "borrow" their integrity, helping projects develop their own credibility.

Providing opportunities for agencies and universities at environmental restoration projects supports the scientific process. These efforts often provide data for future research. University involvement may develop undergraduate and graduate students by providing meaningful work experience, training, and the opportunity to interface with technical professionals.

The Weldon Spring site has and continues to successfully involve Governmental agencies and universities in environmental restoration activities. This practice has improved the efficiency and the quality of the decision-making process. The lessons learned should be used by others wishing to employ similar strategies.