



Closing in on Area IV contamination at Santa Susana Field Laboratory (SSFL)

The chemical co-located sampling program, a key strategy in the effort to identify and describe chemical contaminants in SSFL Area IV soils, has reached a milestone: Phase 1 sampling in Area IV has been completed. Efforts are now focused on analyzing the data from sampling and determining where to best focus resources to complete our knowledge of Area IV contamination so we can begin cleanup planning.

This rigorous process is being conducted by the U.S. Department of Energy (DOE), with oversight by the California Department of Toxic Substances Control (DTSC), in several phases as called for in the Administrative Order on Consent (AOC).

Want info on sampling results?

Reports – DOE is compiling the validated sampling results into reports called Technical Memoranda, which will identify the chemical contaminants, locations, extent, depth, and concentrations in Area IV soils. As DTSC approves the Memoranda, DOE will make them available on the Energy Technology and Engineering Center (ETEC) website (<http://www.etc.energy.gov>).

Meetings – USEPA, DTSC and DOE periodically host technical roundtable meetings with interested stakeholders to share results from sampling as they become available and to finalize plans for the data gap investigation.

Check the DOE ETEC website regularly for presentations from past meetings and announcements of upcoming meetings.



- Phase 1, Co-Located Sampling: In conjunction with samples taken by the U.S. Environmental Protection Agency (USEPA) for radiological analysis, DOE recently completed analysis for 2,500 surface and subsurface samples from Area IV.
- Phase 2, Co-Located Random Sampling: DOE/DTSC will receive samples from the same random locations that USEPA will sample, starting with the Northern Buffer Zone (NBZ).
- Phase 3, Chemical Data Gap Investigation: DOE and DTSC are implementing a “data gap” study to complete our understanding of contamination in Area IV. We are evaluating all soil data we have to identify any gaps in our knowledge and determine what additional sampling is needed to fill in the gaps. The initial focus for the data gap investigation is Sub-area HSA 5C.

Greetings SSFL community:

With the continued participation of our community, we were able to accomplish a great deal over last year, moving us closer to cleanup. Your ongoing interest and continued investment of personal time and energy in the multitude of SSFL activities is much appreciated. The Area IV cleanup will be the better for it.

As we continue to work toward cleanup, our priorities for this year include:

- Completion of all soil sampling in Area IV and the Northern Buffer Zone
- Preparation of the Environmental Impact Statement
- Characterization inside remaining buildings
- Continuation of the Soil Treatability Study
- Groundwater treatability activities
- Ongoing community involvement
- Ongoing environmental and groundwater monitoring

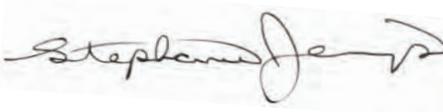
In this issue of *CleanUpdate* you will learn about the ongoing Soil Treatability Study, which we have asked Sandia National Laboratories to conduct (pages 6-7), our new and improved ETEC Website (below) and where we are in our soil sampling program (page 1). This issue also includes the 2011 ETEC Community Involvement Annual Report (pages 3-5).

We hope you will enjoy this issue. We look forward to your continued participation in 2012.




John Jones,
Federal Project Director




Stephie Jennings,
Deputy Federal Project Director

Change is good

DOE rolls out redesigned ETEC website

A question for the “regulars” at the ETEC website: did you notice anything new out in cyberland lately? New look? Different organization?

Indeed. DOE-ETEC has redesigned its website to enhance the look and feel and to make it more user-friendly. According to DOE’s Community Liaison, Jazmin Bell, “We wanted to make things easier to find. For example, we now have a section devoted to characterization, so you don’t have to dig through different locations to find what’s going on with the soils and water investigation.

“We also have a new section for community involvement,” she adds. “With the new organization, if you want to find out about tours or meetings or opportunities to comment, you can click on the community involvement page.”

The new home page has an area with a calendar of upcoming events. “We have so many SSFL meetings that we wanted to highlight those on the home page – anything that DOE is doing will be there – or anything that DOE is involved in, like the SSFL Community Bus tours,” Bell notes.

She is quick to add that nothing has been taken away; everything from the prior site is on the new one. The changes also include more photos and small cosmetic changes.

What do you think?

“We are interested in stakeholder feedback on our changes – let us know what you think about it,” Bell says. If you have comments, please write to etec-energy@emcbc.doe.gov.

News brief

SHPO concurs on trenching project

The California State Historic Preservation Office (SHPO) has notified DOE that it concurs with DOE’s determination that No Adverse Impact to historic resources would result from a proposed project to excavate two trenches, with four additional contingency trenches if necessary, for geologic testing at SSFL.

In its letter to SHPO, DOE described efforts to identify archeological sites in the area and committed to flagging them to ensure they would be avoided during the work. Additionally, DOE has committed to having a Native American and archaeological monitor on site during all ground disturbing activities. Native American consultation has been ongoing with several site visits with all individuals identified by the Native American Heritage Commission.

Community Involvement

2011 Annual Report

2011 Annual Report: Partnering With the SSFL Community

Partnering with the SSFL community is among DOE's highest priorities. Our theme in 2010 was "Building Relationships" – with our regulators, our stakeholders, public officials, our partners at SSFL, and neighboring Native Americans. In 2011, we continued to build those relationships and partnered with the SSFL community in innovative efforts to help community members better understand the contamination at SSFL Area IV and to lay the groundwork for cleanup.

We have much more reliable data now as a result of the past year's radiological and chemical field sampling. We are grateful for the thoughtful and generous help provided by the community in shaping the sampling program. We are now working with the SSFL community to identify on-site soil treatment technologies for possible application at SSFL. Key accomplishments in the areas of community involvement and public information are highlighted below.

DOE encourages readers to offer feedback on our Annual Report below and on our ongoing activities throughout the year. Please send your comments by email to stephanie.jennings@emcbc.doe.gov or by regular mail to Ms. Stephanie Jennings, DOE Deputy Federal Project Director, P.O. Box 10300, Canoga Park, CA 91309.

COMMUNITY INVOLVEMENT

Chemical Co-Located Sampling

Throughout the past year, DOE, along with DTSC and USEPA, provided several opportunities for the SSFL community to participate in the co-located sampling program (see article on page 1), as highlighted below.

- **Technical and community meetings.** Prior to sampling in each of the eleven sub-areas in Area IV, DOE participated along with USEPA and DTSC in meetings to inform stakeholders of the plans for sampling in the specific sub-areas and to obtain their input – at USEPA's regularly scheduled Technical Work Group Meetings and at other stakeholder meetings held approximately each month throughout the year.
- **Interaction on work plans.** DOE made its work plans for chemical sampling activities available to the public on the ETEC website and announced them to stakeholders by email prior to start of sampling activities. These included the Master Field Sampling Work Plan and the individual work plans for sampling in each sub-area (in the form of Addenda to the Master Work Plan). Also included on the website were DTSC's approval letters for the work plans.
- **Technical memoranda.** As sampling for each sub-area is completed, the data are analyzed by DOE's laboratory and independently validated. The validated results are published in a report called a "Technical Memorandum" and posted on the DOE ETEC website upon DTSC's approval. The first sub-area to have validated sampling results published in a Technical Memorandum and approved by DTSC was Sub-area 5C. DOE added this report to the ETEC website in October 2011. The remaining sub-area reports will be made available in the coming months.

- **Public visitation days.** On the second Wednesday of each month, DOE and DTSC co-hosted a public visitation day to allow the public an opportunity to observe ongoing work, including sampling. USEPA also hosted a public visitation day on the fourth Wednesday of each month. During 2011, about 15 members of the public visited Area IV during five DTSC-DOE-hosted visitation days to observe sampling activities.

Establishing Clean-up Values ("Look-up Tables" as specified in the AOC)

- **Method Detection Limit (MDL) Study.** To better understand laboratory limits in being able to detect and report minute quantities of chemicals in the soils, DOE undertook a study known as the Method Detection Limit (MDL) Study. DOE and its field contractor worked closely with interested members of the community to identify and select locations for sampling soils that would be analyzed for the MDL Study and to frame the process for the study.
- **Look-up Tables.** DOE supported initial planning by DTSC, along with USEPA and interested members of the community, to develop site clean-up values, which will be in the form of "Look-up Tables," as directed by the AOC. These will be based on data collected by USEPA and DTSC during field sampling to determine "background" levels for radioactive and chemical contaminants, as well as other factors such as minimum laboratory reporting limits. DTSC hosted the first opportunity for public input at a Technical Roundtable Meeting on October 20. An additional public meeting was held on January 18, 2012.

Groundwater U

- From March through June 2011, DOE, along with NASA and Boeing in cooperation with DTSC, sponsored “Groundwater U” – a series of educational seminars on groundwater, both in general and specific to SSFL. The series consisted of seven seminars led by groundwater and remediation experts, including the expert panel members who developed the SSFL conceptual groundwater model, a key component of the *Groundwater Remedial Investigation Report*. The series also included an SSFL field trip for Groundwater U participants. Over 100 people attended the seminars, and feedback from the attendees indicated that the seminars were beneficial in helping people understand the groundwater issues at SSFL and comment on the report.



Soil Treatability Study

DOE and Sandia National Laboratories began a Soil Treatability Study to determine if there are feasible technologies that would meet AOC requirements to clean up contaminated soils in Area IV, thus minimizing the amount of contaminated soils that would need to be removed by truck from the site. (See articles on pages 6-7.)

- **Public meetings.** DOE and Sandia hosted a kick-off presentation for interested community members on October 25 to outline and obtain feedback on plans for conducting the study. An additional public information session was held on January 30, 2012, to provide a more thorough explanation of soil remediation technologies.
- **Soil Treatability Investigation Group.** Members of the community who are interested in devoting their time to the Soil Treatability Study were invited to join the Soil Treatability Investigation Group (STIG), along with representatives of industry, government, regulators, DOE, Sandia, and other interested agencies. The STIG meets approximately once every other month to provide input to the Study, review study plans, agree on screening criteria, and discuss results from the various steps in the Study and the evaluation of candidate technologies. The first meeting of the STIG was held on November 15. The STIG will continue its involvement throughout the duration of the study, which is anticipated to be completed in 2013.

Other Studies and Activities

- **Radiological Background Study.** Through funding by DOE, USEPA completed background radiological sampling and published the *Draft Radiological Background Study Report* for public review in July 2011.

- **Chemical Background Study.** DTSC is in the process of developing a *Draft Chemical Background Study Report*. The public had an opportunity to comment on DTSC’s sampling and analysis plan, and a group of stakeholders participated in “field days” in summer 2011, hosted by DTSC, to observe the offsite sampling activities. DTSC (with DOE participation) also held a technical round-table meeting in June with stakeholders to present and discuss results of the sampling and laboratory-evaluation process. DTSC has completed its offsite sampling and plans to issue the draft report this spring.
- **Building survey.** Depending on availability of funding, DOE plans to begin radiological surveys of remaining buildings in Area IV later in 2012. The building survey is needed before the buildings can be decontaminated and removed. DOE’s *Draft Building Survey Plan* and *Draft Standard Operating Procedures* were made available on DOE’s website in September 2011. On a regularly scheduled on-site tour of Area IV in October, DOE demonstrated, for several community members, the techniques to be used in the radiological surveys.
- **Noise monitoring.** In August 2011, DOE conducted a Noise Monitoring Study along truck routes leading out of the site. DOE posted a *Noise Monitoring Plan* and a summary fact sheet on the ETEC website in advance of the monitoring activity. DOE handed out the fact sheet at public meetings, and sent it to its email list of more than 500 people. The fact sheet was also available to local residents near the locations where the monitoring was to take place. Results of the noise monitoring study will be incorporated into DOE’s pending Environmental Impact Statement.

Ongoing Consultations with Neighboring Native Americans

Meeting and tour regarding trenching. DOE has a formal consultation program with neighboring Native Americans. In September 2011, prior to trenching activities to better understand the subsurface geology and groundwater of the SSFL site, DOE hosted a meeting and tour for representatives from the nearby Chumash and Fernandeño Tataviam tribes to inform them of the planned trenching and ensure that the trenching activities would be conducted in a manner that would not disturb Native American artifacts or sacred locations. DOE conducted a formal consultation, submitted protocols to the State Historical Preservation Office (SHPO), and obtained approval from SHPO to proceed. See “News brief” on page 2.

Former Worker Interviews

During 2010 and 2011, DOE conducted interviews with 132 former SSFL workers in an effort to help us better understand past operations and how and where contamination could have occurred. The interviews also captured the flavor of the time and place in history to which SSFL contributed. A report providing the results of the interviews is on DOE's SSFL website. To protect privacy of the individuals who participated, the report does not identify the names of the people, but it does provide reflections and recollections by actual site employees of their work at ETEC.

PUBLIC INFORMATION

DOE uses several means to provide information to the public, as described below.

- **DOE website.** The beginning of 2012 saw the fruits of work done in 2011 when the DOE website at www.etc.energy.gov went "live" with a major update to meet changing needs, and to make things easier to find. The site has been reorganized to be more user-friendly. The ETEC website provides historical and current information related to Area IV. In addition to emails sent to those on DOE's email distribution list, the DOE website is a primary method for the interested public to search for, review, and download DOE documents.
- **Email announcements.** DOE has an email distribution list of more than 500 people, many of whom are in the local communities. During 2011, DOE issued 8 email announcements to inform stakeholders of key activities; meetings; draft and final documents; and staffing, contract, and legal updates.
- **CleanUpdate newsletter.** DOE's *CleanUpdate* newsletter provides the local community with an update of Area IV plans, activities, and documents. During 2011, *CleanUpdate* was issued in February, June, and October. It was sent by regular mail to more than 4,300 people, emailed to the 500-plus individuals on DOE's distribution list, and posted on DOE's website.
- **Annual community involvement report.** Along with the first *CleanUpdate* issuance of each year, DOE publishes the Annual Community Involvement Report as an insert. This report summarizes the various means used by DOE throughout the previous year to inform and involve the SSFL community in Area IV activities.
- **Media interactions.** DOE was interviewed by 7 media outlets, and had 9 instances of media coverage of SSFL.

- **Site bus tours.** In addition to hosting public visitation days (see p. 3 above), DOE participated in 13 SSFL community bus tours over several Saturdays in 2011 for about 600 individuals. Boeing sponsors these tours.

- **Community and other meetings.** DOE interacts frequently with community members at public meetings and on tours, to inform them of plans and progress, to involve them in ongoing planning, and to educate interested people about highly technical topics. At an



average of three meetings per month, DOE participated in or attended meetings of the SSFL Workgroup, SSFL Public Participation Group, USEPA's Technical Work Group, DTSC/DOE stakeholder meetings on co-located sampling, DTSC's chemical background study update, community-sponsored meetings, and topical meetings (e.g., Groundwater U, Chemical Background Study, Soil Treatability Study).

A Refresher on DOE's Role at SSFL

DOE is responsible for cleaning up contamination that resulted from past activities of the ETEC, which operated within Area IV of SSFL. ETEC was dedicated to the development and testing of components for fast breeder nuclear reactors and extensive research into liquid metals.

DOE's commitments to clean up Area IV contamination are defined under two AOCs:

- **Soil and sediment:** Under the December 2010 AOC, developed with DTSC, DOE committed to characterize and clean up soil contamination in Area IV under a process defined in the agreement.
- **Groundwater:** The 2007 Consent Order documents DOE's commitments to characterization and cleanup of Area IV groundwater.

A key element of the clean-up effort is maintaining a transparent and inclusive process that informs interested community members about ongoing progress and involves them in key decisions. This Annual Report is one element of our information program.

SSFL Areas I, II, and III were used by predecessors of Boeing, NASA, and the Department of Defense for rocket engine and laser testing. NASA and Boeing are responsible for any contamination in those areas.



Soil Treatability Study

Energy Technology Engineering Center • U.S. Department of Energy

What is the Soil Treatability Study?

The Soil Treatability Study (STS) is an investigation of alternative remediation technologies that could be implemented with the soils in place at SSFL to meet the clean-up goals agreed to in the AOC.

DOE has contracted with Sandia National Laboratories to provide technical direction for the study. The Sandia team will identify a range of possible technologies, screen them for the candidates most likely to be effective at SSFL, conduct bench (laboratory) and pilot (on-site) tests to evaluate their viability, and document the results in a report to DOE.

Why are we doing the Soil Treatability Study?

The study will determine if any existing technologies could reduce the amount of soil that would need to be removed in compliance with clean-up goals as established under the AOC. DOE is committed to compliance with the AOC signed in 2010, and the STS is a requirement of the AOC.

But digging deeper, a key reason that the STS is in the AOC is because large-scale excavation and transportation of soil away from SSFL may entail undesirable impacts, including:

- Increased health risks to workers;
- Transportation of chemically and radioactively contaminated soil to off-site licensed disposal sites within and outside California;
- Increased noise and congestion along transportation routes;
- Air quality concerns;
- Potential risk and/or unintended damage to on-site archaeological resources; and

- Additional risk to SSFL native vegetation and wildlife.

DOE's plans for cleanup will include efforts to mitigate all negative impacts, but some impacts may be unavoidable.

To minimize the potential negative impacts of soil excavation, we hope that the study will find alternative technologies that could help reduce chemical and radioactive contamination sufficiently to meet AOC requirements and to:

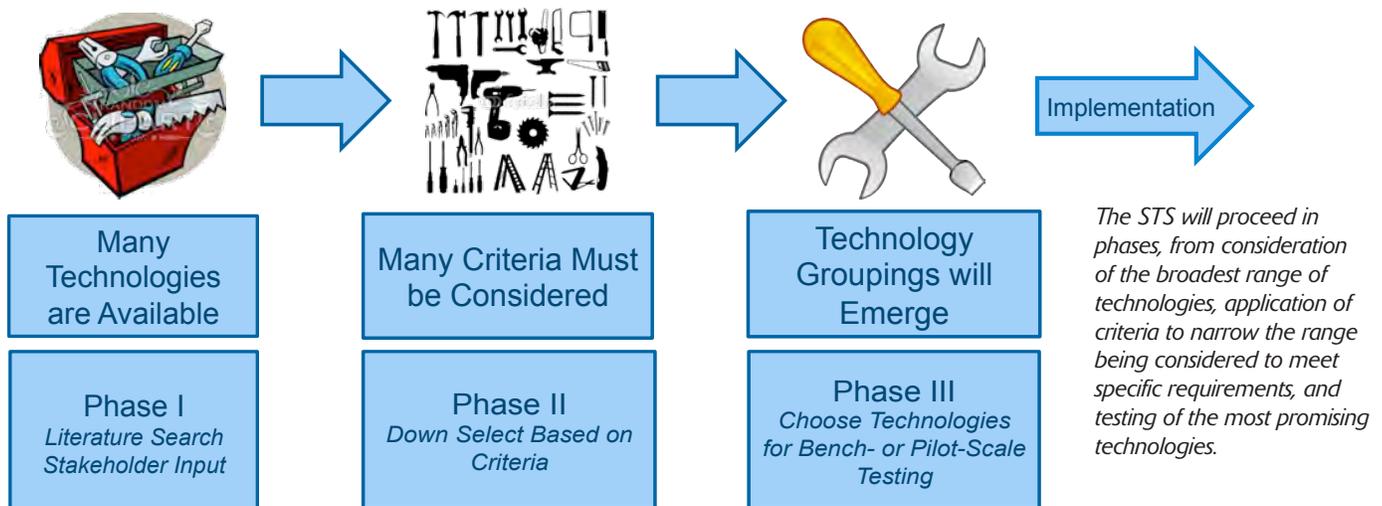
- Reduce the total quantity of soil that will have to be excavated and transported off-site;
- Reduce the quantity of soil that will be needed to replace soil that is removed – some of which may be found in a different part of SSFL and the rest of which will have to be brought to the site from other locations (all of which must be verified by USEPA not to exceed local background levels of contamination); and
- Reduce contamination in the soil that is excavated, which could allow selection of different off-site disposal facilities.

Selection criteria:

How will viable technologies be selected?

How will Sandia choose the technologies for further study in the Soil Treatability Study? Preliminary criteria for screening and selecting technologies for further consideration include:

- Technology description: Can the technology be implemented at the location of the contamination?
- Development status: What is the maturity of the technology? Is it a new or emerging technology, is it in development, or has it already been proven?



- Targeted contaminants: What contaminants does the technology treat?
- Effectiveness and durability: To what degree can the technology reliably clean up the targeted contaminants to desired levels? How well might the technology address contamination under site conditions?
- Applicability: Under what conditions is this technology applicable?
- Time to treat: How long does it take to treat a typical area or site with this technology?
- Availability: How many vendors offer this technology?

Sandia will compile a list of technologies deemed most appropriate to site conditions in a report to DOE. DOE will decide whether to pursue any alternative technologies as part of its overall strategy for cleaning up SSFL contaminants. DTSC will have the final approval over DOE's plans.

The optimum strategy will be one that:

- Remediates the soil to meet Look-up Table values as described in the AOC;
- Is capable of more complete remediation;
- Does not interfere with other technologies;
- Minimizes the volume of soil to be removed from the site.

How you can stay involved: Public Participation Opportunities

DOE has developed this study with members of the public in mind. Those wishing to stay informed about the study can read the *CleanUpdate* as new information becomes available. In addition, you can attend public meetings. The kick-off meeting was held October 25, 2011. An overview presentation on soil remediation technologies took place January 30, 2012. To receive notification about future meetings, please join our email list by sending your contact information to etec-energy@emcbc.doe.gov.

Community members wanting a deep level of involvement over a period of time were invited to serve on the Soil Treatability Investigation Group (STIG), which will meet approximately every other month to provide suggestions, review plans, make site visits, and provide advice on the study. The group includes:

- Interested members of the public;
- DTSC, Boeing, NASA, other interested agencies, and industry representatives; and
- Representatives from Sandia, DOE and its contractor staff.

The group had its first meeting November 15, 2011, where they discussed a soil remediation technology matrix, a planned expert opinion survey, suggestions for experts to be invited to participate in that survey, potential scenarios for submission to the experts for consideration, and the information that the experts would be invited to provide about each technology option they suggest. At a second meeting on January 31, 2012, Sandia provided a more thorough explanation of soil remediation technologies.

What might alternative technologies look like?

Several distinct approaches to reducing or eliminating the amount of soil that needs to be excavated will be evaluated for their feasibility. These include:



Phytoremediation: a process through which plants, including trees and bushes, take up or accumulate contaminants internally, thereby reducing the concentrations of contaminants in the soil. This technology has been used elsewhere to clean up metals, radionuclides, polychlorinated biphenyls (PCBs), solvents, explosives, and hydrocarbons.



Bioremediation: the use of bacteria to enhance natural decomposition of contaminants, through stimulation of naturally existing species or introduction of non-natural species. This technology has been effective elsewhere for cleanup in low permeability soils for petroleum hydrocarbons, solvents, metals, and radionuclides.



Physical and chemical remediation: use of the physical properties of the contaminants or the contaminated medium to chemically convert, separate, or contain the contamination. This technology has been effective elsewhere for confined areas of well-defined soils with contamination that includes solvents, hydrocarbons, organics, and metals.



Thermal: can be done in two ways – in situ involves application of heat to contaminated soil in place at SSFL to destroy or vaporize organic chemicals. As the chemicals change into gases, the gases can be captured and cleaned up in an off-site treatment unit. Ex situ treatment involves digging up the soil and treating it in a facility built on-site to destroy or remove contaminants through exposure to high temperature in treatment cells, combustion chambers, or other means during the remediation process. The treated soil would then be replaced. This technology has been effective elsewhere for defined areas of contamination that include organics, PCBs, solvents, pesticides, and polyaromatic hydrocarbons (PAHs).



Nanotechnology: Use of certain materials at the nanoscale level (very tiny – at the molecular or atomic level) and taking advantage of highly reactive materials because of the large surface-area-to-volume ratio and the presence of a larger number of reactive sites. These properties allow for increased contact with contaminants, thereby resulting in rapid reduction of contaminant concentrations. This technology has been effective elsewhere for cleanup of solvents such as tetrachloroethylene (TCE); PCBs; metals such as arsenic and chromium; and nitrate, perchlorate, sulfate, and cyanide.

For more about remediation options visit the ETEC website at <http://etec.energy.gov/Library/Main/Kickoff%20Meeting%20Presentation%2010-25-11.pdf>

Conversation with the Director: Technical and budgetary outlook for 2012



John Jones,
Federal Project Director

Welcome to “Conversation with the Director.” I want to reserve space for question-answer conversations about key topics, whether they are funding issues, direction from Washington, or questions that seem to be on the minds of community members. To make this more interesting, I have asked *CleanUpdate* staff to pose questions they think our readers would be interested in:

What do you see as the major 2011 accomplishments?

Completion of Phase 1 chemical soil characterization was a tremendous accomplishment and a tribute to teamwork among DTSC, DOE, and USEPA, plus active participation by the community. Another success story is initiation of the Soil Treatability Study with its Soil Treatability Investigation Group. We look forward to continued success on this, with support from dedicated community members who are volunteering precious time to this and other SSFL efforts.

What are your major 2012 goals? Our biggest priority this coming year is to complete Phase 3 of the soil chemical characterization to fill gaps in our knowledge of soil contamination. We have set an extremely challenging schedule, and we believe we can do it. USEPA is, of course, characterizing the radiological contamination in parallel, and the knowledge we gain will form the basis for the Soils Remedial Action Implementation Plan.

What do you see as upcoming challenges? A major challenge is funding. With the climate in Washington, and the political pressure for reduced government spending, funding will be a challenge for all federal agencies across the board in coming years. We will continue to manage available funds effectively toward meeting our commitment to the AOC.

Parting thoughts? After many years managing various DOE projects, I must say that SSFL stakeholders are the most engaging and active community in my experience. I appreciate that; it keeps me continuously learning and communicating with the SSFL stakeholders on the progress being made towards the work being completed as prescribed in the AOC. DOE is very committed to meeting our obligations in the AOCs. I look forward to continuing to work with all the parties; this next year promises to be an exciting time!

For more information

<http://www.etc.energy.gov>

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