



Lessons Learned from the In-Situ Grouting in the Subsurface Disposal Area Post Critical Decision-4

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Statement:

Protection of the Snake River Plain Aquifer was a major driver for environmental remediation at the Department of Energy's (DOE) Idaho Site. In 2010, the Idaho Cleanup Project (ICP) used in-situ grouting to stabilize buried waste and reduce the migration of specific radioactive contaminants to the aquifer. The action was accomplished using American Recovery and Reinvestment Act (Public Law 111-5) Program funding of a capital asset acquisition project under DOE Order 413.3A, Program and Project Management for Acquisition of Capital Assets. Lessons learned from previous subsurface grouting activities contributed to the safe, timely and cost efficient completion of the project. Lessons learned during the execution of the project have been applied to other work within the Idaho Site Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) project.

Discussion:

In 1980, the entire Idaho Site was put on the National Priorities List to address contamination of the Snake River Plain Aquifer from direct injection of liquid radioactive waste and migration of contaminants from known soil contamination including the SDA's buried waste. The Phase 2 Remedial Design/Remedial Action Work Plan (DOE/ID-11405, January 2010) was the framework for ISG of SDA buried waste to contain releasable technetium-99 and iodine-129. The treatment objective was to reduce contaminant mobility in the interim until a surface barrier is constructed over the SDA landfill. Treatment involved 21 discrete locations in the landfill, with a cumulative original area estimated to range from 0.13 to 0.2 acres. The 21 locations included one soil vault and 20 discrete portions of various trenches that included 2,168 individual drilling positions. If the injected grout volume was within 20% of the maximum potential volume, grouting was deemed effective and complete. If grouting was not within 20% of the maximum (e.g., refusal was met), project personnel evaluated field observations and knowledge of the buried waste (e.g., waste form and container type) and applied professional judgment to determine if additional grout columns were needed. Adjusting the drilling retraction rate by changing the rotational speed of the drill prevented excessive grout returns and ground heave, yet insured the volume was within 20% of potential volume. The project was able to increase the cumulative area up to 0.2 acres to ensure complete treatment. Field decisions, Agency decisions, and completion are documented in project records and are included in the Interim Completion Report for Phase 2 Operable Unit 7-13/14, In Situ Grouting (DOE/ID-11436, January 2011) (in CERCLA record at ar.inel.gov). The Lessons Learned document identified 12 specific lessons learned from this project which have relevance to current EM activities.

Analysis:

Project Management Lessons Learned from Previous Grouting Experience Applied to ISG

1. Project Management Must Understand the Technology Application Prior to Operations (CD-1)
2. Demonstrate Nuclear Operations in a Non-nuclear Environment Prior to Nuclear Implementation (CD-2)
3. Ensure Control of All Energized System Components (CD-1)
4. Operational Issues could have been Identified Earlier if Additional Project Personnel had Participated in Off-site Demonstration (CD-4)
5. Perform Management Self Assessment (MSA) Prior To Start Of All New Operations (CD-3)
6. Contractor without Prior DOE Experience Will Require Support (CD-3)
7. Develop Regulatory Plans with Sufficient Flexibility to Allow Field Changes (CD-1)
8. Plan Redundancy into Project To Address Areas of Technical Risk (CD-2)
9. Quality Control of Job Specific Materials Performed on Site (CD-2)
10. Plan for Maintenance and Repairs (CD-1)
11. Generation of Contaminated Waste Forms Must be Controlled (CD-3)
12. Contamination Control Should be Designed into the Operating System (CD-2)

Actions:

FPDs should read the whole Lessons Report to evaluate applicable elements to their projects and activities. Report contained: http://energy.gov/sites/prod/files/000646_EM-C_Soil_and_Groundwater_Cleanup_-_In-Situ_Grouting_Lessons_Learned_Post_CD-4_15_Jun_11.pdf

Critical Decision(s): CD-1, CD-2, CD-3, CD-4

Facility Type(s): N/A

Work Function(s): Soil Remediation

Technical Discipline(s): N/A



Waste exhumation underway at the Idaho Cleanup Project executed under ARRA (Reference 2).

REFERENCES:

1. Arenaz, M. "Lessons Learned from the In-Situ Grouting in the Subsurface Disposal Area Post Critical Decision-4." U.S. Department of Energy Idaho Operations Office, Idaho Falls, ID, May 31, 2011. Retrieved from http://energy.gov/sites/prod/files/000646_EM-C_Soil_and_Groundwater_Cleanup_-_In-Situ_Grouting_Lessons_Learned_Post_CD-4_15_Jun_11.pdf on January 9, 2015.
2. <https://www.flickr.com/photos/departmentofenergy/7407935298/in/set-72157630197359954>