

Hanford Site Asbestos Management Lessons Learned – 15183

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ABSTRACT

The U.S. Department of Energy (DOE) is responsible for the environmental cleanup of the Hanford Site central plateau. As part of this responsibility, DOE contractors conduct deactivation, decommissioning, decontamination, and demolition (D4) of retired/inactive facilities, including very large chemical processing facilities. To date, DOE contractors have demolished hundreds of facilities, reducing baseline site maintenance costs and reducing the environmental threats and hazards that the degrading buildings present.

Many of these Hanford facilities include asbestos-containing materials (as well as other hazardous components), which must be managed in compliance with applicable regulations and standards. In most cases, the facilities are demolished as Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) removal or remedial actions.

In an effort to streamline cleanup operations and to utilize site cleanup funding more efficiently, while still being protective of personnel and the environment, agreements were reached between the US Environmental Protection Agency (EPA) Hanford Project Office, the Washington Department of Ecology (Ecology), the Benton Clean Air Agency (BCAA) and the US Department of Energy Richland Operations Office (DOE-RL) on approaches to be utilized for demolition. One of these approaches would involve leaving cement asbestos board siding (e.g. transite), an EPA National Emissions Standards for Hazardous Air Pollutants (NESHAP) Category II non-friable asbestos-containing material, in place during demolition using heavy equipment, employing a set of controls that would maintain protection of personnel and the environment. This agreement was documented in a number of formal communications, including Notices of Intent issued as required by the asbestos NESHAP regulation, letters between the various agencies, CERCLA work plans, and the approved contractor baselines. A large number of buildings were demolished with transite siding in place, using the agreed upon controls and approaches. Personnel breathing zone and work area perimeter monitoring verified that the controls employed were protective in that there were no exceedances of permissible exposure limits during or after the demolition operations.

EPA later reconsidered their previous concurrence with demolishing transite materials in place and issued a joint letter with Ecology revoking concurrence on any of the aforementioned CERCLA decision documents and associated work plans. DOE and their contractors took action to comply with the approach to demolition preferred by EPA for future demolitions, and initiated a series of actions to modify asbestos management practices in their operations accordingly. This paper will discuss both the actions taken to address EPA concerns with sites where transite materials were left in place for demolition and actions taken to ensure that the central plateau D4

program complies with the 40 CFR 61 Subpart M, *National Emission Standard for Asbestos*, (Asbestos NESHAP) methods for asbestos management.

INTRODUCTION

The Hanford Site, managed by DOE, encompasses approximately 1,517 km² (586 mi²) in the Columbia Basin in south-central Washington State (Figure 1). From 1943 to 1990, the primary mission of the Hanford Site was the production of nuclear materials for national defense. In July 1989, the EPA placed the areas of the Hanford Site on the National Priorities List (NPL) pursuant to CERCLA. The primary work scope emphasis on the Hanford Site has now shifted to an environmental restoration and cleanup mission.

There are two main geographic components of the cleanup work at the Hanford Site, the River Corridor and Central Plateau (Figure 1). The River Corridor includes the former fuel fabrication area (300 Area), reactor operations areas (100 Areas) and considerable land area not directly affected by past production operations. This region is adjacent to the Columbia River and cleanup must deal with the threats to that valuable resource. The Central Plateau includes the former fuel processing facilities and numerous waste disposal facilities. Each of these components of cleanup is in itself a complex and challenging task requiring many years and billions of dollars to complete.

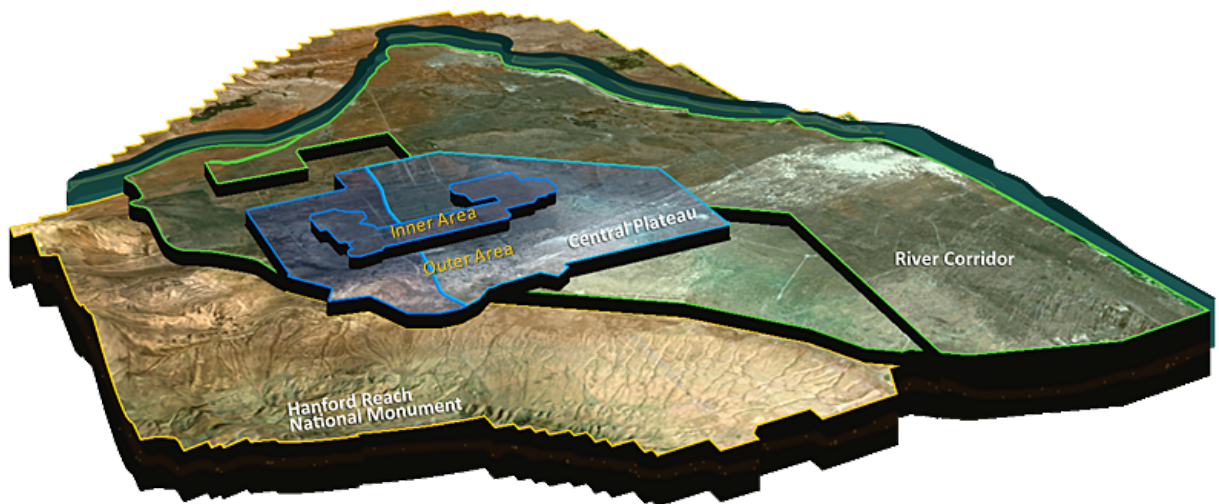


Fig. 1 Hanford Site Geographic Cleanup Components

The Central Plateau is a region near the center of the Hanford Site. The Central Plateau includes approximately 194 km² (75 mi²) in the central portion of the Hanford Site as shown. This component includes the Outer Area (168 km² (65 mi²)) and the Inner Area (26 km² (10 mi²)). The Outer Area is that portion of the Central Plateau outside the boundary of the Inner Area, and represents a relatively less complex cleanup challenge with many of the areas requiring cleanup being near surface contamination or debris. Cleanup of the Central Plateau Inner Area is a much more complex and challenging task because it contains a large inventory of chemical processing and support facilities, tank systems, liquid and solid waste disposal and storage facilities, utility systems, administrative facilities, and groundwater treatment systems. The Inner Area is

anticipated to be the “final footprint” of Hanford, and will be dedicated to long-term waste management and containment of residual contamination.

The Central Plateau included more than 900 facilities and structures including offices, shops, and trailers, as well as large processing, storage, or handling facilities such as the Plutonium Finishing Plant. A combination of regulatory decision paths will be applied to structures depending on the extent of radioactive or hazardous chemical contamination present. DOE will manage the process to determine what cleanup remedy will be used for most uncontaminated structures. Contaminated structures will be dismantled in accordance with DOE decommissioning policies or as CERCLA removal actions if a threat of release of hazardous substances to the environment is present. In the absence of final decisions, interim actions can be used to support continued remediation activities as funding allows.

To date, approximately 70 facilities have been demolished in the Central Plateau as part of the plateau remediation contractor cleanup effort. Many of these buildings had asbestos-containing materials (ACM) abated prior to demolition (e.g. thermal system insulation removal with glovebag method). Over 20 of these buildings were demolished with Category II ACM in place during D4. Demolition of these facilities with the Category II ACM in place was conducted within approved work plans, notices of intent, or contractor baselines. Examples of some of these facilities are shown in Figure 2.



Fig. 2 Transite-Sided Building in the Hanford Central Plateau Area

DISCUSSION

Demolition or renovation of facilities at Hanford has occurred throughout the history of the Site, it is not unique to recent years. However, the frequency of D4 activities did take a significant upturn at the end of the Hanford production mission, when the Site emphasis shifted to cleanup and environmental restoration. The requirements governing these D4 activities have continued to evolve, including those requirements applicable to the management of asbestos-containing materials (e.g. many of these demolitions occurred before the advent of, or applicability of, the asbestos NESHAP). D4 activities gained additional momentum during the American Recovery and Reinvestment Act (ARRA) period from 2009-2012.

Many examples exist, some pre-dating the ARRA period, of the D4 of Hanford Site facilities with approaches that allow leaving Category II ACM in place. These examples were conducted with full regulatory agency knowledge, and served as part of the basis for scoping demolitions in the Central Plateau during ARRA (Figure 3).

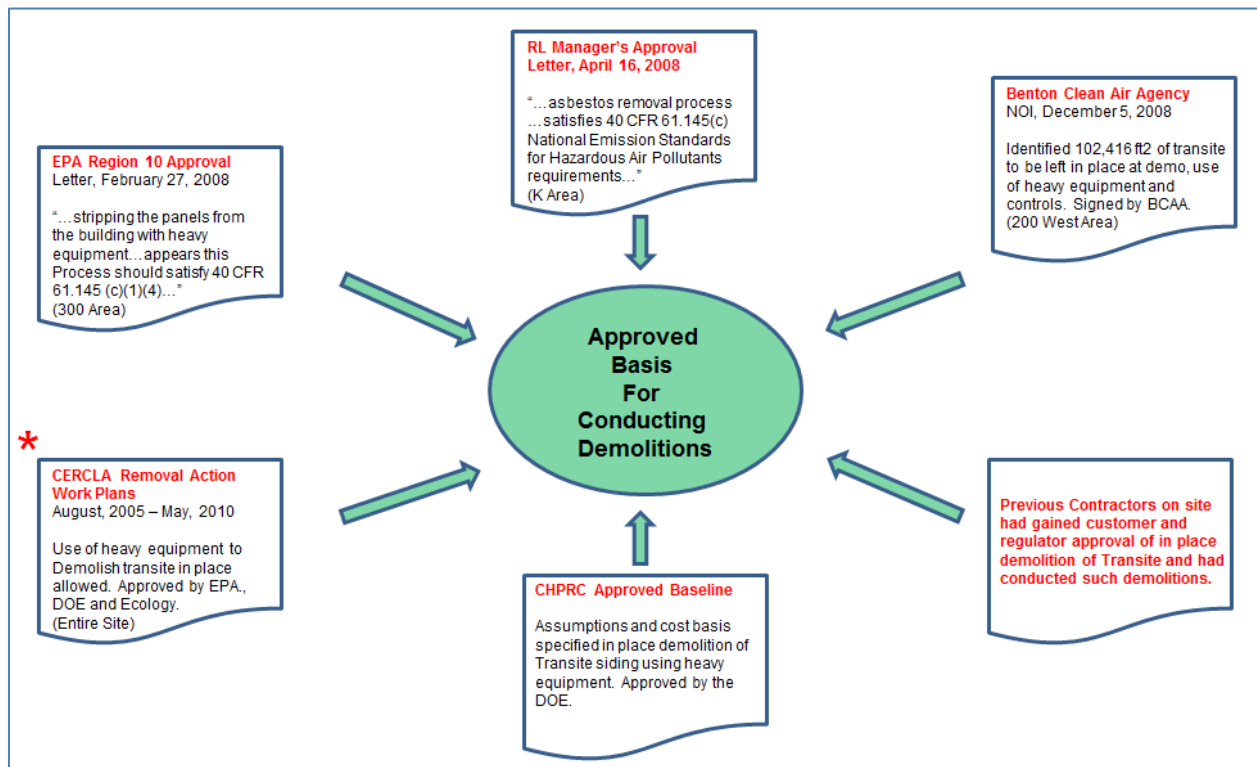


Fig. 3 Basis for Approach Used for Transite Demolitions in the Central Plateau

Demolitions of facilities with Category II ACM (predominantly transite siding) proceeded under pre-approved work plans, notices of intent, and other documentation. These D4 activities were conducted in a manner to be protective of personnel and the environment. Fixatives were applied to the materials prior to demolition, fogging and wetting with amended water, and other

controls were used during demolition. Containers were properly configured (lined), marked and routed to disposal as appropriate to the hazards.

“Visible emissions” were not observed during the D4 work activities; none were reported or documented by project management staff, the workforce, or the regulators during demolition and waste handling activities.

Extensive air sampling was conducted throughout the demolition and waste handling activities. Sampling routines included both personal breathing zone samples (lapel samplers on actual workers) and work area perimeter samples (Figure 4). All 270+ personal breathing zone samples were below the permissible exposure limit and nearly 2800 perimeter samples were all less than or equal to 10% of the permissible exposure limit. The results of these sampling activities are summarized in the August 2012 report, “Industrial Hygiene Data Evaluation Team Report on Asbestos Samples Associated with Demolition Activities and Follow-up Sampling” [1].



Fig. 4 Perimeter Sampling During ACM D4 Activities

In December, 2011, the U. S. Environmental Protection Agency Office of Inspector General issued an “Early Warning Report” [2] regarding the use of “unapproved” asbestos demolition methods. This report stated, among other things, that:

“EPA should immediately and clearly communicate NESHAP and OSHA requirements for the demolition of asbestos-containing structures to regional, program, and field offices to prevent potentially hazardous exposures. EPA should notify these offices that unapproved methods are not to be used without obtaining appropriate waivers. Further, EPA should identify all sites, such as Hanford, with work plans that contain EPA authorization to use unapproved methods for asbestos demolitions, and retract any such approvals that deviate from the Asbestos NESHAP regulation.”

On March 12, 2012, the EPA Hanford Project Office and Ecology issued a letter to the DOE Richland Operations Office revoking their concurrence on any CERCLA decision documents which would enable or could be interpreted to enable the use of demolition methods that are not in compliance with the asbestos NESHAP, specifically, any document that authorizes “demolition activities where transite siding is left in place to be mechanically removed in a way that causes the siding to become crumbled, pulverized or reduced to powder.

Subsequently, EPA Region 10 conducted an inspection of the Hanford Site (mostly former demolition sites) in August, 2012. General discussions, formal and informal information requests, follow-up visits by EPA Region 10 and EPA Hanford Project Office, and finally, settlement talks, occurred in the latter part of 2012 through early 2014. A Notice of Violation (NOV) was issued by the EPA Hanford Project Office in October, 2013 and a Consent Agreement and Final Order (CAFO) was issued by EPA Region 10 in April, 2014. The alleged violations noted in these documents are paraphrased as follows:

- Inadequate documentation of an EPA approval for disposal of non-CERCLA asbestos waste at the onsite CERCLA disposal facility (NOV).
- Unloading of asbestos waste at the onsite CERCLA disposal facility by vehicles that were not properly marked to indicate an asbestos dust hazard (NOV).
- Failure to comply with a work plan requirement to have an IH or professional engineer certification to leave non-friable asbestos in place during demolition (NOV).
- Failure to comply with the work plan requirement for “no visible emissions,” in that broken pieces of transite material were found at an industrial facility demolition site (NOV).
- Failure to provide accurate waste disposal site and waste transporter information on Notices of Intent (NOI) to BCAA (CAFO).
- Failure to remove regulated asbestos-containing materials prior to demolition activities (CAFO).
- Failure to adequately wet/contain regulated asbestos-containing materials (CAFO).

Settlements were reached with EPA on both the NOV and the CAFO. In reaching settlement, DOE or their contractor neither admitted nor denied the specific factual allegations or legal conclusions set forth in the NOV or CAFO. It was in the best interest of the parties and the

taxpayer to move forward with the Settlement, and to modify processes which had been in use at Hanford for asbestos management to avoid future disagreements.

RESPONSE TO CONCERNS

From the time issues with the approach being used for asbestos management in Hanford Central Plateau D4 operations were first noted, DOE and CHPRC worked cooperatively with EPA and initiated program changes to address the concerns (most were prior to the NOV or CAFO). Specifically, the following actions were taken:

- Contracted a nationally-recognized asbestos NESHAP expert. This expert has been used extensively to advise CHPRC in all aspects of asbestos management onsite, including future demolition practices and procedures. CHPRC has made this expert available to other Hanford Site contractors.
- Offered and conducted Asbestos NESHAP training courses. Four training sessions, taught by the same nationally-recognized expert mentioned above, were conducted to improve employee knowledge levels and awareness. These courses were open to, and attended by, Hanford Site contractor personnel (including management, professionals, and bargaining unit workforce representatives), DOE-RL and Headquarters representatives, EPA, and Ecology.
- Enhanced employee understanding, awareness and made more information resources readily available to employees. Employee knowledge and information resources were improved through modified general employee training modules, postings to an asbestos awareness website (Figure 5), employee notices and safety topics.

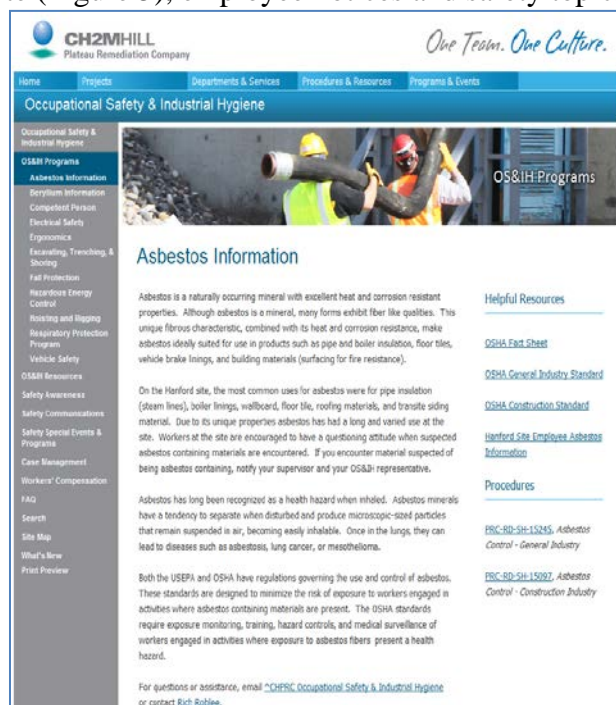


Fig. 5 Employee Asbestos Information Website

- Increased coordination between onsite contractors regarding asbestos management. Periodic meetings are held between the Site contractors to discuss timely topics relating to asbestos management and awareness. Some topics discussed include general agreements on consistent posting of sites, processes for access control for areas where legacy ACM is located in the field, and a process for addressing newly-discovered legacy asbestos on site.
- Conducted a number of technical assessments and evaluations. These technical evaluations included exposure assessments to support onsite activities and evaluation and summary of sampling/analysis results.
- Issued new procedures/guidance documents or enhanced/modified existing documents. A number of existing documents were modified to address EPA concerns, including modification of CERCLA work plans, development of new asbestos site/facility surveillance procedures, and issuance of a guidance document for CERCLA D4 activities which involve asbestos-containing materials. Further improvement of documentation and guidance is underway.
- Increased Subject Matter Expert (SME) involvement. Additional asbestos SMEs were brought to the environmental organization to strengthen the knowledge base and skill set. Strengthened the involvement of CHPRC asbestos subject matter experts in work planning, alternatives development, field activities and post-demolition inspections through procedural changes and enhanced involvement with the projects.
- Assigned a senior staff member to focus on the CHPRC asbestos program and EPA concerns. A senior member of the contractor's Environmental Programs and Strategic Planning organization was assigned to focus solely on resolution of EPA concerns, to lead Settlement discussions with EPA for the contractor, and to enact program and policy changes in the contractor asbestos management program to assure compliance.

Several demolitions of facilities with ACM have been conducted since these, and other, program improvements were put in place. These demolitions have been carefully reviewed with EPA prior to implementation, in that several involved pre-demolition removal of regulated ACM, Category II ACM siding removal, or demolition with non-friable Category I material (resilient flooring or caulking material) left in place in compliance with the applicable regulations. EPA has had no issues with the conduct of these D4 activities and the treatment of ACM as part of the demolitions.

CONCLUSIONS

A considerable amount of time, resources and effort were expended to address the Hanford Central Plateau asbestos issues associated with the D4 program. To avoid a repeat of the issues encountered with demolition of ACM-containing facilities (and many of these apply to management of other hazardous materials), Hanford has implemented a number of lessons learned:

- Examined all approvals and existing agreements to confirm adequate regulatory “cover” is provided.
- Eliminated dependence on “handshake” agreements (a legacy the current contractor inherited as a pre-existing condition), all agreements should be adequately documented with appropriate approval authority.
- Periodically re-examined and revalidated “aged” agreements, as policy and personnel changes may bring the validity of previous agreements in to question.
- Communicated with local and regional regulators to confirm that all parties are on the “same page” prior to start of key activities.
- Affirmed in those cases where regulatory authority has been delegated, that the delegated authority is still valid.
- Provided formal guidance for asbestos management to the projects (proceduralized).
- Increased SME time in the field (work planning, execution and completion verification) to validate compliance.
- Developed well documented pre-demolition survey reports to memorialize facility asbestos inventories and abatement requirements (e.g. clearly establish “what facility components are asbestos”, and just as importantly, “what facility components are not asbestos”).
- Enhanced asbestos compliance training of all levels/types of employees to requirements minimizes uncertainty and confusion, and to have more trained eyes verifying compliance.

DOE and their contractor, CH2M HILL Plateau Remediation Company are continuing to progress on cleanup of the Central Plateau, including the compliant and safe demolition of facilities that include asbestos-containing materials. Several such demolitions have been conducted recently at Hanford, as a result of great success in working with our employees, the regulators and other contractors at the Site.

REFERENCES

1. *“Industrial Hygiene Data Evaluation Team Report on Asbestos Samples Associated with Demolition Activities and Follow-up Sampling”*, CHPRC-01772, Revision 0, April, 2012.
2. *“Early Warning Report: Use of Unapproved Asbestos Demolition Methods May Threaten Public Health”*, Report No. 12-P-0125, December, 2011.