

Epilogue: A Review of the Use of Risk-Informed Management in the Cleanup Program for Former Defense Nuclear Sites

by

Omnibus Risk Review Committee

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An epilogue adds information at the end of a report, book, play, or movie about what has occurred since the end of the initial release. The Omnibus Risk Review Committee Report was submitted to Congress and the U.S. Department of Energy (“DOE”) on August 7, 2015.¹ This Epilogue is based on follow-up that occurred between submission of the Report in August 2015 and late April 2016. The body of the Report is unchanged.

BACKGROUND

The Committee provided a copy of its Report to a select group of key stakeholders and conducted briefings with a number of them.

Since submitting the Report, the Committee has received comments from two types of sources. One has been from letters that we received,² as follows:

- Letter to Congress from the Governors of Washington and Oregon, August 27, 2015.
- Letter to Congress from the Attorney General of Washington, August 31, 2015.
- Letter to Congress from the Hanford Communities, September 24, 2015.
- Letter to the Committee from the Attorney General of Washington, December 17, 2015.
- Letter to the Committee from U.S. EPA (“EPA”), April 26, 2016.

The second source of comments was in response to briefings presented by the chairman and several members of the Committee as follows:

- Senior staff of DOE and EPA in Washington D.C., September 22, 2015.
- Staff members of the House Appropriations Committee in Washington, D.C., September 28, 2015.
- Site managers and other DOE staff via phone and web, October 13, 2015.
- Staff members of the Office of Management and Budget via phone, October 26, 2015.

¹ The Omnibus Committee Report can be found at http://www.cresp.org/wordpress/wp-content/uploads/2016/05/Omnibus-Risk-Review-Report_FINAL.pdf

² These letters can be found at: <http://www.cresp.org/cresp-projects/cresp-reviews/omnibus/>

- Webinar for the Performance and Risk Assessment Community of Practice, November 10, 2015.
- Conversation with representatives of the Government Accountability Office (GAO) via phone, November 13, 2015.
- Senior DOE staff members from the safety office, acquisition and project management office, and real property office in Washington, D.C., December 15, 2015.
- Staff members of the Senate Armed Services Committee in Washington, D.C., December 15, 2015.

OBJECTIVES

The purpose of the Epilogue is to address three issues raised in the above communications which reflect confusion about the findings and recommendations found in the Committee’s Report. These are:

- 1) Role of states, tribal nations and local governments on the Interagency Task Force (“ITF”);
- 2) Report’s recommendations regarding resolution of disputes over cleanup between host states and DOE; and
- 3) Lack of consistency in remedial decisions for groundwater at Holden Mine and Hanford.

This Epilogue addresses the most salient issues raised by commenters with information that we hope will help clarify parts of the Report text, and is part of the record for those who will follow-up on this Committee’s effort. The Committee has received comments from the State of Washington (December 17, 2015) and EPA (April 26, 2016) regarding issues of inconsistency.³

1. COMMITTEE VIEW ABOUT THE ROLE OF THE STATES, TRIBAL NATIONS AND LOCAL GOVERNMENTS

The Committee recognizes that states, tribal nations, and local governments have played important roles in the DOE-EM-led risk management process. These organizations have been involved in risk-informed decision-making processes, and some have site offices on DOE facilities and subject matter experts devoted to DOE-EM site issues. The Committee does not recommend changing these important roles.

The Committee recommended that Congress establish a standing Interagency Task Force (“ITF”), comprised of senior officials of DOE, EPA, DNFSB, and independent experts, and co-chaired by DOE and EPA. The mission of the ITF would be to advise and assist DOE in taking actions, with

³ These set of letters is available at: <http://www.cresp.org/cresp-projects/cresp-reviews/omnibus/>>[1 June 2016].

EPA cooperation, to promote consistency and risk-informed decision-making and results, both within DOE sites and across the DOE complex, with respect to site cleanup, priority-setting, resource allocation, integration of regulatory authorities and standards, regulatory compliance, cleanup technology and approaches, dispute resolution and other activities that impact the cost-effectiveness of, and risk-informed decisional basis for, cleanup decisions at individual sites and across the DOE complex. The ITF should be appropriately staffed, supported by technical staff and have a budget line. It should prepare an annual report for Congress, the Secretary of the DOE, and the Administrator of EPA.

The Committee Report was silent on state, local and tribal nation participation in the ITF. The Committee suggests that DOE and EPA, the proposed co-chairs, are in the best position to make that determination.

Since submission of the Report to Congress and DOE, the Committee has been informed that an ongoing, informal dialogue has begun to be held between high-level officials of EPA and DOE,⁴ to discuss, among other matters, some of the key issues raised in the Report. The Committee is encouraged by this inter-agency dialogue and urges that it continue. We believe that this development indicates agency interest in addressing the findings and recommendations of the Report and reinforces the need for Congress to act to formally establish a standing inter-agency task force that has the staff and funding it needs to function effectively, that involves each of the affected federal agencies (e.g., DOE, EPA, Defense Nuclear Facilities Safety Board), and that can endure over time and through changes of Administration, as recommended in our Report.

2. DISPUTE RESOLUTION METHOD (RECOMMENDATION 17)

Our recommendation regarding federal court litigation by states against DOE to challenge DOE's failure to implement cleanup requirements in Federal Facilities Agreements ("FFAs") or in consent orders or decrees has been misunderstood or mischaracterized. We did not recommend eliminating or restricting the current FFA dispute settlement process, or the right of states to challenge DOE's failure to comply with requirements in FFAs or in consent orders or decrees, or the remedies available to states. Our recommendation would preserve the dispute settlement process under current FFAs, which enables the parties to FFAs to work out their differences in the first instance without resort to litigation, as well as the right ultimately to litigate such disputes if one or more parties is dissatisfied with the results of the FFA dispute resolution process.

⁴ We understand that the offices of the Deputy Administrator of EPA and of the Principal Deputy Assistant Secretary for Environmental Management of DOE have been spearheading this dialogue.

Our recommendation was essentially procedural in nature, proposing that if dispute resolution under FFAs is unsuccessful, states would have an opportunity to bring unresolved claims to a national reviewing body comprised of experts, followed by an opportunity for review by the U.S. Court of Appeals for the D.C. Circuit.⁵ In contrast to the existing system of uncoordinated litigation in diverse federal district courts, this process would ensure that disputes about federal facility cleanup priorities would be resolved through a national perspective, taking into account the limited cleanup funds available to DOE and overall risk reduction priorities. There would be no change in the governing substantive laws or remedies available to states.

3. LACK OF CONSISTENCY IN REMEDIAL DECISIONS

In the Committee’s Report, we identified areas of inconsistent application of requirements, policies and practices to deal with similar hazards and risks at different DOE legacy waste sites. These inconsistencies included selection of legislative and regulatory regimes, implementation of National Contingency Plan (“NCP”) requirements for remedy selection, determination of state standards as Applicable or Relevant and Appropriate Requirements (“ARARs”), future land use determinations, application of cleanup technologies, the role of the EPA National Remedy Review Board, and dispute resolution (discussed above).

An example comparing groundwater remedies at the Holden Mine and Hanford sites, used by the Committee to illustrate inconsistent use of regulatory flexibility and application of ARARs,⁶ engendered particular concern and comment from the State of Washington and subsequent clarifications from EPA Headquarters. The following discussion aims to respond to the most salient issues raised in the Washington state and EPA comments. Because of the extent of the agencies’ comments on this point, and the clear importance they placed on it, the Committee’s response to this issue is more extensive than that provided for the other issues addressed by this epilogue.

Washington State’s comments acknowledge that there are differences in how groundwater remediation requirements were applied at Holden Mine versus at the Hanford River Corridor, but contend that there were good reasons for these differences. EPA’s comments similarly acknowledge the differences but contend, in essence, that every remedial site is different, that

⁵ The Committee’s recommendation proposes that disagreements not resolved to a party’s satisfaction through the FFA dispute resolution process would (provided a party wishes to pursue the matter further) be resolved thereafter, in the first instance, by an expert national review body; EPA could, if it chose, participate along with DOE and states in the proceedings of this body. It was our view that existing consent orders and decrees would continue in force; however, they would be transferred to the jurisdiction of the national review body, with opportunity for review of that body’s decision by the D.C. Circuit.

⁶ The discussion of this example is found in the Report at pages 58-59 (Section 3.2.2.3).

the Agency has wide latitude under federal law to craft remedies, and that site-specific differences between the two sites account for the major differences in the selected remedies for groundwater at Hanford and Holden Mine. EPA further asserts that the Agency's public involvement procedures, including those for designation of ARARs, are robust and sufficient, implying that these consistently ensure ARAR transparency and remedial accountability at DOE sites.

We have reviewed and considered the state and EPA comments very carefully. Neither set of comments causes us to believe that changes in the Report or our Committee's recommendations are warranted. In fact, the Committee views both sets of comments as largely confirming the point we made about inconsistencies in remedial decision making at Holden, a Forest Service site with cleanup being financed by a private PRP, on the one hand, and Hanford, a DOE site with cleanup paid for out of public funds, on the other hand. The Committee further disagrees with EPA as to the effectiveness, in these instances, of the Agency's public involvement procedures in consistently ensuring public accountability and transparency in remedial decision-making. At Hanford, short-cuts in public involvement processes adopted for decision making at the Hanford 100 Area undermined and obscured public accountability for major commitments of remedial funds in the 100 Area; as further explained below, the recent multi-billion-dollar 100 Area "Big Dig" was undertaken without issuance of a final RI/FS and final ROD, based on an 18-year old, interim ROD authorizing an expandable remedy, and comprised by multiple internal, task-specific remedy decisions— for which public notice was provided only after the fact.

CERCLA provides that federal and state cleanup requirements imposed at federal facilities must be the same as those imposed at non-governmental (e.g., private party) sites.⁷ The statute further requires, inter alia, that, in order to be designated as an ARAR, applicable to a federal facility (or non-governmental facility), a state requirement must be consistently applied to other sites in the state.⁸ The Committee Report shows that, in at least one key instance—with respect to groundwater remedies selected at Washington state's Holden Mine and Hanford sites, respectively—there is evidence that these statutory injunctions were not followed, and of

⁷ With respect to federal cleanup requirements, Section 120 (a) states that "[e]ach department, agency, and instrumentality of the United States (including the executive, legislative, and judicial branches of government) shall be subject to, and comply with, this chapter in the same manner and to the same extent, both procedurally and substantively, as any nongovernmental entity." (Emphasis added.) With respect to state cleanup requirements, subparagraph (4) of Section 120 (a) provides that, "[s]tate laws concerning removal and remedial action, including State laws regarding enforcement, shall apply to removal and remedial action at facilities owned or operated by a department, agency, or instrumentality of the United States or facilities that are the subject of a deferral under subsection (h) (3) (C) of this section when such facilities are not included on the National Priorities List. The preceding sentence shall not apply to the extent a State law would apply any standard or requirement to such facilities which is more stringent than the standards and requirements applicable to facilities which are not owned or operated by any such department, agency, or instrumentality." (Emphasis added.)

⁸ 40CFR§300.400(g) (4). See also EPA, OSWER, Fact Sheet, "CERCLA Compliance with State Requirements" (Dec.1989).

resulting regulatory inconsistencies with large cost and resource allocation implications for the DOE cleanup program.

Although the sites are not identical, it is notable that at both Hanford and Holden Mine, site groundwater flows into surface water, and that a stated concern of the regulators is to prevent contaminants in groundwater from migrating from the site into surface water. However, considerable regulatory flexibility was applied in remedial decision making at Holden, including use of the “waste management area” concept which led to measures required by regulators for cleanup of groundwater at Holden that are significantly less stringent than those imposed for groundwater cleanup at Hanford.⁹

At Holden Mine, the private party financing remediation has not been required to clean up highly-contaminated groundwater under the site's three enormous waste piles, nor was it required to remove or clean up the waste piles themselves, which were the source of the groundwater contamination.¹⁰ The concept used to enable the private party to avoid having to cleanup groundwater under the Holden waste piles was that by building groundwater barriers below the waste piles to contain contaminants, the waste piles could be designated as “waste management areas,” (WMAs) and groundwater under the WMAs would not have to be treated to meet otherwise applicable standards (ARARs).¹¹ At Holden, in addition, further flexibility with respect to groundwater remediation requirements was provided for the private party: for the first five years of the remedy, only one set of groundwater barriers (beneath/down-gradient of only one of the three waste piles) was required to be built, leaving contaminated groundwater beneath the other two waste piles uncontained during that period; the private party will also be allowed to try to prove that a second set of barriers (beneath/downgradient of the other two waste piles) is not needed (because various specified goals will be met) or that an ARAR waiver is justified, or else the private party will be required to build such barriers in the fifth year.

At Hanford, by contrast, remedies selected to date have required DOE to actively clean up contaminated groundwater to meet ARARs (as well as to perform very extensive and costly excavation in order to remove sources of contamination to the groundwater). To our knowledge, the waste management area-groundwater barrier concept is not being used currently at Hanford to provide (as at Holden) a wholesale exception from groundwater cleanup

⁹ The ROD for Holden indicates that the State of Washington has accepted the federal remedy selected for the site as satisfying state requirements; the state has also signed off on remedies selected at Hanford.

¹⁰ The tailings piles were required to be graded and capped, but not removed.

¹¹ The waste management area concept comes from a passage in the preamble to the federal NCP. The NCP preamble states that EPA's policy for compliance with groundwater cleanup standards is that “remediation levels should generally be attained throughout the contaminated plume, or at and beyond the edge of the waste management area when waste is left in place.” (55 Fed. Reg. 8713). (Emphasis added.)

requirements for any given area of existing contaminated groundwater. An example of the groundwater cleanup approach being taken at Hanford is at the vast River Corridor 100 Area, where extensive pump and treat has been required to restore to highest beneficial use all contaminated groundwater, as well as to conduct extensive and costly source control. This approach culminated in a "Big Dig" spanning large portions of the 26-square-mile 100 Area, involving excavation down 85 feet to groundwater, and digging up millions of tons of contaminated soils.¹² It thus appears that the state of Washington is not consistently applying groundwater cleanup requirements at all sites in the state--and that at least as compared to Holden, appears to be imposing far more onerous and costly requirements at federally-funded Hanford than at a private-party-financed site.

In a comment on a draft of the Report circulated for factual accuracy, EPA stated that at the Hanford Environmental Remediation Disposal Facility (ERDF) --a new-build, RCRA-style waste disposal facility, not a groundwater contamination site-- regulators used the "waste management area" concept to allow flexibility in locating the point of compliance for future groundwater monitoring at ERDF. EPA's comment did not identify a factual inaccuracy and was not responsive to an assertion in our Report; accordingly, no changes to the Report were made in response to it. The Omnibus Report did not discuss ERDF or its regulation. Rather, the Report stated the WMA concept had not been used at Hanford to provide DOE relief from the requirement to clean up an area of existing contaminated groundwater. EPA did not dispute this statement then nor has the Agency done so in its subsequent comments to the Committee. In sharp contrast to the contaminated groundwater cleanup requirements imposed at Hanford, however, a WMA designation was used to provide relief from key ground water cleanup requirements at Holden Mine.¹³

EPA later (in April 2016) asserted that a remedy similar to that selected for Holden had been considered and rejected as not being cost-effective at the Hanford 100 Area, citing a 1999 interim action ROD. Nothing in the cited interim action ROD, however, refutes the Committee's point that the flexibility afforded by the WMA area concept has not been used at Hanford to

¹² Approximately 2.3 million tons of contaminated soil were excavated from a single operable unit (100-C-7) within the 100 Area from 2010-2013 alone (see WM2013 Conference, February 24 – 28, 2013, Phoenix, Arizona, USA, Post, T., et al., "The 100-C-7 Remediation Project: An Overview of One of DOE's Largest Remediation Projects," presented at WM2013, Conference, Arizona, Feb. 24-28, 2013, Available at: <<http://www.wAsym.org/archives/2013/papers/13260.pdf>>[1 June 2016]; and over 11 million tons of contaminated soil were excavated from the larger 220-square-mile River Corridor (of which the 100 Area is a major part)(J. Bradford, "Washington Closure Hanford: Cleaning up the River Corridor" March 2015, Available at: <http://pmicrb.org/images/downloads/WCH/pmi_e1502024_wch.pdf>[1 June 2016].

¹³ The August 2015 Governors' letter stated, incorrectly, that the Committee had failed to correct a factual error relating to Holden Mine that had been identified by EPA in the Agency's "factual accuracy" comments on a prior draft of the Committee Report. To the contrary, the EPA comment noted in the Governors' letter did not prompt the Committee to "correct" the Report because the EPA comment was not relevant or responsive to any assertion in the Omnibus Report. EPA's factual accuracy comments to the Committee were received on May 22, 2015 in the form of an enclosure and text with comments inserted in the margins.

allow any given area of groundwater to be exempted from otherwise applicable groundwater remediation requirements at the site. EPA acknowledges that a containment option examined was rejected as a remedial alternative in 1999 and does not assert that containment or a waste management area approach was ever considered in the ensuing 15+ years during which the vast bulk of the extensive cleanup of the 100 Area has taken place. The 1999 interim action ROD cited by EPA in fact never mentions a waste management area option for the 100 Area. Further, the containment remedy rejected in the cited interim ROD is not specified in any detail so the basis for EPA's suggestion that the rejected remedial alternative resembles the waste management area remedy selected for groundwater at Holden is unclear. Also, as the interim action ROD expressly states, no detailed cost figures were developed for alternative remedies other than the selected remedy; accordingly, it does not provide any evidentiary support for EPA's claim that the containment alternative considered was not cost-effective at Hanford.

The history of this remedial decision-making in the Hanford 100 Area challenges the picture of consistent and robust public involvement procedures and public accountability presented in EPA's comments to the Committee. The 100 Area decision document that EPA cites in its comments as the "Hanford ROD" is an interim ROD 18 years old. The 100 Area cleanup, from its inception in the mid-1990's until very recently, was conducted under the auspices of interim action RODs, without benefit of completed RI/FSs and other required CERCLA documentation. In fact, no RI/FS or final ROD was signed for the 100 Area until 15+ years later, when the vast bulk of the excavation of the 100 Area had already been completed.¹⁴ The 1999 Interim ROD and other interim RODs for the 100 Area issued in the 1990s only examined in detail limited measures with relatively modest costs; the 1999 ROD cited by EPA was for an interim action remedy estimated to cost \$56 million. Yet interim decision documents were used as the basis for increasingly more ambitious and costly final cleanup measures over the following 15+ years, resulting in expenditures for the River Corridor cleanup of more than \$3.7 billion.¹⁵

Contrary to the National Contingency Plan (NCP), these remedial decisions and expenditures were made without the benefit of a final RI/FS that would provide the detailed and accountable

¹⁴ EPA policies on the use of interim RODs limit interim actions to addressing short-term problems (generally under 5 years in duration) requiring a relatively modest commitment of funds, as detailed at pp. 52-53 of the Report.

¹⁵ This conservative estimate was arrived at as follows: (1) the 100 Area Cleanup project has moved forward as a closure project under the title of River Corridor, particularly after the award of the so-titled "River Corridor Closure" contract to Washington Closure Hanford (WCH) in 2005, (2) the Government Accountability Office (GAO) reported in "Nuclear Waste: Action Needed to Improve Accountability and Management of DOE's Major Cleanup Projects" (GAO-08-1081, September 2008) that, prior to 2005, ~\$1B had been expended on River Corridor Cleanup, and (3) in accordance with a recent briefing from Washington Closure Hanford (J. Bradford, "Washington Closure Hanford: Cleaning up the River Corridor" March 2015, Available at: <http://pmicrb.org/images/downloads/WCH/pmi_e1502024_wch.pdf>[1 June 2016], the cost of the "River Corridor Closure" contract through completion was \$2.7B. Groundwater remediation actions in the 100 Area represented a significant portion of this effort, and groundwater cleanup efforts through pump and treat facilities will remain an operations and maintenance expense going forward.

information on risks and remedial costs needed to make sound cleanup decisions.¹⁶ The interim action ROD cited by EPA provided for a “plug-in” remedy combined with an “observational approach,” as well as short-cuts regarding public notification, enabling the scope of the remedy to expand to include additional areas without full NCP documentation and public oversight procedures. Explanations of Significant Differences (ESDs) were issued in connection with these remedy expansions. ESDs were initially issued prior to remediating additional sites, but this practice was changed to giving public notice of ESDs after remediation was completed, thus undermining public accountability over the Big Dig decisions. We are aware of no CERCLA decisional document in the Administrative Record for Hanford that specifically evaluates, prior to its initiation, the 100 Area Big Dig, estimating its costs, examining remedial alternatives, and applying the nine CERCLA remedy selection factors, as required by the final remedy selection process mandated by CERCLA. These highly costly excavation measures, targeted mainly at hexavalent chromium contamination and its purported threat to Columbia River aquatic life, were imposed notwithstanding the lack of evidence that hexavalent chromium releases from the site were posing any material risk to salmon in the Columbia River.¹⁷ It is useful to note that a 2015 study reports similar findings.¹⁸

In its April 2016 letter and at an earlier Fall 2015 meeting with Committee representatives, EPA asserted that existing EPA policies requiring ARARs to be identified in various remedial decision documents that are publicly noticed provided sufficient transparency to the ARAR selection process. The record demonstrates otherwise. For example, at the meeting an EPA official asked the Committee to detail the differences in how state ARARs had been applied at Holden Mine vs. at Hanford with respect to the Committee’s example (i.e., groundwater remediation requirements). For reasons explained in the Committee’s Report, this comparison would be difficult if not impossible to make because ARAR decisions are not adequately documented in site decisional documents. As discussed in the Committee’s report--and also detailed in EPA’s National Remedy Review Board (NRRB) remedy reviews for Hanford dating back to 2000 (and most recently, in NRRB’s March 2015 review)--while remedial decision documents typically list the ARARs that have been designated for site cleanup (and may provide brief conclusory

¹⁶ It is interesting to note that at Holden Mine, the normal NCP process, including issuance of a final RI/FS and final ROD and compliance with public participation requirements, was followed prior to selection and implementation of the groundwater/source control remedy for the site.

¹⁷ Dauble, DD, Poston, TM, Patton, GW, Peterson, RE. 2004. Evaluation of the effects of chromium on Fall Chinook Salmon in the Hanford Reach of the Columbia River: integration of recent toxicity test results. Pacific Northwest National Laboratory. [PNNL-14008]. Available from: <http://www.pnl.gov/main/publications/external/technical_reports/PNNL-14008.pdf>[1 June 2016].

¹⁸ Burger, J., Gochfeld, M., Powers, CW, Brown KG, Clarke JH. 2014. Salmon exposure to chromium in the Hanford Reach of the Columbia River: Potential effects on life history and population biology. Consortium for Risk Evaluation with Stakeholder Participation III. Available from: http://www.cresp.org/wordpress/wp-content/uploads/2016/05/Governors_Omnibus_Comments_9-27-15.pdf>[1 June 2016].

statements about the applicability of ARARs), there is very little written, publicly available documentation actually analyzing ARAR applicability or explaining how and on what basis any given ARAR has been selected for a site; this is true for DOE sites generally and Hanford in particular. It is for precisely this reason that the Committee Report recommends institution of a transparent, well-documented ARAR selection and implementation process for all potentially high-cost state ARARs at DOE sites.