

WIPP - February 2014 Operational Events and the Compliance Recertification Application (CRA) 2014 – 15293

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ABSTRACT

On Wednesday, February 5, 2014, an underground mine fire involving a salt haul truck occurred at the Waste Isolation Pilot Plant (WIPP). There were 86 workers in the mine when the fire occurred. All workers were evacuated. Nine days later, on Friday, February 14, 2014, there was an incident in the underground repository at WIPP which resulted in the release of americium and plutonium from one or more transuranic (TRU) waste containers into the environment. The release was detected by an underground continuous air monitor and then directed through high-efficiency particulate air (HEPA) filter banks located in the surface exhaust building. However, a measurable portion bypassed the HEPA filters via leakage through two ventilation system dampers and was discharged directly to the environment from an exhaust duct. No personnel were determined to have received external contamination; however, some individuals that were on site were identified through bioassay to have initially tested positive for low level amounts of internal contamination. Trace amounts of americium and plutonium were detected off-site. While significant to day-to-day operations, these events have no impact to the long-term performance of the repository. Because WIPP's recertification is based solely on the post-closure performance of the repository (40 CFR 191, Subparts B and C) [1], these recent events do not affect the long-term performance predictions or its technical and scientific basis. In this paper we will further explore the requirements for WIPP's recertification, and the basis for our contention that the recent WIPP operational events do not impact long-term repository performance or have any implications on salt as a geologic disposal media, and that recertification efforts should continue uninterrupted.

INTRODUCTION

The Department of Energy/Carlsbad Field Office (DOE/CBFO) is responsible for managing activities related to the disposal of TRU and TRU-mixed waste in the geologic repository at the WIPP, near Carlsbad, New Mexico. The Environmental Protection Agency (EPA) is required by the WIPP Land Withdrawal Act (LWA) [2], to prepare disposal regulations for the disposal of TRU waste and determine whether the DOE continues to be in compliance with the final disposal regulations at each compliance recertification. The WIPP LWA states that the DOE is also responsible for preparing and submitting documentation of continued compliance with the final disposal regulations of 40 CFR 191 Subparts B and C every five years after initial waste receipt. The first waste shipment was received at the WIPP March 26, 1999. Therefore, three (Compliance Recertification Applications (CRA's) have been submitted to the EPA thus far (2004, 2009, and 2014) [3,4,5]. The CRA-2014, like its predecessors, shows through performance assessment (PA) that the repository meets the 40 CFR 191.13 requirements for long-term disposal system performance. The focus of the analysis described in the CRA-2014

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and all of its predecessors is on repository performance during the post-closure period, which begins when the repository is sealed, and continues into the future for 10,000 years. Operational, near-term activities are not evaluated in certification applications or WIPP PAs, except for the effect(s) they may have on the future state of the repository. The CRA-2014 was submitted to the EPA in March 2014. The EPA is currently evaluating the completeness and adequacy of the CRA-2014.

The WIPP underground truck fire of February 5, 2014 and unrelated but subsequent waste container breach and radioactive release of February 14, 2014 have prompted detailed investigations and analyses by the DOE, independent groups, and WIPP regulators alike. For obvious reasons, these investigations are appropriate and necessary—it must be completely understood what and how these events occurred so that deliberate and positive steps can be taken to assure that such events do not happen again. With such intense focus and scrutiny placed on these recent events, the long-term compliance of the WIPP (i.e., 10,000 year performance period, beginning after closure of WIPP) may seem less important. It is easy for the public and the regulators to lose the perspective that these events, which resulted in a release orders of magnitude below regulatory required reportable limits, in no way compromise the capability of the salt formation to perform and isolate the waste as predicted in the past and present CRAs. WIPP will recover from these operational issues. Recovery will not be easy or inexpensive, and may take longer than most expect, but neither event casts doubt or disparages the current long-term compliance baseline (currently the CRA-2009), the WIPP repository design and concept, or the long-term isolation capabilities and performance of the WIPP repository. While the long-term isolating capabilities of the repository are not in question, changes that may be necessary due to recovery efforts that may need to be accounted for in the long-term compliance demonstration at some point. Some changes may require EPA approval before they can be implemented if they lead to conditions that are significantly different than what was presented in the most recent compliance application. In order to avoid unnecessary delays in both approval and implementation of such changes, this paper presents a regulatory strategy to assure that repository changes necessary for recovery are implemented as soon as possible while remaining in compliance with the current regulatory certification.

RECERTIFICATION, PLANNED CHANGE REQUESTS, AND THE COMPLIANCE BASELINE

Experience gained from the first two recertification efforts has shown that achieving a Recertification Decision by the EPA is an arduous process and can span years from development of the CRA through EPA's review and certification decision. Once a recertification decision is issued, the CRA and its supporting documentation represent the new "compliance baseline." This baseline also includes any published deliberations made by the EPA in support of their decision. It is upon this new baseline that any subsequent changes made to the disposal system will be evaluated and approved. If a given change is approved, then the compliance baseline is effectively migrated to include approved change. The lengthy multi-year recertification cycle is troublesome because it is very difficult to introduce new changes into the compliance baseline while the EPA is focusing its efforts on review and approval of a recertification application. Doing so would only serve to delay the EPA's review and approval of the CRA.

As previously mentioned, significant changes to the disposal system cannot be implemented without prior approval. EPA approval of such changes is sought via “planned change requests” or “PCRs.” These changes cannot be introduced and evaluated in a CRA. For this reason, the DOE carefully stages planned changes for the interim period between the time the EPA issues a recertification decision and the time at which the DOE must begin preparing the next CRA. An example of a repository change that has been deemed “significant” and executed via the planned change process is the change from the “Option D” panel closure system to the Run-of-Mine Salt Panel Closure System submitted to EPA September 28, 2011. EPA published their proposed rule to approve the new closure system on December 3, 2013 [6], and published the final approval in the Federal Register October 8, 2014 [7]. This 3-year process illustrates the need for communication and coordination of any PCRs that occur between recertification submittals.

The long-term effects of a given planned change are typically evaluated using the most current compliance baseline and the most current PA models. In most cases, the most current baseline must be used because it represents the latest EPA-approved performance evaluation system. Analyzing impacts using outdated (or new, but yet unapproved) PA models is not acceptable in a formal regulatory environment. Therefore a “blackout” period effectively exists during which the DOE does not introduce new changes to the disposal system, and the EPA focuses on reviewing and issuing a recertification decision. Thus far, the DOE and EPA have cooperated and coordinated the timing of planned changes such that operational priorities and recertification activities are optimized for both parties. This informal but yet structured submittal/review/approval method has worked well in previous recertification cycles.

RECENT WIPP EVENTS, WIPP RECOVERY EFFORTS, AND THE REGULATORY PATH FORWARD

The underground fire and radiation release mentioned previously have caused cessation of waste disposal activities. While significant to day-to-day operations, these events have essentially no impact to the long-term performance of the repository. Because WIPP’s recertification is based solely on the 10,000-year regulatory period beginning at repository closure, these recent events do not affect the long-term performance predictions or its basis. Recovery efforts, however, may require changes to the facility in order to return to operational status. Such changes may be determined significant enough to merit EPA approval. As mentioned previously, such planned changes, if deemed “significant,” must be evaluated against the most current compliance baseline (currently the CRA-2009). Also note that because the DOE submitted the CRA-2014 in March 2014, we are currently in the midst of the “blackout period.” That is, any new changes introduced at this time would necessarily be evaluated using the current, but arguably outdated CRA-2009 baseline. The CRA-2014 baseline has not been approved and will not be suitable for use as an analytic tool until EPA makes its recertification decision. Furthermore, the CRA-2014, in its current form, does not include any changes that might be needed for recovery. Therefore, any recovery-related changes that are evaluated using the CRA-2009 baseline would again need to be factored into the CRA-2014 baseline, once it is approved. This needless redundancy should be avoided. Because the WIPP project is in the early stages of implementing the Recovery Plan, it is premature to identify what, if any changes to the repository will be necessary. It seems prudent, then, for EPA to focus on reviewing and approving the CRA-2014, thereby providing an up-to-date compliance baseline that would be a

suitable analytic tool with which to evaluate any repository changes needed for the recovery of WIPP.

CONCLUSION

Clearly, the recent WIPP fire and release events were unplanned and their strain on the regulatory schedule could not be avoided. These events should not, however, be construed in such a way as to cast doubt on the long-term isolating capabilities of the WIPP; they do not. Moreover, these events should not derail the current regulatory path forward. Pausing the current review of the CRA will only serve to unnecessarily delay the resumption of waste disposal operations at the WIPP by lengthening the regulatory recertification and change approval process. Therefore it is necessary for EPA to expeditiously review and approve the CRA-2014 such that any new change proposal can be assessed against the CRA-2014's current baseline.

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