Title 40 CFR Part 191
Subparts B and C
Compliance Recertification Application 2014
for the
Waste Isolation Pilot Plant

Consideration of the Presence of Resources
(40 CFR § 194.45)

United States Department of Energy
Waste Isolation Pilot Plant

Carlsbad Field Office
Carlsbad, New Mexico

Compliance Recertification Application 2014
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Acronyms and Abbreviations

CCA	Compliance Certification Application
CFR	Code of Federal Regulations
CRA	Compliance Recertification Application
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
FEP	feature, event, and process
PA	performance assessment
PABC	performance assessment baseline calculation
WIPP	Waste Isolation Pilot Plant

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45.0 Consideration of the Presence of Resources (40 CFR § 194.45)

45.1 Requirements

§ 194.45 Consideration of the Presence of Resources

Any compliance application shall include information that demonstrates that the favorable characteristics of the disposal system compensate for the presence of resources in the vicinity of the disposal system and the likelihood of the disposal system being disturbed as a result of the presence of those resources. If performance assessments predict that the disposal system meets the containment requirements of §191.13 of this chapter, then the Agency will assume that the requirements of this section and §191.14(e) of this chapter have been fulfilled.

45.2 Background

40 CFR § 194.45 (U.S. EPA 1996a) implements the assurance requirement that the disposal system be sited so that the benefits of the disposal system's natural barriers compensate for the increased probability of disruptions to the disposal system resulting from exploring and developing existing resources. In promulgating this requirement, the U.S. Environmental Protection Agency (EPA) determined that performance assessment (PA) provides a rigorous analytical methodology to determine whether the Waste Isolation Pilot Plant (WIPP) site has compensating features that outweigh the presence of resources (U.S. EPA 1996b). In accordance with the compliance criteria, the U.S. Department of Energy (DOE) must demonstrate that the PA has incorporated the potential effects of human activities near the WIPP prior to disposal, and of drilling and excavation mining over the regulatory time frame.

45.3 1998 Certification Decision

In the Compliance Certification Application (CCA) (U.S. DOE 1996), Chapter 7.0, Section 7.5, the DOE describes the measures taken to comply with the requirements of section 194.45. The CCA, Chapter 7.0, Section 7.5 states that the results of the PA, taking into account the potential for resource exploration, met the containment requirements of the EPA as dictated by the disposal regulations and compliance criteria. The CCA, Chapter 7.0, Section 7.5.2 states that the DOE concluded that the favorable characteristics of the WIPP compensate for any possible disturbance.

The EPA found that the information contained in the CCA, Chapter 7.0, Section 7.5, and portions of the CCA cross-referenced in Chapter 7.0, Section 7.5, demonstrates that the DOE accounted for potential resource exploration and met the EPA's requirements based on the results of the PA. Furthermore, the DOE's Final Environmental Impact Statement for the WIPP indicates that resource considerations were taken into account during the disposal system's site selection process (U.S. DOE 1980, Volume 1, Section 7.3.7). Based on these factors, the EPA concluded that the DOE complied with the requirements of section 194.45. A complete description of the EPA's 1998 Certification Decision for section 194.45 can be obtained from U.S. EPA 1998a and U.S. EPA 1998b.

45.4 Changes in the CRA-2004

The DOE did not report any significant changes to the information on which the EPA based the 1998 Certification Decision. The Compliance Recertification Application (CRA) of 2004 (CRA-2004) (U.S. DOE 2004), Chapter 7.0, Section 7.5, contains all the changes related to resource considerations since 1998. The DOE made some minor changes to the list of features, events, and processes (FEPs) considered in the CRA-2004, but the changes did not affect the outcome of the PA. (See the CRA-2004, Appendix SCR, Table SCR-1.)

In the CRA-2004, Chapter 7.0, Section 7.5, the DOE demonstrated that:

- The effects of mining and drilling over the regulatory time frame have been incorporated into the PA according to the requirements of sections 194.32, 194.33, and 194.43.

- The PA incorporates the effects on the disposal system of any activities that occur in the vicinity of the disposal system or are expected to occur in the vicinity of the disposal system during the 10,000-year regulatory period, according to the requirements of section 194.32.

- The results of the PA demonstrate compliance with the containment requirements of section 191.13 (U.S. EPA 1993).

The results of the recertification PA are documented in the CRA-2004, Chapter 6.0, Section 6.5, and in supplemental information on the CRA-2004 Performance Assessment Baseline Calculation (PABC) (Leigh et al. 2005). In addition, the impacts of resource development outside the controlled area were considered in the development of the WIPP's conceptual models, as well as in the site selection process.

45.5 EPA's Evaluation of Compliance for the 2004 Recertification

The EPA's review of the activities and conditions in and around the WIPP site did not identify any significant changes since the 1998 Certification Decision related to the presence of resources.

Based on a review and evaluation of the CRA-2004; supplemental information in the CCA, Appendices GCR, IRL, and DEL provided by the DOE in the CRA-2004; and an assessment of changes since 1998, the EPA determined that the DOE continued to comply with the requirements in section 194.45.

45.6 Changes or New Information Between the CRA-2004 and the CRA-2009 (Previously: Changes or New Information Since the 2004 Recertification)

Section 194.45 states, "If performance assessments predict that the disposal system meets the containment requirements of Section 191.13 of this chapter, then the Agency will assume that the requirements of this section and §191.14(e) of this chapter have been fulfilled." Therefore, provided that the PA appropriately incorporates processes relating to resource discovery and production, and predicts releases that are below limits established by the EPA, compliance with section 194.45 will have been demonstrated. This conditional logic relies heavily upon whether

or not the PA is structured to appropriately represent resource-related activities at the WIPP site. To accomplish this, the DOE used a structured methodology to identify and select FEPs that may have an impact on the disposal system. This process was documented in CRA-2009 (U.S. DOE 2009) Section 32, "Scope of Performance Assessment," and Appendix SCR-2009. There were no changes in screening decisions for resource-related FEPs for the CRA-2009.

While there were no screening changes for FEPs related to the presence of resources, there were two changes relating to the implementation of the presence of resources in PA models. These changes included a new drilling rate (LAMBDAD) (see Appendix DATA-2009 and Appendix PA-2009, Section PA-2.1.1) and a change in the duration of direct brine releases through the PA parameter MAXFLOW (see Appendix PA-2009, Section PA-2.1.1). These changes were not significant, but were made to incorporate the most recent information available relating to the exploitation of resources (see "Consideration of Drilling Events in Performance Assessment," Section 33). Besides these two drilling-related parameters, there were no planned changes adopted by the DOE since the CRA-2004 that impact the previous position and bases for demonstrating compliance with this section. The PA calculations responsive to section 191.13 showed predicted releases to be well within the regulated limits and demonstrated that the favorable characteristics and isolating capability of the WIPP outweigh the risks associated with the presence of resources at the site. Therefore, the requirements of section 194.45 were met.

45.7 EPA's Evaluation of Compliance for the 2009 Recertification

During the EPA's review of the activities and conditions in and around the WIPP site, no significant changes were identified that relate to the presence of resources since the 1998 Certification or 2004 Recertification decisions.

The EPA concluded that the PABC-2009 (Clayton et al. 2010) predicted releases within the regulatory limits; therefore, the favorable characteristics of the site continue to outweigh risks associated with the presence of resources. In addition, the impacts of resource development outside the controlled area were considered in the development of the WIPP's conceptual models, as well as in the site selection process. The EPA did not receive any public comments on the DOE's continued compliance with the Consideration of the Presence of Resources requirements of section 194.45 (U.S. EPA 2010a).

Therefore, based on a review and evaluation of the CRA-2009 and its supplemental information, the EPA determined that the DOE continued to comply with the requirements for section 194.45 (U.S. EPA 2010b).

45.8 Changes or New Information Since the CRA-2009

The DOE monitors resource-related activities within the WIPP vicinity, and updates parameters and/or models as appropriate to assure that current practices are accurately represented in the WIPP PA (U.S. DOE 2012). Since the last recertification application, the rate of drilling for petroleum resources has increased to 67.3 boreholes per square kilometer over 10,000 years. This is represented as PA parameter (LAMBDAD) (Kicker and Herrick 2013), and is an increase from the value of 59.8 boreholes per square kilometer used in the PABC-2009. Additionally, the representation of borehole plugs has changed slightly, based on minor changes in the number of

plugs emplaced per borehole in recently plugged and abandoned boreholes near the WIPP (U.S. DOE 2012). The WIPP PA parameter GLOBAL:PBRINE has been updated to reflect over 15 years of additional data in the immediate vicinity of the WIPP with regard to the occurrence of pressurized brine while drilling (Kirchner et al. 2012). Finally, the PA parameter BOREHOLE:TAUFAIL has also been updated based on the results of experiments conducted since the last certification application (Herrick et al. 2012). These parameter updates have a minimal impact upon PA results, which continue to show predicted releases well within the regulated limits established in section 191.13.

Conventional mining for potash is continuing within the vicinity of the WIPP. The effects of mining are accounted for in the WIPP PA as prescribed by section 194.32(b). The implementation of the mining scenario in the WIPP PA is described in Appendix PA-2014, Section PA-3.9.

A solution mining project operated by Intrepid Potash Corporation has begun just outside the Delaware Basin boundary since the CRA-2009. The initiation and operation of this activity does not affect the current representation of mining in the WIPP PA, and therefore no changes have been made to the WIPP models. The description, screening argument, and screening decision for this activity are presented in Appendix SCR-2014, Section SCR-5.2.2.3.

Because the WIPP PA results show that predicted releases are below the limits established by section 191.13, and because these calculations account for the exploitation of resources present, it has been demonstrated that the favorable characteristics and isolating capability of the WIPP outweigh the risks associated with the presence of resources at the site. Therefore, the requirements of section 194.45 are met.

45.9 References

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