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Waste Isolation Pilot Plant Certification Management Plan

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ABBREVIATIONS AND ACRONYMS

AIC	active institutional controls
ASME	American Society of Mechanical Engineers
CBFO	Carlsbad Field Office
CCA	Compliance Certification Application
CCDF	complementary cumulative distribution function
CFR	Code of Federal Regulations
CMP	Certification Management Plan
CRA	Compliance Recertification Application
CTAC	CBFO Technical Assistance Contractor
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
EM	DOE Office of Environmental Management
FEP	features, events, and processes
LANL	Los Alamos National Laboratory
LWA	Land Withdrawal Act
MgO	magnesium oxide
M&OC	Management and Operating Contractor
OAR	Office of Air and Radiation
PA	Performance Assessment
PIC	passive institutional controls
PDP	Performance Demonstration Program
QAPD	Quality Assurance Program Document
QA	quality assurance
SA	Scientific Advisor
SNL-CPG	Sandia National Laboratories – Carlsbad Program Group
TRU	transuranic
USDW	underground sources of drinking water
WAC	Waste Acceptance Criteria
WIPP	Waste Isolation Pilot Plant
WWIS	WIPP Waste Information System

1.0 INTRODUCTION

The U.S. Department of Energy (DOE) Waste Isolation Pilot Plant (WIPP) is the nation's first deep geologic repository certified for the disposal of defense-related transuranic (TRU) waste. The construction of WIPP was authorized by Section 213 of the *Department of Energy National Security and Military Applications of Nuclear Energy Authorization Act of 1980* (Public Law [Pub. L.] 96-164; 93 Statute 1259, 1265). The TRU waste being disposed of in the repository was generated by atomic energy defense activities resulting from all of the non-civilian activities and programs of the DOE, including weapons production, naval reactors, defense research and development, associated defense environmental restoration and waste management and other defense-related activities, as defined more specifically in the Nuclear Waste Policy Act.

Under the Waste Isolation Pilot Plant Land Withdrawal Act (LWA), Public Law 102-579, as amended, Congress provided the DOE jurisdiction over a 16-square-mile parcel of land in southeast New Mexico for WIPP. The LWA also established the regulatory authority of the U.S. Environmental Protection Agency (EPA) by specifying that the underground emplacement of TRU wastes for disposal at WIPP could not commence until the DOE submitted a Compliance Certification Application (CCA) which demonstrated WIPP compliance with EPA radioactive waste disposal standards found in Subparts B and C of Title 40 *Code of Federal Regulations* (CFR) Part 191, *Environmental Protection Standards for the Management and Disposal of Spent Nuclear Fuel, High-Level and Transuranic Radioactive Wastes*; and the EPA certified the WIPP compliance using the WIPP-specific criteria of 40 CFR Part 194, *Criteria for the Certification and Re-Certification of the Waste Isolation Pilot Plant's Compliance With the 40 CFR Part 191 Disposal Regulations*. Finally, the LWA requires the EPA to conduct periodic recertification of continued compliance beginning five years after the initial receipt of TRU waste for disposal and at five-year intervals thereafter until the end of the decommissioning phase.

The DOE submitted a CCA to the EPA in October 1996. The CCA included facility information, regional descriptive information, summaries of more than 20 years of scientific studies, details of the long-term repository performance assessments (PAs), and descriptions of programs in place to monitor the long-term performance of the WIPP repository. The EPA evaluated the CCA and subsequent technical responses from the DOE and on May 18, 1998, issued a rulemaking with a certification decision showing that WIPP met the radioactive waste disposal standards. The WIPP facility began receiving waste shipments on March 26, 1999, which began the recurring recertification process required by the LWA.

The documents used by the EPA to reach their certification decision (63 FR 27354, May 18, 1998) and to document their subsequent oversight activities are legal and regulatory documents that are located in the following EPA Air Dockets:

- EPA Air Docket A-93-02, containing information the EPA used in reaching their certification decision such as the Compliance Application Review Documents, the

response to comments, and the Final Rule and Preamble: Certification Decision - May 13, 1998.

- EPA Air Docket A-98-49, containing information about the EPA's oversight activities since the certification decision.

The EPA Certification is subject to change by rulemaking. The DOE manages the corresponding WIPP compliance program and provides the mandated documentation of continued compliance every five years, also known as a Compliance Recertification Application (CRA).

With the certification of WIPP and the initiation of waste disposal operations, the DOE Carlsbad Field Office (CBFO) issued this Certification Management Plan (CMP) to establish the processes for the following:

- Maintain and document continued compliance with the disposal regulations.
- Manage ongoing activities of the Management and Operating Contractor (M&OC), the scientific advisor (SA), and other DOE contractors fulfilling requirements of the certification.
- Report, track and document changes to the certification.
- Prepare for recertification.

The CBFO's objectives for this plan are to:

- Describe the Certification Program elements used to demonstrate compliance with 40 CFR Part 191, Subparts B and C.
- Explain the related relationships, duties, and responsibilities of the DOE and WIPP support organizations.
- Describe routine, recurring and nonroutine functions.
- Provide information to aid in communication with regulators.

2.0 OVERVIEW OF THE WIPP-SPECIFIC CRITERIA

This section identifies and briefly discusses the criteria of 40 CFR Part 194 that are relevant to the CMP. These criteria are found in Subpart A, "General Provisions," Subpart B, "Compliance Certification and Recertification Applications," and Subpart C, "Compliance Certification and Recertification General Requirements." Subpart D, Public Participation, is applicable only to EPA and is not included in this plan.

2.1 General Provisions

The following general provisions of 40 CFR Part 194, Subpart A, are important to Certification Management:

- **Purpose, Scope, and Applicability** - Define the extent and relevance of the criteria as they apply to the certification or recertification of WIPP (§194.1).

- **Definitions** - Provide the meaning of key regulatory terminology (§194.2).

- **Communications** - Specify the signature requirements for a recertification, and for communications and written reports submitted by the Secretary of Energy to the Administrator of the EPA (§194.3).

- **Conditions of a Compliance Certification** - Identify the EPA's authority to specify conditions when issuing a certification and to modify, suspend, or revoke the certification. Provides requirements and schedules for reporting planned and unplanned changes, either significant or non-significant, to the Compliance Certification and reporting requirements for a release or expected release of radionuclides (§194.4).

- **Publications Incorporated by Reference** - Reference publications that are relevant to certification management and the preparation of a recertification application (§194.5).

- **Alternative Provisions** - Establish procedures by which the EPA may propose alternative provisions for any of the Compliance Criteria of 40 CFR Part 194 (§194.6).

- **Approval Process for Waste Shipment from Waste Generator Sites for Disposal at WIPP -** Describe the criteria for quality assurance and waste characterization programs that must be approved by the EPA before TRU waste generator/storage sites can commence shipments to WIPP (§194.8).

The DOE prepares various reports to demonstrate compliance with the EPA criteria. The specific details of these reports are documented in the *Waste Isolation Pilot Plant Reporting Implementation Plan* (DOE/WIPP 99-2286).

2.2 Compliance Recertification Applications

Title 40 CFR Part 194 Subpart B sets forth the format and content for recertification applications, including required content, submission of reference material, and

completeness requirements. The criteria that are relevant to Certification Management are identified below:

- **Completeness and Accuracy of Compliance Applications** - Establish the process used by the EPA to determine that the DOE has produced a complete and accurate recertification application, and provide a schedule for the EPA to review the application (§194.11).

- **Submission of Compliance Applications and Reference Materials** - Identify the format and the number of compliance recertification applications, along with required reference material that must be sent to the EPA (§194.12 and §194.13).

- **Content of a Compliance Recertification Application** - List the elements required for a complete compliance application and specify the relevant information needed in a recertification application (§194.14 and §194.15).

2.3 Compliance Recertification General Criteria

Title 40 CFR Part 194 Subpart C implements criteria that are relevant to Certification Management. These criteria include:

- General Criteria
- Containment Criteria
- Assurance Criteria
- Groundwater and Individual Protection

2.3.1 General Criteria

The general criteria of Subpart C must be met in all recertification activities. These general criteria include §§194.21 through 194.27, as discussed below:

- **Inspections** - Authorize the EPA to conduct announced and unannounced inspection of all activities and relevant records at WIPP and TRU waste generator/storage sites that provide information included in compliance recertification applications (§194.21).

- **Quality Assurance (QA)** - Establish the criteria for the DOE to have a Quality Assurance program for work conducted for EPA activities. This QA program must meet the requirements of the American Society of Mechanical Engineers (ASME) NQA-1-1989 edition, (ASME NQA-2a-1990 addenda, part 2.7, to ASME NQA-2-1989 edition, and ASME NQA-3-1989 edition (excluding Section 2.1[b] and [c], and Section 17.1) and that data and information collected have been qualified pursuant to specific requirements (§194.22).

- **Models and Computer Codes** - Identify the criteria that must be applied to models and computer codes used in performance assessments and compliance assessments that support EPA recertification activities (§194.23).

- **Waste Characterization** - Implement criteria for documenting the physical, chemical, and radionuclide composition of existing waste and projected waste that will be emplaced, and establishes the criteria for tracking upper or lower limits of waste components that have been identified as important to PA (§194.24).

- **Future State Assumptions** - Establish how performance and compliance assessments are to incorporate assumptions about future events, with specific criteria related to the dynamic analyses of three classes of natural processes, namely hydrogeologic, geologic, and climatic conditions that will evolve over the 10,000-year regulatory time frame (§194.25).

- **Expert Judgment** - Provide guidance on when and how an individual expert or panel of experts may be used to support the certification process and lists the criteria that must be met in an expert judgment elicitation (§194.26).

- **Peer Review** - Impose specific criteria for conducting the peer review process for conceptual models, waste characterization assessments, and engineered barriers studies in a manner compatible with NUREG-1297 (§194.27).

2.3.2 Containment Criteria

The containment criteria apply to cumulative releases of radionuclides to the "accessible environment" over the 10,000-year regulatory period from both undisturbed and disturbed scenarios. The criteria of §§194.31 through 194.34, outlined below, implement the numerical containment requirements of §191.13. Specifically, releases from a disposal system to the accessible environment over the regulatory time frame must have less than one chance in ten of exceeding the release limits set forth in Appendix A, Table 1, of §191.13, and have less than one chance in 1,000 of exceeding ten times the release limits set forth in the same table.

- **Application of Release Limits** - Establish the criterion that releases from a disposal system to the accessible environment not exceed the release limits set forth in Appendix A, Table 1, of §191.13, and criterion that release limits be calculated based on the time of disposal (that is, after decommissioning) §194.31).

- **Scope of Performance Assessments** - Establish the criterion for the scope of the parameters used in PAs in determining the likelihood that WIPP will not exceed the §191.13 release limits during the 10,000-year regulatory time frame. This criterion also requires PA to include both natural and man-made processes and events and all other processes, events, or sequences, and combinations of

processes and events that may affect the repository over the regulatory time frame (§194.32).

- **Consideration of Drilling Events in Performance Assessments** - Establish specific criteria for incorporation of human-initiated drilling events in the PA based upon different scenarios as a single event or a combination of events. Drilling rates and activities are a key element in the calculation of releases that are used to demonstrate compliance with the containment requirements (§194.33).

- **Results of Performance Assessments** - Establish the criteria for the results of the PA to be expressed using complementary cumulative distribution functions (CCDFs). To document the development of probability distributions and the computational techniques used for drawing random samples from these probability distributions, for any uncertain parameters used in the PA. The PA is also to include a statistically sufficient number of CCDFs and any certification or recertification application must display the full range of CCDFs generated. Finally, any certification or recertification application must demonstrate that the mean of the population of CCDFs meets the containment requirements of §191.13 with at least a 95 percent level of statistical confidence (§194.34).

2.3.3 Assurance Criteria

Title 40 CFR §191.14 implemented six qualitative assurance standards that complement the containment standards of §191.13 by providing confidence needed for demonstrating long-term compliance with the containment standards. The DOE is to demonstrate compliance with the qualitative assurance standards in any recertification application per the criteria of 40 CFR §§194.41 through 194.46. The criteria for each of the assurance requirements are as follows:

- **Active Institutional Controls (AICs)** - Establish the criteria for the DOE to control access to the disposal site following closure and prevent human intrusion into the WIPP facility up to 100 years after disposal (§194.41).

- **Monitoring** - Provide that the DOE conduct preclosure and postclosure monitoring of disposal system parameters that were identified through analysis as having a potential to affect the containment of waste in the disposal system (§194.42).

- **Passive Institutional Controls (PICs)** - establish the criteria for the DOE to implement a program to preserve knowledge about the location, design, and contents of the WIPP disposal system to avert future unintentional intrusions into the repository. The program is defined as including, but not being limited to, permanent markers placed at a disposal site, public records and archives, government ownership and regulation of land or resource use, and identification of various methods to preserve knowledge about the location, design, and contents of a disposal system (§194.43).

- **Engineered Barriers** - Establish the criteria for the DOE to incorporate in the disposal system engineered barrier(s) designed to prevent or substantially delay the movement of water or radionuclides toward the accessible environment (§194.44).

- **Consideration of the Presence of Resources** - Establish the criteria for the DOE to demonstrate through PA that the WIPP disposal system meets the containment requirements of §191.13. Further, the DOE must demonstrate that the favorable characteristics of the WIPP disposal system outweigh the presence of resources in the vicinity of WIPP and the potential for the disposal system to be disturbed because of those resources (§194.45).

- **Removal of Waste** - Establish the criteria for the DOE to document the feasibility of removing emplaced waste from the disposal system for a reasonable period of time, following emplacement (§194.46).

2.3.4 Individual and Groundwater Protection

The individual and groundwater protection criteria of 40 CFR Part 194 together implement the quantitative requirements of §191.15 and 40 CFR Part 191, Subpart C, which places limitations on both the potential radiation exposure of individuals and the possible levels of radioactive contamination of groundwater due to waste disposal. The individual protection criteria require the disposal facility to provide a reasonable expectation that for 10,000 years after disposal, undisturbed performance will not cause the annual committed effective dose equivalent to exceed 15 millirems (150 microsieverts) to any member of the public in the accessible environment. The groundwater protection criteria provide underground sources of drinking water (USDW) be protected to the extent prescribed by the Safe Drinking Water Act regulations at 40 CFR Part 141.

The following criteria ensure compliance with individual and groundwater protection requirements of §191.15:

- **Consideration of Protected Individual and of Exposure Pathways** - Provide specific assumptions for calculating concentrations of potential radionuclide contaminants in groundwater resulting from releases under different physical circumstances, and for determining the dose that would be received by a hypothetical individual making use of that water. The hypothetical individual is to be situated at the point of maximum exposure. The dose calculation is to consider all potential exposure pathways from the repository to the exposed individuals and the individual is assumed to consume two liters of water per day from any underground source (§§194.51 and 194.52).

- **Consideration of USDW** - Establish the criterion that USDW in the accessible environment that are expected to be affected by the disposal system over the regulatory time frame, and their interconnection, be considered in compliance assessments to demonstrate compliance with the groundwater protection

requirements at 40 CFR Part 191, Subpart C. This section also specifies factors that must be considered in compliance assessments that analyze dose to a hypothetical individual resulting from exposure to radioactive contaminants in USDW (§194.53).

- **Scope of Compliance Assessments** - Contain criteria that must be followed when conducting compliance assessments to demonstrate the disposal system is in compliance with the individual dose and groundwater protection requirements (§194.54).

- **Results of Compliance Assessments** - Specify information and documents that are to be included in compliance assessment packages prepared to demonstrate compliance with the individual dose limits and radionuclide concentration limits for groundwater implemented by the individual protection requirements of 40 CFR §191.15 and the groundwater protection requirements of Subpart C of 40 CFR Part 191 (§194.55).

3.0 CBFO PROGRAM ORGANIZATIONS AND RESPONSIBILITIES

The DOE CBFO oversees the operation of the WIPP facility. The CBFO organizations and their areas of responsibility are outlined in the *Safety Management Functions, Responsibilities, and Authorities Manual*, DOE/WIPP 98-2287. These organizations oversee and direct activities associated with the following:

- Waste acceptance
- Waste characterization and packaging
- Waste transportation
- Waste receipt and emplacement
- Repository mining and maintenance
- Regulatory compliance
- Internal audits and assessments
- Monitoring
- Repository performance assessment
- Repository investigations.

The CBFO also provides the infrastructure and unique WIPP facilities for activities related to underground science programs.

The CBFO manages the EPA Certification. The overall management of this program takes in several organizational units of the CBFO that are responsible for maintaining continued compliance with the disposal regulation within the areas of their management responsibility. The CBFO prepares and coordinates plans for the management of TRU waste disposed of at WIPP, assesses compliance with the program guidance, and reviews activities and assumptions among all defense TRU waste sites for characterization and transportation of TRU waste for disposal at WIPP.

3.1 Office of the Manager

The Office of the Manager directs CBFO activities as follows:

- Effectively operates a safe and efficient TRU waste repository at WIPP.
- Operates an effective system for management of TRU waste from generation to disposal.
- Complies with applicable laws, regulations, and permits.
- Provides the final approval on a recertification application before it is transmitted to the DOE Secretary of Energy for signature and submittal to the Administrator of the EPA.

The Office of the Manager reports directly to the DOE Office of Environmental Management (EM) for program policy and direction and ensures that the other offices of the CBFO perform in a manner that meets EM's expectations and the requirements of the EPA. The Office of the Manager also provides a full range of legal services in support of programmatic efforts across the CBFO and oversees underground experiments.

3.2 Office of Quality Assurance

The CBFO Quality Assurance Manager has the programmatic responsibility for implementing the CBFO *Quality Assurance Program Document* (QAPD) (DOE/CBFO 94-1012), which includes the quality assurance requirements needed to meet the criteria in 40 CFR §194.22. The provisions of the QAPD apply to all programs and projects managed by the CBFO that require a quality assurance program.

The CBFO and organizations supporting the CBFO are required to implement the applicable requirements of the QAPD within their systems for management and control. For work performed in support of the EPA Certification, the Office of Quality Assurance coordinates the following audits and surveillances to assure compliance with the QAPD.

- Facility certification/recertification
- CBFO QAPD implementation

- Performance Demonstration Program (PDP)
- Acceptable knowledge documentation
- Compliance monitoring programs
- Repository behavior modeling
- TRU inventory baseline data

3.3 Assistant Manager for Operations

The Assistant Manager for Operations provides day-to-day operational oversight within the CBFO. The Assistant Manager for Operations assists the CBFO Manager and Deputy Manager in the management of TRU waste characterization, packaging, transportation, acceptance, handling, and disposal. The Assistant Manager for Operations is responsible for development and execution of applicable policies and programs, and directs and supervises the Compliance Certification Manager, the Office of Site Operations, and the Office of National TRU Program.

3.3.1 Compliance Certification Manager

The Compliance Certification Manager is responsible for overseeing the daily management of the EPA Certification and for scheduling and managing activities including PA work and inventory updates required for the preparation and submittal of a CRA to the EPA. The Compliance Certification Manager is responsible for the preparation and maintenance of the CMP, and the *Recertification Project Plan*, DOE/WIPP 01-3199, which provide guidance to the CBFO and CBFO contractors in conducting certification and recertification activities. The Compliance Certification Manager is also responsible for the preparation and submittal of planned and unplanned change requests to the EPA that do not fall under the responsibility of another office and the preparation of the Annual Change Report pursuant to 40 CFR §194.4(b)(4).

The Compliance Certification Manager reports to the Assistant Manager of Operations and coordinates activities with the Director of the Office of the National TRU Program Disposal and the Office of the National TRU Program.

3.3.2 Office of Site Operations

The Office of Site Operations directs WIPP site activities. This office is responsible for the preparation and management of the *Compliance Monitoring Implementation Plan for 40 CFR §191.14(b)*, *Assurance Requirement* (DOE/WIPP 99-3119), which outlines the

monitoring parameters identified as important to PA in the certification process. The Office of Site Operations oversees the following:

- Monitoring programs
- Emplacement of waste
- Emplacement of magnesium oxide (MgO)
- Mining and closing of waste panels
- Preparation and submittal of planned and unplanned change requests to the EPA that fall under the responsibility of this office.
- Repository investigations

The Office of Site Operations is responsible for coordinating the activities of the compliance monitoring programs during the periodic EPA monitoring inspection. Pursuant to 40 CFR §194.4, the Office of Site Operations must document to the EPA that a proposed experiment in the underground, for example, or other non-WIPP related uses of the Withdrawal area, will not adversely impact disposal operations, and must receive EPA approval to proceed. The Office of Site Operations is responsible for the preparation and submittal of planned and unplanned change requests to the EPA that fall within their area of responsibility. With regard to underground experiments, the Office of Site Operations assures that the experiment is conducted within approved bounds consistent with the certification.

3.3.3 Office of the National TRU Program

The Office of the National TRU Program is responsible for oversight of generator site waste characterization, certification authorities, the certification process, the PDP, inventory management, and TRU waste planning. When a generator site makes a declaration of readiness, the Office of the National TRU Program formally notifies the Office of the Manager and EPA of the declaration, initiating the audit process that leads to certification or recertification of the site to ship waste to WIPP. In preparation for a site audit, the Office of the National TRU Program provides the following to EPA Office of Air and Radiation (OAR):

- Relevant waste characterization program plan
- Site-specific quality assurance project plan
- TRU waste certification plan and any other required documentation
- A list of containers for replicate testing

The Office of the National TRU Program then schedules the audit as well as activities leading up to the audit, such as the following:

- Conference calls with the EPA
- Availability of CBFO technical and quality assurance personnel
- Availability of site technical and quality assurance teams to discuss quality assurance deficiencies, nonconformance findings, written corrective action reports, or other issues

Further, the Office of the National TRU Program is responsible for the preparation and submittal to the EPA of planned and unplanned change requests that fall within their area of responsibility.

4.0 CBFO CONTRACTOR ORGANIZATIONS AND RESPONSIBILITY

The CBFO has assigned areas of responsibility to its contractors for maintaining compliance with the EPA Certification. The general areas of responsibility for the contractors are as follows:

- The M&OC manages the operation of the WIPP site, including environment, safety, and health functions, permitting, mobile characterization, and quality assurance.
- Sandia National Laboratories - Carlsbad Program Group (SNL-CPG) is the scientific advisor for recertification, conducting experimental programs and PA activities required to show that the waste disposal system can safely isolate TRU wastes from the environment for at least 10,000 years.
- Los Alamos National Laboratory (LANL) is the scientific advisor for waste characterization, updates the TRU waste inventory, and oversees mobile loading.
- The CBFO Technical Assistance Contractor (CTAC) provides technical support to CBFO for waste characterization, QA audits and surveillances, operational assessments, program reviews, and evaluations of WIPP support organizations and waste generator sites.

While each of the contractors have different areas of responsibility, the activities of one contractor will often have dependencies on those of the other contractors. It is therefore important for the CBFO to ensure that the contractors maintain a well-integrated relationship throughout the life of the project to ensure successful results. Contractor responsibilities and dependencies are identified in Table 1.

Table 1 - CBFO Contractor Responsibilities and Relationships		
M&OC	**SNL-CPG**	**LANL**
GENERAL REQUIREMENTS (40 CFR §§194.21 through 194.27)		
Quality Assurance Program • Work conducted for EPA. These activities include waste characterization activities, monitoring activities and field measurement.	**Quality Assurance Program** • Work conducted for PA Certification activities must meet the criteria of §194.22.	**Quality Assurance Program** • Work conducted to update the repository waste envelope.
	Models and Computer Codes • Development and implementation of conceptual models and computer codes must meet the criteria of §194.23.	
Waste Characterization §194.24 Record Keeping and Accounting • WIPP Waste Information System (WWIS) is used to gather, store, and process information pertaining to TRU waste. • WWIS stores information pertaining to characterization, certification, and emplacement of waste at WIPP. • The WWIS tracks waste components and associated uncertainties against their upper and lower limits. • The WWIS tracks radionuclides important to PA.		**Waste Characterization** • Provide routine updates to the repository waste envelope that includes emplaced waste, stored waste and anticipated waste.
	Future States Assumption • Assure that features, events, processes (FEPs), and related scenarios are consistent with the criteria of §194.25.	
Expert Judgment • Expert judgment or elicitation used to support a compliance application.	**Expert Judgment** • Expert judgment or elicitation used to support a compliance application.	**Expert Judgment** • Expert judgment or elicitation used to support a compliance application.
Peer Review • Peer Review is a nonroutine, activity-dependent process used to support a compliance application.	**Peer Review** • Peer Review is a nonroutine, activity-dependent process used to support a compliance application.	**Peer Review** • Peer Review is a nonroutine, activity-dependent process used to support a compliance application.

Table 1 - CBFO Contractor Responsibilities and Relationships		
M&OC	**SNL-CPG**	**LANL**
Containment Requirements (40 CFR §§194.31 through 194.34)		
Consideration of drilling events in Performance Assessment • Routinely collect data to determine drilling rate for use in PA.	**Performance Assessments Assessment** • Periodically reevaluate and screen all FEPs and subsequent scenarios relevant to PA in accordance with §194.32(e) Periodically rerun PA and demonstrate that the mean of the population of CCDFs meets the containment requirements of §191.13.	
ASSURANCE REQUIREMENTS (40 CFR §§194.41 through 194.46)		
Parameters Monitored to Support Conceptual Models, FEPs, Modeling Assumption and Performance Assessment Collect monitoring data and repository investigation data, as required by the Certification, and provides this data to SNL-CPG.	**Parameters Monitored to Support Performance Assessment** Collect repository investigation data that together with the monitoring data collected by the M&OC is analyzed for impacts to the long-term performance of the repository.	**Parameters Monitored to Support Performance Assessment** Update the TRU waste inventory data documents and analyses that SNL-CPG uses to support PA. The inventory data is also reported in the recertification application. Conduct Actinide chemistry experimental studies in support of long-term compliance.
Engineered Barrier MgO • MgO emplaced with waste	**Engineered Barrier MgO** • MgO emplaced with waste	**Engineered Barrier MgO** • MgO emplaced with waste
Presence of Resources • Types and quantities of natural resources present at the site	**Presence of Resources** • Types and quantities of natural resources present at the site	
INDIVIDUAL AND GROUNDWATER PROTECTION (40 CFR §§194.51THROUGH 194.55)		
Individual and Groundwater Protection Requirements • Periodically review existing data on USDW and update for use in compliance assessments if required.	**Individual and Groundwater Protection Requirements** • Periodically review existing data on USDW and update for use in compliance assessments if required.	

The M&OC is also responsible for maintaining a compliance library. The compliance library is a document management system that is an electronic document management system (at the time this plan was approved the system was operated on Hummingbird® software). The library provides a centralized on-line repository of compliance-related electronic documents that can be easily accessed using a web-based browser interface. The system is used in the management of the certification to track correspondence, log regulatory requests and responses, retain institutional memory, and be a tool for compiling the documentation of continued compliance. Security is provided by data encryption and password authorization. Configuration control is performed by allowing varying access levels and permissions to users, and by logging access to documents by time, date, user and type of access.

5.0 EPA CERTIFICATION MANAGEMENT ACTIVITIES

Maintaining continuing compliance with the EPA Certification requires due diligence on the part of CBFO and its contractors. The activities that must be performed to maintain compliance include:

- Routine activities that occur on a regular basis (e.g., daily, monthly, quarterly)
- Nonroutine activities
- Change management activities performed to determine the impact of a change and to identify the best path forward
- Recertification, the periodic documentation of continued compliance with the disposal regulations

5.1 Routine Activities

Activities that occur on a regular basis are considered routine. Routine activities required by the EPA Certification are discussed in this section.

5.1.1 Monitored Activities

Monitoring conducted to demonstrating compliance with the requirements of 40 CFR §191.14(b) is done in accordance with the criteria of 40 CFR §194.42. Monitoring provides data on disposal system parameters that have been deemed appropriate for evaluating the long-term performance of the repository based on an analysis conducted by SNL-CPG. This analysis, which is addressed in Chapter 7 and Appendix MON of the EPA Certification, is reevaluated at least once every five years as part of the recertification effort to determine if any of the parameters need to be changed. Ten parameters are monitored. These parameters can be divided into those relating to PA and those relating to conceptual models, FEPs, and modeling assumptions. The monitoring parameters related to PA are:

- Waste activity
- Culebra groundwater composition
- Change in Culebra groundwater flow
- Drilling rate in the Delaware Basin
- Probability of encountering a Castile brine reservoir in the Delaware Basin

The monitoring parameters related to conceptual models, FEPs and modeling assumptions are:

- Creep closure and stresses
- Extent of brittle deformation
- Initiation of brittle deformation
- Displacement of deformation features
- Subsidence in the vicinity of the repository

The M&OC is responsible for conducting monitoring activities. The M&OC organizations responsible for monitoring and the frequency for conducting the monitoring and reporting results are outlined in DOE/WIPP 99-3119.

The M&OC has established five monitoring programs that collect data and information on each of the parameters. The monitoring programs and plans they use to conduct their work are identified in Table 2.

Table 2 - Monitoring Programs, Plans and Parameters

Programs	Plans	Parameters
Geotechnical Engineering Program	WIPP Geotechnical Engineering Program Plan (WP 07-1)	• Creep closure and stresses • Extent of brittle deformation • Initiation of brittle deformation • Displacement of deformation features
Groundwater Monitoring Program	WIPP Groundwater Monitoring Program Plan (WP 02-1)	• Culebra groundwater composition Ca^{2+},Cl-, HCO_{32-}, K^{+}, Mg^{2+}, Na^{+}, SO_{42-} • Change in Culebra groundwater flow
Delaware Basin Drilling Surveillance Program	Delaware Basin Drilling Surveillance Plan (WP 02-PC.02)	• Drilling rate in the Delaware Basin • Probability of encountering a Castile brine reservoir in the Delaware Basin
Subsidence Monitoring Program	WIPP Underground and Surface Surveying Program (WP 09-ES.01)	• Subsidence in the WIPP vicinity, leveling loops through approximately 50 monuments
Waste Tracking Program	WIPP Waste Information System Program and Data Management Plan (WP 08-NT.01)	**Waste Activity** • Ten radionuclides ^{241}Am, ^{238}Pu, ^{239}Pu, ^{240}Pu, ^{242}Pu, ^{233}U, ^{234}U, ^{238}U, ^{90}Sr, and ^{137}Cs **Waste Material** • Ferrous metals (iron); minimum of $2x10^{7}$ kilograms • Cellulosic, plastics and rubber; maximum of $2x10^{7}$ kilograms • Nonferrous metals (metals other than iron); minimum of $2x10^{3}$ kilograms

Periodically, as directed by the DOE, the M&OC submits data from the monitoring programs to the SA. The SA is responsible for analyzing and evaluating the monitoring

data and determining whether the results are within PA expectations. The SA then documents the results of their analysis to the CBFO Office of Site Operations in a Compliance Monitoring Parameter Assessment report. The Office of Disposal uses this report to assure the repository is behaving as expected.

5.1.2 Annual Reports

Each year, by November 18, the DOE submits to EPA an Annual Change Report required by 40 CFR §194.4 (b)(4) to the EPA. It is the responsibility of the M&OC to prepare this report for the DOE. The report is to document nonsignificant changes and updates that differ from information contained in the most recent compliance certification. The report is to include revisions to relevant plans and procedures during the reporting period, document the waste parameters identified in Table 2 and provide the following annual monitoring reports, if available:

- Delaware Basin Monitoring Annual Report
- WIPP Site Environmental Report
- WIPP Subsidence Monument Leveling Survey
- Geotechnical Analysis Report

5.1.3 Generator Site Recertification

Each waste generator site certified to dispose of waste at WIPP must go through annual recertification by the CBFO. The CBFO is responsible for conducting the recertification audits at the generator sites. CTAC supports the CBFO in these audits, at the CBFO's request. When conducting a recertification audit, the following site-specific documents should be reviewed.

- Site-specific program documents written and approved to the latest waste acceptance criteria (WAC)
- Program implementation as determined by a site certification audit
- Reports from surveillances conducted since the last certification
- Performance in shipping TRU waste to WIPP
- Performance in the PDPs

5.1.4 EPA WIPP Inspection

The EPA conducts periodic inspections at WIPP of CH and RH activities under the authority of 40 CFR §194.21, which authorizes the Agency to inspect WIPP during its operational period to verify continued compliance with the EPA's WIPP Compliance

Criteria and the EPA Compliance Certification. The purpose of the inspection is threefold:

- Determine if the ten parameters listed in Table 2 are being adequately monitored.
- Determine if wastes sent to WIPP were emplaced in the underground facility as specified in the EPA Compliance Certification.
- Determine if MgO emplaced in the underground is appropriately tracked.

It is the responsibility of the M&OC to provide proof of records and documentation for the programs to be inspected. Documentation typically reviewed during an inspection includes:

- Calibration records on monitoring and sampling equipment.
- Procedures, plans, training records, and qualification cards.
- Validated monitoring data.
- Records verifying that any computer software used by the M&OC to support the EPA Compliance Certification meets the rigor of NQA 2.7, as specified in §194.22(a) and (b).
- A copy of the waste emplacement map for the active disposal room.

5.1.5 Maintenance of the WIPP Waste Information System

Each waste generator site with contact-handled and remote-handled TRU waste that is destined for disposal at WIPP is required to access and enter appropriate data about the waste in the WWIS, a computerized data management system designed to gather, store, track, and processes information pertaining to the waste. The Office of the National TRU Program directs the operation of the WWIS and has issued the *WIPP Waste Information System User's Manual* (DOE/CBFO 97-2273) to define the responsibilities of the generator sites in entering data into the WWIS. The information from the WWIS is used for the purposes of accepting waste for disposal, receipt of waste, and the final disposal of waste in WIPP. The WWIS is also used to track the total waste activity and material parameter weights listed in Table 2 for the waste in the repository.

Managing and maintaining the WWIS in compliance with Section 6 of the QAPD and generating required reports are the responsibilities of the M&OC, which operates the WWIS.

5.2 Nonroutine Activities and Events

Activities that occur randomly or only once, such as an EPA request for information or activities associated with planned or unplanned changes, are considered nonroutine. Nonroutine events include releases of radionuclides.

5.2.1 EPA Request for Information

In accordance with the criteria at §194.4(b)(2), the EPA may request information related to the EPA Certification at any time. The CBFO, upon receiving a request for information, must respond within thirty days. The CBFO will assign the responsibility of preparing a response to the EPA information request to the appropriate CBFO contractor.

5.2.2 Changes to the Certification – Communication with the EPA

The EPA certification criterion in 40 CFR §194.4 requires the CBFO to report to the EPA changes to project activities or conditions that differ from those that formed the basis for the most recent EPA Certification. A change can be either significant or nonsignificant. Nonsignificant changes do not require EPA approval prior to implementation and are reported annually per 40 CFR §194.4(b)(4), as discussed in Section 5.1.2. Significant changes are either planned or unplanned and CBFO is required to report significant changes to the EPA per the criteria of §194.4(b)(3).

It should be noted that the EPA has reserved the right to make the final determination on whether a change is significant. However, as a guideline for making an initial assessment on the significance of a change, the CBFO proposes the term "differ significantly" applies to any information that invalidates or places serious question on one or more of the key assumptions or components of the current EPA Certification basis. Such information could affect the conceptual models, parameters, or parameter values and distributions used in the current certification basis. Such circumstances could merit a new or revised evaluation of compliance using different assumptions, conceptual models, numerical models, or computer codes.

The CBFO internal process for evaluating changes and new information for compliance with the EPA Certification of WIPP is depicted in Figure 1. This is a recurrent process that includes three distinct steps. The first step in this process, as shown in Figure 2, is the collection of data and information that differs from the data and information documented in the current basis of the EPA's certification of WIPP. Figure 3 shows the second step in the process that is used to evaluate the relevance of the change for regulatory and/or impacts to the disposal system. Figure 4 is the third and final step where changes determined to be potentially significant by the second step are evaluated to determine if the change only requires the CBFO to notify the EPA or prepare a formal change request.

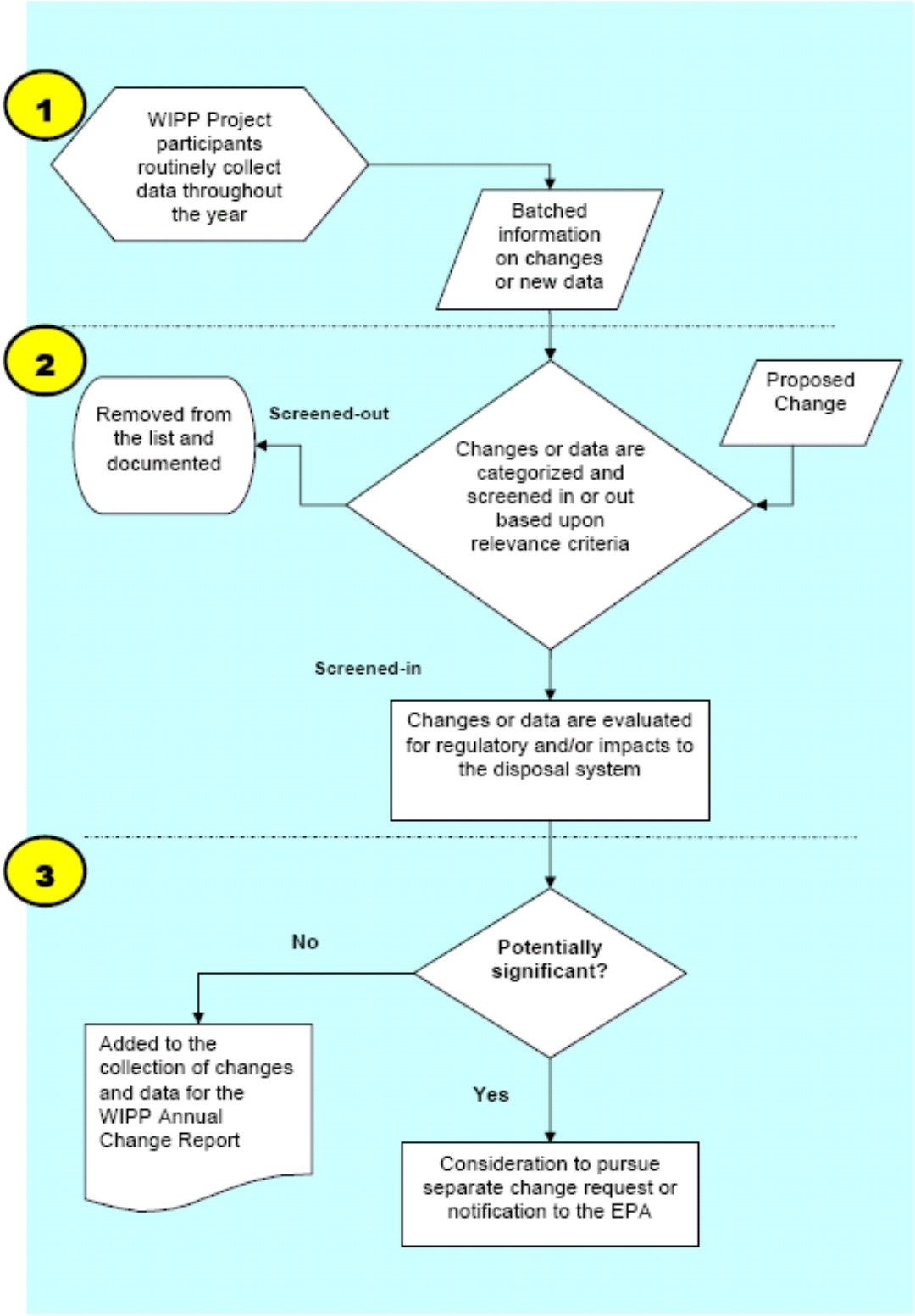
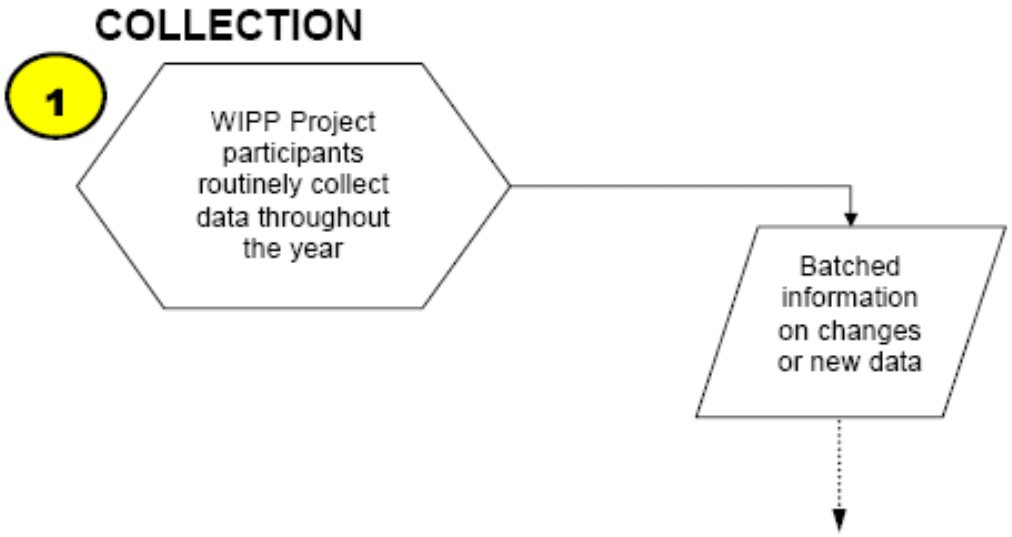


Figure 1 - Recurring Process for Evaluating Change and New Information for Compliance with the EPA Certification of WIPP (40 CFR §194.4[b])



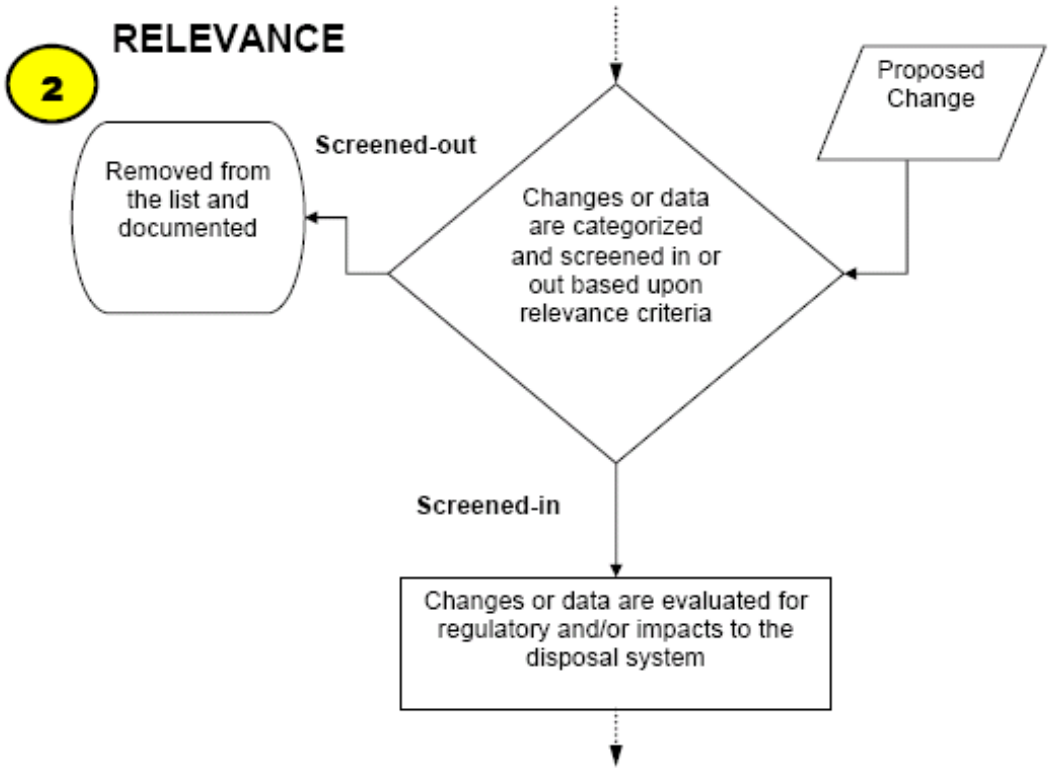
The routine collection of data includes document and procedure changes, monitoring data, experimental data, waste information, proposed changes, modifications to software/hardware (as defined in 40 CFR §§194.22 and 194.23), already implemented changes, and information different from that provided in the current basis of the EPA's certification of WIPP. Sources of information may also be from literature reviews and technology development in related industries.

WIPP Project participants involved in collecting this information are:

- WTS/WRES
- SNL
- LANL

The DOE is typically the lead on proposing major changes; however, several less substantial changes should be managed and implemented at the WIPP participant organization level. This information should be collected in a systematic manner and reviewed on regular intervals for direct and indirect impacts. It is suggested that the intervals be performed on a quarterly basis to help minimize end of the year workload and for consistency with the CBFO regulatory reporting cycles.

Figure 2 - Collection of Data to be Evaluated for Changes to the Basis of the EPA Certification of WIPP

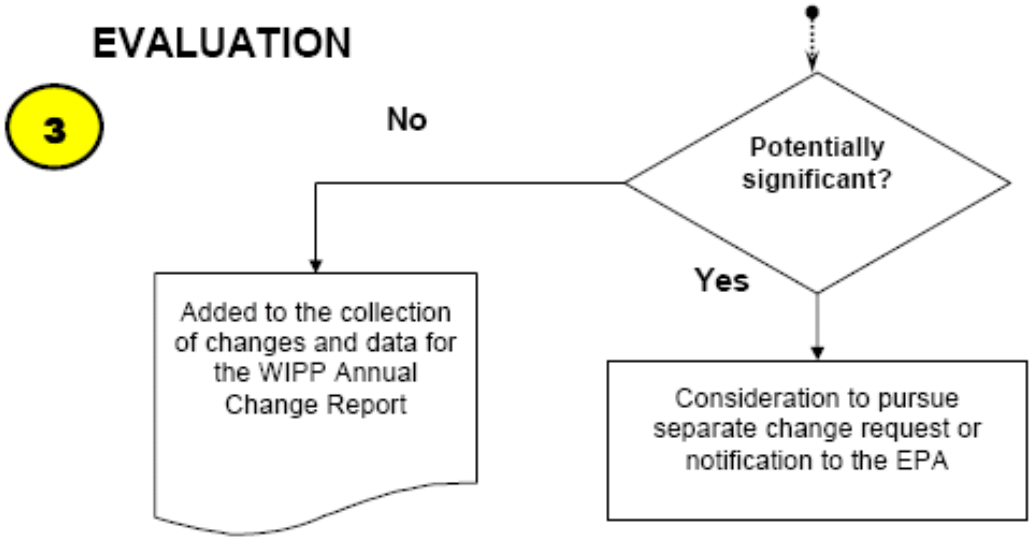


Changes, new information and data must be evaluated for relevance to the basis of the WIPP certification. **Each WIPP participant organization should have a documented process in place to evaluate this information and categorize it according to screening criteria**.

Changes and information that are **screened-out** should be documented and saved to records.

Changes and information that are **screened-in** must be further evaluated for impacts to the disposal system performance or the ability of the DOE to demonstrate regulatory compliance. All changes and new information that have been **screened-in** as relevant to the certification should be submitted to the CBFO and **WTS/WRES** for further processing.

Figure 2 - Evaluation of Change for Significance to the EPA Certification WIPP



WIPP participant roles and responsibilities are more clearly defined at this point

SIGNIFICANCE
WTS/WRES will perform the regulatory evaluation to determine potential significance to the terms and conditions of WIPP certification. If tied to disposal system performance, **SNL** will evaluate changes and/or new information for long-term impacts. Results from the impact analyses are documented by **SNL** and provided to the CBFO. If either evaluation shows that a change or new information is potentially significant, immediate notification should be made to the CBFO.

NON-SIGNIFICANCE
Results that conclude non-significance are to be documented and retained by **WTS/WRES** for reporting in the WIPP Annual Change Report. All other WIPP support organizations should provide such information to both the CBFO and **WTS/WRES** as documentation is completed.

OUTPUT
Depending upon the results of the evaluation and management considerations, possible outcomes may be one of the following:

1) Immediate notification to the EPA (pursuant to 40 CFR §194.4(b)(3)(iii or v)),
2) Submittal of a request or notification to the EPA,
3) Capture of the change in the Annual Change Report,
4) Postponing/reconsidering a change, or
5) Additional evaluation

The CBFO will determine the path forward for changes deemed **potentially significant**.

Figure 3 - Evaluation of Change for Relevance to the Basis of the EPA Certification of WIPP

5.2.2.1 Proposing a Planned, Potentially Significant Change

It is the responsibility of the Cognizant DOE Office to report to the EPA any planned change in activities or conditions that differ significantly from the most recent EPA Compliance Certification per the requirements of 40 CFR §194.4(b)(3)(i). The planned change cannot be implemented by CBFO prior to the receipt of EPA approval. A planned change may be identified as the result of the M&OC Compliance Certification screening process of proposed changes to procedures and plans, or it may be a change that is being proposed by any of the CBFO offices or any of the CBFO contractors. Once a planned change has been identified and the CBFO has concluded that the change is needed, a change proposal will be prepared at the direction of the CBFO. The change proposal will include as appropriate an assessment of the impact of the change on PA. The CBFO Office of Site Operations is responsible for submitting the planned change proposal to the EPA Office of Air and Radiation. The EPA will determine whether the planned change complies with the terms of the most recent EPA Compliance Certification. If the change is determined to be compliant, the CBFO will be allowed to implement the change and no new rulemaking will be required. If the change is not compliant, the CBFO will not be allowed to implement the change until a modification to the current certification is obtained. A modification to the certification requires EPA rulemaking.

5.2.2.2 Notification of an Unplanned, Potentially Significant Change or Condition

The DOE, upon discovering an unplanned change to activities or conditions that differ significantly from the most recent EPA Compliance Certification, must report the change to the EPA. If the change is consistent with the conditions described in §194.4(b)(3)(ii), the DOE must cease waste emplacement and notify the EPA within 24 hours pursuant to §194.4(b)(3)(iii). If the change does not meet the conditions described in §194.4(b)(3)(ii), the DOE must report the change to the EPA within ten days pursuant to §194.4(b)(3)(v). The CBFO contractors will assist the CBFO Office of Site Operations in resolving the issue, and the DOE will submit the resolution to the EPA. If waste emplacement was suspended, the DOE may resume emplacement of waste only upon receipt of written notification from the EPA pursuant to §194.4(b)(3)(iv).

5.2.3 Notification of a Release or Potential Release

Should an event occur or be expected to occur that (1) causes the containment requirements established pursuant to §191.13 to be exceeded; (2) results in releases from already emplaced waste leading to committed effective doses that exceed or are expected to exceed those established pursuant to §191.15; or (3) results in releases of concentrations of radionuclides to USDW that leads to or is expected to lead to dose to man that exceeds the limits established pursuant to Part 191, Subpart C, then the M&OC will immediately provide verbal notification of the event to the CBFO Office of Site Operations. The M&OC will follow the verbal notification with a written notification

of the event within 24 hours of the determination of the event. The written notification will include:

- The time and date of the release or the estimated time of the potential release.
- The location and environmental media of the release or the potential release.
- The type and quantity of waste (in activity in curies of each radionuclide) released or with the potential to be released.
- The hazard posed by the release or the potential release.

The CBFO Office of Site Operations will determine if the EPA should be notified based on the results of an analysis of the release or expected release by SNL-CPG. Based on the results of the analysis CBFO will notify the M&OC if waste emplacement should be stopped.

The DOE will submit the event to the EPA as appropriate. If the release required waste emplacement to be suspended, it will be resumed upon receiving written notification from the EPA authorizing the resumption of waste disposal activities at WIPP.

5.3 Planned Future Activities

5.3.1 Active Institutional Controls

The CBFO is responsible for the implementation of AICs at WIPP after the shafts to the repository are sealed upon decommissioning. The CBFO will implement this system of AICs for a minimum of 100 years after disposal. Information on the AICs the CBFO plans to implement can be found in Appendix AIC of the original CCA (DOE/CAO-1996-2184, *40 CFR Part 191 Compliance Certification Application for the Waste Isolation Pilot Plant*).

5.3.2 Passive Institutional Controls

The CBFO is responsible for implementing PICs as soon as possible following closure. To facilitate the implementation of the WIPP PICs program, the CBFO has issued the *Passive Institutional Controls Implementation Plan*, DOE/WIPP 04-2301, which serves as a tool to assist the DOE in managing activities included in the PICs program. Controls include:

- Permanent markers placed at a disposal site.
- Public records and archives.
- Government ownership and regulations regarding land or resource use.

- Other methods of preserving knowledge on the location, design, and contents of the repository.

Information on a conceptual design for PICs can be found in Appendix PIC of the original CCA (DOE/CAO-1996-2184). As technology advances, this design concept may be revised over the operational lifetime of WIPP.

5.3.3 Decommissioning the WIPP Site

With the completion of disposal operations at the WIPP site, the project enters the decommissioning phase. The repository will be prepared for permanent closure during this phase. Surface facilities will be decontaminated and decommissioned, underground excavations will be closed, and shaft seals will be emplaced. During the decommissioning phase, the DOE must continue to demonstrate compliance with the disposal regulations, every five years until the end of the decommissioning phase.

5.4 Long-Term Performance of the Disposal System

The long-term performance of the disposal system is demonstrated using PAs. The results of PA are used by the DOE in the 40 CFR Part 191 Subparts B and C compliance program to assess disposal system behavior and demonstrate compliance with the containment requirements of 40 CFR §191.13, the individual protection requirements of 40 CFR §191.15, and the groundwater protection requirements of 40 CFR 191 Subpart C. The PA must include all significant processes and events that may have an effect on the disposal system, including inadvertent human intrusion. The PA considers reasonable potential release scenarios from the repository, and it is structured and conducted in a way that demonstrates an adequate understanding of the physical conditions at the disposal system and its surroundings. The PA is used to show that the future performance of the disposal system can be predicted with reasonable assurance. The WIPP PA consists of a series of linked computer models that describe the physical attributes of the repository (e.g., geometry and sitting, geology, waste forms, quantities, natural and engineered features, flow and transport) in a manner that captures the behaviors, interactions and uncertainties amongst its various components. The numerical computer models are developed from more than twenty conceptual models that represent the physical and chemical attributes of the repository. The results of PA demonstrate, with a reasonable expectation, that the probability of cumulative releases of radioactive materials from the disposal system to the accessible environment over the 10,000-year regulatory time frame are below the EPA release limits. The SA is responsible for development, maintenance, quality assurance, and documenting and analyzing the outputs of PA runs. The SA shall also assess the impacts on the long-term performance of the disposal system when any of the PA assumptions, inputs or conceptualizations are changed.

5.5 Recertification Process

The recertification process was established to comply with Section 8(f) of the LWA, which requires the DOE to document continued compliance with the disposal regulation

of 40 CFR Part 191, Subpart B and C, beginning five years after the first receipt of waste and every five years thereafter through decommissioning of the facility. The recertification process is not subject to rulemaking or judicial review (see LWA, Section 8[f][2]). A CRA cannot be used to introduce a change to the certification unless EPA approved the change in the five-year period preceding the recertification effort. The CBFO documents continued compliance with the disposal regulation by preparing a CRA in accordance with the criteria of §194.15, which mandates each CRA document specific information pertaining to repository performance and site characterization. Topics addressed in a CRA include (but are not limited to) the following:

- Natural and engineered features of the disposal system, including geology, geophysics, and hydrogeology of the repository and its environs, as well as the geochemistry of interactions between the disposal system and the wastes placed in the disposal system.

- Assessments of the disposal system's long-term performance, including the input parameters used in those assessments.

- Criteria used to accept waste at WIPP and the programs and activities that ensure adherence to those criteria.

- Information concerning the inventory of TRU waste emplaced in the repository, stored at DOE sites, and the waste the DOE expects to generate at those sites in the future

- Reassessments of WIPP-relevant FEPs that are important to repository's performance, in light of data acquired since WIPP's original certification.

- Individual and groundwater protection standards and the DOE's analyses demonstrating that WIPP will meet or exceed those standards.

- Assurance requirements (including AIC and PIC), monitoring, and impact of natural resource extraction.

Preparing, completing and submitting a CRA involves a wide range of disciplines and extensive involvement of the various WIPP project participants who are actively involved in planning, writing, performing, and reviewing documentation related to compliance, testing, or research to support the recertification process. The project participants are the CBFO, the M&OC, SNL-CPG, LANL, CTAC, and specified supporting contractors. The specific responsibilities of the project participants in the process for preparing a CRA are documented in DOE/WIPP 01-3199, *Recertification Project Plan*, which guides project execution and control. The Recertification Project Plan documents assumptions and decisions, facilitates communication, scope, scheduled baselines, and also provides insight into the regulatory process.

6.0 CONTACT INFORMATION

The CBFO Assistant Manager for Operations is involved in all aspects of managing the EPA Compliance Certification together with other CBFO Offices and CBFO contractors. To assist individuals doing work covered by the EPA Compliance Certification, Table 3 identifies the areas of responsibility for the various organizations, including contact information.

Table 3 - Contact Information

40 CFR §194.4	Implementing and reporting changes to the EPA Certification	CBFO Office of Site Operations M&OC
40 CFR §194.15	Recertification applications format, content, and submittal	Compliance Certification Manager
40 CFR §194.21	Announced and unannounced EPA inspection	Compliance Certification Manager
40 CFR §194.22	Certification activities must meet: *Quality Assurance Program Requirements for Nuclear Facilities* (NQA-1-1989), ASME's *Quality Assurance Requirements of Computer Software for Nuclear Facility Applications* (Part 2.7 of NQA-2a-1990 addendum to ASME NQA-2-1989), and ASME's *Quality Assurance Program Requirements for the Collection of Scientific and Technical Information on Site Characterization of High-Level Nuclear Waste Repositories* (NQA-3-1989 edition), excluding Sections 2.1(b), 2.1(c), and 17.1	CBFO Quality Assurance M&OC Quality Assurance SNL-CPG Quality Assurance CTAC Quality Assurance
40 CFR §194.23	Models and computer codes	CBFO Compliance Certification Manager SNL-CPG
40 CFR §194.24	Update the wastes inventory for any compliance recertification. This update is to provide an appraisal of the inventory of physical, chemical, and radionuclide components of waste emplaced in the WIPP repository, plus stored and projected waste that will be emplaced.	CBFO Office of the National TRU Program LANL
40 CFR §194.24	Waste tracking	CBFO Office of Site Operations M&OC (WWIS)
40 CFR §194.25	Future state assumption	CBFO Office of Site Operations SNL-CPG
40 CFR §§194.31 through 194.34	Containment requirements	CBFO Compliance Certification Manager SNL-CPG
40 CFR §§194.41 and 194.43	AIC and PIC	CBFO Office of Site Operations M&OC
40 CFR §§194.42 and 194.45	Monitoring programs and consideration of the presence of resources	CBFO Office of Site Operations M&OC SNL-CPG

Table 3 - Contact Information		
40 CFR §194.44,	Engineered barrier (MgO)	CBFO Office of Site Operations M&OC SNL-CPG
40 CFR §§194.51 and 194.55	Compliance assessments (Individual and Groundwater Protection)	CBFO Compliance Certification Manager M&OC SNL-CPG

7.0 REFERENCES

ASME NQA-1-1989 edition. *Quality Assurance Program Requirements for Nuclear Facilities*.

ASME NQA-2-1989 edition. *Quality Assurance Requirements for Nuclear Facilities Applications*. ASME NQA-2a-1990 addenda, part 2.7. *Quality Assurance Requirements of Computer Software for Nuclear Facility Applications*.

ASME NQA-3-1989 edition. *Quality Assurance Program Requirements for the Collection of Scientific and Technical Information for Site Characterization of High-Level Nuclear Waste Repositories* (excluding Section 2.1[b] and [c], and Section 17.1).

Sandia National Laboratories. Nuclear Waste Management Procedure NP 9-1, Analyses

Sandia National Laboratories. Nuclear Waste Management Procedure NP 9-2, Parameters

U.S. Congress. *Waste Isolation Pilot Plant Land Withdrawal Act of 1992*. Public Law 102-579 as amended by Public Law 104-201.

U.S. Congress. *Department of Energy National Security and Military Applications of Nuclear Energy Authorization Act of 1980*. Public Law 96-164.

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U.S. Department of Energy. 1996. *40 CFR Part 191 Compliance Certification Application for the Waste Isolation Pilot Plant*, DOE/CAO-96-2184. Carlsbad Field Office, Carlsbad, NM.

U.S. Department of Energy. *WIPP Waste Information System User's Manual*, DOE/CBFO 97-2273. Carlsbad Field Office, Carlsbad, NM.

U.S. Department of Energy. *Compliance Monitoring Implementation Plan for 40 CFR §191.14(b), Assurance Requirement*, DOE/WIPP 99-3119. Carlsbad Field Office, Carlsbad, NM.

U.S. Department of Energy. *Waste Isolation Pilot Plant Reporting Implementation Plan*, DOE/WIPP 99-2286. Carlsbad Field Office, Carlsbad, NM.

U.S. Department of Energy. *Passive Institutional Controls Implementation Plan*, DOE/WIPP 04-2301. Carlsbad Field Office, Carlsbad, NM.

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U.S. Environmental Protection Agency. 1996. 40 CFR Part 194, *Criteria for the Certification and Recertification of the Waste Isolation Pilot Plant's Compliance with the 40 CFR Part 191 Disposal Regulations*, Final Rule, 61 *Federal Register* 5224-5245, Washington, D.C.

U.S. Environmental Protection Agency. 1998. *40 CFR Part 194 Criteria for the Certification and Recertification of the Waste Isolation Pilot Plant's Compliance with the Disposal Regulations: Certification Decision*. Final Rule, 63 *Federal Register* 27354-27406, May 18, 1998. Radiation Protection Division, Washington, D.C.

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Washington Environmental and Regulatory Services. WP 02-PC.02, Delaware Basin Drilling Surveillance Plan. Waste Isolation Pilot Plant, Carlsbad, NM.

Washington Environmental and Regulatory Services. WP 02-1, WIPP Groundwater Monitoring Program Plan. Waste Isolation Pilot Plant, Carlsbad, NM.

Washington TRU Solutions LLC. WP 07-1, WIPP Geotechnical Engineering Program Plan. Waste Isolation Pilot Plant, Carlsbad, NM.

Washington TRU Solutions LLC. WP 08-NT.01, WIPP Waste Information System Program and Data Management Plan. Waste Isolation Pilot Plant, Carlsbad, NM.

Washington TRU Solutions LLC. WP 09-ES.01, WIPP Underground and Surface Surveying Program. Waste Isolation Pilot Plant, Carlsbad, NM.