

WIPP Bulletin

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Protecting Public Health and the Environment

Office of Radiation & Indoor Air

Spring 1996 Number 3

A Message From the New Director

By Frank Marcinowski
Director
WIPP Program

Two key principles have guided EPA's WIPP Program since its inception: 1) to protect human health and the environment from potential releases of waste from the WIPP repository; and 2) to maintain an open process whereby the public is involved and informed in EPA's regulatory process. As the new Director of EPA's WIPP Program, I want to assure you that I firmly believe in, and will continue to foster, these principles.

I come to the WIPP program with over 10 years experience in the federal government working on radiation issues. From 1985 to 1989, I worked as an inspector for the Nuclear Regulatory Commission Region 1, in King of Prussia, Pennsylvania and as a Health Physicist for the Department of Energy at the Oak Ridge and Los Alamos National Labs. Then, in 1989, I accepted a position as a Health Physicist for EPA's Radon Program in Washington, DC and for the past six years served that program in various technical and managerial roles.

I am pleased to report that the WIPP program met several major milestones in the past few months despite government shut-downs and crippling snow storms: the 40 CFR part 194 Compliance Criteria were finalized in January 1996--one year after the proposed rule was issued; comprehensive comments were submitted to DOE on its Draft Compliance Certification Application also in January, 1996; and EPA's Compliance Application Guidance was made available for public comment in October 1995 and will be finalized in March 1996. The program is now focusing its efforts on

conducting a credible scientific review of DOE's certification application.

I look forward to continuing to effectively implement the WIPP Land Withdrawal Act and will continue to work with WIPP stakeholders throughout the certification process.

EPA Publishes Final Compliance Criteria for the WIPP

By Mary Kruger
Policy Analyst

EPA published its final Compliance Criteria for the WIPP in the *Federal Register* on February 9, 1996. The Criteria, mandated by the 1992 WIPP Land Withdrawal Act, implement the generic transuranic waste disposal regulations issued by the Agency for the WIPP site.

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Final Criteria *continued from page 1*

Before disposal operations may begin at the WIPP, the Department of Energy (DOE) must first submit an application that demonstrates that the facility will comply with EPA's radioactive waste disposal regulations, which were issued in final form in December 1993. EPA must then evaluate the complete application and determine if the WIPP, in fact, complies with the Agency's disposal standards. The criteria instruct DOE on the elements required in the compliance application so that it can be properly evaluated for compliance. These criteria apply only to the WIPP.

In January 1995, EPA issued proposed compliance criteria. Comments from the public were accepted through May 1, 1995. The comment period was subsequently re-opened from August 1 to September 15, 1995. The Agency received many instructive comments resulting in substantial changes to the criteria.

In addition to publication of the Compliance Criteria, EPA developed

- ▶ A Background Information Document describing the technical bases for developing the criteria;
- ▶ An Economic Impact Analysis, estimating any cost impact of the criteria that is not already imposed by existing regulations or requirements; and
- ▶ A Response-to-Comments Document, outlining the Agency's responses to public comments on the proposed criteria.

These documents may be reviewed at any of EPA's four dockets.

The Final Compliance Criteria are divided into four subparts:

Subpart A contains definitions of terms, references, and reporting requirements for DOE. It also describes the Agency's authority to modify, suspend, or revoke certification or re-certification.

Subpart B describes the procedure for submission of the application, and specifies the content of the certification application and

subsequent re-certification applications.

Subpart C consists of requirements that apply to activities undertaken to demonstrate compliance with EPA's disposal standards. *General requirements* pertain to quality assurance and peer review of data and methods and the use of computer codes and models that simulate the performance of the WIPP. *Containment requirements* dictate that the disposal system must be designed to limit releases of radionuclides to specified levels for 10,000 years after the facility accepts its final waste for disposal.

Assurance requirements in **Subpart C** complement the containment requirements and further reduce the likelihood of excess radiation being released. For example, DOE must design both passive and active institutional controls. Passive institutional controls are permanent site markers and record keeping and/or archiving systems to assure that relevant information is passed on to future generations. Active institutional controls include guards patrolling the site. Subpart C also implements requirements in the disposal standards for *protecting individuals and ground water* from possible exposure to radioactive contamination from the WIPP.

Finally, **Subpart D** describes the procedure that EPA will follow to include the public in its rulemaking process for both the certification and re-certification decisions. A proposed decision on whether or not the WIPP should open will be available for public comment. Hearings will be held in New Mexico and all input from the public will be considered before the Agency makes its final decision.

Technical Exchange Meeting

Imagine a destructive event sometime in the future; like a large meteorite striking the WIPP repository. Could such an event occur in the next 10,000 years? If it did occur, how much of the waste would be released?

By Mike Eagle
Chemical Engineer

On November 7th and 8th, EPA, DOE, state and local representatives and stakeholders met in Washington, DC to exchange ideas.

Prior to this technical exchange, a comprehensive list of about 1,000 events, known as the *Swedish List*, was developed with input from disposal programs internationally. As DOE's screening process evolved, some events were omitted for various reasons. For example, DOE excluded wind erosion from the list because the consequences would be so insignificant that the occurrence would not cause any release of radionuclides. DOE also omitted meteorite impact as an event because the probability of occurrence is so small--less than 10^{-4} over 10,000 years.

About 400 events remain on the list requiring further analyses. The issues recently discussed in Washington, included:

- ▶ a list of possible events that might affect the disposal system's performance
- ▶ a screening methodology applied to the list of events and
- ▶ the results to date of the screening process.

EPA is applying a probabilistic standard for predicting performance of the WIPP 10,000 years into the future. The standard will be met if the predicted releases of waste are found to be both small enough and sufficiently unlikely to occur over the next 10,000 years. The standard also requires that the impact of all the events with significant probability be added up to determine if the sum of releases exceeds the release limit. If the sum of releases exceeds the release limit then EPA will not grant certification to open the WIPP. The prerequisite to this process is to identify the relevant events and to determine its probability and consequence.

Man-made events are of more concern than natural ones. This is because the repository is in a deep salt deposit that is geologically stable; the salt deposit is about 250 million years old. The event of most concern is deep drilling [for resources] that may intrude into the repository and open a pathway [s] through which waste may be released into the environment. Much work is going into the analysis of the drilling intrusion scenario in order to answer two basic questions: 1) How many drilling events could occur over the next 10,000 years? And, 2) If this occurs, what would be the effect on the repository? Stay tuned.

An Implementation Tool: The Compliance Application Guidance Document

By Agnes Ortiz
Chemical Engineer

The Compliance Application Guidance (CAG) is a document based on EPA's Final Compliance Criteria. The Agency intends to use the CAG to evaluate the completeness of DOE's WIPP compliance certification application. The CAG describes EPA's expectations regarding the specific elements that should be included in the application. EPA believes that the document will give DOE, WIPP stakeholders, and the public a common understanding of EPA's expectations and will facilitate the development of a complete application.

In the Spring of 1995, the Agency developed a pre-release draft of the CAG and made it available to WIPP stakeholders to gather early input on its content and clarity. A revised draft was then released to the public on October 18, 1995. EPA published a *Federal Register* notice to announce the availability of a draft CAG, based on the proposed criteria. The purpose of the notice was to invite the public to participate in the development of the CAG by providing their comments by December 18, 1995. The comments were considered as the Agency revised the guidance to ensure that the document clearly explains EPA's expectations for a complete certification application.

The Agency expects to release a final CAG to the public in March 1996. Although EPA has provided the public an opportunity to comment on the draft CAG, it is a non-binding, interpretive document, and is not subject to the notice-and-comment rulemaking requirements of the Administrative Procedure Act, 5 U.S.C. 553.

Communications Plan to be published

EPA plans to publish its first Communications Plan for the WIPP

By Cheryl Malina
Public Affairs Specialist

in March. The new plan describes how EPA presently -- and in the future -- is communicating with the public and other interested parties

concerning EPA's activities at the WIPP. EPA is committed to developing and maintaining an open communications and consultation process while it fulfills its WIPP regulatory responsibilities. This commitment includes developing and disseminating booklets, fact sheets, and other informational materials through mailings, conducting public hearings, and establishing EPA's WIPP Information Line.

The plan will be mailed to all members of the WIPP Mailing List. It will also be available on EPA's TTN Electronic Bulletin Board. We want to hear from you -- your ideas and opinions are important to us. If you have any suggestions or recommendations for improving our communications with you, or if you have questions about EPA's role and WIPP activities, please write us or call our WIPP Information Line, 1-800-331-WIPP and leave your name, daytime telephone number, recommendation or question and one of the staff will return your call. Our mailing address appears at the end of this newsletter.

EPA Review of DOE's Draft Compliance Certification Application

By Agnes Ortiz
Chemical Engineer

On March 31,
1995, DOE submitted
a document entitled
"Draft Title 40 CFR part

191 Compliance Certification Application for the Waste Isolation Pilot Plant" (DCCA). The document was followed by an updated version of the material on July 28, 1995. Although EPA was not required to review a "draft" application, the Agency used this as an opportunity to conduct a "dry run" of our internal review process for the final application and to provide DOE with feedback on technical issues as the Department develops the final application.

EPA announced the availability of the DCCA in the *Federal Register* (60 FR 42566) on October 16, 1995. The purpose of the notice was to invite the public to participate in the review by providing comments. The comments that were submitted may be viewed at the EPA docket No. A-93-02.

ORIA staff and contractors conducted a multi-disciplinary review, culminating in staff-level

comments sent to DOE on October 31, 1995. ORIA cautioned that the comments (or lack of comments on a particular issue) did not reflect any EPA judgment about the "completeness" of the DCCA or whether the WIPP will comply with EPA's radioactive waste disposal regulations. The staff-level review focused on technical issues and did not represent a final decision of compliance. ORIA further explained that any decision about whether the WIPP complies with EPA's disposal regulations will be made by the Administrator after: 1) the final compliance criteria are issued; 2) a complete final application is received from the Secretary of Energy; and 3) after public notice and opportunity to comment.

General comments on the DCCA were grouped into three main categories: 1) Support for Conceptual Models; 2) Waste Characterization; and 3) Quality Assurance. The following discussion highlights some of EPA's concerns.



Support for Conceptual Models

Because the conceptual models are a major component in understanding the potential releases from the repository, it is important that such models be fully documented and justified. The DCCA provided insufficient documentation for the conceptual models used in DOE's analyses. The DCCA also provided insufficient support for DOE's selection of conceptual models and their implementation in the computer models.



Waste Characterization

The identification of the radionuclide inventory is critical to complying with 40 CFR Part 191 and the DCCA provided an estimate of the radionuclide inventory. However, the DCCA, did not discuss the uncertainty associated with the estimate. Also, the DCCA did not sufficiently discuss the waste-related parameters, such as radionuclide solubility, that are used as part of the conceptual and computer models and which may affect the disposal system's performance.

The DCCA assumed that the remote-handled and the contact-handled wastes (two types of transuranic waste proposed to be disposed at WIPP) would be distributed uniformly in the repository, but did not demonstrate how

such a distribution would be achieved, or why such an assumption was valid. The lack of such a demonstration could invalidate the basis of the performance assessment analyses.

DOE's WIPP Disposal Decision Plan indicates that remote-handled waste disposal will begin in 2002, by which time disposal of contact-handled waste could have occurred. The DCCA did not explain what, if any, waste loading scheme DOE plans to use at the WIPP. In addition, it did not explain how DOE will ensure that the waste emplaced in the WIPP will be consistent with the inventory assumed in DOE's analyses.



Quality Assurance

DOE is working to improve WIPP's quality assurance (QA) program. The review of the materials submitted suggests that many steps remain to be taken before the WIPP's QA program is effectively implemented at the different levels--including contractors, subcontractors, waste generators and principal investigators.

The DCCA provided insufficient evidence of the specific QA requirements to which DOE is committing, little description of the specific mechanisms for implementation of these requirements, and no evidence of their implementation. Specifically, the DCCA did not provide evidence that an effective QA program has been applied rigorously to data, computer codes and other relevant items and activities which support the demonstration of compliance.

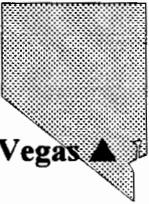
For more on these comments, refer to the EPA docket no. A-93-02. Many of these comments are similar to those made by EPA staff in previous documents and at technical exchanges. EPA provided DOE with more detailed comments on the DCCA in January 1996. These comments were also docketed. EPA will continue to engage in constructive, technical dialogue with DOE.

As a result of the review, the Agency confirmed that the framework of the proposed internal review process will be useful during the review of the final application. The Agency also identified areas where we may change or add to our review process to ensure a thorough review.

Finally, the Agency feels that the two objectives selected for the DCCA review exercise were met. First, the Agency tested the internal review process for the review of the final application. The Agency will benefit from the lessons learned. Second, the Agency has provided valuable feedback to DOE that will enable the Department to prepare a more complete and technically sound final application.

Overview of WIPP Quality Assurance Activities

By Jim Benetti
Health Physicist

Las Vegas 

In 1995, the Office of Radiation and Indoor Air (ORIA) in Las Vegas reviewed DOE's top tier Quality Assurance (QA) documents and also participated as an active observer in a number of DOE's QA audits.

The observations allowed us to identify concerns and enabled ORIA/LV to gain confidence in DOE's QA implementation for WIPP. The areas of observation included the experimental program audits and waste generator sites audits for the Carlsbad Area Office (CAO), national laboratories testing programs audits, software audits, audits of activities associated with qualification of existing data (QED), and other surveillance activities. During these observations, ORIA/LV expressed a number of concerns with DOE. For example, there were inconsistent procedures for rating program elements and minor discrepancies between verbal close-outs and written audit reports. It was noted, that generally, DOE is addressing these concerns.

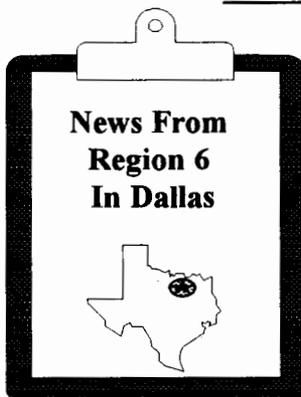
DOE's top tier QA documents reviewed this year include: DOE/CAO Waste Characterization Quality Assurance Program Plan (QAPP) Rev. 0, DOE/Carlsbad Area Office Quality Assurance Program Description (QAPD) Rev. 0 and I and the Sandia National Laboratory (SNL) Procedure QAP 20-3 and 19-1.

Based on our observations of DOE WIPP program audits and a review of DOE top tier QA documents, ORIA/Las Vegas concluded that

DOE and its contractors' QA program have shown steady improvement since 1994. However, the implementation of many parts of the WIPP QA program still need to be strengthened.

Environmental Compliance Report Update

By Chuck Byrum
Environmental Scientist



The WIPP facility must comply with applicable federal environmental laws and regulations including hazardous waste regulations issued under the Resource Conservation and Recovery Act (RCRA). EPA's Regional Office in

Dallas, works in cooperation with New Mexico's Department of the Environment to assure that the WIPP meets these regulations.

Under the WIPP Land Withdrawal Act, DOE is required to submit documentation to EPA every two years demonstrating WIPP's compliance with applicable environmental laws and regulations. DOE has submitted its first Biennial Environmental Compliance Report (BECR) which EPA found to be incomplete. The Agency requested DOE to supply evidence in the Report that the WIPP is complying with these regulations.

In response to EPA's request, DOE is currently requesting letters of compliance from the federal agencies responsible for enforcing these laws and regulations which will state whether or not the WIPP is currently in compliance with these environmental laws.

The Land Withdrawal Act also requires the EPA Administrator to make a formal decision

on whether the WIPP is in compliance with these laws within 180 days after DOE submits their report. When the Agency considers DOE's Report complete, it will begin deliberations on its compliance decision.

Accessing Information Electronically On the TTN

By Paula Selzer
Public Affairs Specialist

WIPP information is available on EPA's TTN (Technology Transfer Network) Bulletin Board. The final Compliance Criteria, Response to Comments, and the Background Information Document are all available for downloading.

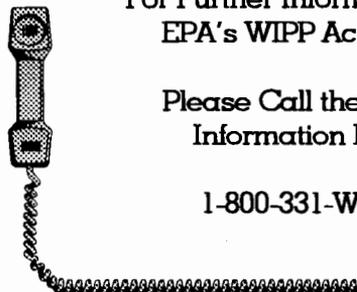
You may access the TTN via TELNET at ttnbbs.rtpnc.epa.gov. Or, if you have a modem and communications software, call (919) 541-5742. Once you reach the bulletin board, log on and register (if you are using the system for the first time). Then, go to the main menu and choose "T" [Gateway to Technical areas]. From the next list choose "U" to reach ORIA options. From this menu, Choose W for WIPP, and "Z" to go to the download area to obtain the information. If you have problems or technical questions, call the help line at (919) 541-5384.

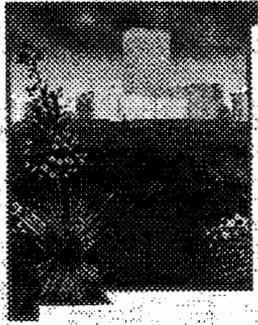
The outreach team is also planning to establish a Web site on the Internet. The upcoming *WIPP home page* will have links to documents that relate to the WIPP. Look for the WIPP home page on EPA's WWW site in the months ahead.

For Further Information on
EPA's WIPP Activities

Please Call the WIPP
Information Line

1-800-331-WIPP





*Federal Advisory
Committee
Considers WIPP
Compliance
Criteria Issues*

By Cheryl Malina
Designated Federal Official
WIPP Review Committee

The WIPP Review Committee of the National Advisory Council for Environmental Policy and Technology (NACEPT) is a Federal advisory committee that provides EPA with independent advice and counsel on some of the difficult policy and technical issues related to implementation of the WIPP Land Withdrawal Act. Committee members are experts from academic institutions, state government, environmental groups, industry, and nonprofit organizations. The Committee has held three meetings to date.

The Committee most recently met in Albuquerque, New Mexico in September of 1995 to discuss WIPP compliance criteria issues. The WIPP Land Withdrawal Act requires EPA to develop these criteria to assess whether the WIPP will comply with EPA's standards for the disposal of radioactive waste. The meeting was open to the press and the public and provided a forum for presentations, questions, and comments.

EPA posed the following questions for the Committee's consideration on issues related to three specific areas of the proposed compliance criteria. Background information on the issues and the Committee's responses are also included.

1) Release Limits

EPA's radioactive waste disposal standards include "containment requirements" which set limits on the amount of radioactive waste that can exit the disposal system. The containment requirements use "release limits," one for each radionuclide, as a measure of whether a release of waste is likely to occur in an amount that would endanger public health. The Agency must set these release limits based on the physical state of the waste at a fixed moment in time after the waste is disposed of in the WIPP.

The Agency has selected two options for the fixed point in time to be used in calculating the release limits. Which option would be more appropriately applied to WIPP?

- A. ***Zero years, meaning the moment the repository is backfilled and sealed or***
- B. ***100 years after the repository is backfilled and sealed. The release limits at 100 years would be somewhat smaller, due to the decay of radionuclides.***

The majority of the Committee had no strong opinion, since the magnitude of the difference between the two starting points is small when compared with the overall uncertainty levels associated with the size and nature of the waste inventory. The Committee recommended that EPA review the disposal standards to determine the intent of implementation. The Committee also noted that it would be useful to express the release limits and any differences in release limits, in a risk framework.

2) Passive Institutional Controls

The use of passive institutional controls (PICs) at the WIPP could, deter future generations from inadvertently drilling into the disposal system in the course of exploring for and extracting natural resources. Passive institutional controls could consist of permanent markers at the disposal system or institutionally maintained archives that preserve a record of the disposal system.

Should credit be given to the Department of Energy (DOE) for the use of PICs at the WIPP? If so, credit would be awarded to DOE as a percentage reduction in the predicted drilling rate that would be used in performance assessments.

The Committee was split regarding credit for PICs. The Committee thought that if credit were to be allowed, it may be more practical to assume that PICs delay the onset of drilling rather than reduce the frequency of intrusion. Any such delay should be limited to a few hundred years.

3) Peer Review

The use of peer review can increase confidence in the results of activities when their adequacy cannot otherwise be established through testing, alternate calculations or previously established standards and practices. EPA received public comments that its proposed approach is too broad and duplicates compliance criteria requirements.

How can EPA revise critical program area guidelines in order to establish a consistent rationale for the use of peer review? In general, the Agency does not wish to require peer review of a specific activity unless doing so would assist the Agency in determining the adequacy of DOE's application for certification of compliance. Rather, the Agency is interested in obtaining a comprehensive spectrum of knowledge on specific issues having high uncertainty and affecting long term performance of the WIPP.

The Committee concluded that peer review is an essential element in the compliance application process, and made the following recommendations:

- 1) Sensitivity analysis is a useful tool in establishing areas requiring peer review. The analysis should flow from performance assessment (PA), and appropriate aspects of PA must also be peer reviewed.
- 2) DOE should be required to prepare a document summarizing previous peer reviews on

WIPP-related matters as an essential first step in EPA's review of the adequacy of past peer reviews on sensitive issues.

EPA used the recommendations from the Committee in development of the final compliance criteria for the WIPP, issued in February 1996. A copy of the final report of the WIPP Review Committee may be viewed at the EPA WIPP Docket locations in New Mexico and Washington, DC.

Update on the No-Migration Petition

By Reid Rosnick
Geologist

EPA's is also responsible for the review and processing of DOE's No-Migration Petition. The petition is required by the Resource Conservation and Recovery Act (RCRA), and demonstrates that no hazardous waste or hazardous constituents will migrate from the boundary of the WIPP for as long as the wastes remain hazardous (10,000 years). Waste destined for WIPP is considered "mixed waste" -- it contains both radionuclides and hazardous substances.

DOE submitted a draft No-Migration Petition to EPA in May of 1995. The draft petition contained only information for the operations phase at WIPP (the time of waste emplacement and closure). EPA has reviewed this document and provided comments to DOE on the completeness and technical content of the petition. The portion of the petition that will attempt to prove no migration over 10,000 years will be submitted to EPA in May 1996.

Additionally, EPA authorized the State of New Mexico to carry out the State's base RCRA program and the State's mixed waste program in lieu of the respective federal programs. EPA continues to provide support to the New Mexico Environment Department for DOE's RCRA permit application. The RCRA permit is required at facilities that treat, store, or dispose of hazardous wastes. New Mexico's permit will cover among other things, the operation life,

closure, and post-closure of the WIPP with respect to the safe handling, disposition, and monitoring of hazardous waste.

Regulatory Dockets can be viewed at the following sites:

Carlsbad Public Library
101 S. Halagueno
Carlsbad, NM 88220
(505) 885-6776

Zimmerman Library
Government Publications Department
University of New Mexico
Albuquerque, NM 87131
(505) 277-5441

Fogelson Library
College of Santa Fe
1600 St. Michaels Drive
Santa Fe, NM 87505
(505) 473-6576

US EPA Air Docket
Waterside Mall Room M1500
401 M St. SW
Washington, DC 20460
(202) 260-7548

The Dockets are referenced as:

Radioactive Waste:

Docket No. R-89-01 Radioactive Waste Disposal Standards (40 CFR Part 191)

WIPP:

Docket No. A-92-56 Compliance Criteria (40 CFR Part 194)

Docket No. A-93-02 Compliance Certification and Determination

*The WIPP Bulletin is edited by
Cheryl Malina and Paula Selzer*

Recent EPA WIPP Publications:

Implementation of the Waste Isolation Pilot Plant Land Withdrawal Act, 1994 Report to Congress

Document Number: EPA 402-R-95-001

EPA's Communications Plan for the Waste Isolation Pilot Plant

Document Number EPA 402-K-95-006

Document Number EPA 402-K-95-007 (Spanish)

EPA's Public Participation Program for the WIPP

Document Number EPA 402-K-95-002

Document Number EPA 402-K-95-003 (Spanish)

Federal Register Notice, Volume 61, No. 28, pps 5223-5245, February 9, 1996 "Criteria for the Certification and Re-Certification of the Waste Isolation Pilot Plant's Compliance with the 40 CFR Part 191 Disposal Regulations; Final Rule."

EPA Fact Sheet: Final Compliance Criteria for the Waste Isolation Pilot Plant (40 CFR Part 194)

Document Number EPA 402-95-008

Document Number EPA 402-95-009 (Spanish)

Background Information Document for Compliance Criteria for the Waste Isolation Pilot Plant (40 CFR Part 194)

Document Number EPA 402-R-906-002

Economic Impact Analysis for Compliance Criteria for the Waste Isolation Pilot Plant (40 CFR Part 194)

Document Number EPA 402-R-906-003

Response to Comments Document for Compliance Criteria for the Waste Isolation Pilot Plant (40 CFR Part 194)

Document Number EPA 402-R-906-001

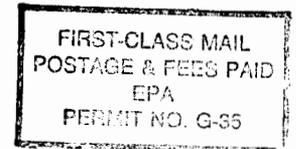
Compliance Application Guidance Document for the Compliance Criteria for the Waste Isolation Pilot Plant (40 CFR Part 194)

Document Number EPA 402-R-95-014



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