UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

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Dr. Inés R. Triay, Manager
Carlsbad Field Office
Department of Energy
P.O. Box 3090
Carlsbad, NM 88221

Dear Dr. Triay:

The Environmental Protection Agency (EPA) has completed an evaluation of the Department of Energy's (DOE) requests of April 26, 2001, and June 29, 2001, to consider an alternative use of Panel 1 of the Waste Isolation Pilot Plant (WIPP). Based on our review of the information that you provided, and in accordance with section 194.4(b)(3)(vi) of the Compliance Criteria, we hereby inform you of our determination that DOE's proposed alternative use of WIPP Panel 1 is compliant with the terms and conditions of EPA's WIPP certification. Therefore, you may implement the following specific changes set forth in the April 26 and June 29 letters:

Use of all, part, or none of the space in each of the rooms in Panel 1 for CH-TRU waste disposal, and

Closure of Panel 1 without emplacement of any RH-TRU waste.

As we explain in the enclosed report, we have determined that these changes will not adversely impact the ability of disposal system to contain transuranic radioactive waste. In addition, we do not believe that these changes affect any other conditions of our May 1998 Certification Decision.

We appreciate your efforts in responding quickly to our requests for more information, thus enabling us to make this determination. In accordance with section 194.4(b) of the Compliance Criteria, DOE is required to inform EPA of any further design modifications that differ from the Compliance Certification Application. If you have any questions about this determination, please contact Agnes Ortiz at (202)564-9310.

Sincerely,

Frank Marcinowski, Director
Radiation Protection Division

Enclosures
cc: Cindy Zvonar, CBFO
Matthew Silva, EEG
Steve Zappe, NMED

Enclosure: EPA Review of 4/26/01 and 6/29/01 Panel 1 Use Proposal

1. Introduction

This report summarizes the Environmental Protection Agency's (EPA's) review of the Department of Energy's (DOE's) request for alternative use of Panel 1 of the Waste Isolation Pilot Plant (WIPP). In an April 26, 2001, letter (Attachment 1), DOE proposed three changes to the use of Panel 1:

1) Place CH-TRU waste containers in either 1-, 2-, or 3-high stacks. MgO backfill will be emplaced with the waste so that the ratio of backfill to waste remains consistent with ratios described in the CCA.

2) Use all or only part of the space in each of the seven Panel 1 rooms for waste disposal. Some rooms could be bypassed and left void of waste.

3) Close Panel 1 without emplacing any RH-TRU waste.

Based on this proposal, on June 22, 2001, EPA requested additional information on the proposed changes (Attachment 2). DOE responded with additional data and information related to requests 2 and 3, and revised the initial proposal to rescind the request for approval to stack waste containers in 1- or 2-high stacks (Attachment 3).

Therefore, this evaluation considers the proposed changes of using all, part, or none of space in each of the rooms of Panel 1 and closing Panel 1 without RH-TRU waste (items 2 and 3 above).

2. Review of Proposed Changes

During numerous site visits EPA staff have noted the degraded condition of Panel 1 because of its advanced age, and we are concerned about the possible effects of the condition of Panel 1 on the safe emplacement of waste.

The Environmental Evaluation Group (EEG) recommended in August 1996, EEG-63, Stability Evaluation of the Panel 1 Rooms and The E140 Drift at WIPP (obtainable from EEG) ". . . it is best to abandon Panel 1 and mine a new panel as soon as all permitting process are complete." EEG also noted,

> . . . with a high degree of confidence, it would be possible to safely use portions of Panel 1 for waste storage. This would require close monitoring and periodic stability assessments to identify the most stable rooms. In addition, we foresee the need for installation of external support systems to prevent the potential for roof falls during waste emplacement operations [p. 30].

DOE's proposal attempts to implement EEG's recommendation to use Panel 1 appropriately.

DOE did not provide any information in response to EPA's June 22, 2001, request for additional information on roof falls because DOE is no longer proposing to stack drums 1- or 2-high stacks. Therefore the main remaining technical issue was the impact that partially filled or empty rooms, or the absence of RH-TRU waste in Panel 1, could have on the ability of the repository to contain waste. EPA's June 22 letter also requested additional information on whether or not partially filled or empty rooms could act as preferential pathway for releases of radionuclides (Attachment 2).

On June 29, 2001, DOE provided additional data and information responding to EPA's June 22 letter (Attachment 3). The data and information provided in DOE's response support the conclusion that the characteristics of the empty or partially filled rooms will be much like native salt, with permeabilities several orders of magnitude less than rooms that contain waste (as stated in the Compliance Certification Application). DOE references modeling that shows that empty rooms will approach a permeability of approximately intact salt ($K<10^{-19}$ m^2) (Attachment 3). After approximately two hundred years, partially filled or abandoned rooms will have permeabilities similar to unmined salt and will not be able to act as preferential pathways for fluids (Attachment 3, p. 3). Releases as predicted in the certification performance assessment will not increase (Docket A-93-02, Item II-G-1). EPA determines that the data and information presented in Attachment 3 adequately support the conclusion that partially filled or empty rooms will not act as preferential pathways for release of radionuclides.

EPA also requested additional information on whether or not the waste loading scheme for the entire repository will be affected by the proposed change in use of Panel 1. DOE's June 29 letter presents data supporting the conclusion that the proposed changes in waste loading will not increase predicted future releases from the repository. EPA concurs with these findings and determines that DOE's statistical analyses are sufficient to support the conclusion that the effects of the proposed changes on potential releases will be insignificant. EPA determines that this conclusion applies to the proposed geometry and current design of the waste disposal area.

DOE's proposal not to emplace RH-TRU waste in Panel 1 will lower the overall actinide inventory of Panel 1, given the assumption that the total RH inventory will be less than the approved CCA inventory because of the exclusion of panel one RH waste. If the actinide source term is less, then potential releases from the repository are not increased. The exclusion of RH-TRU waste from Panel 1 should not impact the predicted long-term predicted performance of the WIPP. If DOE were to seek an increase in the amount of RH-TRU waste in remaining panels, or any other change related to RH-waste emplacement design, it would be necessary to obtain EPA's approval of the proposed change prior to implementation.

3. Conclusion

We determine that the proposed changes to the usage of Panel 1, involving:

> use of all, part, or none of the space in each of the rooms in Panel 1 for CH-TRU waste disposal, and
> closure of Panel 1 without emplacing any RH-TRU waste,

will not increase projected certification releases and are insignificant to long-term performance of the WIPP disposal system. Therefore, we approve these requested changes. This change should be noted in the annual change report.

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

June 29, 2001

Mr. Frank Marcinowski
Office of Radiation and Indoor Air
U.S. Environmental Protection Agency
401 M. Street, S. W.
Washington, DC 20460

Dear Mr. Marcinowski:

This letter transmits additional information requested in your letter dated June 22, 2001 concerning a proposed change in the utilization of Panel 1 at the Waste Isolation Pilot Plant (WIPP).

Upon further consideration, we have determined that placement of CH-TRU waste containers in either 1- or 2-high stacks is not efficient because of floor conditions in the rooms. The floors are presently in such condition that they will have to be milled to a level condition to allow any waste emplacement. If a particular room is to be utilized, it is much more efficient to remove enough of the floor to stack 3-high as a part of the floor-leveling operation. Accordingly, we are no longer requesting the authority to stack CH-TRU waste containers 1- or 2-high and we have not supplied the additional information you requested to support approval of that request.

DOE is now requesting the flexibility to make only the following changes at WIPP:

- Use all, part or none of the space in each of the rooms in Panel 1 for CH-TRU waste disposal.
- Close Panel 1 without emplacing any RH-TRU waste.

The enclosure contains additional information requested regarding these two remaining changes. As discussed in our initial request dated April 26, 2001, the proposed change will allow the DOE to optimize the utilization of Panel 1 based on considerations of worker safety, operational efficiency and cost. Adding the flexibility included in the proposed change will allow the DOE to minimize the worker risk associated with re-mining and maintaining the back (roof) and ribs (sides) of the older excavations and will also improve operational efficiency. Finally, our analyses continue to demonstrate that these changes are non-significant, and that the proposed changes will not significantly change the certified baseline or compromise repository performance.

CBFO:ORC:DM:VW:01-0797:UFC:5822

At the present rate of waste receipt, DOE will have to cease waste disposal in Panel 1 to avoid blocking access to room 6 by July 31, 2001 if authorization to bypass room 6 is not granted by then. Under these circumstances, we request that you act separately on the request to bypass rooms in Panel 1, if necessary, to expedite action on that portion of our request.

If you have any questions, please contact Daryl Mercer at (505) 234-7452.

Sincerely,

Roy A Nelson for Dr. Inés Triay

Dr. Inés R. Triay
Manager

Enclosure

cc: w/enclosure
D. Huizenga, DOE EM
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cc: w/o enclosure
B. Lilly, CBFO
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J. Lee, WTS
P. Shoemaker, SNL

CBFO:ORC:DM:VW:01-0797:UFC:5822

1. Roof Fall Analysis:

This request for additional information specifically pertains to stacking CH-TRU waste containers 1- or 2-high. This information is no longer needed because DOE has withdrawn its request for the flexibility to stack 1- or 2-high.

2. Backfill:

This request for additional information also specifically pertains to stacking 1- or 2-high and is no longer needed because DOE has withdrawn its request for the flexibility to stack 1- or 2-high.

3. Impact of Unused Rooms:

"You state that, "If rooms are left open, they will close to a condition equivalent to unmined salt." (Section 3.5) Justify this assumption. What evidence do you have to support this conclusion?

It is clear that you assume that an unused Room will close to become equivalent to unmined salt. Has your evaluation also considered the possibility that an empty room may act as a preferential pathway for fluid to enter the repository in the event of an intrusion borehole? Please explain how this scenario for intrusion is or is not plausible.

Disposal rooms close rapidly. This was observed in the WIPP underground where approximately one meter of closure occurred in Panel 7 between 1988 and 1998. Closure calculations of several experiments conducted at WIPP have demonstrated that the magnitude of creep closure can be accurately modelled. These large-scale experimental results were used to validate geomechanical models. The technical community, including the NRC WIPP Panel (1996), concur that predicted closure rates have a relatively small uncertainty and the magnitude of deformation is captured adequately by the models. The expectation that room closure leads to waste entombment underlies the scientific foundation for disposal in salt.

There is a large body of empirical evidence that abandoned rooms in working salt and potash mines continue to close with time, and eventually close completely to a condition equivalent to that of the unmined rock. This is particularly evident in some of the deep potash mines in Saskatchewan where previously mined rooms close quickly. Mraz et. al (1996), for example, have published data on closure rates in rooms at the K2 mine of IMC showing rapid closure continuing several years after mining. Where rooms have been backfilled, the reconstitution to native salt conditions is even more rapid. During a recent workshop in Carlsbad, Dr. Peter Breidung of Kali und Salz GmbH (Germany) noted that their disposal operations and production mines commonly backfill rooms and shafts which reconsolidate to *in situ* conditions (Breidung, 2001). In fact, Kali und Salz operations have mined back through old workings and the backfilled zones are essentially indistinguishable for the native rock. Similar results are known from salt mines in German domes, including the Asse mine.

This evidence from working mines is compelling, although it may not be directly applicable to the WIPP since the extraction ratios at WIPP are much lower and closure rates correspondingly slower. Thus, while the total closure of WIPP rooms is expected, it will take longer to occur than closure in operating salt or potash mines. In order to estimate the times needed for complete closure under WIPP conditions, it is necessary to rely on model predictions. The modelling results are summarized in the following paragraphs. They include calculations on empty rooms, which were conducted as the WIPP underground was being constructed, as well as later calculations on the closure of rooms backfilled with materials such as salt or waste. Note that these latter calculations are relevant since collapse of material from the roof, floor and ribs will approximate the salt-backfill case.

Room closure can be quantified by geomechanical modeling. Response of the underground is conventionally modeled using the finite element method (FEM). Many pertinent analyses of waste rooms have been performed (e.g., Morgan, 1987, Callahan and DeVries, 1991 and Stone, 1997). Morgan's analysis of closure of an empty single room using SANCHO (a precursor of SANTOS) estimated total room closure in 195 years (Figure 1), without simulating the effects of roof collapse and floor heave. The analyses by Stone used the FEM code SANTOS. Figure 2 is a plot referenced by Stone, which illustrates room closure rates (although this particular calculation simulates the presence of WIPP waste in the room). Porosity is reduced to about 8% in approximately 100 years. As salt-backfilled rooms or empty rooms approach total closure, permeability will reduce asymptotically to values equivalent to those of intact salt ($K<10^{-19}$ m^2). This estimate of re-consolidated salt permeability (K) derives from a relationship between permeability and density, which was developed for the shaft seal system design (Sandia, 1996).

If disposal rooms are left open and unsupported or roof bolted, creep closure and structural response will include floor heave and roof fall. With creep closure the empty (no WIPP waste) room would close around disaggregated material derived from the damaged rock in the roof, floor and ribs. Halite consolidation would then be the primary mechanism of porosity reduction. Callahan and DeVries calculated the closure of backfilled rooms, which are equivalent in many ways to an empty room filled with debris. They calculated mean stress development for rooms containing various backfill materials, which usually exceeded 10 MPa in 200 years. Salt debris subjected to such stress conditions would be well consolidated. Evidence from many studies indicates re-consolidation is effective and rapid (Mellegard et al., 1998) under conditions of modest mean stress (of the order of 5 MPa). Thus, the closing room would provide ample stress to reconsolidate the salt aggregate.

This scenario holds when some of the debris in the formerly empty room includes anhydrite from Marker Bed 139 and anhydrite a and b, since the anhydrite material will be encapsulated in broken salt. These processes of stress induced consolidation and fracture healing will ensure that the rooms return to close to their unmined state within a few hundred years. It should also be noted that there are numerous examples of rooms in operating mines totally closing in short periods of time (years). While the conditions in these mines are generally more severe than at the WIPP, since the extraction ratios, and thus the pillar loading are much higher, these differences will only affect the timing of the closure, not its eventual occurrence.

If rooms in Panel 1 were filled with mined salt, the granular salt would reconsolidate and reduce porosity and permeability. As depicted in Figure 3, creep closure and the natural healing mechanisms of crushed salt would tend to eliminate void space. The relatively high mean stresses calculated by Callahan and DeVries (greater than 10 MPa) ensures the granular salt would have porosity less than 5% in a very short time. Based on the permeability/density relationship noted earlier (Sandia, 1996), this range of consolidation equates to a permeability less than or equal to 10^{-18} m^2. Eventually, in a few hundred years, permeability will return to values equivalent to intact salt ($K<10^{-19}$ m^2). These porosity and permeability values are estimated from a body of experimental work supporting the compliance shaft seal design report (Sandia, 1996), and indicate that both permeability and porosity of rooms backfilled with mined salt would become much lower than the value of typical waste rooms. Behavior of rooms left empty would mimic rooms back-filled with crushed salt, because the salt debris is analogous to salt back-fill. The requisite closure for re-consolidation would ensue within decades.

In terms of the performance of the repository over the regulatory period, the permeability of the closed room will be more than several orders of magnitude less than the waste (value for waste permeability in the Compliance Certification Application was 1.7×10^{-13} m^2). Given this wide diversity of permeability, the closed rooms will behave from a performance standpoint as if they represented intact salt. Early in the life of the repository, before the rooms have fully closed, the open rooms will have the potential to act as open conduits, and therefore as preferential pathways for fluid, in the event of a human intrusion. However, when the rooms close in a time on the order of 200 years, as indicated by Morgan's calculations and by mining experience, total closure will occur before likely intrusion. In the CCA model, the first intrusion could not occur until 700 years after WIPP decommissioning, and in the PAVT until 100 years, and in both cases the mean time for the first intrusion was on the order of 1500 to 2000 years. Also, note that even if certain rooms in Panel 1 remain empty, panel closures will still control flow of fluids into and out of the Panels – any high permeability path through an empty room would only effect flow regimes within the Panel. Finally, it should be noted that a fully closed room will not have any remaining channels for flow. The only effect in PA of leaving certain rooms open will therefore be to marginally reduce the waste storage area.

References:

Breidung, K. P. (2001). Direktor Kali und Salz GmbH. From discussions at the CBFO/German Workshop in Carlsbad, NM.

Callahan, G. D. and K. L. DeVries. 1991. "Analyses of Backfilled Transuranic Wastes Disposal Rooms." SAND91-7052. Sandia National Laboratories, Albuquerque, NM.

Mraz, D., L. Rothenburg and J. Unrau. 1996. "Review of In-Situ Stress and Strain Monitoring Programs around Openings in a Deep Potash Mine," Proceedings 4th. Conference on the Mechanical Behavior of Salt, Montreal.

Mellegard, K. D., T. W. Pfeifle and F. D. Hansen. 1998. "Laboratory Characterization of Mechanical and Permeability Properties of Dynamically Compacter Crushed Salt." SAND98-2046. Sandia National Laboratories, Albuquerque, NM.

Morgan, H. S., 1987. "Estimate of the Time Needed for TRU Storage Rooms to Close," Memorandum to D.E. Munson, in Butcher, B. M. and F. T. Mendenhall, 1993. "A Summary of the Models Used for the Mechanical Response of Disposal Rooms in the WIPP with Regard to Compliance with 40 CFR 191, Subpart B," SAND92-0427. Sandia National Laboratories. Albuquerque, NM.

NRC (National Research Council) 1996. "The Waste Isolation Pilot Plant: A Potential Solution for the Disposal of Transuranic Waste". Committee on the Waste Isolation Pilot Plant Board on Radioactive Waste Management. Washington, DC:National Academy Press (Available from the National Technical Information Service (NTIS), Springfield VA as PB97-138069/XAB.)

Sandia National Laboratories. 1996. "Waste Isolation Pilot Plant Shaft Sealing System Compliance Submittal Design Report." SAND96-1326. Sandia National Laboratories. Albuquerque, NM.

Stone, C. M. 1997. "Final Disposal Room Structural Response Calculations." SAND97-0795. Sandia National Laboratories, Albuquerque, NM.

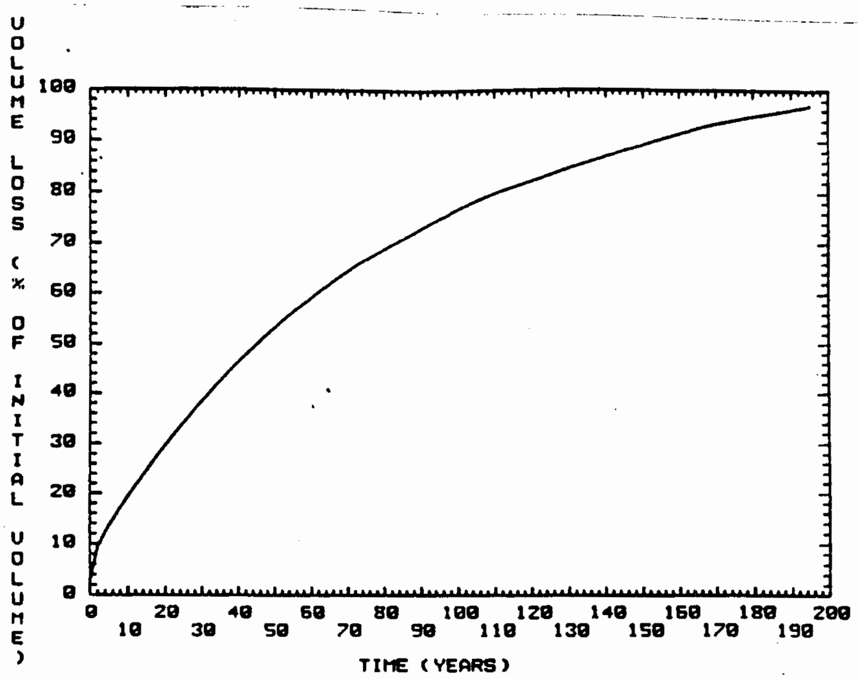

Figure 1. Closure of Empty Storage Room (Morgan, 1987)

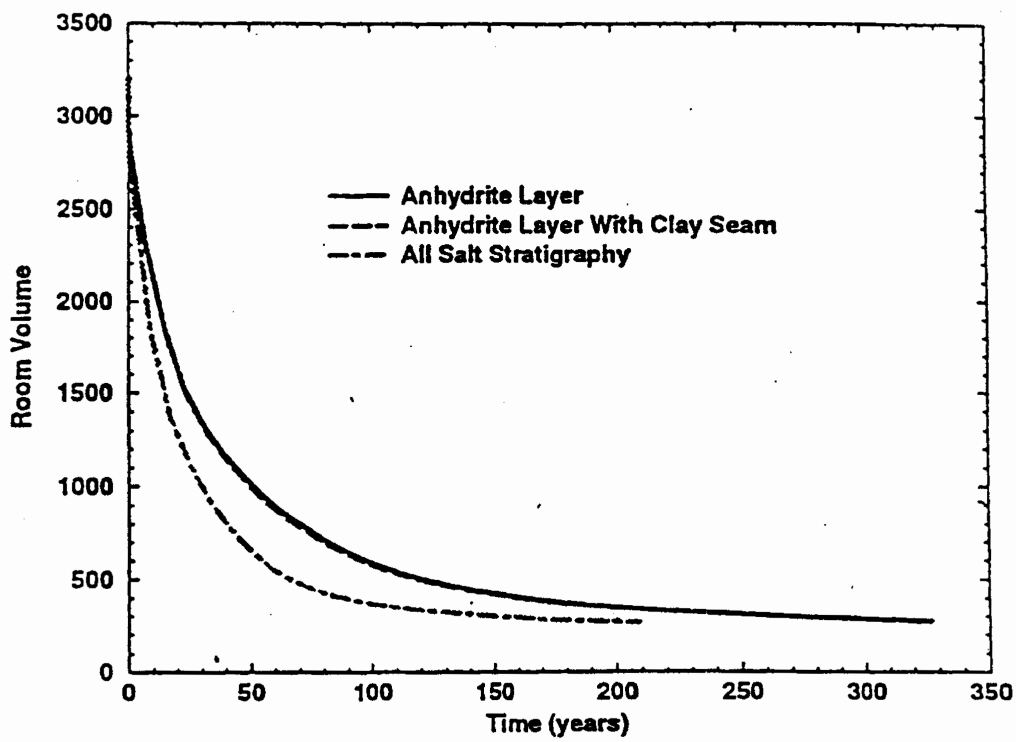

Figure 2. Disposal Room Volume (m^3) Reduction with Time.

RSI-163-90-074

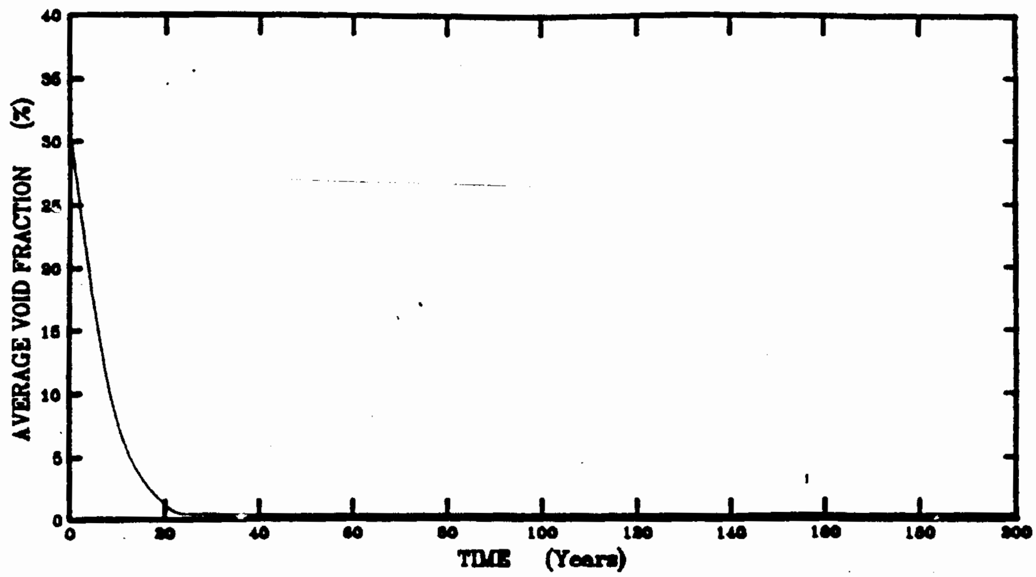

Figure 3. Disposal Room Volume Reduction when Back-filled with Crushed Salt.

4. Waste Loading:

It appears that your conclusion that the expected total releases from the repository are independent of the waste loading scheme is predicated on the assumption that waste is uniformly emplaced. Under the proposed changes, waste will not be uniformly emplaced in Panel 1. Is this conclusion still appropriate? Please explain.

CBFO believes that the conclusion is still appropriate. Attachment IV and Section 3.6 of the DOE submittal on Panel 1 Utilization present detailed analyses and a reasoned argument to demonstrate that the expected release from the repository will be independent of the waste emplacement scheme. It may be helpful to rephrase the assumptions, arguments and reasoning used in the Appendix IV mathematical analyses, since those analyses are rather abstract.

The basis for concluding that the expected total release from the repository is independent of the waste emplacement scheme has two components. First, the mathematical analysis in Attachment IV demonstrates that the expected release from cuttings/cavings is independent of the waste loading scheme. Then, Section 3.6 of the DOE submittal provides a reasoned argument to demonstrate that this result is also applicable to the total release from the repository.

Before discussing each component, it is useful to define the "expected" release from the repository. The expected value is the average or mean value of all the releases from a CCDF, i.e., each point on a CCDF represents a consequence (a release) for a specific time history of borehole intrusions. The average value of all these consequences represents the expected or mean value of the release from the repository. Note that this expected value will be a single value, as opposed to a CCDF that has a range of values for various intrusion time histories.

Mathematical Analysis (Attachment IV)

Attachment IV demonstrates that nonuniform loading of waste within the repository will have no effect on the expected value of the CCDF for cuttings/cavings. This is demonstrated by proving that the expected volume released by cuttings/cavings is independent of the area over which the waste is emplaced and of local variations in the (physical) density of the emplaced waste (see Sections IV.2(a) and IV.2(b)). The mathematical proof for this conclusion is derived in Section IV.2(b). Equation IV.2 of Section IV.2(b) demonstrates that the expected volume is independent of the fraction of the waste, fWD_i, loaded in each separate area of the repository, $aWDi$, and of the total number of separate areas in the repository, nWD, so that the number of panels and rooms is irrelevant to the expected volume released by cuttings/cavings. In fact, the repository can be divided into an arbitrary number of small areas, each with its own unique conditions (e.g., loading), but the expected or average volume released will be the same.

Section IV.3 extends this argument from the expected volume released to the expected activity of the radionuclides released by cuttings/cavings. The expected value of radionuclide release, shown in Equation IV.10, is independent of: the initial areal density, dR_i, of radionuclide in the i^{th} area; the fraction of the total amount of radionuclide, fR_i present in the i^{th} area; and, the total number of separate areas, *nWD*, in the repository. Again, the repository can be divided into an arbitrary number of small areas, each with its own radioactive waste loading without affecting the expected or average activity released.

A key assumption for the derivation in Section IV.3 is that the activity of the waste removed by cuttings/cavings is proportional to the product of the cuttings/cavings area and the areal density in the i_{th} area of the repository. This is certainly true for cuttings/cavings, which is conceptualized to remove a plug of material with all its radionuclides from the repository immediately to the surface.

Reasoned Argument (Section 3.6)

The analysis in Attachment IV is specific to cuttings and cavings, but it can be extrapolated to demonstrate that the expected total release from the repository is independent of the actual waste loading scheme. The reasoned argument is as follows:

- Attachment IV shows that the expected radioactive release through cuttings/cavings is independent of the detailed waste-loading scheme in individual rooms and of the waste loading scheme in smaller areas within each room.

- The analysis in Attachment IV.3 also applies to the expected releases of CH-TRU through spallings, if 1) the spall volume is unchanged by the waste loading scheme and 2) the activity of the released material varies linearly with the fraction of waste activity emplaced in each room. The first condition is consistent with the CCA, wherein spall volume depends on the physical properties of the waste but is independent of the radioactive content. The second condition is also reasonable because an area with (for example) one-half of the nominal complement of radionuclides will generally release one-half of the activity that an area with the nominal complement of radionuclides will release.

- Cuttings/cavings and spallings are the main components of the total expected release from the repository (see Figure 13.2.3, Helton et al. 1998). Since the expected releases from cuttings/cavings and spallings are independent of the waste loading scheme, and since the total release is essentially the sum of the releases from cuttings/cavings and spallings, it follows that the total expected release will also be independent of the actual waste loading scheme.

Reference:

Helton, J.C., J.E. Bean, J.W. Berglund, F.J. Davis, K. Economy, J.W. Garner, J.D. Johnson, R.J. MacKinnon, J. Miller, D. G. O'Brien, J. L. Ramsey, J.D. Schreiber, A. Shinta, L. N. Smith, D.M. Stoelzel, C. Stockman, and P. Vaughn. 1998. *Uncertainty and Sensitivity Analysis Results Obtained in the 1996 Performance Assessment for the Waste Isolation Pilot Plant.* SAND98-0365. Albuquerque, NM: Sandia National Laboratories.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

JUN 22 ~~1999~~ 2001

OFFICE OF
AIR AND RADIATION

Dr. Inés R. Triay, Manager
Carlsbad Field Office
Department of Energy
P.O. Box 3090
Carlsbad, New Mexico 88221

Dear Dr. Triay:

The Environmental Protection Agency (EPA) is reviewing the Department of Energy's (DOE's) request, dated April 26, 2001, to approve changes in the utilization of Panel 1 of the Waste Isolation Pilot Plant (WIPP). EPA is examining the potential impacts of: (1) emplacing CH-TRU waste containers in 1-, 2- or 3-high stacks, (2) using all, part or none of the space in each of the rooms in Panel 1, and (3) closing Panel 1 without emplacing RH-TRU waste. We are aware of the safety issues that are developing in Panel 1 and we want to assist you in completing the work in Panel 1 as soon as possible. In order for us to make a determination on these changes, we are requesting additional information about analyses on the impact of roof falls on 1- and 2-drum high stacks, the assumption that the unused rooms will return to be equivalent to unmined conditions and other questions. Please see the enclosed list of questions.

Until we have an opportunity to examine the additional requested information, DOE is only authorized to stack CH-TRU 3 drums high. Once we receive the additional information we will review it and make a determination as quickly as possible. If you have any questions about the information we are requesting, please call Sharon White at (202)564-9457.

Sincerely,

Frank Marcinowski, Acting Director
Radiation Protection Division

Enclosure

cc: Cindy Zvonar, CBFO
Matthew Silva, EEG

Enclosure

Additional Information Needs on the Utilization of Panel 1

Roof Fall Analysis:

- The proposal does not include analysis of the potential impact of a roof fall on a one or two stack. Please submit documentation that shows how a roof fall on a 1- or 2-drum stack will influence Subpart A compliance. In addition you state, "Alternatives with 1-high or 2-high stacks would reduce the thickness of the compacted drum(s), but the intrinsic properties of the stack would not be changed." (Section 3.5) This conclusion may be correct for the long-term, but it is not clear from your documentation that this is true during the short-term. Submit analyses that support the conclusions that 1-high and 2-high stacks would not change the potential impact of roof falls during the operational phase.

Backfill:

- You state, in the Executive Summary, that, "MgO backfill will always be emplace with the waste so that the ratio of backfill to waste remains constant.".If only supersacks of MgO are available, how will the backfill to waste ratio be maintained?

Impact of Unused Rooms:

- You state that, "If rooms are left open, they will close to a condition equivalent to unmined salt." (Section 3.5) Justify this assumption. What evidence do you have to support this conclusion?

- It is clear that you assume that an unused Room will close to become equivalent to unmined salt. Has your evaluation also considered the possibility that an empty room may act as a preferential pathway for fluid to enter the repository in the event of a intrusion borehole? Please explain how this scenario for intrusion is or is not plausible.

Waste Loading:

- It appears that your conclusion that the expected total releases from the repository are independent of the waste loading scheme is predicated on the assumption that waste is uniformly emplaced. Under the proposed changes, waste will not be uniformly emplaced in Panel 1. Is this conclusion still appropriate? Please explain.

J1

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

APR 26 2001

Mr. Frank Marcinowski
Office of Radiation and Indoor Air
U.S. Environmental Protection Agency
401 M. Street, S. W.
Washington, DC 20460

Dear Mr. Marcinowski:

This purpose of this letter is to request approval from the Environmental Protection Agency (EPA) regarding a proposed change in the utilization of Panel 1 at the Waste Isolation Pilot Plant (WIPP). The proposed change will allow the DOE to determine the optimum waste configuration in each room at the time of emplacement based on considerations of worker safety, operational efficiency and cost. We previously briefed your agency regarding this subject on June 28 and December 13, 2000.

As part of on-going operational evaluations, the flexibility to vary the utilization of Panel 1 was identified as important from both a worker safety and an operational efficiency perspective. The rooms of Panel 1 are over 12 years old and the natural process of room closure has reduced the vertical clearance to the extent that re-mining would be necessary to provide sufficient headroom and acceptable floor conditions for waste to be emplaced as described in the CCA, i.e., three waste containers high. Adding the flexibility included in the proposed change will allow the DOE to minimize the worker risk associated with re-mining and maintaining the back (roof) and ribs (sides) of the older excavations and will also improve operational efficiency.

The proposed changes include the flexibility to do the following:

- Place CH-TRU waste containers in either 1-, 2- or 3-high stacks. MgO backfill will be emplaced with the waste so that the ratio of backfill to waste remains consistent with ratios described in the CCA.

- Use all or only a part of the space in each of the seven Panel 1 rooms for waste disposal. Some rooms could be bypassed and left void of waste.

- Close Panel 1 without emplacing any RH-TRU waste.

CBFO:ORC:DM:VW:01-0762:UFC:5486

The enclosed package contains a description of the requested changes and an analysis of their effects. Our analysis demonstrates that these proposed changes are non-significant, i.e., that the changes will not significantly change the certified baseline or compromise repository performance.

If you have any questions, please contact Daryl Mercer at 505-234-7452.

Sincerely,

Lawrence D. Bailey Jr. for

Dr. Inés R. Triay
Manager

Enclosure

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