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Environmental Protection Agency
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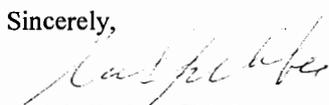
SUBJECT: Comments on the Proposed Rules: 40 CFR 194; **Criteria for the Certification and Determination of the Waste Isolation Pilot Plant's Compliance with Environmental Standards for the Management and Disposal of Spent Nuclear Fuel, High-Level and Transuranic Radioactive Wastes.**

To Whom It May Concern:

The attached comments regarding the referenced rulemaking were developed by the New Mexico Environment Department DOE Oversight Bureau. They are provided for the purpose of communicating technical concerns and recommendations and do not represent regulatory positions of the New Mexico Environment Department.

Should you require clarification regarding any of the comments you should call Mr. Keith E. McKamey of my staff at 505-234-8984.

Sincerely,


Neil S. Weber, Chief.
DOE Oversight Bureau

NSW/jwp

Enclosure

cc: Keith McKamey
Benito Garcia

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<p style="text-align: center;">NMED COMMENT/RECOMMENDATION</p>	<p style="text-align: center;">40 CFR 194 Proposed Rule</p>
<p>"DOE and contractor activities should be subject to peer review before decisions are made and actions are taken" (ref. 40 CFR1500.1 b). The intent of peer review is to add value and credibility to activities and to minimize delays that would be otherwise costly after-the-fact. More value should be given to peer review especially by organizations funded specifically for that purpose.</p>	<p>NACEPT Issue -- Peer Review</p>
<p>"The Salado Sea, a sub-basin to the Permian Basin, represents the most similar geologic and hydrologic conditions compared to the WIPP site. It can be defined as a isopach value of 1000" (ref. Galley; Oil and Geology of the Permian Basin of Texas and New Mexico; 1955) It would be advisable to research a more current author.</p>	<p>Subpart C - Compliance Certification and Determination -- Scope of Performance Assessments -- Consideration of Human - Initiated Processes and Events; Comments are solicited by EPA on how the Delaware Basin should be define</p>
<p>"These calculations provide a maximum of 62.5 boreholes. This may not be enough given a 20 acre spacing secondary recovery which could have as many as 41 boreholes per km x 2.5 = 102.5." (ref. Exxon - Avalon Field)</p>	<p>Subpart C - Compliance Certification and Determination -- Scope of Performance Assessments -- Consideration of Human - Initiated Processes and Events and 194.33; not less than 25 and not greater than 62.5 boreholes per square kilometer.</p>
<p>- "In general, a method is lacking for verification of computer modeling which analyzes risk and probability of occurrence for natural hazards/events and anthropogenic processes/hazards."</p>	<p>Section 194.22 -- Quality Assurance; generally addresses model verification based on ASME NQA references. Section 194.23 (c)(1) -- Models and computer codes; requires documentation of methodologies, scenario construction, and data collection procedures that support modeling activities. Section 194.32 -- Scope of performance assessments; requires consideration of natural and human-initiated processes and events.</p>
<p>"provide a comprehensive table of references pertaining to the subject area..."</p>	<p>Section 194.13 -- Submission of reference materials; requires references to be submitted to EPA. Stakeholders were told that copies of the March 1999 application will be available on compact disk and will include references accessed through a hypertext feature.</p>
<p>"add 'waste characterization program' to WAC and 'including a record of audits and surveillances and results of waste characterization studies..."</p>	<p>Section 194.14 (f) -- Content of compliance certification application; requires a description of any waste acceptance criteria and actions taken to assure adherence to such criteria. I assume that results of audits and surveillances would comprise "actions taken..."</p>
<p>"add 'brine and repository horizons' to list of media requiring background concentrations."</p>	<p>Section 194.14 -- Content of compliance certification application; generally requires this information. Section 194.42 -- Monitoring; requires baseline state definition which includes (b)(1)(i) Brine quantity, flux, composition, and spatial distribution.</p>

<p>"add 'a topographic map showing the surface projection of the underground facility, the location of abandoned resource wells and WIPP wells, and location of current and proposed oil/gas exploration wells."</p>	<p>Section 194.14 (h)(1-10) -- Content of compliance certification application; this recommendation is included comprehensively.</p>
<p>"Add a visual representation of the penetrated horizons within the 16 section boundary." (Ex. 3-D diagram representing the surface, geologic formations, and the boreholes that penetrate each zone and a cross section to detail the subsurface)</p>	<p>Section 194.14 (a) -- Content of compliance certification application; description of features that affect disposal system performance</p>
<p>"access to geographical information system/database to verify monitoring or experimental programs."</p>	<p>Section 194.12 -- "Unless otherwise specified by the Administrator, ... shall be submitted in a printed form..." Although the use of a GIS for formal electronic transmission of WIPP program information is not a requirement included in the proposed rule, it is not precluded. The Administrator may therefore request (require) alternative submission of applications or updates via electronic methods. Stakeholders were told that the March 1995 application submittal will be available on compact disk and will include references accessed through hypertext within the application.</p>
<p>"Change section (a)(4) to state "new waste characterization information" ..."</p>	<p>Section 194.15 (a)(4) -- Content of compliance determination application(s); Continued compliance will be supported with <u>updated waste descriptions</u> according to Section 194.24(a)(ii) -- Waste Characterization. Section 194.24 (a)(3) requires DOE to initiate a study of the effect of waste characteristics on waste containment in the disposal system with the results included in the application for certification of compliance.</p>
<p>" reference ASME NQA-1 for design, inspection and test control and EPA QAMS-055/80 for environmental and other monitoring data."</p>	<p>Section 194.5 -- Publication incorporated by reference; NQA- 1 is listed however the QAMS-055/80 is not. In view of the quality assurance requirements of Section 194.22, the QAMS has been acknowledged although not referenced. To list QAMS and NQA-1 would be redundant.</p>
<p>"Add definitions for Performance Assessment (194.33), Safe Distance, and Controlled Area (194.33)"</p>	<p>Section 194.2 -- Definitions</p>
<p>"Add Indefinite Environmental Monitoring, especially groundwater" "Add continuous drilling fluid monitoring for radioactive elements for oil and gas drilling within a projected distance from WIPP."</p>	<p>Section 194.22 (a)(2)(ii) -- Quality Assurance ; Environmental Monitoring</p>
<p>"Quality Assurance Plans should also include 'Data from Laboratory Measurements'".</p>	<p>Section 194.22 (c)(1-8) -- Quality Assurance ; Reported values from laboratories are directly related to the laboratory quality control analyses that support the "quality indicators" that WIPP is required to provide in the application for certification of compliance. These values, presumably, will be included.</p>
<p>"Quality indicators should include; (6) Data Validation and (7) Data Verification..."</p>	<p>Section 194.22 (c)(7-8) -- Quality Assurance; These QA elements have been included explicitly in this section.</p>

<p>"Expert Judgement: This section should also include a provision for elicitation of State representatives with adequate credentials to expert panels;..."</p>	<p>Section 194.26 (h) --Expert judgement; The proposed rule states; "Group and individuals (including those not directly employed by the Department by the Department's contractors) <u>shall be afforded</u> an opportunity to present their scientific and technical view as input to any expert elicitation process. The proposed rule assumes that State representatives with adequate credentials will be included. The LWA, SEC.17. ACCESS TO INFORMATION, permits "to the extent practicable" the State and EEG to attend expert panel and peer review group meetings, as well as, evaluate and analyze WIPP activities. The proposed rule sanctions comment and involvement by State, NAS, and EEG to the expert elicitation process. Elicitation of the State will come through oversight evaluation comments.</p>
<p>"reference the existence of older, abandoned wells including the drilling, completion, and plugging procedures in use at the time and the potential for degradation"</p>	<p>Section 194.33 (second b)(2) -- Consideration of human-initiated processes and events; "Natural processes will degrade or otherwise affect the permeability of boreholes over the regulatory time frame." This obviates the need for a comment.</p>
<p>"seals will isolate all groundwater zones consistent with the NM State Engineer's Rules and Regulations 4-20.2 & 4-19.1</p>	<p>Section 194.33 (b)(6) -- Consideration of human-initiated processes and events; seals will remain consistent with current practice in the Delaware Basin</p>
<p>"subsidence caused by withdrawal of oil/gas resources should be mentioned..."</p>	<p>Section 194.42 (b)(2)(iv) --Monitoring; The rule requires DOE to submit with it's application the results of a study of the effects of disposal system parameters on waste containment and shall include (iv) Subsidence and other effects of human activity in the vicinity of the disposal system. The results of the study should identify causative subsidence factors, <u>inter alia</u> , withdrawal of oil/gas resources.</p>
<p>"at least one parameter should be monitored during the disposal phase and for as long as practicable following closure."</p>	<p>Section 194.42 (a) -- Monitoring; Within the context of the proposed rule (a) of this section is relative to monitoring for RCRA releases from the disposal system, (a)(1) states that the disposal system will be monitored after disposal consistent with 40 CFR 264,265, 268, 270. (a)(2)(iii) - states "Discuss the length of time over which each parameter will be monitored to detect deviations from expected performance." This does not preclude monitoring "for as long as practicable following closure".¹</p> <p>Section 194.42 (b) -- Monitoring; Within the context of the proposed rule (b) of this section is relative to monitoring geomechanical and geochemical baseline states of the disposal system. (b)(1) requires, to the extent practicable, pre-closure monitoring of the disposal system shall end when the last container is emplaced, but before shafts are backfilled and sealed. (b)(2) requires DOE to monitor; <u>brine</u> - quantity, flux composition, and spatial distribution; <u>gas</u> - quantity and composition; <u>temperature</u> distribution; and <u>other parameter important to containment of waste</u> in the disposal system identified through studies required in (b)(2), i.e., (i) Backfilled mechanical state including porosity, permeability, and degree of compaction and reconsolidation. (ii) Extent of deformation of the surrounding roof, walls, and floor of the waste disposal room. (iii) Initiation or displacement of major brittle deformation features in the roof or surrounding rock; and (iv) Subsidence and other effects of human activity in the vicinity of the disposal system.</p>

"Engineered barriers should contain some form of alarming identity to hazardous materials if encountered by human intrusion (ie. dyed rock, semi-impenetrable material)
 Prior to cementing - drilling contractors should sandblast and/or rough-coat pipe to insure a better bond.
 Common cementing practices in the industry - Establish injection rate (vacuum zones have higher porosity - use less cement) (tight zones - use more cement) prior to cement job.
 Calculate cement volume (50% excess no caliper, 35% excess with caliper) set drillable retainers one above and one below each possible water zone (ie. 49er, Dewey Lk., Magenta, Culebra, and Delaware) pump liquid sodium silicate (ie. Flo check - Halliburton) to build upon, pump premium plus Class C cement (sulfate resistant with 2% calcium chloride (CaCO₂) as an accelerator along with 10% salt (10% of mixing water weight) to prevent formation erosion. During primary job close in annulus and squeeze each water zone before you bump plugs and shut in for curing."

Section 194.44 -- Engineered barriers;

¹ The implication is that EPA and NMED will agree on the duration of post-closure monitoring to be stipulated in the RCRA per closure plan monitoring requirements of the permit, i.e., "post closure care period" and is discussed in the CF to reduce duplicate monitoring. This is reasonable, given that groundwater (Culebra) will be the primary release/exposure pathway considered in determining compliance of the facility with both 40 CFR 264, 268 and 40 CFR 194 as proposed. And too, NMED should consult with EPA on monitoring requirement techniques insuring that the containment of waste in the disposal system is not jeopardized (a)(1).

Section 194.14 -- Content of compliance certification application (g), requires submittal of "a description of background radiation in air, soil, and water in the vicinity of the disposal system and the procedures employed to determine each". Establishing an environmental monitoring background implies a regulatory requirement that routine monitoring of established radiological background sample locations be conducted to identify deviations that may influence disposal system performance, hence, continued compliance. The WIPP Land Withdrawal Act requires a review and determination by EPA, every five years, of continued compliance (not recertification) of the WIPP to the disposal regulations and will include "monitoring results". Section 194.15 -- Content of compliance determination application(s); of the proposed rule requires that "updated documentation" be provided, inter alia, Monitoring results (a)(2).

● COMMENT: Monitoring results will include; radiological (194.14 (g)) and RCRA (194.42 (a)(2)(i)) constituent background concentrations and should not update the established background concentrations, but be used for determining constituent release or deviations from background levels and should continue through the "post-closure care period", 30 years for 40 CFR 264.117 (268.6) and an unspecified duration for 40 CFR 191.14.

"Monitored parameters shall include"...add "but not be limited to". This section should not limit monitored parameters to those that may "affect the transport" of Radionuclides. This section should also include those parameters that "indicate the movement of Radionuclides", which would be the ultimate test of satisfying 40 CFR 191.14, "Disposal systems shall be monitored after disposal to detect substantial and detrimental deviations from expected performance".

Section 194.42 -- Monitoring; EPA is requiring the facility to determine critical performance parameters and to monitor each parameter. DOE is mandated in (b)(2) to conduct a study to determine and monitor these parameters. Results are to be included in the application for certification of compliance and the periodic (every 5 years) application(s) for compliance determination. Parameters, although not specified, should include comprehensive geomechanical parameters relative to repository performance and Radionuclide and hazardous constituent releases or migrations for compliance determinations relative to the background concentrations.

EPA COMMENT SOLICITATION 60 CF 5766

EPA proposes that DOE retrieve any waste emplaced in the disposal system upon revocation of the certification.

COMMENT: The spirit, if not the letter, of the WIPP Land Withdrawal Act includes the State in any major determination such as this, whatever the scenario. In the LWA SEC. 9 COMPLIANCE WITH ENVIRONMENTAL LAWS AND REGULATIONS (c); decision rolls and responsibilities are very clear and relative primarily to non-compliance. EPA and the State can invoke revocation and require implementation of retrieval plan procedures.

EPA proposes DOE conduct studies to identify critical performance parameters that should be included in a comprehensive list criteria parameters that EPA will require in the application.

COMMENT: This is satisfactory, but should be decided through colloquy between DOE, EPA, and NMED.

EPA proposes a flexible approach to acceptance and inclusion of "old data" (pre-ASME-NQA series), if sufficiently reliable.

COMMENT: This approach is justified. It would be unreasonable to disallow the use of "old data" if it can be qualified through technical/quality review process and determined to be reliable. The qualification process should be delineated.

EPA proposes that the expected curie activity 100 years after disposal of waste in the WIPP be used in calculating applicable release limits.

COMMENT: This is reasonable and should be considered when determining the "post-closure care period." It should be at least 100 years (maximum limit of active institutional control) or for as long as practicable after closure. The basis of this calculation will be the "WIPP TRU-Waste Baseline Inventory Report, CAO 94-1005", which is constantly being updated or modified. Before a reliable calculation could be made, the inventory must be determined with a high level of confidence.

EPA solicits comments on requiring radionuclide and federal hazardous waste monitoring programs to be consistent in order to minimize duplication of efforts.

COMMENT: This approach is appropriate and will require coordination between the NMED and EPA, e.g., in establishing background concentrations of Culebra brines at compliance monitoring locations and the permeable or fractured Salado interbeds as suggested by the proposed rule.

EPA solicits comments on the feasibility of monitoring the disposal system after disposal and the repository has been backfilled and sealed.

COMMENT: Long term, remote, intra-repository monitoring of the geomechanical parameters is not feasible, primarily because the integrity of the system will be violated and retrieval very unlikely because of economic and ALARA considerations. It would be more appropriate to include an engineered barrier, e.g., microfine grouting (sealing the exposed perimeter Salado interbeds) to compensate for migration of Radionuclides and/or hazardous materials through this pathway. The integrity of this seal could be determined prior to waste emplacement in a given panel. The same could be accomplished for the marker beds above and below the disposal horizon.

EPA solicits comments on the extent - if any - to which contributions from passive institutional controls should be considered in PAs.

COMMENTS: No credit should be given for passive institutional controls as pointed out in the CF, i.e., failure of the MOU between DOE and BLM regarding area O&G drilling permits. Every effort should be made to label the site and a permanent marker erected. In many ways the repository could become a resource of future significance. Human error can not be obviated.

EPA solicits comments on the appropriateness of specifying engineered barriers as the subject of study and on whether alternative barriers should be specified.

COMMENT: From a very simplistic but logical standpoint, every effort should be made to control the future internal state of the repository to supplant any macro effects on the pathways into and out of the repository. These conduits to the accessible environment, should be sealed to prevent migration, i.e., each panel could be mined, the perimeters sealed (grouted) and integrity verified, and the waste emplaced. Backfill, designed to retard flow of Radionuclides and hazardous constituents, as well as, act as a pH buffer to control (negate) nuclide solubilities should be required. These EAs would support confidence in the long-term performance of the repository, presuming of course that they could be economically justified.

The No-Migration Determination for the Test Phase basically stated that migration from the repository through the groundwater pathway during the short term test phase was not likely but provided no assessment of the long term. The NMD for the disposal phase will address a longer term and should be consistent with the 194 criteria.

EPA solicits comments on criteria that satisfies 40 CFR 191.14(e); presence and recovery of resources versus favorable containment characteristics of the site. DOE must demonstrate that site containment characteristics of the WIPP compensate for the presence of resources and the likelihood of human-initiated processes and events.

COMMENT: 14(e) suggests that areas containing natural resources should be avoided when selecting a site. Initial site selection acknowledged the potash resources in the area but did not accurately determine the extent of oil and gas reserves. With construction complete and the repository ready to receive waste, it is untenable to revisit this issue, nonetheless, consequences of improper siting will affect the ability of the WIPP to obtain PA certification and will relate directly to the rate of human-intrusion. Issuance by EPA of a certification, at this point in time, will indirectly demonstrate that waste containment characteristics of the site outweigh the presence of resources and resultant rate of human-intrusion. NMED should be concerned with amelioration of the rate of human-intrusion by DOE in its compliance application.

EPA solicits comments on whether there is a need for further clarification of the analysis of undisturbed performance.

COMMENT: Human-intrusion is defined in 194.2 and it seems appropriate that EPA define "unlikely natural events" and develop a list of probabilities for qualifying events specific for the WIPP, inter alia, deep dissolution, volcanism, tectonics, meteorite impacts, etc.