

EEG-20



**AN EVALUATION OF THE NON-RADIOLOGICAL
ENVIRONMENTAL PROBLEMS RELATING TO THE WIPP**

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New Mexico

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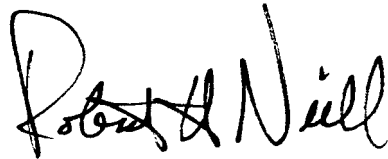
FOREWORD

The purpose of the Environmental Evaluation Group (EEG) is to conduct an independent technical evaluation of the potential radiation exposure to people from the proposed Federal radioactive Waste Isolation Pilot Plant (WIPP) near Carlsbad, in order to protect the public health and safety and ensure that there is minimal environmental degradation. The EEG is part of the Environmental Improvement Division, a component of the New Mexico Health and Environment Department -- the agency charged with the primary responsibility for protecting the health of the citizens of New Mexico.

The Group is neither a proponent nor an opponent of WIPP.

Analyses are conducted of available data concerning the proposed site, the design of the repository, its planned operation, and its long-term stability. These analyses include assessments of reports issued by the U.S. Department of Energy (DOE) and its contractors, other Federal agencies and organizations, as they relate to the potential health, safety and environmental impacts from WIPP.

The project is funded entirely by the U.S. Department of Energy through Contract DE-AC04-79AL10752 with the New Mexico Health and Environment Department.

A handwritten signature in black ink, appearing to read "Robert H. Neill". The signature is stylized with a large initial "R" and "N".

Robert H. Neill
Director

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INTRODUCTION

The evaluation of the non-radiological concerns inherent in the WIPP consisted of a) identifying the apparent specific environmental concerns, b) evaluating the control strategies for ameliorating these concerns and finally c) identifying the Federal or State regulatory mechanism for insuring that the control strategies proposed are adequately complied with during the construction and operation of the WIPP facility.

The WIPP project is designed to receive, inspect, emplace and store defense-generated transuranic wastes in a retrievable fashion in an underground salt medium and to conduct studies and perform experiments in salt with high-level wastes. While not unique in its individual components, the entire operation presents some inherent environmental problems.

The WIPP site is located in an area of low population density and proposes a low on-site employment population during construction and operation. These factors allow for a low population/problem exposure rate.

The major non-radiological environmental problems which will be addressed in this report are the following; air pollution, water pollution and sanitary waste, solid waste, domestic drinking water, occupational health and safety and toxic chemicals.

AIR POLLUTION

Air quality is affected by most human activity. A review of the Final Environmental Impact Statement and the WIPP Safety Analysis Report indicates that the major increase in air pollutants will occur during the construction phase of the project.

The heavy-duty diesel-powered construction equipment emit carbon monoxide, hydrocarbons, nitrogen oxides, aldehydes, sulfur dioxide and particulates. Fugitive dust is also produced during the construction and operation of the facility. Gaseous and airborne particulate waste generated in the operation of WIPP will be released in the amounts shown in the WIPP Safety Analysis Report, Table 3.1-6, as follows:

Table 3.1-6⁽¹⁾

NONRADIOACTIVE GASES AND PARTICULATES RELEASED
TO THE ATMOSPHERE ANNUALLY

<u>Material</u>	<u>Quantity Kg</u>
Hydrogen	1.1
Helium	0.0005
Hydrogen chloride	0.34
Carbon monoxide	13,180
Hydrocarbons	4,310
Nitrogen oxides	70,300
Sulfur oxides	4,160
Particulates	4,066
Salt dust (excavation and surface handling)	1,680

The Environmental Improvement Division of the Health and Environment Department has reviewed the entire project and has issued a permit pursuant to New Mexico Air Quality Control Regulation Number 702.² The Air Quality Bureau's review included compliance with applicable New Mexico Air Quality Control Regulations, and both State and Federal Ambient Air Quality Standards. The permit was issued contingent upon certain conditions being met during construction and operation.

It is my opinion that all requirements have been met in addressing the air pollution concerns and that air quality will not be adversely affected by the WIPP.

WATER POLLUTION/SANITARY WASTE

There are no planned water discharges for the WIPP. All drilling fluids, salt-pile runoff, and wash water will be held within diked areas. Runoff collection ditches around the salt pile and a salt evaporation pond are proposed to contain all salt water and to protect this area in compliance with New Mexico Water Quality Control Commission Regulations.

The Environmental Improvement Division has issued a finding that a ground-water discharge plan is not required for the Site and Preliminary Design Validation (SPDV) program. The Division has stated that they expect "...a thorough and objective treatment of brine reservoirs and salt dissolution processes...".

An on-site sewage treatment plant is proposed which will consist of two parallel aerobic lagoons connected to a common effluent loading tank. The system will be designed for a 45,000 gal/day loading. Liquids from the lagoon will be used for site landscaping and dust control.

The engineering plans and specifications for the sewage treatment plant have not been received by the Environmental Improvement Division and therefore a permit to construct and operate a facility has not been obtained.

In summary it appears that with the exception of the reservations expressed by the Environmental Improvement Division and various other groups and individuals concerning brine reservoirs and salt dissolution that the apparent water pollution concerns associated with the construction and operation of the project have been adequately addressed. A permit to construct and operate the sewage treatment plant must still be obtained. The depth to groundwater in the area is in excess of 200 feet and therefore should not present a problem.

SOLID WASTE

The WIPP will generate about 2,500 yd³/y of solid (paper, rags, plastic material, garbage from the cafeteria, wood scrapes, sheet metal scrapes, etc.), non-radioactive waste in addition to the 2 million tons of salt excavated during the lifetime of the plant. The non-salt solid waste will be deposited in an on-site sanitary landfill.

Because of the extent to which salt material is handled it could become a heavy source of air pollution. The WIPP proposes to address this problem by controlling the surface conveyor system by enclosing the belts of the stationary conveyors with removable covers. All belt transfer points will be fully enclosed and connected to dust collector. However, the recently proposed cost-reduction program of DOE would replace the conveyor with trucks to transport the salt.⁴

The WIPP proposes to spray the salt storage pile with water to protect it from wind erosion (N.M. Air Quality permit condition).² The effect of spraying should cause a hard coating of cemented salt particles to form.

The proposal for handling solid waste at the WIPP appears to be adequate.

DOMESTIC DRINKING WATER

Water for domestic use and fire protection (90,000 gal/day assuming three shifts/day) will be purchased from the Double Eagle Water Company which is a public source owned by the City of Carlsbad.

Water will be supplied by a 24-inch diameter reinforced concrete pipe to a junction point about 13 miles north of the site. A 10-inch diameter pipeline will supply water from the tie-in point by gravity flow to the site. At the site the water will be chlorinated before it enters two 165,000 gallons above ground storage tanks.

The Double Eagle Water Company is a publicly operated water system regulated by the State of New Mexico. The source is in compliance with the New Mexico and Federal drinking water standards. The water company and the State take frequent water samples to insure that the system remains in compliance.

I foresee no problems in this area.

OCCUPATIONAL HEALTH AND SAFETY

The safety protection criteria proposed for the WIPP incorporates sound industrial hygiene practices such as confinement, physical barriers, fire barriers, separate ventilation systems, back-up systems, and pressure differential. Air flow is directed from areas of lower to areas of higher potential for contamination. In building with the potential for contamination a negative pressure is proposed to minimize the spread of contaminants.

The construction of the shaft and related construction is currently being evaluated by the Mine Safety and Health Administration (MSHA). The operation is currently being inspected four times a year to insure miners' safety and health. During the operation of the plant the MSHA will inspect the mining aspects of the operation. It is my understanding that the Corps of Engineers will be assigned the task of insuring that all other aspects of health and safety are complied with.

The State of New Mexico will have no involvement in evaluating the mining aspects or the ongoing operation from a safety or industrial hygiene point of view.

The WIPP appears to have incorporated the latest safety and industrial practices in designing the facility. A critical factor will be to insure that the facility is designed and operated according to the proposed plan.

TOXIC CHEMICALS

The WIPP project is primarily designed to receive, inspect, emplace and alternatively to dispose of transuranic waste. There will be no chemical processing at the site and therefore no appreciable chemical handling problem.

A health physics laboratory is proposed to perform radioactivity analyses for the operational control, environmental monitoring, and health physics sampling program. Several types of chemicals, acids and solvents will be used in preparing samples.

The storage of sodium hypochloride and diesel fuel always presents a problem, however, the safety provisions seem to be adequate.

The Environmental Evaluation Group recognized the danger in having large quantities of pyrophoric, toxic or corrosive material in shipments arriving at the WIPP.³ The following wording was suggested.

"Pyrophoric materials in excess of 1% by weight shall not be shipped to WIPP. No pyrophoric material shall be shipped unless they have been mixed with chemically stable materials (e.g. concrete, glass, etc.) so that they will not ignite spontaneously under the ambient conditions of shipment or storage at the repository."

and

"TRU contaminated toxic substances shall not be shipped to WIPP unless the toxic materials are identified as prescribed under 'Labeling', 'Data Package', and the WIPP operator has been notified and grants approval prior to shipment. The shipment containing nonradioactive toxic materials shall also be in accord with the regulations of the State of New Mexico and the toxic materials shall be uniformly dispersed in the waste. TRU contaminated corrosive materials shall not be contained in the TRU wastes unless they have been neutralized or otherwise rendered non-corrosive."

The wording suggested by Marshall Little of the Environmental Evaluation Group was substantially adopted along with TRU Waste Certification requirement

and, therefore, these materials should not be a problem if the criteria are followed.⁵ I would suggest that an inventory be developed of all chemicals to be used in the health physics laboratory and that proper handling techniques and precautions be developed to insure their safety.

RECOMMENDATIONS/FINDINGS

1. Air Pollution

This has been adequately addressed and the necessary permits have been obtained by DOE. The State of New Mexico will obviously have to monitor the activities at the WIPP to insure that the permit conditions are being complied with.

2. Water Pollution/Sanitary Waste

All necessary reviews of surface and groundwater pollution sources have been adequately complied with. A final resolution of the potential problem with brine reservoirs and of salt dissolution must be ultimately resolved.

A permit to construct and operate the sewage lagoon system must be obtained before it is constructed.

3. Solid Waste

Adequately addressed.

4. Domestic Drinking Water

Adequately addressed.

5. Occupational Health and Safety

This is essentially handled by federal agencies (MSHA and eventually Corp of Engineers). I do not see a problem from New Mexico's standpoint.

6. Toxic Chemicals

There is a need to quantify and identify the chemicals to be used in the Health Physics Laboratory. The EEG has done a very effective job in assuming adequate TRU waste certification compliance requirements. If compliance is achieved, I foresee no problem.

7. Stipulated Agreement Settlement

The "Supplemental Stipulated Agreement" between the Department of Energy and the State of New Mexico is a far reaching approach resolving New Mexico's off-site concerns.

The significant environmental issues include an agreement to aid the State in the development and implementation of a radiological emergency response plan and the financial assistance (\$1,083,750.00) to purchase equipment and technical assistance. A radiological emergency response plan, identifying all concerned entities, has been needed by the State for some time.

The agreement allows the State the opportunity to monitor activities at the site of origin, at points of entry into the State, and at any point on or off the site. The State may restrict shipment to certain highways in the State.

The agreement allows the State the opportunity to monitor environmental aspects both off and on the site. This is critical in determining whether all quality assurance provisions agreed to are being followed.

The agreement guarantees funding for the State's independent review capability (EEG) until 1985. I would suggest that a plan be developed and funded that would allow the Environmental Evaluation Group to continue in a role of monitoring and evaluation to insure that the various quality assurance proposals are followed. One has only to look at the track record of various storage sites to conclude that an on-going independent monitoring program must be maintained.

CONCLUSION

The Environmental Evaluation Group was created to provide the State of New Mexico with an independent professionally qualified group of experts to evaluate the Waste Isolation Pilot Plant. Through the leadership of Robert H. Neill and a staff of various experts the role earlier envisioned is being admirably fulfilled. Every aspect of the WIPP is being thoroughly reviewed. Many quality assurance provisions were incorporated into the project because of the insistence of the EEG.

I have reviewed all aspects dealing with the non-radiological issues and believe that they are adequately addressed. My only final recommendation is that an independent State monitoring program be continued for the duration/operation of the project.

REFERENCES

1. U. S. Department of Energy, Waste Isolation Pilot Plant, Safety Analysis Report, 5 vols., 1980.
2. Letter of June 6, 1980, from Kenneth M. Hargis, Chief, Air Quality Bureau to Mr. D. T. Schueler, Waste Isolation Pilot Plant Project Manager.
3. Letter of October 7, 1980, from Thomas E. Baca, Director, Environmental Improvement Division to Mr. D.T. Schueler, Project Manager, WIPP Project Office.
4. U. S. Department of Energy, Environmental Analysis Cost Reduction Proposals, WIPP-DOE-136, July, 1982.
5. Little, Marshall S., Environmental Evaluation Group, Review Comments on the Report of the Steering Committee on Waste Acceptance Criteria for the Waste Isolation Pilot Plant, EEG-4, February, 1980.
6. U. S. Department of Energy, TRU Waste Certification Compliance Requirements for Contact-Handled Wastes Retrieved From Storage for Shipment to the WIPP, WIPP-DOE-137 UC-70, September, 1982.