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**PROBLEMS with the
WIPP HAZARDOUS WASTE PERMIT**

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Problems with the Waste Isolation Pilot Plant (WIPP) Hazardous Waste Permit can be grouped under several categories, including waste, waste characterization, repository and operations, post-closure and groundwater monitoring. Problems with the Permit will be described and pertinent comments by the applicant, Department of Energy, and its contractor, Westinghouse Electric Co. Waste Isolation Division (DOE/WID), on the Permit will be given. Their comments describe how they would like the Permit to be changed.

WASTE

NO PERMIT, NO WASTE! DOE/WID have been trying to ship waste to WIPP without a Permit by claiming that they can separate out "purely radioactive" waste and that purely radioactive waste is regulated only by the Atomic Energy Act (AEA). However, WIPP is a hazardous waste facility and therefore is regulated under the Resource Conservation and Recovery Act (RCRA) under the jurisdiction of the New Mexico Environment Department (NMED). In addition, in the past DOE has always claimed that **all** waste at WIPP would be dealt with as **mixed waste** (both hazardous and radioactive). In fact, because of the effects of **radiolysis** (see below), all waste may in reality be mixed waste anyway.

DOE is attempting to ship 36 drums of waste from Los Alamos National Laboratory (LANL) to WIPP before the Permit is issued. These are from **waste stream** "TA-55-43, Lot No.1" – a waste stream that was made up by DOE and which has many problems with **characterization**. It was not characterized identically to methods laid out in the Permit, even though NMED has said contact-handled transuranic (CH-TRU) waste should be characterized in conformance with CH-TRU mixed waste criteria. DOE, of course, objects to this requirement.

DOE/WID also say that they can also ship waste without a permit because WIPP has **Interim Status**. Because there were hazardous waste facilities operating all over the country when RCRA was passed by Congress, those facilities were "grandfathered in" and allowed to continue operating with "interim status" until they were permitted. All such facilities have now been permitted. WIPP, however, was not operating at that time and was only under construction. Therefore, WIPP should not be "grandfathered in." The issue of the ability of DOE/WID to ship waste without a permit will be heard in March by a federal court in Washington, D.C.

No remote-handled (RH) waste at WIPP: The draft Permit prohibits any RH waste at WIPP whether mixed or not. [RH waste is so hot that it must be remotely handled.] So little is known about RH waste that it would be almost impossible to characterize it and determine what hazardous constituents are in the waste. DOE/WID want NMED to change the Permit to allow RH waste at WIPP,



but they included almost no information about RH-TRU characterization or management in their Permit application.

Hazardous wastes should be treated. Draft 1 of the Permit required wastes to be treated. This requirement was removed in Draft 2, the current draft Permit. Wastes should be treated to reduce releases of hazardous materials during accidents or drum breaches and to make the waste less mobile when brine or water fills the repository after it is closed.

The draft Permit prohibits acceptance of **PCB-contaminated waste** at WIPP. DOE wants to be able to bring this waste to WIPP.

WASTE CHARACTERIZATION

WIPP's ability to isolate waste from the environment depends on strict limits on the kinds of waste disposed at the site. Therefore, it is crucial that the kinds, quantities and concentrations of wastes are well understood. Unfortunately, the waste characterization processes do not guarantee this.

Waste is divided into **waste streams** at the generator/storage sites. It is first divided into three broad groups, **Homogeneous Solids, Soils/Gravel and Debris Wastes**. It is further divided and characterized using **Acceptable Knowledge (AK)**, **real-time-radiography (RTR)**, **visual examination (VE)** and **sampling & analysis**.

No off-site waste without a Permit modification for each site. Each generator/ storage site (like LANL or Rocky Flats) is unique. Each has unique waste created by different processes and each characterizes this waste in different ways. DOE wants a blanket approval for all these sites to send waste to WIPP. However, NMED should approve the characterization process at each site before that site can ship waste to WIPP.

In addition, NMED must be required to attend the site audits which check to see if a site can correctly characterize the waste under the requirements of the Permit. DOE must not be allowed to audit itself alone. DOE must also not be allowed to have the requirement allowing the public to comment on the final Waste Analysis Plan audit report removed from the Permit.

The **Waste Analysis Plan (WAP)**. The WAP is the heart of characterization but doesn't require all the necessary testing and analysis. Some of problems with the WAP include:

1. The WAP should apply to all wastes, not just mixed waste;
 2. The date and basis for waste stream definition must be specified so DOE/WID can't "make-up" a waste stream (as they did at LANL in TA-55-43, Lot No. 1);
 3. The WAP must specify methods to determine the role of radiolysis in generating **Volatile Organic Compounds (VOCs)**;
 4. All retrievably stored waste must have RTR, VE and be treated to treatment standards;
 5. The WAP must specify analysis for explosives, perchlorate and vinyl chloride;
 6. All identified **Tentatively Identified Compounds (TICs)** must have confirmatory sampling;
- and
7. More stringent room-averaged VOC concentration limits must be specified.

VOCs are generally solvents and are often found in the waste as gases. They can be generated in the process that created the waste or be generated later in the waste containers through radiolysis

(irradiation of PVC plastic and rubber materials produces hazardous compounds) or other breakdown of the waste. The Permit requires that the **headspace gases** in all containers be sampled and analyzed for VOCs. [DOE only wants to sample a small percentage of the containers.] However, many containers have sealed plastic bags or rigid containers (like cans) in them that could be filled with VOCs. Therefore, not only the headspace of each container but also **all inner confinement layers, including rigid inner layers**, should be sampled. There is no other way to know the actual VOC concentrations in the containers.

Although the Permit acknowledges that radiolysis may generate VOCs, it does not specify methods for sampling and analyzing these VOCs. This is especially important since some radiolysis-generated VOCs are **reactive** (benzene), **ignitable** (acetone), or **corrosive** (hydrogen chloride). These types of waste are prohibited at WIPP. DOE wants all references to radiolysis removed from the Permit.

In addition, the Permit now states that **Tentatively Identified Compounds (TICs)** (compounds that are found in waste samples, but which are not on a list of compounds to be analyzed for that waste stream) will **not** be added to the list to be analyzed if they are determined through AK to be generated by radiolysis (or from the packaging materials, or are found less than 25% of the time). AK should not be used to exclude such constituents from analysis.

Acceptable knowledge. AK is documentation of the history of the waste and the processes which generated it. This documentation is not always complete and often does not describe what is actually in the waste containers. DOE has said that the primary use of AK is to determine whether a waste stream is mixed, rather than to characterize waste streams that have already been determined to be mixed. Yet DOE wants to use AK (verified by radiography and headspace gas analysis) of Debris Wastes to satisfy the Permit requirement that they "...must obtain a detailed chemical and physical analysis of a representative sample of the wastes." [The make up of Debris Wastes varies from drum to drum, hence it is difficult to take a **representative** sample.] Since it has already been shown that AK often does not comprehensively describe a container's contents; that radiography can miss prohibited items in Debris Waste; and that headspace gas analysis cannot describe VOCs that are in some inside containers, **characterization must include both radiography and visual examination** of all containers unless there is adequate proof based on actual extensive results at each generator/storage site that both aren't necessary. The Permit must also increase the Mandatory Acceptable Knowledge list of what information must be used as AK to include the current Supplementary Acceptable Knowledge list.

Statistical methods. Although headspace gas sampling and analysis is to be performed on every container of waste (and DOE objects to sampling 100% of the containers), no other characterization method (other than AK) is required to be used on every container. Instead, the Permit uses statistical methods to determine what small percentage of containers will stand for all the potentially thousands of containers in a waste stream. For instance:

The Permit allows a 2% miscertification rate. This means that they only have to open and visually examine 2% of containers that have undergone radiography to verify that they have been characterized correctly. The 2% rate is based on experience at the Idaho National Engineering and Environmental Laboratory (INEEL). DOE/WID want to apply this 2% rate to **all** generator/storage sites even though the TA-55-43, Lot 1 waste at LANL had an 8%-33% miscertification rate. Waste characterized to the WIPP WAC for the abandoned bin-scale tests had a 58% miscertification rate at INEEL itself. [This is another reason why there must be a Permit modification before any site can send waste to WIPP – each site is unique in its **ability** to characterize waste.] DOE/WID are trying to say the 2% rate is an historical rate, but none of the sites has any historical rate because none has characterized

waste under the WAP of an approved Permit. DOE/WID still need to prove that they actually can characterize the waste properly.

There are many other complicated statistical ways for determining how many containers should actually be checked. For instance, only one container per year of newly generated homogeneous solids will be randomly selected (possibly from thousands) to be analyzed for PCBs, internal VOCs, SVOCs and metals. Percentages for testing of retrievably stored wastes are also specified. Many of these percentages seem far too small to catch problems and need to be revised toward greater frequency and sampling. Yet many of DOE/WID's comments are directed toward testing far fewer containers and reporting any problems found to NMED less frequently. For instance, they want to choose radiographed drums to be verified by VE not from each waste stream as the Permit says, but from the total certified population of waste streams. DOE/WID say one of the reasons to do less characterization is to have less worker exposure. Yet they also want to eliminate the Permit requirement to do all headspace gas sampling in radiation containment areas. DOE/WID also convinced NMED to lower the confidence level for analysis from 95% in Draft 1 of the Permit to only 90% in the current draft Permit. The 95% rate needs to be reinstated.

THE REPOSITORY AND OPERATIONS

Panel 1 should not be used. Only one panel of seven rooms has been excavated underground at WIPP. These rooms were excavated in the 1980's and have far exceeded their expected life. The floors and walls are bulging in and the roofs have to be supported by two and sometimes even three roof support systems. These roof support systems work well as long as they are maintained, but maintenance can't be performed on them while waste is being emplaced. Even with maintenance, the third roof support system won't last more than two or three years. Roof falls in Panel 1 are likely, not a "remote possibility" as is stated in the Permit. In their Application DOE/WID never described the special conditions of Panel 1 and the Permit should not authorize the use of this Panel. If NMED does allow Panel 1 to be used, they should require DOE/WID to satisfy them through outside inspections that each room can be filled and closed safely before a roof fall could occur in that room. DOE is required by the Land Withdrawal Act and its Amendments to have an annual inspection of the WIPP mine by the U S Bureau of Mines (USBM). Since the USBM was abolished four years ago, DOE has pursued no outside inspection of WIPP. Panel 1 rooms are also poorly designed and future panels should be required to have improved designs. A permit modification for such a design should be necessary before new panels could be excavated.

Like the special conditions of Panel 1, the Permit needs to acknowledge the special conditions of the **Year 2000 (Y2K)**. Normal operations, safety and accident systems all have numerous computer dependencies. All waste should be prohibited from WIPP until all systems have been inventoried, checked, upgraded and tested to be Y2K compliant. In addition, systems at WIPP are tied into outside systems like electricity, phones, satellite tracking systems, etc. Although emergency electrical generators at WIPP have enough fuel for six days, what if an electrical black-out lasts longer than that and fuel is hard to get? No one knows if Y2K will be a whimper or a roar so no waste should be shipped to WIPP until all such outside systems have been proved to be Y2K compliant as well – certainly well after January 1, 2000.

Approved **waste containers only have lifespans of 20 years**. Since workers will be in the repository for at least 35 years, containers should be required to have a longer lifespan before they start to degrade. **No aisle space** is required in the underground rooms, hence monitoring, retrieval and overpacking (putting one container into a new, larger container) of waste containers would be difficult in

case of suspected container breaches or container fires. Because of the flammable gases in the waste and the potential for fire and explosion in a sealed room or panel, the Permit says the **panel seals** shall be able to withstand a methane gas explosion. However, the seals work in theory only. The technology has never been tested and it is unclear if they actually will hold if there is an explosion or a major roof fall in a sealed panel. If the seals failed under such conditions, the force of the explosion and/or roof fall would propel radioactive and hazardous materials into active areas of the repository where people are working. It could even propel these materials up the exhaust shaft into the environment.

To protect workers, there are **limits to the concentrations of VOC gases** that can be in each underground room. These limits have been greatly increased in the current draft Permit. They should be reduced to limits more protective of health and safety. [DOE wants to increase them further.] In fact, there should be individual drum limits as well as room based limits. Some of the constituents of the waste are so dangerous that they could seriously harm a worker exposed during a drum-drop accident – an accident that is considered to be likely.

Perhaps most important, however, is the **inadequate air monitoring** for non-VOC hazardous waste releases. The Permit assumes that monitoring for radiological releases would also indicate whether there is a hazardous release since the two would probably be released together. Unfortunately, there is no system of real-time radiation monitors at WIPP that would detect if a release while it is occurring. When DOE originally applied for the Permit there was an extensive system of **Continuous Air Monitors (CAMs)** both underground and in the Waste Handling Building (WHB) above. Virtually all have been removed or are non-operational, even though TRU facilities typically use CAMs to immediately identify significant airborne radioactivity concentrations. Automatic hand and shoe contamination monitors have also been removed from the WHB. The radiation monitoring program relies on "hand frisking" contamination surveys and "swipes" of containers that are then analyzed. Swiping can only tell you that a release has occurred, not that one is occurring now. In addition, the Permit exempts DOE/WID from swiping or even inspecting the center drum of a "seven-pack" of drums. The release detection program essentially relies on observations by workers to identify if an accidental release is occurring, yet workers couldn't identify leaks from pressurized containers or even fires within stacks of waste containers. The Permit should require an extensive system of CAMs with alarm capability underground and in the WHB. It should also require that the center drum in the 7-pack be inspected or that it be replaced with an empty "spacer" drum.

Finally, the Permit allows DOE/WID to **store** (as opposed to "dispose") waste in the WHB for up to one year and store waste in parked TRUPACT-II's in the parking lot for two months. The parking area shouldn't be used as a *de facto* warehouse. Two months is overly long to store waste in the WHB (except possibly for "derived" wastes – wastes created at WIPP by operational activities). In addition, the Permit needs to acknowledge the threats that nearby off-site activities – like **fluid injection and oil and gas exploration** – pose to the integrity of the repository.

POST-CLOSURE

The Permit requires monitoring, inspection and other post-closure activities for 30 year after a panel or the repository is sealed and closed. This is not long enough. Although releases from the repository could show up within 30 years under worst case scenarios, 100 years is a more realistic timeframe.

Certainly the panels should be inspected and monitored for more than 30 years, since there will be people working in the repository for 35 years or more. Post-closure activities should continue for the panels until all workers are out of the mine and the repository is sealed.

The Permit requires Westinghouse to provide **liability coverage and financial assurance** for the Closure/Post Closure period. DOE feels that Westinghouse should be exempted from such requirements. Financial assurance is necessary to guarantee that Westinghouse can meet their commitments incorporated in the Permit for the Closure and Post-Closure periods.

GROUNDWATER MONITORING

One of the 30-year post-closure activities is groundwater monitoring to detect hazardous waste releases into the water at and near WIPP. Monitoring will actually begin before WIPP closes to determine a "baseline." Unfortunately, **DOE/WID's Application incorrectly described the hydrology of the geologic formations overlying and nearby WIPP.** They incorrectly stated that there is no groundwater in the Santa Rosa and Dewey Lake Redbeds Formations in the central part of the site. A large water-saturated area has been found there. In fact, this water is leaking into the repository exhaust shaft. They treat the Culebra Formation as the only potential pathway for the transport of contamination. They ignore other potential groundwater pathways from WIPP to areas outside the site and have not mapped the drainage patterns at and near the site. Drainage at WIPP is almost entirely underground since WIPP is sited in **karst** – a geologic formation defined by underground channels which allow fluids to flow quickly from one area to another, carrying any contaminants that are present with them.

The Permit now requires seven monitoring wells – six in the Culebra Formation and one in the Dewey Lake Redbeds Formation (but not directly over the repository). Another well should be added in the Dewey Lake Redbeds near the WIPP exhaust shaft. Additional wells should be placed in other karstic flow-paths which would first have to be more clearly identified.

The Permit sets the **Point of Compliance** (the place where, if contaminants reach that far, containment is considered to have failed and the repository is out of compliance) at the outside edge of the waste panels. DOE wants to set the Point of Compliance at the site boundary – about another mile out.

February, 1999