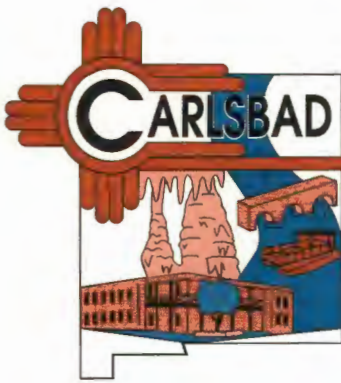


**Summary of Public Comments on WIPP Class 2 VOC PMR - 2015**

<b>Name</b>	<b>Organization</b>	<b>City</b>	<b>Date</b>	<b># of Pages</b>
Mayor Dale Janway	City of Carlsbad	Carlsbad	10/15/2015	1
Dave Sepich	Nuclear Task Force	Carlsbad	10/15/2015	2
Russel Hardy	CEMRC	Carlsbad	10/27/2015	1
Joni Arends	CCNS	Santa Fe	11/11/2015	6
Steve Zappe	Citizen	Santa Fe	11/11/2015	5 + attachments
Scott Kovac/Jay Coghlan	NWNM	Santa Fe	11/12/2015	6
Janet Greenwald	CARD-AFES	Albuquerque	11/12/2015	5
Don Hancock	SRIC	Albuquerque	11/12/2015	6 + attachment

**Total comments submitted = 8**



**DALE JANWAY**  
MAYOR

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**STEVE MCCUTCHEON**  
CITY ADMINISTRATOR

October 15, 2015

To: Ricardo Maestas:

New Mexico Environment Department  
Hazardous Waste Bureau  
2905 Rodeo Park Drive, Building E  
Santa Fe, New Mexico 87505

[Ricardo.Maestas@state.nm.us](mailto:Ricardo.Maestas@state.nm.us)

Dear Mr. Maestas:

I'm writing in support of the recent Class 2 Permit Modification Request submitted by the Department of Energy's Waste Isolation Pilot Plant regarding the Volatile Organic Compound (VOC) monitoring process. We especially appreciate the opportunities the community was given to make sure we understand these proposed changes.

It is clear that these proposed changes do not reduce or diminish VOC sampling. In fact, these proposed modifications use higher technology sampling equipment, revise the risk calculation formula to one that makes more sense, and add monitoring of TCE to the list of chemical agents.

The proposed monitoring station move makes sense, since this program is designed for workers who work above ground. Furthermore, this permit change will make this move official- as WIPP has already been using this location since last year's radiological incident.

Thank you for the opportunity to comment on this Class 2 permit modification. I encourage the NMED to quickly approve these proposed changes.

Sincerely,

Carlsbad Mayor Dale Janway

**COUNCILORS**

**Ward 1**  
NICK G. SALCIDO  
LISA A. ANAYA FLORES

**Ward 2**  
SANDRA K. NUNLEY  
J.R. DOPORTO

**Ward 3**  
JASON G. SHIRLEY  
WESLEY CARTER

**Ward 4**  
JANELL E. WHITLOCK  
DICK DOSS

October 15, 2015

Ricardo Maestas:

New Mexico Environment Department  
Hazardous Waste Bureau  
2905 Rodeo Park Drive, Building E  
Santa Fe, New Mexico 87505

[Ricardo.Maestas@state.nm.us](mailto:Ricardo.Maestas@state.nm.us)

Dear Mr. Maestas:

Mr. Maestas, as chairman of the Carlsbad Mayor's Nuclear Task Force regulatory review subcommittee, I submit the following findings.

The Mayor's Nuclear Task Force is an advisory committee consisting of about 40 area business, governmental, scientific and political leaders who serve to ensure that Mayor Dale Janway and other elected officials are well informed when deciding what is in the community's best interest on nuclear-related industries. John Heaton is chair of the task force.

Our regulatory subcommittee met with WIPP officials on several occasions to review and discuss the current proposal to make several changes to WIPP's Volatile Organic Compound (VOC) monitoring procedure. Our goal is to make sure WIPP's host community, Carlsbad, is represented in this permit modification process, and to ensure that these modifications are in the community's best interests in terms of worker and citizen safety.

As the host community of a nationally important project such as this, it is extremely important that we make our voice heard. Our subcommittee considers the PMR to be an improvement to the Hazardous Waste Facility Permit and **recommends its approval**. After an extensive review, it is apparent that the proposed changes do not reduce or diminish VOC sampling.

We appreciate WIPP's willingness to meet with us, to answer our questions and to consider our suggestions. We especially value the fact that the draft submitted to the state includes revisions, based in part on our recommendation, that detail the fact that WIPP's underground workers are being protected from VOCs by several additional underground monitoring processes.

This PMR is an improvement for several key reasons, including:

1. This proposed modification adds one chemical agent, trichloroethylene (TCE), to the VOC target analyte list for VOC monitoring. No chemical agents are removed from the monitoring list.



2. The monitoring stations are being moved because the previous sampling stations (in the permit) pose additional risk due to the possibility of radiological contamination, and WIPP has already been using these new monitoring stations since last year's radiological release. WIPP used an air dispersion model to decide on the best location, and provided a good explanation of why it decided on this location.
3. Our subcommittee had several questions about the additional VOC monitoring taking place at the facility, which is now addressed in the draft permit. This particular VOC monitoring plan deals specifically with monitoring workers at the above-ground portion of the WIPP facility for potential chronic (over time) exposure. Workers in the WIPP underground are monitored for possible acute exposure through the permit, and all potential exposures (both chronic and acute) are additionally monitored through WIPP's industrial hygiene program.
4. This plan will involve switching to higher tech sampling equipment that is easier to use and less likely to develop leaks, meaning increased accuracy and precision in monitoring.
5. The proposal includes a revision to the formula WIPP uses for risk calculation, as associated with VOCs. The new formula is a better fit with other similar regulatory formulas, makes it easier to add additional analytes to the monitoring list in the future, simplifies reporting and, finally provides a better assessment of health impacts since it considers both the carcinogenic and non-carcinogenic effects of these compounds.

In conclusion, there is nothing in this permit that diminishes WIPP's VOC monitoring. Improved equipment, additional target chemicals and a better risk calculation formula will improve WIPP's ability to monitor and protect its workers. We encourage the NMED to approve this Class 2 PMR.

Dave Sepich,  
Regulatory Subcommittee Chair  
801 ½ N. 8<sup>th</sup> St.  
Carlsbad, NM 88220  
575-361-3283

**From:** [Russell Hardy](#)  
**To:** [Maestas, Ricardo, NMENV](#)  
**Cc:** [Russell Hardy](#); [Basabilvazo, George - DOE \(George.Basabilvazo@wipp.ws\)](#)  
**Subject:** WIPP Permit Modification Comment  
**Date:** Tuesday, October 27, 2015 2:17:59 PM

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Good afternoon. My name is Russell Hardy and I am the Director of the Carlsbad Environmental Monitoring & Research Center (CEMRC), an entity of New Mexico State University and I am submitting a formal comment to be considered as part of the class two permit modification request process being submitted by the DOE and its contractor (NWP).

The CEMRC is funded by the U.S. Department of Energy to conduct an independent environmental monitoring program in conjunction with the Waste Isolation Pilot Plant (WIPP). In my role as Director of CEMRC, I am very involved with WIPP operations and as such, I have attended numerous meetings to hear and to understand the current permit modification for the hazardous waste facility permit as it relates to repository monitoring of volatile organic compounds (VOCs) at the WIPP. As a result of attending these meetings and discussing, in detail, the various aspects of the current permit modification for VOC sampling, I support the DOE and the contractor's request, in its entirety, to move underground repository sampling for VOCs to the surface as the current VOC sampling areas (denoted in the permit as VOC station A and VOC station B) are located in contaminated portions of the repository and, since the February 14, 2014 underground radiation release event, WIPP employees have been unable to sample in these areas. In addition to the underground contamination issue, recent improvements in technology and instrumentation have made it possible to make surface sampling a reality as detection limits for VOCs at the PPT (parts-per-trillion) level are readily achievable, thereby allowing for samples to be collected on the surface even though those samples have been further diluted by air traveling from the underground. Additionally, I believe that the DOE/Contractor's request to move repository VOC sampling from the underground to the surface makes sense from both a worker protection point of view as well as a scientific feasibility point of view. Further, I believe that the basis for repository sampling for VOCs is to ensure that surface workers are not exposed to dangerous levels of VOCs. Therefore, by moving this sampling to the surface, the DOE/Contractor are now directly assessing the air that workers in close proximity to emissions from the WIPP underground exhaust shaft are located. Additionally, if this request is approved as submitted, underground workers at WIPP will continue to be protected by two other monitoring programs – 1) disposal room VOC monitoring (which will occur once waste emplacement in the underground is restarted) and 2) WIPP Industrial Health monitoring which currently occurs prior to employees entering an area in the underground and continues to occur as long as personnel are working in underground areas. Therefore, for these reasons, I support the permit modification being submitted by the DOE/Contractor at the WIPP.

Lastly, I would like to disclose that I am directly affected by this decision as my employer (NMSU/CEMRC) currently holds a contract with the NWP to perform analysis of VOC, Hydrogen, and Methane samples from the WIPP underground and/or surface of the WIPP site.

Thank you for the opportunity to voice my support of this permit modification request. Please let me know if you have any questions or need any additional information.

Russell Hardy, Ph.D.  
Director  
Carlsbad Environmental Monitoring & Research Center  
1400 University Drive  
Carlsbad, NM 88220  
(575) 234-5555 phone  
(575) 234-5573 fax





## Concerned Citizens for Nuclear Safety

22 Monte Alto  
Santa Fe, New Mexico 87508  
505.986.1973  
[www.nuclearactive.org](http://www.nuclearactive.org)

November 11, 2015

Mr. Ricardo Maestas  
New Mexico Environment Department  
Hazardous Waste Bureau  
2905 Rodeo Park Drive, Building 1  
Santa Fe, New Mexico 87500  
Phone: (505) 476-6050

Via e-mail to [Ricardo.Maestas@state.nm.us](mailto:Ricardo.Maestas@state.nm.us)

Re: Six Proposed Class 2 WIPP Permit Modification Requests about  
Revision to Volatile Organic Compound Monitoring Procedures, September 2015

Dear Mr. Maestas:

Please find below the comments of Concerned Citizens for Nuclear Safety (CCNS) about the six proposed Class 2 Waste Isolation Pilot Plant (WIPP) Permit Modification Requests (PMRs) - Revise Volatile Organic Compound Monitoring Procedures, dated September 8, 2015. CCNS asserts that Topics 5 and 6 are Class 3 PMRs and require heightened public review, comment and opportunity for a public hearing.

At the end of our comments we raise concerns about the "degraded" condition of and leaking fire suppression equipment at WIPP, as reported by the Defense Nuclear Facilities Safety Board (DNFSB) in recent monthly reports. CCNS requests that the New Mexico Environment Department (NMED) use its regulatory power to **stop** all recovery operations at WIPP until the fire suppression equipment is operational. It does not make sense for operations to continue without operating fire suppression equipment. Given the recent truck fire and release of radioactive and hazardous materials from exploding drum(s) in the underground, it is obvious that all fire suppression equipment be in tip-top condition.

### General Comments

First, the PMRs do not address the big picture at WIPP following the February 2014 truck fire and radiation and hazardous materials releases from exploding waste container(s) shipped from Los Alamos National Laboratory, which contaminated portions of the facility. The six PMRs cannot stand by themselves. The Permittees (Department of Energy (DOE) and Nuclear Waste Partnership (NWP)) must provide the public with information about the range of upcoming PMRs to address the February 2014 releases in order for us to provide informed comments about these proposed PMRs. Because WIPP cannot currently comply with its existing New Mexico Environment Department (NMED) hazardous waste permit, the Permittees have put forward this set of PMRs to revise the volatile organic compound (VOC)



monitoring procedures. The PMRs must so state that Permittees are not in compliance with their permit.

Second, CCNS urges NMED to add a new "While WIPP is Not Emplacing Waste" section in the permit. This section would include current operations that are outside the existing permit. The proposed section would also gather all the modifications made to the permit solely because of the February 2014 releases and contamination events. It would provide an easily referenced place for all modifications that would need to be restored/changed/deleted prior to a WIPP reopening.

For example, if the permit were modified to change the VOC monitoring location, as proposed by the Permittees, then the change would be placed in this new section.

CCNS understands the difficulties in monitoring VOCs in a contaminated facility, but once WIPP reopens, VOC monitoring should return to the current permit conditions.

Finally, there are major problems with three of the proposed PMRs. They are Topics 2 (change the repository VOC monitoring locations), 5 (revise the method of determining compliance with the surface non-waste worker environmental performance standard for air emissions) and 6 (remove the minimum running annual average (RAA) mine ventilation exhaust rate). Each one would significantly reduce the protection of human health and the environment as compared with the requirements that have been in place since the permit was first issued in 1999.

CCNS requests that NMED deny the Permittees' PMRs 2, 5 and 6 and invite them to resubmit them as Class 3 PMRs.

### Specific Comments

#### **Topic 1 - Add trichloroethylene (TCE) to the VOC target analyte list for VOC monitoring**

- CCNS agrees that TCE should be included in the VOC target analyte list.

#### **Topic 2 - Change the repository VOC monitoring locations**

- This modification should be denied.
- This request would eliminate the two underground VOC monitoring stations. The primary reason given to change the monitoring locations to the surface is because of the difficulty of VOC monitoring in the radiologically contaminated underground, including because the sampling equipment might be radiologically contaminated. That contamination merits increased surface and underground monitoring, **not** the elimination of the underground monitoring. Eliminating underground monitoring would not protect workers, the environment and human health as required by the hazardous waste permit.
- The Permittees monitor other contaminated facilities across its nuclear weapons enterprise and have proposed methods to address the "baseline" contamination.
- The proposed change is contrary to 15 years of WIPP permit requirements, which provide for two underground sampling locations. That monitoring resulted in detection of VOC exposures in the underground in 2009 and increased protection for workers, human health and the environment.



*Topic 2 proposes to change the procedure for monitoring by changing the RVMP monitoring locations from the underground to the surface. Moving the repository VOC monitoring locations to the surface will continue to protect the non-waste surface worker and provide an equivalent RVMP. The Permittees are requesting the use of VOC sampling locations on the surface since the logistics of accessing the current underground locations are complicated due to radioactive contamination. These logistic complications are addressed by monitoring on the surface as described in Section 3 of this PMR. p. 3.*

- Further, the location on the surface that is assumed to have the highest concentration of VOCs is based on a computer model, and therefore is assumed. Thus the air dispersion is also assumed. DOE proposes to replace the original assumption of the amount of risk with a new assumption of the location of the risk. This is unacceptable.
- Samples must be taken at **both** surface and underground locations simultaneously. The actual sampling results must be used to calculate risk. After the collection of actual data, a correlation could be made that when there are "x" VOCs in the underground, and the wind is blowing so fast in a certain direction, there are "x" VOCs on the surface.
- Permittees must explain why they are not monitoring inside the buildings. Given the contamination in the underground, it is necessary to take samples where the people are, including in the Waste Handling Building.

#### **Topic 3 - Change the type of sampling equipment for VOC monitoring**

- The Permittees must state the industry standard QA/QC requirements and describe how WIPP will follow these standards.
- The public cannot provide informed public comments about the PMRs until that information is made available.

#### **Topic 4 - Change the sampling durations for VOC monitoring**

*Topic 4 proposes to change the procedure for sampling by changing the sampling duration for the RVMP. The Permittees are proposing to increase the sampling duration from 6-hour time-integrated samples to 24-hour time-integrated samples. Experience has shown that during a typical work day at the WIPP facility, VOC concentrations are affected by ventilation changes in the repository throughout the day. Twenty-four hour samples are less likely to be affected by these changes than shorter-duration samples. p. 3*

- The concentration of VOCs when workers are present is important information to know. It is data that should **not** be diluted by adding meaningless data from when there are no operations.

*Method TO-15 refers to time-integrated samples as having 1 to 24 hour durations. Generally, samples to identify occupational exposures have a duration on the order of a work shift, typically six to eight hours. Samples for determining chronic effects to public receptors are longer in duration, typically 24 hours in duration, to average out the variability that may occur during the sampling period. Experience has shown that during a typical work day at the WIPP facility, VOC concentrations are affected by ventilation changes in the repository throughout the day. Twenty-four hour samples are less likely to be affected by these changes than shorter-duration samples. The 24-hour samples may remove some of the variability that is observed in the VOC results. p. 10.*

- Once again, just because the VOC concentrations change due to ventilation changes throughout the day is no reason to try to hide those variations by diluting them.

**Topic 5 - Revise the method of determining compliance with the surface non-waste worker environmental performance standard for air emissions**

- The proposed modification is for a major permit change for determining compliance with air emissions for 10 volatile organic compounds. The proposal would eliminate calculated "concentrations of concern" for carcinogenic VOCs, which reduces protection of workers, human health and the environment.
- The proposal is extremely complex and is a Class 3 PMR. NMED should deny the request and invite the Permittees to resubmit it as a class 3 modification request.
- The request also includes significant changes in the remedial actions required.

*Topic 5 proposes to change the procedure for reporting VOC concentrations for the RVMP by determining compliance with the non-waste surface worker environmental performance standard for air emissions using a direct calculation of risk instead of the indirect method in the Permit. The determination of risk in the Permit uses concentrations of concern to relate underground VOC concentrations to non-waste surface worker risk. Concentrations of concern were determined by the NMED by back-calculating the underground concentration associated with a specific risk at the surface. This indirect method has assumptions regarding dispersion in the atmosphere and dilution in the underground ventilation air stream. The proposed method measures the VOC concentrations on the surface, near the point of exposure, after dispersion and dilution have occurred, and, therefore, are not assumed. p. 4.*

- The 10 VOCs must be sampled in the underground as currently required in the permit.
- WIPP is a pilot plant. NMED should require the Permittees to do the necessary sampling and reporting.
- All assumptions need to be reexamined through the Class 3 PMR process.
- The Permittees must describe what tests they have been done to validate the models.

*The proposed method uses U.S. Environmental Protection Agency (EPA) risk methodology and recommended risk factors to calculate risk. The EPA methodology is the same that was used by the NMED in establishing the concentrations of concern, however, the Permittees are updating information that was provided in the original Permit Application to satisfy the requirements of 20.4.1.900 NMAC (incorporating 40 CFR 270.23 (c) and (e)). This information is being updated based on changes to human health risk factors recommended by the EPA. The Permittees are proposing to revise procedures that are used to determine if the risk to the non-waste surface worker exceeds the risk limits established by the Permit. The Permittees are not proposing risk limits that are different than those established by the Permit. The proposed process for calculating risk incorporates risk from both the non-carcinogenic and carcinogenic effects for each compound. This process makes the risk determination more realistic than the current practice of using COCs for determining risk. p. 4.*

- Further, there are multiple changes in this topic, including changing the location, changing EPA risk factors by eliminating COCs, and making things more "realistic."



*The Permittees are proposing these changes at this time to coincide with recovery activities. When recovery is complete, the Permittees intend to continue surface monitoring to protect the non-waste surface worker and limit personnel access to radiologically contaminated areas in the underground. This is consistent with DOE operational philosophy to maintain personnel radiological exposures to as low a reasonably achievable. p. 5.*

- The Permittees must explain what the proposed sampling location has to do with DOE's "operational philosophy to maintain personnel radiological exposures to as low a reasonably achievable."
- For more than 15 years the permit has required actual measurements of the air being breathed in the underground, and now the Permittees are proposing to eliminate that requirement that obviously protects workers, human health and the environment.

#### **Topic 6 - Remove the minimum running annual average (RAA) mine ventilation exhaust rate**

- Permittees propose to eliminate the 260,000 cubic feet per minute (cfm) permit requirement because it can no longer meet it as a result of the underground contamination and as a result, WIPP's ventilation is now limited to 60,000 cfm in filtration mode. The Permittees' goal should be to restore the 260,000 cfm in order to protect workers, human health and the environment.
- CCNS asserts that this is a Class 3 PMR. NMED should deny the request and invite the Permittees to resubmit it that describes the new ventilation system and demonstrates that it would be at least as protective of human health and the environment during waste handling operations as the existing permit requirements.

Beyond the PMRs, there are other outstanding fire prevention, safety and security issues at WIPP. CCNS requests that NMED review **and take regulatory action** about the concerns raised recently by the Defense Nuclear Facilities Safety Board (DNFSB) about leaks and other degraded conditions in key fire suppression equipment. **CCNS questions why WIPP recovery operations are even taking place when key fire suppression equipment is not in operating condition.** Given that there were two fires/explosions in February 2014, NMED must use its regulatory power to **stop all recovery operations until fire suppression equipment is fully operational.** Two recent DNFSB monthly reports reveal - and there are probably more examples, which NMED should explore:

#### **Fire Protection Status Review**

In its July 2015 monthly report, the DNFSB raised outstanding concerns about "surface fire protection systems and equipment maintenance, such as leaks in fire water pump packing and in buried fire looping piping, ... [and] underground material conditions."  
[http://www.dnfsb.gov/sites/default/files/Board%20Activities/Reports/Site%20Rep%20Monthly%20Reports/Waste%20Isolation%20Pilot%20Plant/2015/mr\\_20150731\\_122.pdf](http://www.dnfsb.gov/sites/default/files/Board%20Activities/Reports/Site%20Rep%20Monthly%20Reports/Waste%20Isolation%20Pilot%20Plant/2015/mr_20150731_122.pdf)

#### **Potentially Inadequate Safety Analysis (PISA)**

In its September 2015 most recent monthly report, the DNFSB raised concerns about the Waste Handling Building (WHB) Fire Suppression System (FSS) "operating in a degraded mode. This resulted in a PISA declaration, followed by a positive Unreviewed Safety Question (USQ) on September 18."



[http://www.dnfsb.gov/sites/default/files/Board%20Activities/Reports/Site%20Rep%20Monthly%20Reports/Waste%20Isolation%20Pilot%20Plant/2015/mr\\_20150930\\_122.pdf](http://www.dnfsb.gov/sites/default/files/Board%20Activities/Reports/Site%20Rep%20Monthly%20Reports/Waste%20Isolation%20Pilot%20Plant/2015/mr_20150930_122.pdf)

Please advise at your earliest convenience about what NMED is going to do about the faulty fire suppression equipment.

Thank you for your careful consideration of our comments. Please contact me with any comments, questions or concerns at [jarends@nuclearactive.org](mailto:jarends@nuclearactive.org).

Sincerely,

A handwritten signature in black ink that reads "Joni Arends". The signature is written in a cursive, flowing style.

Joni Arends, Executive Director

Steve Zappe  
60 La Pradera  
Santa Fe, NM 87508

Mr. Ricardo Maestas  
New Mexico Environment Department  
2905 Rodeo Park Drive East, Building 1  
Santa Fe, NM 87505

November 11, 2015

Ricardo,

I am submitting comments on the September 8, 2015 Class 2 permit modification request (**PMR**) submitted by the US Department of Energy Carlsbad Field Office and Nuclear Waste Partnership (**Permittees**) to the New Mexico Environment Department (**NMED**), proposing changes to the Waste Isolation Pilot Plant (**WIPP**) Hazardous Waste Facility Permit (**Permit**). Please consider and provide responses to my comments when you deliberate modifying the Permit as requested in the PMR.

The Permittees divided their PMR discussion into six topics, to which I will comment on four of them. These are:

- Topic 2 – Change the repository VOC monitoring locations
- Topic 4 – Change in the sampling duration for the VOC monitoring
- Topic 5 – Revise the method of determining compliance with the non-waste surface worker environmental performance standard
- Topic 6 – Remove the minimum running annual average mine ventilation exhaust rate

#### Topic 2 – Change the repository VOC monitoring locations

The Permittees adequately justify, in the context of the overall PMR and related appendices, relocating the VOC monitoring locations for the Repository VOC Monitoring Program (**RVMP**) from the underground to above ground locations, based upon updated air dispersion modeling reflecting current conditions. The maximally exposed non-waste surface workers continue to be those who are downwind of the exhaust shaft in Building 489.

1. The Permittees offer various descriptions throughout the PMR for a new VOC monitoring location (station VOC-C) near Building 489, but fail to adequately incorporate that language or description in the actual language of the permit text. Here are some examples:

- “Station VOC-C is proposed to be stationed at the west air intake of Building 489”  
(top of page 9)

- “...modeling indicated that the best location to monitor is the air intake to Building 489” (middle of page 9)

However, the language proposed for inclusion in the Permit Attachment N, Section N-3a(1) reads:

*Building 489 has been identified as the location of the maximum non-waste surface worker exposure. Air samples will be collected at the air intake for Building 489 (Figure N-1) to quantify VOCs in the ambient air.*

Note that this does not state it will be at the west air intake, nor does it explicitly identify this location as station VOC-C, instead relying on a reference to a separate figure. The Permit language must be as precise as possible, and should state explicitly that station VOC-C is located at the west air intake of Building 489.

2. The situation is similar for new VOC monitoring location VOC-D. At the top of page 9, it says “Station VOC-D is proposed to be stationed at WQSP-4,” whereas the language proposed for Section N-3a(1) says *Background VOCs will be measured by sampling at groundwater pad WQSP-4 (Figure N-1)* without explicitly identifying this location as station VOC-D. This text description must also be as precise as for Station VOC-C, not relying on reference to a figure.

3. Furthermore, the depiction of the VOC monitoring locations on Figure N-1 is insufficient to clearly identify them without reference back to the text. Figure N-1 should be modified to explicitly identify Building 489 with a label in the enlarged box as the location for station VOC-C, and monitoring well WQSP-4 should be identified with a label in the lower right corner as the location for station VOC-D.

#### Topic 4 – Change in the sampling duration for the VOC monitoring

4. The proposal to change the sampling duration for the RVMP samples from six to 24 hours is conservative and protective, in light of the modeling results provided in Appendix D, pages D-14 to D-18. Sampling over a 24-hour period eliminates the impact of a shorter duration where samples might be collected during the day when atmospheric turbulence disperses VOCs released from the repository.

#### Topic 5 – Revise the method of determining compliance with the non-waste surface worker environmental performance standard

In Topic 5, the Permittees discuss revising the methodology for demonstrating compliance with the non-waste surface worker environmental performance standards. The historic approach implemented in the Permit relies upon not exceeding VOC-specific concentrations of concern (**COCs**) in the active panel that were calculated to result in an acceptable risk to surface receptors. The proposed approach relies on the determination of the actual risk to the receptor from the target VOCs that will be directly measured at a point



of compliance. COCs are an indirect method of determining risk, whereas measurement of VOC concentrations allows a direct calculation of risk.

5. On page 12 of the PMR, the Permittees identify the process to calculate risk. After determining the concentration of target VOCs based on measurements at surface monitoring stations, the process is to “Subtract the results of background Station VOC-D from the results at Station VOC-C.”

However, subtraction of background is not included in the language proposed in Permit Attachment N, Section N-3e(1), thus creating a discrepancy. Instead,  $Conc_{VOC}$  is defined as the concentration of the target VOC at the receptor, apparently without any subtraction. If this is the case, the Permittees should not be allowed to reduce the concentration measured at VOC-C by subtracting the background concentration measured at VOC-D. In any case, the Permit should be consistent and explicit in identifying what concentration is used to calculate risk due to exposure to each target VOC.

6. On page 14 of the PMR, the Permittees identify four advantages to the approach of calculating risk directly. In part, they state:

*Third, reporting will be greatly simplified since a single exceedance of a COC by any particular compound will no longer have to be reported unless it is high enough to cause the overall risk or HI to exceed the action levels. Fourth, the methodology provides a more comprehensive assessment of health impacts since it considers both the carcinogenic and non-carcinogenic effects of compounds, making the risk calculations more protective of human health than the use of the COCs.*

While it is clear that reporting will be greatly simplified, it could be argued that the new risk calculations are not necessarily more protective of human health, since the COC method triggered remedial action when the running annual average for any VOC exceeded its COC, providing an early warning of potential risk from either carcinogenic or non-carcinogenic VOCs.

7. Also on page 14 of the PMR, the Permittees propose to allow “alternative remedial actions” (subject to approval by the NMED Secretary) in lieu of closing active disposal rooms or panels. The specific language proposed for inclusion is in Permit Condition 4.6.2.4, Remedial Action.

The language as proposed is overly broad and unnecessary, particularly with the use of the phrase, “prior to reaching the action level.” The two examples of alternative remedial actions” offered on page 14 of the PMR (move affected employees so that excessive chronic exposure does not occur, remediate the emissions by managing waste emplacement activities) are actions currently allowed under the Permit without prior approval by the Secretary.

It appears the intent of the language proposed in Permit Condition 4.6.2.4 is to avoid closing active disposal rooms or panels in the event of excess risk. The Permittees should

be motivated to proactively and aggressively manage their operations to preclude these occurrences, not seek an “escape clause” for failing due diligence after the fact. I strongly recommend that the sentences proposed for insertion at the end of the first two paragraphs in Permit Condition 4.6.2.4 be excluded from the final Permit.

8. In order to encourage the Permittees to manage their operations to preclude these occurrences, NMED should impose a requirement under Permit Condition 4.6.2.2, Reporting Requirements, for the Permittees to report, on a quarterly basis, the most recent and the historic maximum running annual average (including measurement dates) for both carcinogenic and non-carcinogenic VOCs on a link the WIPP Home Page. This would allow the public to determine whether there are any observable potential health risks to non-waste surface workers at WIPP.

#### Topic 6 – Remove the minimum running annual average mine ventilation exhaust rate

9. The Permittees’ discussion under Topic 6 contains some incorrect information. It states

*The model started with the VOC concentration that resulted in an acceptable risk to the non-waste surface worker and applied an air dispersion factor to calculate the concentration at the top of the Exhaust Shaft. A corresponding concentration was calculated at the bottom the Exhaust Shaft by assuming a repository ventilation flow rate of 425,000 scfm. Because the measurement point, known as Station VOC-A is some 1,300 feet south of the base of the Exhaust Shaft, a corresponding concentration was calculated assuming a disposal circuit ventilation rate of 130,000 scfm. The resulting concentrations became the COCs for each compound. The values in Table 4.6.2.3 are the acceptable concentrations if the repository and disposal circuit ventilation rates are 425,000 and 130,000 scfm, respectively.*

*In 2006, the Permittees modified the Permit to change the manner in which compliance with the COCs in Table 4.4.1 is demonstrated. In lieu of individual headspace gas measurements on each container and specification of the container filter vent characteristics, direct measurement of filled disposal room concentrations was instituted. This action broke the tie between disposal room concentrations and concentrations at Station VOC-A since compliance with one can now be managed independently of the other and the numerical model simulating the flow from the container to the monitoring station is no longer relevant. Since this model, including its assumptions regarding minimum flow rates is no longer needed, the minimum repository ventilation flow rate of 260,000 scfm is likewise no longer necessary to protect human health or the environment. (emphasis mine)*

Actually, the COCs were calculated assuming a mine ventilation exhaust rate of 260,000 scfm, hence the imposition of this value as the minimum running annual average mine ventilation rate in Permit Condition 4.5.3.2, Ventilation (see attached spreadsheet “VOC Releases.xls” [tabs “sur-fnl-5” and forward] and the November 19, 1998 memorandum, pages 7-8, referenced in footnote 13 of the PMR). Changes implemented in 2006 by which compliance with the COCs in Table 4.4.1 was demonstrated did not “break” the tie between

COCs and concentrations at Station VOC-A, nor they did render the numerical modeling “no longer relevant.” COCs were calculated the same way in 2006 and again in 2010 during the first renewal of the WIPP Permit as they had been in 1998. The only reason the minimum repository ventilation flow rate of 260,000 scfm is now no longer necessary is because the Permittees are proposing to measure VOC concentrations at the point of compliance at newly designated Station VOC-C and directly calculate the resultant risk. I support removal of the minimum running annual average mine ventilation exhaust rate from Permit Condition 4.5.3.2.

### Conclusion

I support the overall approach to managing risk from VOCs to receptors on the surface as proposed in the PMR. It is made possible primarily by the significantly improved maximum method reporting limits (**MRLs**) imposed in Permit Attachment N, Table N-2 for surface monitoring samples. This, coupled with refined air dispersion modeling at lower exhaust ventilation rates confirming Building 489 as the location of maximum impact from VOC releases, should ensure a technically defensible monitoring program for protecting human health at WIPP. I believe incorporation of my comments strengthen the program by reducing ambiguity and providing public access to relevant information.

Please feel free to contact me if you have any questions about my comments.

Sincerely,

A handwritten signature in black ink, appearing to read "Steve Zappe". The signature is fluid and cursive, with a large initial "S" and a stylized "Z".

Steve Zappe



## MEMORANDUM

TO: File

FROM: Steve Zappe

DATE: November 19, 1998

SUBJECT: NMED calculations for VOC concentrations in WIPP Underground HWDUs

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In response to comments received from the DOE and WID regarding unreasonably low limits on volatile organic compounds in the repository (Comments 1.1.5 and 94), NMED proceeded to document its process for determining VOC limits for Underground HWDUs.

The first step was to develop a spreadsheet capable of reproducing the results presented by the Permittees in their permit application. Relevant information was submitted to NMED in Appendix D9 of the permit application (*Exposure Assessment for Protection of the Atmosphere*) and Chapter 5 of the No-Migration Variance Petition (*Environmental Impact Analysis*). Information concerning calculations of concentrations of concern for the VOC monitoring program described in Appendix D20 of the permit application (*Confirmatory Volatile Organic Compound Monitoring Plan*) was obtained during a telephone conversation with WID (J.R. Stroble and Bob Kehrman) sometime in 1996 or 1997.

Initially each scenario was developed in a separate file, but I finally put everything into one Excel '97 workbook so I could quickly switch between different scenarios. Attached are pages printed from the master workbook (VOC Releases.xls) used to calculate VOC concentrations. Following is a description of each sheet along with relevant assumptions and observations:

**res-avg** - Exposure to Resident at WIPP LWA Boundary, Average VOC Headspace Concentrations - DOE Calculations. Agrees with results in Tables D9-3 and D9-4.

This spreadsheet sets up the basic framework for all subsequent calculations, using the Permittees' assumptions for all parameters. The headspace gas concentrations used here are based upon data accumulated and presented in Appendix C2 of the permit application. Appendix C2 also provides the justification for the use of weighted averages based upon expected proportions of different types of wastes and headspace gas measurements taken from 900 drums of TRU mixed waste prior to September 29, 1995.

Initial assumptions which were later changed based upon additional information provided by the Permittees included the mine ventilation exhaust rate. The Permittees assumed, for modeling purposes, that the

mine ventilation exhaust rate was 425,000 ft<sup>3</sup>/min over the exposure duration period (35 years in this instance). Also, the exhaust shaft concentration assumed a full repository (9 closed and 1 open panel equivalents) with no ventilation barriers, a relatively conservative assumption.

The Permittees never asked that these modeled headspace gas concentrations be imposed by the Permit. This calculation was an attempt by the Permittees to demonstrate that, if the actual waste disposed at WIPP did not exceed these limits, the overall risk to a receptor living at the WIPP LWA Boundary would be one to two orders of magnitude below acceptable risk levels. This spreadsheet confirms this conclusion.

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**antelope** - Exposure to Antelope Ridge Rancher within WIPP LWA Boundary, Average VOC Headspace Concentrations - DOE Calculations. Agrees with results in Tables D9-5 and D9-6.

**livridge** - Exposure to Livingstone Ridge Rancher within WIPP LWA Boundary, Average VOC Headspace Concentrations - DOE Calculations. Agrees with results in Tables D9-5 and D9-6.

These two scenarios assume an occupational exposure to a hypothetical rancher working within one of two grazing allotments within the WIPP LWA Boundary. The only differences between these two spreadsheets depicting risks to ranchers and the spreadsheet depicting risk to a resident at the WIPP LWA Boundary are as follows:

- Exposure frequency (EF) reflects an occupational exposure for the ranchers (8 hours/day, 5 days/week for 35 years) rather than a residential exposure (continuous for 35 years); and
- Air Dispersion Factor (ADF) is determined by averaging over the appropriate grazing allotment rather than a stationary settlement on the WIPP LWA Boundary at the point of least dispersion.

Not surprisingly, these two spreadsheets also indicate the overall risk to a rancher working within the WIPP LWA Boundary would be one to two orders of magnitude below acceptable risk levels.

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**res-max** - Exposure to Resident at WIPP LWA Boundary, Maximum VOC Headspace Concentrations - DOE Calculations. Calculations not actually performed by the Permittees, but "back-calculated" numbers provided by the Permittees were plugged into the first sheet.

The Permittees documented their assumption for establishing headspace concentration limits (maximum headspace concentrations) in Revision 5.2 of the permit application, using the following equation:

$$HSC_{voc} = \left( \frac{\text{acceptable level of risk}}{\text{calculated risk}} \right) \times \text{headspace concentration}$$

where for carcinogens,

$HSCL_{VOC}$  = headspace concentration limit for each VOC, ppmv  
acceptable level of risk =  $1E-06$  for Class B,  $1E-05$  for Class C  
calculated risk = based upon weighted average concentrations  
headspace concentration = weighted average, ppmv

and for non-carcinogens,

acceptable level of risk = Hazard Quotient of 1.0  
calculated risk = based upon weighted average concentrations  
headspace concentration = weighted average, ppmv

The Permittees derived the headspace concentration limits based upon calculated risk in Revision 5.2. However, there are numerous differences in headspace concentration limits presented in Tables D9-11 and D9-12 of Revision 5.2 from those presented in Table D9-7 of Revision 6 which the Permittees never documented or justified. The calculations in this spreadsheet used the headspace concentration limits specified in Revision 6.

In Comment 94 on the Draft Permit, the Permittees stated the following:

*"The Permit Application correctly identifies EPA's health-based risk assessment limits and the OSHA time weighted average exposure limits as the appropriate regulatory standards to use in determining whether operation, maintenance, and closure of the miscellaneous unit will be protective of human health and the environment. The Permittees' proposed VOC monitoring approach is valid for two reasons<sup>1</sup>:*

- (1) *"It is consistent with environmental limits imposed by the EPA. Using the EPA risk assessment methods, the Permit Application demonstrated that the proposed VOC concentration limits for both carcinogens and non-carcinogens are protective of human health and the environment. The analysis in Appendix D9 of the Permit Application first identified the type of human receptors that are theoretically able to receive the largest chronic dose. This was determined to be a hypothetical resident who constructs and occupies a house on the WIPP site boundary. There are no such individuals and the analysis reflects a worst-case scenario, because the construction of residences closer than the boundary is prohibited under the WIPP Land Withdrawal Act and the DOE's management of the land. Maximum average container headspace concentrations were then determined and maximum permissible exposures were calculated in accordance with EPA's public health risk policy (e.g., a one in one million chance of developing cancer for exposure to carcinogenic materials and a hazard index of less than one for non-carcinogens). This analysis showed that, in all cases, exposures would be well below acceptable levels."*

Unfortunately, the Permittees failed to include this analysis in the permit application. Further, as will be shown later, the "hypothetical

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<sup>1</sup> The second reason stated that the Permittees had demonstrated that the concentrations will meet all applicable worker safety requirements, but this is not relevant to discussions concerning risk to non-workers.

resident who constructs and occupies a house on the WIPP site boundary" is not the human receptor that is theoretically able to receive the largest chronic dose under the conditions specified in the permit application.

This spreadsheet provides NMED's analysis consistent with what the Permittees intended to include in the permit application. Note that while the risk to a receptor to individual carcinogens are within acceptable levels, the additive excess cancer risk from all carcinogens is  $1.7E-05$ , or 17 times greater than an acceptable risk of  $1E-06$ . This demonstrates that a resident is at an elevated risk of developing cancer if the concentrations proposed by the Permittees in their application were approved and is not, as the Permittees assert, an exposure that is "well below acceptable levels."

Several of the Permittees' proposed concentrations are also unacceptable because they exceed the Lower Explosive Limit (**LEL**) for chlorobenzene, toluene, and 1,1,1-trichloroethane specified on the table on Page 10. Although VOC concentrations would not reach equilibrium in an open room due to ventilation, they would reach equilibrium in a closed room. NMED will not approve concentrations which could result in exceeding the LEL.

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**sur-max** - Exposure to Surface Worker within WIPP PPA, Maximum VOC Headspace Concentrations - DOE Calculations. Using concentrations from Table D9-7, results agree with Tables D9-8 and D9-9 for surface worker.

This scenario assumed a non-waste worker at the surface stationed adjacent to the exhaust shaft. Additional assumptions made on this spreadsheet which differ from previous ones are:

- Exposure frequency (EF) reflects an occupational exposure for the surface worker (8 hours/day, 5 days/week, 48 weeks/year for 10 years);
- Air Dispersion Factor (ADF) is the maximum identified within the Property Protection area, near the exhaust fans;
- Ventilation barriers are used, such that the maximum releases from an open panel occur when 6 rooms have been filled and ventilation barriers are erected, and the last room is filled; and
- Maximum average headspace concentrations (from Table D9-7) are used

One interesting effect is noticed when comparing the actual exhaust shaft concentrations (**ECS act**) calculated in the previous scenario with this one. The simple act of implementing room ventilation barriers reduces concentrations to approximately 25% of the levels obtained when no ventilation barriers are used.

While the risk to a receptor to most individual carcinogens are within acceptable levels, both 1,2-dichloroethane and 1,1,1-trichloroethane exceed their respective acceptable excess cancer risk levels for the surface worker. Furthermore, the additive excess cancer risk from all carcinogens is  $2.6E-05$ , which is more than twice the acceptable excess

cancer risk level of  $1E-05^2$ . This demonstrates that a surface worker is at an elevated risk of developing cancer if the concentrations proposed by the Permittees in their application were approved and is not, as the Permittees assert, an exposure that is "well below acceptable levels." NMED has identified the surface worker as the human receptor that is theoretically able to receive the largest chronic dose under the conditions specified in the permit application.

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**coc-doe** - DOE COC Calculation, Based Upon Exposure to Surface Worker within WIPP PPA, Maximum VOC Headspace Concentrations. Although the Permittees never provided their method for determining VOC Concentrations of Concern (**COCs**) in their application, NMED identified the method through direct discussions with the Permittees. Following is a description of the method:

$$COC_{voc} = \left( \frac{HBL}{ADF} \right) \times \left( \frac{V_{exhaust}}{V_{panel}} \right)$$

where,

$COC_{voc}$  = concentration of concern for each VOC, ug/m<sup>3</sup>  
 $HBL$  = Health-base level for each VOC, ug/m<sup>3</sup>  
(Eqn 5-1 for carcinogens, Eqn 5-9 for non-carcinogens,  
from Chapter 5 of the No-Migration Variance Petition)  
 $ADF$  = Air dispersion factor, unitless  
 $V_{exhaust}$  = mine ventilation exhaust rate, standard ft<sup>3</sup>/min  
 $V_{panel}$  = mine ventilation panel rate, standard ft<sup>3</sup>/min

The calculations for COC are specific to a receptor, which means that the health-based level for a resident at the WIPP LWA Boundary cannot be combined with the air dispersion factor for the surface worker. It appears, based upon examination of the COCs presented in Table 3.1 in Appendix D20, that the Permittees calculated the COCs for the surface worker scenario.

The results agree with the values presented in Table 3.1 in Appendix D20, with the following exceptions. The Permittees incorrectly assumed an Averaging Time (**AT**) of 70 years instead of 10 years in determining non-carcinogenic HBLs for both chlorobenzene and 1,1,1-trichloroethane. This resulted in COCs for these two constituents 7 times greater than is appropriate. Furthermore, the Permittees apparently used the non-carcinogenic Reference Dose (**RfD**) for 1,1,2-trichloroethane instead of the correct RfD for 1,1,1-trichloroethane. This error, compounded by using the wrong AT, resulted in the Permittees requesting a COC nearly 2400 times greater than is appropriate. If NMED had allowed the Permittees to use these incorrectly calculated COCs, the threshold for identifying unsafe concentrations of these VOC would not have been protective of human health.

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<sup>2</sup> NMED has set the acceptable excess cancer risk level for a resident at the WIPP LWA Boundary at  $1E-06$ , while setting the acceptable excess cancer risk level to a surface worker at  $1E-05$ . This was done in recognition that the Permittees exert some level of control over exposure to their own workers, and thus a higher level of acceptable risk was warranted.



This is the only spreadsheet which calculates COCs using the health-based limit divided by the air dispersion factor. NMED has determined a better method for determining COCs is as follows:

$$COC_{VOC} = ECS_{ACT} \times \left( \frac{V_{exhaust}}{V_{panel}} \right)$$

where,

$COC_{VOC}$  = concentration of concern for each VOC, ug/m<sup>3</sup>  
 $ECS_{ACT}$  = actual exhaust shaft concentration for VOC, ug/m<sup>3</sup>  
 $V_{exhaust}$  = mine ventilation exhaust rate, standard ft<sup>3</sup>/min  
 $V_{panel}$  = mine ventilation panel rate, standard ft<sup>3</sup>/min

All other sheets use the actual exhaust shaft concentration instead of the ratio of HBL to air dispersion factor, and the final COCs specified in the Draft Permit are based upon this equation. One benefit to this method is that it establishes a direct relationship between the expected concentration of VOCs in the exhaust shaft to what is measured in the confirmatory monitoring plan. Thus, both the validity of modeling assumptions used to predict releases from the repository (based upon headspace gas concentrations) and the actual releases from the repository (as actual exhaust shaft concentrations) can be confirmed by monitoring emissions from the panels.

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**open-doe** - Open Room Scenario with Room Vent Rate @ 35,000 ft<sup>3</sup>/min using DOE Maximum VOC Concentrations. This is a spreadsheet developed by TechLaw Inc. to confirm the Permittees' calculations for underground waste worker exposure in the event of a roof fall as provided on Table D9-ATT 1-2 of the permit application. This scenario assumes that an underground waste worker who is upwind of the waste stack will be exposed to the VOCs from 21 drums which, in response to a roof fall, will fall from the top row and breach.

For this scenario, the spreadsheet calculated concentrations in the room air immediately after a roof fall approximately twice as high as the concentrations reported by the Permittees on Table D9-ATT 1-2. However, NMED believes the higher concentrations are correct, since the concentrations for the 8-hour time-weighted averages match the Permittees's values on Table D9-ATT 1-2.

The Permittees did not calculate concentrations in the air for four constituents (chlorobenzene, 1,1,2,2-tetrachloroethane, toluene, and 1,1,1-trichloroethane) because they failed to update Table D9-ATT 1-2 from Revision 5.2 of the permit application. This table incorrectly states that no VOC headspace concentration limits were imposed on Table C5, but Revision 6 did include limits for these VOCs. Thus, there are no comparisons on this spreadsheet for these four constituents.

This spreadsheet indicates that an underground waste worker in an open room could inhale 1,2-dichloroethane and 1,1,1-trichloroethane in concentrations exceeding Immediate Danger to Life and Health (**IDLH**) limits in the event of a roof fall. Thus, the VOC limits proposed by the Permittees are not protective of the health of an underground worker in the event of a roof fall in an open room.

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**closed-doe** - Closed Room Scenario with Room Vent Rate @ 35,000 ft<sup>3</sup>/min using DOE Maximum VOC Concentrations. This is a spreadsheet developed by TechLaw Inc. to confirm the Permittees' calculations for underground waste worker exposure in the event of a roof fall on Table D9-ATT 1-4. This scenario assumes that an underground waste worker who is downwind of a full room with ventilation barriers in place will be exposed to VOCs expelled following a roof fall in that closed, full room.

For this scenario, the spreadsheet calculated concentrations in the room air immediately after a roof fall that were approximately 70% of the concentrations reported by the Permittees on Table D9-ATT 1-4. However, NMED believes these concentrations are correct, since the concentrations for the 8-hour time-weighted averages match the Permittees's values on Table D9-ATT 1-4.

The Permittees did not calculate concentrations in the air for four constituents (chlorobenzene, 1,1,2,2-tetrachloroethane, toluene, and 1,1,1-trichloroethane) because they failed to update Table D9-ATT 1-4 to include VOC limits specified on Table C-5 in Revision 6. Even so, Table D9-ATT 1-4 showed that the VOC limit for 1,2-dichloroethane proposed by the Permittees exceeded the IDLH limit. This spreadsheet confirms this exceedance, and also identifies three additional constituents which the Permittees failed to consider (1,1,2,2-tetrachloroethane, toluene, and 1,1,1-trichloroethane) that exceed their respective IDLH limits in the event of a roof fall. Thus, the VOC limits proposed by the Permittees are not protective of the health of an underground worker in the event of a roof fall in a closed room.

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**closed-idlh** - Closed Room Scenario with Room Vent Rate @ 35,000 ft<sup>3</sup>/min, Maximum VOC Concentrations Not To Exceed IDLH Limit. Comparison between the open room and closed room scenarios indicate the closed room scenario presents greater risk to an underground worker, primarily because the worker is downwind of the release. NMED used the previous spreadsheet to back-calculate VOC limits which would not exceed the IDLH limit for the closed room scenario. These are depicted on the spreadsheet and provide on the table on Page 10 in the column titled *Closed Room Maximum VOC Not to Exceed IDLH, ppmv*.

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**sur-fnl-5** - Exposure to Surface Worker within WIPP PPA, VOCs Not Exceeding 1E-05 Additive Excess Risk for Cancer, 1.0 for HI. These are the numbers imposed in the revised Draft Permit for room-based limits and COCs.

The previous Draft Permit required the Permittees to maintain a minimum mine ventilation exhaust rate of 425,000 standard ft<sup>3</sup>/min and a minimum active room ventilation rate of 35,000 standard ft<sup>3</sup>/min. The Permittees, in their Comment 99 on the Draft Permit, requested flexibility in mine ventilation operation. As a result of this comment, the revised Draft Permit was modified to require a minimum mine ventilation exhaust rate of 260,000 standard ft<sup>3</sup>/min (or 60,000 standard ft<sup>3</sup>/min in filtration mode).

However, the mine ventilation exhaust rate ( $V_{\text{exhaust}}$ ) has a direct impact on calculations of risk due to exposure to VOCs. If  $V_{\text{exhaust}}$  is lowered, the concentrations of VOCs in the entrained air increases, resulting

in greater receptor concentrations and increased risk levels. With the requirement to maintain a minimum  $V_{\text{exhaust}}$  of 425,000 standard  $\text{ft}^3/\text{min}$  eliminated, all calculations previously provided by the Permittees are invalid.

The approach taken to calculate room-based limits and COCs was as follows:

1. First, I obtained a new value for the RfD for 1,1,1-trichloroethane, since discussions with WID indicated they had used 1,1,2-trichloroethane as a substitute after discovering EPA's Integrated Risk Information System (**IRIS**) didn't have any information. Barbara Toth of NMED called the National Center for Environmental Assessment (**NCEA**) to see if they could help. While NCEA did not have data on 1,1,1-trichloroethane's carcinogenicity, they provided an oral RfD =  $2\text{E}-01$  mg/kg-day, which I converted to a Reference Concentration (**RfC**) =  $7\text{E}-01$  for use in this and subsequent spreadsheets.
2. Next, I apportioned all carcinogenic risk evenly so the sum =  $1\text{E}-05$  for the surface worker case, and all non-carcinogenic risk summed to 1.
3. Back-calculated concentrations to yield the apportioned risk level for each VOC.
4. Compared resultant concentrations with the table on Page 10 for LEL and IDLH limits and ensured these limits were not exceeded. As a result, chlorobenzene and toluene maximum concentrations were set at the LEL. 1,2-dichloroethane and 1,1,1-trichloroethane maximum concentrations were set to not exceed the closed room IDLH limit.
5. The methylene chloride concentration was set below its LEL and IDLH limit because of notes I took during a conversation with WID several years ago in which they stated that, in order to avoid exceeding IDLH during a roof fall event, the maximum concentration was 100,000 ppmv. Although NMED's calculations indicated a higher concentration could be used, I retained the Permittees' proposed concentration.
6. Adjusting these concentrations established carcinogenic risks levels which were no longer evenly apportioned. I re-apportioned the risk levels for the remaining constituents (except for non-carcinogens, which didn't matter). Then I again back-calculated concentrations as in step 3 above. These are the concentrations that appear in the revised Draft Permit.

Note that while the lower mine ventilation rate is used to determine exhaust shaft concentrations of VOCs, the ratio of the typical mine exhaust ventilation rate to the panel rate ( $425,000/130,000$ ) is used to calculate COCs. Permit Attachment N, Section N-3e, provides the equation to normalize VOC concentrations measured during a sampling event to be comparable to samples collected under typical mine ventilation rate operating conditions.

**res-fnl-6** - Exposure to Resident at WIPP LWA Boundary, VOCs Not Exceeding  $1\text{E}-06$  Additive Excess Risk for Cancer, 1.0 for HI. Note that I lowered the additive excess cancer risk in step 2 above for the resident scenario to  $1\text{E}-06$  consistent with footnote 2, otherwise the approach is identical to the surface worker scenario described above. If the concentrations imposed in the revised Draft Permit (from the sur-fnl-5 calculations) are used here instead of the concentrations on this spreadsheet (i.e., the imposed concentrations are used to determine risk to a resident rather than a surface worker), the

resultant additive excess cancer risk is approximately 1.6E-06. NMED believes this is still protective of a resident at the WIPP LWA Boundary.

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**sur-doe** - Exposure to Surface Worker within WIPP PPA, What DOE Asked For (Using Lower V exhaust). This spreadsheet uses the original maximum VOC concentrations proposed by the Permittees and calculates revised COCs and risk to surface workers using the lower mine ventilation rate of 260,000 standard ft<sup>3</sup>/min.

This spreadsheet identifies the following problems with the VOC concentration limits proposed by the Permittees when modeled using the assumptions provided in the revised Draft Permit:

- Chlorobenzene, toluene, and 1,1,1-trichloroethane concentrations exceed LEL;
- 1,2-dichloroethane, 1,1,2,2-tetrachloroethane, toluene, and 1,1,1-trichloroethane concentrations exceed IDLH for closed room scenario; and
- Additive excess carcinogenic risk to a surface worker exceeds the acceptable excess cancer risk level of 1E-05 by 2.5 times.

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**res-doe** - Exposure to Resident at WIPP LWA Boundary, What DOE Asked For (Using Lower V exhaust). This spreadsheet uses the original maximum VOC concentrations proposed by the Permittees and calculates revised COCs and risk to residents using the lower mine ventilation rate of 260,000 standard ft<sup>3</sup>/min.

This spreadsheet notes the same exceedances of the LEL and IDLH limits as for the surface worker scenario, and additionally identifies that additive excess carcinogenic risk to a resident at the WIPP LWA Boundary exceeds the acceptable excess cancer risk level of 1E-06 by nearly 4 times.

These last two spreadsheets demonstrate that NMED is justified in not using the Permittees' proposed concentrations under the conditions required by the revised Draft Permit.

Constituent	Lower Explosive Limit (LEL) by % Volume <sup>1</sup>	Equivalent LEL, ppmv	Closed Room Maximum VOC Not to Exceed IDLH, ppmv	Permittees' Requested Maximum VOC, ppmv	VOC Room-Based Limits in Draft Permit, ppmv
Carbon Tetrachloride	not combustible	--	13,427	7,510	11,475
Chlorobenzene	1.3%	13,000	67,138	17,660 <sup>3</sup>	13,000
Chloroform	not combustible	--	33,570	6,325	9,030
1,1-Dichloroethylene	6.5%	65,000	--	28,750	5,050
1,2-Dichloroethane	6.2%	62,000	3,357	9,100 <sup>4</sup>	3,350
Methylene Chloride	13.0%	130,000	154,417	100,000	100,000
1,1,2,2-Tetrachloroethane	not combustible	--	6,710	7,924 <sup>4</sup>	2,720
Toluene	1.1%	11,000	33,570	41,135 <sup>3,4</sup>	11,000
1,1,1-Trichloroethane	7.5%	75,000	47,000	100,000 <sup>3,4</sup>	47,000

<sup>1</sup> Lower explosive limit (LEL) values from the 1998 NIOSH Pocket Guide

<sup>2</sup> IDLH limit values determined from spreadsheet developed by TechLaw, Inc.

<sup>3</sup> Permittees' requested maximum VOC exceeded LEL

<sup>4</sup> Permittees' requested maximum VOC exceeded IDLH limit



April 12, 2010

Constituent	HS voc	COC ppbv	URF	RfC	EF	ED	AT	ADF	ECS max	ESC act	Rcon ug/m3	Rcon ppmv	Risk recept	Risk accept	HBL	IRIS Carcinogen
Carbon Tetrachloride	95545	1660.32	6.0E-06		1920	10	613200	1.23E-02	3198	3195	39.30	6.25E-03	7.384E-06	7.4E-06	39.34	B2
Chlorobenzene†	12970	220.49		5.0E-02	1920	10	87600	1.23E-02	18547	310	3.82	8.30E-04	1.674E-02	2.5E-01	57.03	D
Chloroform	4925	90.41	2.3E-05		1920	10	613200	1.23E-02	134	135	1.66	3.40E-04	1.196E-06	1.2E-06	1.65	B2
1,1-Dichloroethylene	5490	103.27		2.0E-01	1920	10	613200	1.23E-02	519309	125	1.54	3.89E-04	2.412E-04	2.5E-01	1596.88	C
1,2-Dichloroethane	2475	45.06	2.6E-05		1920	10	613200	1.23E-02	56	56	0.69	1.70E-04	5.587E-07	5.6E-07	0.69	B2
Methylene Chloride	53780	1040.02	4.7E-07		1920	10	613200	1.23E-02	1105	1105	13.59	3.91E-03	2.000E-07	2.0E-07	13.59	B2
1,1,2,2-Tetrachloroethane	805	13.99	5.8E-05		1920	10	613200	1.23E-02	0	29	0.36	5.26E-05	6.562E-07	6.6E-07	0.36	C
Toluene†	11000	189.49		5.0E+00	1920	10	87600	1.23E-02	1854675	218	2.69	7.13E-04	1.178E-04	2.5E-01	5703.13	Inadequate
1,1,1-Trichloroethane†	33700	585.62		5.0E+00	1920	10	87600	1.23E-02	1854675	977	12.02	2.20E-03	5.270E-04	2.5E-01	5703.13	Inadequate

HS voc Maximum headspace concentration for VOC, ppmv †

MF voc Mole fraction of the VOC, mole/mole (Equation D9-6)

D voc VOC diffusion characteristic, mole/s/mole fraction/drum - Table D9-1

ADE voc Average drum VOC emission rate, mole/drum/year (Equation D9-5)

MW Molecular weight of the VOC, g/mole - Table D9-1

Drums/panel Drums per panel

V exhaust Mine ventilation exhaust rate, cubic ft/min (minimum flow rate for COC calculations)

SOPE Exhaust shaft concentration of VOC from single full open panel (no barriers), ug/m3 (Equation D9-4, modified)

SCPE Exhaust shaft concentration of VOC from single full closed panel, ug/m3 (Equation D9-1)

Drums/room (Drums/panel) / 7

GR Effective gas generation rate

AORE voc Average yearly open room VOC emission rate, mole/room/year (Equation D9-13)

ACRE voc Average yearly closed room VOC emission rate, mole/room/year (Equation D9-14)

AOPE voc Average yearly open panel VOC emission rate, mole/panel/year (Equation D9-12) - 1 open, 6 closed rooms

SXPE voc Exhaust shaft concentration of VOC from single open panel with room barriers, ug/m3 (Equation 5-24, NMVP)

V panel Mine ventilation panel rate, cubic ft/min

COC ug/m3 Concentration of concern, ug/m3 - panel exhaust concentration of VOC (ECS act multiplied by ratio of air volumes[=425/130])

COC ppbv Concentration of concern, ppbv - panel exhaust concentration of VOC in ppbv

URF Unit risk factor for VOC, m3/ug - Table D9-3

RfC Reference concentration, mg/m3 - Table D9-4 (except 1,1,1-TCA, revised as non-carcinogen per NCEA)

EF Exposure frequency, hours/year

ED Exposure duration, years (10 years)

AT Averaging time, hours (70 years)

ADF Air dispersion factor, unitless - Table D9-2

ECS max Maximum exhaust shaft concentration for VOC limited by acceptable risk, ug/m3 (Equation D9-15)

ECS act Actual exhaust shaft concentration for VOC, ug/m3 - full repository assumption w/ventilation barriers (Equation D9-9, modified)

Rcon ug/m3 Receptor concentration (SXPE+9\*SCPE)\*ADF, ug/m3 - full repository assumption w/ventilation barriers (Equation D9-9, modified)

Rcon ppmv Receptor concentration expressed in parts/million volume

Risk recept Receptor risk level (carcinogenic - Equation D9-15) or hazard quotient (noncarcinogenic - Equation D9-23)

Risk accept Acceptable risk level or hazard quotient, unitless - Table D9-3, D9-4

HBL Health-Based Levels, ug/m3 - (Equations 5-1 (carcinogenic) & 5-9 (non-carcinogenic), NMVP)

† Limits adjusted below evenly apportioned risk as follows:

Chlorobenzene and Toluene maximum concentrations set at Lower Explosive Limit (LEL)

1,1,1-Trichloroethane maximum concentration based on roof fall scenario, to avoid exceeding IDLH

All carcinogenic VOCs reapportioned to reflect actual distributions in disposal inventory

March 25, 2010		Exposure to Surface Worker within WIPP PPA, Original Proportions of VOCs, Reflect 4/12/2010 Temporary Authorization Request																													
Constituent	HS voc	MF voc	D voc	ADE voc	MW	Drums/panel	V exhaust	SOPE	SCPE	Drums/room	GR	AORE voc	ACRE voc	AOPE voc	SXPE voc	V panel	COC ug/m3	COC ppbv	URF	RIC	EF	ED	AT	ADF	ECS max	ESC act	Rcon ug/m3	Rcon ppmv	Risk recept	Risk accept	HBL
Carbon Tetrachloride†	36250	3.63E-02	1.21E-06	1.38	153.84	81000	260000	4457	58.4	11571	0.5	16006	209.7	17265	686.77	130000	3964	630	6.0E-06		1920	10	613200	1.23E-02	805	1212	14.91	2.37E-03	2.8E-06	1.9E-06	9.90
Chlorobenzene†	159514	1.60E-01	1.16E-06	5.84	112.56	81000	260000	13757	188.0	11571	0.5	67523	922.9	73060	2126.43	130000	12484	2712		2.0E-02	1920	10	87600	1.23E-02	7419	3819	46.97	1.02E-02	5.1E-01	3.3E-01	30.41
Chloroform	2669	2.67E-03	1.34E-06	0.11	119.39	81000	260000	282	3.3	11571	0.5	1305	15.4	1398	43.15	130000	239	49	2.3E-05		1920	10	613200	1.23E-02	272	73	0.90	1.84E-04	6.5E-07	2.4E-06	3.35
1,1-Dichloroethylene	1213	1.21E-03	1.40E-06	0.05	96.95	81000	260000	109	1.2	11571	0.5	620	7.0	662	16.59	130000	90	23	0.0E+00	0.0E+00	1920	10	613200	1.23E-02	0	28	0.34	8.59E-05	0.0E+00	2.4E-06	0.00
1,2-Dichloroethane†	980	9.80E-04	1.32E-06	0.04	89.97	81000	260000	83	1.0	11571	0.5	462	5.6	496	12.69	130000	71	17	2.6E-05		1920	10	613200	1.23E-02	54	22	0.27	6.58E-05	2.2E-07	5.4E-07	0.67
Methylene Chloride†	38872	3.88E-02	1.47E-06	1.80	84.94	81000	260000	3206	34.6	11571	0.5	20852	224.9	22201	487.61	130000	2611	752	4.7E-07		1920	10	613200	1.23E-02	2055	799	9.83	2.83E-03	1.4E-07	3.7E-07	25.28
1,1,2,2-Tetrachloroethane	992	9.92E-04	1.21E-06	0.04	167.86	81000	260000	133	1.7	11571	0.5	438	5.7	472	20.50	130000	118	17	5.8E-05		1920	10	613200	1.23E-02	108	36	0.45	6.48E-05	8.1E-07	2.4E-06	1.33
Toluene†	247566	2.48E-01	1.19E-06	9.29	92.13	81000	260000	17927	238.9	11571	0.5	107506	1432.3	116100	2765.78	130000	16070	4265		4.0E-01	1920	10	87600	1.23E-02	148374	4915	60.46	1.60E-02	3.3E-02	3.3E-01	608.27
1,1,1-Trichloroethane†	4046563	4.05E+00	1.21E-06	154.41	133.42	81000	260000	431488	5653.9	11571	0.5	1786756	23412.3	1927229	66487.38	130000	383717	70318		7.0E-01	1920	10	87600	1.23E-02	259654	117372	1443.68	2.65E-01	4.5E-01	3.3E-01	1064.48
HS voc	Maximum headspace concentration for VOC, ppmv †																														
MF voc	Mole fraction of the VOC, mole/mole (Equation D9-6)																														
D voc	VOC diffusion characteristic, mole/s/mole fraction/drum - Table D9-1																														
ADE voc	Average drum VOC emission rate, mole/drum/year (Equation D9-5)																														
MW	Molecular weight of the VOC, g/mole - Table D9-1																														
Drums/panel	Drums per panel																														
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COC ppbv	Concentration of concern, ppbv - panel exhaust concentration of VOC in ppbv																														
URF	Unit risk factor for VOC, m3/ug - Table D9-3																														
RIC	Reference concentration, mg/m3 - Table D9-4 (except 1,1,1-TCA, revised as non-carcinogen per NCEA)																														
EF	Exposure frequency, hours/year																														
ED	Exposure duration, years (10 years)																														
AT	Averaging time, hours (70 years)      Note: for non-carcinogenic risk, AT is the exposure duration in hours																														
ADF	Air dispersion factor, unitless - Table D9-2																														
ECS max	Maximum exhaust shaft concentration for VOC limited by acceptable risk, ug/m3 (Equation D9-15)																														
ESC act	Actual exhaust shaft concentration for VOC, ug/m3 - full repository assumption w/ventilation barriers (Equation D9-9, modified)																														
Rcon ug/m3	Receptor concentration (SXPE+9*SCPE)*ADF, ug/m3 - full repository assumption w/ventilation barriers (Equation D9-9, modified)																														
Rcon ppmv	Receptor concentration expressed in parts/million volume																														
Risk accept	Receptor risk level (carcinogenic - Equation D9-15) or hazard quotient (noncarcinogenic - Equation D9-23)																														
HBL	Acceptable risk level or hazard quotient, unitless - Table D9-3, D9-4																														
	Health-Based Levels, ug/m3 - (Equations 5-1 (carcinogenic) & 5-9 (non-carcinogenic), NMVP)																														

July 2, 2010

Constituent	HS voc	COC ug/m3	COC ppbv	URF	RfC	EF	ED	AT	ADF	ECS max	ESC act	Rcon ug/m3	Rcon ppmv	Risk recept	Risk accept	HBL
Carbon Tetrachloride†	23735	2595	412.5	6.0E-06		1920	10	613200	1.23E-02	1844	794	9.76	1.55E-03	1.8E-06	4.3E-06	22.68
Chlorobenzene†	13000	1017	221		2.0E-02	1920	10	87600	1.23E-02	7419	311	3.83	8.31E-04	4.2E-02	2.5E-01	22.81
Chloroform	9930	890	182	2.3E-05		1920	10	613200	1.23E-02	272	272	3.35	6.86E-04	2.4E-06	2.4E-06	3.35
1,1-Dichloroethylene	5490	409	103		2.0E-01	1920	10	613200	1.23E-02	519309	125	1.54	3.89E-04	2.4E-04	2.5E-01	1596.88
1,2-Dichloroethane†	2400	177	44	2.6E-05		1920	10	613200	1.23E-02	54	54	0.67	1.64E-04	5.4E-07	5.4E-07	0.67
Methylene Chloride†	100000	6718	1934	4.7E-07		1920	10	613200	1.23E-02	2055	2055	25.28	7.28E-03	3.7E-07	3.7E-07	25.28
1,1,2,2-Tetrachloroethane	2960	353	51	5.8E-05		1920	10	613200	1.23E-02	108	108	1.33	1.94E-04	2.4E-06	2.4E-06	1.33
Toluene†	11000	714	189		4.0E-01	1920	10	87600	1.23E-02	148374	218	2.69	7.13E-04	1.5E-03	2.5E-01	456.25
1,1,1-Trichloroethane†	33700	3196	586		7.0E-01	1920	10	87600	1.23E-02	259654	977	12.02	2.20E-03	3.8E-03	2.5E-01	798.44

HS voc	Maximum headspace concentration for VOC, ppmv †
MF voc	Mole fraction of the VOC, mole/mole (Equation D9-6)
D voc	VOC diffusion characteristic, mole/s/mole fraction/drum - Table D9-1
ADE voc	Average drum VOC emission rate, mole/drum/year (Equation D9-5)
MW	Molecular weight of the VOC, g/mole - Table D9-1
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ESC act	Actual exhaust shaft concentration for VOC, ug/m3 - full repository assumption w/ventilation barriers (Equation D9-9, modified)
Rcon ug/m3	Receptor concentration (SXPE+9*SCPE)*ADF, ug/m3 - full repository assumption w/ventilation barriers (Equation D9-9, modified)
Rcon ppmv	Receptor concentration expressed in parts/million volume
Risk recept	Receptor risk level (carcinogenic - Equation D9-15) or hazard quotient (noncarcinogenic - Equation D9-23)
Risk accept	Acceptable risk level or hazard quotient, unitless - Table D9-3, D9-4
HBL	Health-Based Levels, ug/m3 - (Equations 5-1(carcinogenic) & 5-9 (non-carcinogenic), NMVP)

† Limits adjusted below evenly apportioned risk as follows:

Chlorobenzene and Toluene maximum concentrations set at Lower Explosive Limit (LEL)  
1,2-Dichloroethane, Methylene Chloride, and 1,1,1-Trichloroethane maximum concentrations based on roof fall scenario, to avoid exceeding IDLH  
Carbon Tetrachloride risk revised to reflect EPA reduction of inhalation unit risk by a factor of 2.5 on March 31, 2010



November 12, 2015

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Fax: (505) 476-6030

Re: Class 2 WIPP Permit Modification Request - Revise Volatile Organic Compound Monitoring Procedures, September 2015

Dear Ricardo,

Thank you for this opportunity to submit comments on this Class 2 WIPP Permit Modification Request - Revise Volatile Organic Compound Monitoring Procedures, dated September, 2015.

Through comprehensive research, public education and effective citizen action, **Nuclear Watch New Mexico** seeks to promote safety and environmental protection at regional nuclear facilities; mission diversification away from nuclear weapons programs; greater accountability and cleanup in the nation-wide nuclear weapons complex; and consistent U.S. leadership toward a world free of nuclear weapons.

### **General Comments**

First, Nuclear Watch NM requests that the big picture be addressed. This Permit Modification Request (PMR) cannot stand by itself. It is the result of the events of February 2014. There must be a discussion about range of upcoming PMRs due to the February 2014 release. Many of the requests in this PMR are because WIPP cannot currently comply with the existing Permit and this PMR must so state that information.

There should be a new 'While WIPP is not Emplacing Waste' section in the permit. This section could include current operations that are outside the existing Permit. This proposed section could also include all the Modifications made to the Permit solely because of the February 2014 events. All of these operations must be restored to pre-2014 specifications after WIPP reopens.

For instance, the PMR states –

*Unlike underground waste workers who are required by the Permit to be protected using the DRVMP only when waste emplacement is underway, non-waste surface workers must be protected at all times. Currently, the monitoring locations used to ensure this protection are underground and are in areas that are radiologically contaminated. One station, Station VOC-A, is situated in the exhaust air from the entire disposal area. Because of this, Station VOC-A will be subjected to ongoing risk of radiological contamination arising from activities in Panel 7. (Pg. 5)*

- Nuclear Watch NM appreciates the difficulties in monitoring VOCs in a contaminated facility, but once WIPP reopens, VOC monitoring should return to normal.

There are major problems with three of the proposed permit modifications –

- Topic 2 - Change the repository VOC monitoring locations
  - Topic 5 - Revise the method of determining compliance with the surface non-waste worker environmental performance standard for air emissions
  - Topic 6 - Remove the minimum running annual average (RAA) mine ventilation exhaust rate
  - Each of these (2, 5, &6) would significantly reduce the protection of human health and the environment as compared with the requirements that have been in place since the permit was issued in 1999. Thus, each of these proposed modifications should be denied.
- In addition, if the permittees want to pursue Topics 5 and/or 6 remain, these must be considered as Class 3 permit modifications.
  - There are currently too many unknowns concerning the future of the ventilation system at WIPP to remove the minimum running annual average (RAA) mine ventilation exhaust rate.

## **Specific Comments**

### **Topic 1 - Add trichloroethylene (TCE) to the VOC target analyte list for VOC monitoring**

- We agree that TCE should be included in the VOC target analyte list.



## Topic 2 - Change the repository VOC monitoring locations

- This modification should be denied.
- This request would eliminate the two underground VOC monitoring stations. The primary reason given to change the monitoring locations to the surface is because of the difficulty of VOC monitoring in the radiologically contaminated underground, including because sampling equipment might be radiologically contaminated. That contamination merits increased surface and underground monitoring, not the elimination of the underground monitoring. This proposed change is totally contrary to 15 years of WIPP permit requirements, which provide for two underground sampling locations. That monitoring resulted in detection of VOC exposures in the underground in 2009 and increased protection for workers and the public.
- Eliminating underground VOC monitoring would significantly reduce protection of human health and the environment, so the modification should be denied.

(Pg. 3)

*Topic 2 proposes to change the procedure for monitoring by changing the RVMP monitoring locations from the underground to the surface. Moving the repository VOC monitoring locations to the surface will continue to protect the non-waste surface worker and provide an equivalent RVMP. The Permittees are requesting the use of VOC sampling locations on the surface since the logistics of accessing the current underground locations are complicated due to radioactive contamination. These logistic complications are addressed by monitoring on the surface as described in Section 3 of this PMR.*

- Let's be clear, the location on the surface that is assumed to have the highest concentration of VOCs is based on a computer model, and therefore is assumed and also has assumptions regarding dispersion in the atmosphere. So, DOE proposes to replace the original assumption of the amount of risk with a new assumption of where the risk is.
- Think of how informative it would be to have samples taken at **BOTH** locations at the same time. Then no assumptions are needed. Maybe eventually some real-life correlation could be made that when there are X VOCs in the underground, and the wind is blowing so fast in a certain direction, there are x VOCs at the surface.
- Why not monitor inside the buildings? Take the samples where the people are, in addition to the Waste Handling Building.
- We appreciate the difficulties in monitoring VOCs in a contaminated facility, but once WIPP reopens, VOC monitoring should return to normal.

## Topic 3 – Change the type of sampling equipment for VOC monitoring

- Please state the industry standard QAQC requirements and how WIPP will follow these standards.

#### **Topic 4 - Change the sampling durations for VOC monitoring**

*Topic 4 proposes to change the procedure for sampling by changing the sampling duration for the RVMP. The Permittees are proposing to increase the sampling duration from 6-hour time- integrated samples to 24-hour time-integrated samples. Experience has shown that during a typical work day at the WIPP facility, VOC concentrations are affected by ventilation changes in the repository throughout the day. Twenty-four hour samples are less likely to be affected by these changes than shorter-duration samples. (Pg. 3)*

- The concentration of VOCs when workers are present is important information to know. It is data that should not be diluted by adding meaningless data from when there are no operations.

*Method TO-15 refers to time-integrated samples as having 1 to 24 hour durations. Generally, samples to identify occupational exposures have a duration on the order of a work shift, typically six to eight hours. Samples for determining chronic effects to public receptors are longer in duration, typically 24 hours in duration, to average out the variability that may occur during the sampling period. Experience has shown that during a typical work day at the WIPP facility, VOC concentrations are affected by ventilation changes in the repository throughout the day. Twenty-four hour samples are less likely to be affected by these changes than shorter-duration samples. The 24-hour samples may remove some of the variability that is observed in the VOC results. (Pg. 10)*

- Once again, just because the VOCs change is no reason to try to make the changes go away.

#### **Topic 5 - Revise the method of determining compliance with the surface non-waste worker environmental performance standard for air emissions**

- The proposed modification is for a major change in determining compliance with air emissions for ten volatile organic compounds. The proposal would eliminate calculated “concentrations of concern” for carcinogenic volatile organic compounds (VOCs), which reduces protection of public health and the environment. The proposal is extremely complex, so it should be considered as a class 3 modification request. For example, more than a page of the request is four technical formulas. The request also includes significant changes in the remedial actions required.
- Again, these are significant changes which should be considered as a class 3 modification request.

(Pg. 4)

*Topic 5 proposes to change the procedure for reporting VOC concentrations for the RVMP by determining compliance with the non-waste surface worker*

*environmental performance standard for air emissions using a direct calculation of risk instead of the indirect method in the Permit. The determination of risk in the Permit uses concentrations of concern to relate underground VOC concentrations to non-waste surface worker risk. Concentrations of concern were determined by the NMED by back-calculating the underground concentration associated with a specific risk at the surface. This indirect method has assumptions regarding dispersion in the atmosphere and dilution in the underground ventilation air stream. The proposed method measures the VOC concentrations on the surface, near the point of exposure, after dispersion and dilution have occurred, and, therefore, are not assumed.*

- The VOCs must be sampled in the underground.
- It's a pilot plant – do the sampling.
- All assumptions need to be reexamined.
- What tests have been done to validate the models?

*(Pg. 4)*

*The proposed method uses U.S. Environmental Protection Agency (EPA) risk methodology and recommended risk factors to calculate risk. The EPA methodology is the same that was used by the NMED in establishing the concentrations of concern, however, the Permittees are updating information that was provided in the original Permit Application to satisfy the requirements of 20.4.1.900 NMAC (incorporating 40 CFR 270.23 (c) and (e)). This information is being updated based on changes to human health risk factors recommended by the EPA. The Permittees are proposing to revise procedures that are used to determine if the risk to the non-waste surface worker exceeds the risk limits established by the Permit. The Permittees are not proposing risk limits that are different than those established by the Permit. The proposed process for calculating risk incorporates risk from both the non-carcinogenic and carcinogenic effects for each compound. This process makes the risk determination more realistic than the current practice of using COCs for determining risk.*

- There are multiple changes in this topic, including changing the location, changing EPA risk factors by eliminating COCs, and making things more “realistic”.

*(Pg. 5)*

*The Permittees are proposing these changes at this time to coincide with recovery activities. When recovery is complete, the Permittees intend to continue surface monitoring to protect the non-waste surface worker and limit personnel access to radiologically contaminated areas in the underground. This is consistent with DOE operational philosophy to maintain personnel radiological exposures to as low a reasonably achievable.*

- What does the proposed sampling location have to do with DOE's “operational philosophy to maintain personnel radiological exposures to as low a reasonably

achievable”? While for more than 15 years, the permit has required actual measurements of the air being breathed in the underground, that requirement would be eliminated.

- Does this imply that the request will be better protection for the surface worker?

#### **Topic 6 - Remove the minimum running annual average (RAA) mine ventilation exhaust rate**

- The reason to eliminate the 260,000 cubic feet per minute (cfm) permit requirement is because it can no longer be met because WIPP’s ventilation is limited to 60,000 cfm in filtration mode. That is not a reason to eliminate a provision of the permit that protects human health and the environment, as well as underground workers.
- Any request to change the RAA should be in a comprehensive class 3 permit modification that describes the new ventilation system and demonstrates that it would be at least as protective of public health and the environment during waste handling operations as the existing permit requirements.
- There are currently too many unknowns concerning the future of the ventilation system at WIPP to remove the minimum running annual average (RAA) mine ventilation exhaust rate. For instance, the Defense Nuclear Facilities Safety Board has observed –
  - “Of note, once the SVS [supplemental ventilation system] system becomes operable, emergency underground egress through the salt shaft will no longer be possible as the SVS exhausts out this shaft.”
  - [http://www.dnfsb.gov/sites/default/files/Board%20Activities/Reports/Site%20Rep%20Monthly%20Reports/Waste%20Isolation%20Pilot%20Plant/2015/mr\\_20150930\\_122.pdf](http://www.dnfsb.gov/sites/default/files/Board%20Activities/Reports/Site%20Rep%20Monthly%20Reports/Waste%20Isolation%20Pilot%20Plant/2015/mr_20150930_122.pdf)

Sincerely,

Jay Coghlan  
Executive Director

Scott Kovac  
Operations Director

November 12, 2015

Mr. Ricardo Maestas  
New Mexico Environment Department  
Hazardous Waste Bureau  
2905 Rodeo Park Drive, Building 1  
Santa Fe, New Mexico 87505  
Phone: (505) 476-6050

via e-mail to [Ricardo.Maestas@state.nm.us](mailto:Ricardo.Maestas@state.nm.us)  
Fax: (505) 476-6030

Re: Class 2 WIPP Permit Modification Request- Revise Volatile Organic Compound Monitoring Procedures, September 2015

• Many of the requests in this PMR are because WIPP cannot currently comply with the existing Permit and this PMR must so state that information. There should be a new 'While WIPP is not Emplacing Waste' section in the permit. This section could include current operations that are outside the existing Permit. This proposed section could also include all the Modifications made to the Permit solely because of the February 2014 events. All of these operations must be restored to pre-2014 specifications after WIPP reopens.

Once WIPP reopens, VOC monitoring should return to normal.

There are major problems with three of the proposed permit modifications –

- Topic 2 - Change the repository VOC monitoring locations
  - Topic 5 - Revise the method of determining compliance with the surface non-waste worker environmental performance standard for air emissions
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- In addition, if the permittees want to pursue Topics 5 and/or 6 remain, these must be considered as Class 3 permit modifications.

**Topic 1 - Add trichloroethylene (TCE) to the VOC target analyte list for VOC monitoring**

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## Topic 2 - Change the repository VOC monitoring locations

- This modification should be denied.
- This request would eliminate the two underground VOC monitoring stations. The primary reason given to change the monitoring locations to the surface is because of the difficulty of VOC monitoring in the radiologically contaminated underground, including because sampling equipment might be radiologically contaminated. That contamination merits increased surface and underground monitoring, not the elimination of the underground monitoring. This proposed change is totally contrary to 15 years of WIPP permit requirements, which provide for two underground sampling locations. That monitoring resulted in detection of VOC exposures in the underground in 2009 and increased protection for workers and the public.
- Eliminating underground VOC monitoring would significantly reduce protection of human health and the environment, so the modification should be denied.

(Pg. 3)

*Topic 2 proposes to change the procedure for monitoring by changing the RVMP monitoring locations from the underground to the surface. Moving the repository VOC monitoring locations to the surface will continue to protect the non-waste surface worker and provide an equivalent RVMP. The Permittees are requesting the use of VOC sampling locations on the surface since the logistics of accessing the current underground locations are complicated due to radioactive contamination. These logistic complications are addressed by monitoring on the surface as described in Section 3 of this PMR.*

- Let's be clear, the location on the surface that is assumed to have the highest concentration of VOCs is based on a computer model, and therefore is assumed and also has assumptions regarding dispersion in the atmosphere. So, DOE proposes to replace the original assumption of the amount of risk with a new assumption of where the risk is.
- Think of how informative it would be to have samples taken at **BOTH** locations at the same time. Then no assumptions are needed. Maybe eventually some real-life correlation could be made that when there are X VOCs in the underground, and the wind is blowing so fast in a certain direction, there are x VOCs at the surface.
- Why not monitor inside the buildings? Take the samples where the people are, in addition to the Waste Handling Building.
- We appreciate the difficulties in monitoring VOCs in a contaminated facility, but once WIPP reopens, VOC monitoring should return to normal.

## Topic 3 – Change the type of sampling equipment for VOC monitoring

- Please state the industry standard QAQC requirements and how WIPP will follow these standards.

#### **Topic 4 - Change the sampling durations for VOC monitoring**

*Topic 4 proposes to change the procedure for sampling by changing the sampling duration for the RVMP. The Permittees are proposing to increase the sampling duration from 6-hour time- integrated samples to 24-hour time-integrated samples. Experience has shown that during a typical work day at the WIPP facility, VOC concentrations are affected by ventilation changes in the repository throughout the day. Twenty-four hour samples are less likely to be affected by these changes than shorter-duration samples. (Pg. 3)*

- The concentration of VOCs when workers are present is important information to know. It is data that should not be diluted by adding meaningless data from when there are no operations.

*Method TO-15 refers to time-integrated samples as having 1 to 24 hour durations. Generally, samples to identify occupational exposures have a duration on the order of a work shift, typically six to eight hours. Samples for determining chronic effects to public receptors are longer in duration, typically 24 hours in duration, to average out the variability that may occur during the sampling period. Experience has shown that during a typical work day at the WIPP facility, VOC concentrations are affected by ventilation changes in the repository throughout the day. Twenty-four hour samples are less likely to be affected by these changes than shorter-duration samples. The 24-hour samples may remove some of the variability that is observed in the VOC results. (Pg. 10)*

- Once again, just because the VOCs change is no reason to try to make the changes go away.

#### **Topic 5 - Revise the method of determining compliance with the surface non-waste worker environmental performance standard for air emissions**

- The proposed modification is for a major change in determining compliance with air emissions for ten volatile organic compounds. The proposal would eliminate calculated “concentrations of concern” for carcinogenic volatile organic compounds (VOCs), which reduces protection of public health and the environment. The proposal is extremely complex, so it should be considered as a class 3 modification request. For example, more than a page of the request is four technical formulas. The request also includes significant changes in the remedial actions required.
- Again, these are significant changes which should be considered as a class 3 modification request.

(Pg. 4)

*Topic 5 proposes to change the procedure for reporting VOC concentrations for the RVMP by determining compliance with the non-waste surface worker environmental performance standard for air emissions using a direct calculation*

*of risk instead of the indirect method in the Permit. The determination of risk in the Permit uses concentrations of concern to relate underground VOC concentrations to non-waste surface worker risk. Concentrations of concern were determined by the NMED by back-calculating the underground concentration associated with a specific risk at the surface. This indirect method has assumptions regarding dispersion in the atmosphere and dilution in the underground ventilation air stream. The proposed method measures the VOC concentrations on the surface, near the point of exposure, after dispersion and dilution have occurred, and, therefore, are not assumed.*

- The VOCs must be sampled in the underground.
- It's a pilot plant – do the sampling.
- All assumptions need to be reexamined.
- What tests have been done to validate the models?

*(Pg. 4)*

*The proposed method uses U.S. Environmental Protection Agency (EPA) risk methodology and recommended risk factors to calculate risk. The EPA methodology is the same that was used by the NMED in establishing the concentrations of concern, however, the Permittees are updating information that was provided in the original Permit Application to satisfy the requirements of 20.4.1.900 NMAC (incorporating 40 CFR 270.23 (c) and (e)). This information is being updated based on changes to human health risk factors recommended by the EPA. The Permittees are proposing to revise procedures that are used to determine if the risk to the non-waste surface worker exceeds the risk limits established by the Permit. The Permittees are not proposing risk limits that are different than those established by the Permit. The proposed process for calculating risk incorporates risk from both the non-carcinogenic and carcinogenic effects for each compound. This process makes the risk determination more realistic than the current practice of using COCs for determining risk.*

- There are multiple changes in this topic, including changing the location, changing EPA risk factors by eliminating COCs, and making things more “realistic”.

*(Pg. 5)*

*The Permittees are proposing these changes at this time to coincide with recovery activities. When recovery is complete, the Permittees intend to continue surface monitoring to protect the non-waste surface worker and limit personnel access to radiologically contaminated areas in the underground. This is consistent with DOE operational philosophy to maintain personnel radiological exposures to as low a reasonably achievable.*

- What does the proposed sampling location have to do with DOE's “operational philosophy to maintain personnel radiological exposures to as low a reasonably achievable”? While for more than 15 years, the permit has required actual

measurements of the air being breathed in the underground, that requirement would be eliminated.

- Does this imply that the request will be better protection for the surface worker?

**Topic 6 - Remove the minimum running annual average (RAA) mine ventilation exhaust rate**

- The reason to eliminate the 260,000 cubic feet per minute (cfm) permit requirement is because it can no longer be met because WIPP's ventilation is limited to 60,000 cfm in filtration mode. That is not a reason to eliminate a provision of the permit that protects human health and the environment, as well as underground workers.
- Any request to change the RAA should be in a comprehensive class 3 permit modification that describes the new ventilation system and demonstrates that it would be at least as protective of public health and the environment during waste handling operations as the existing permit requirements.

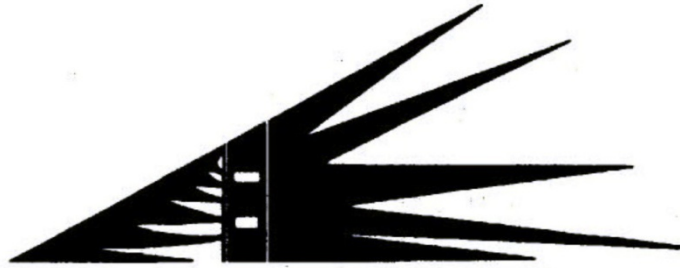
Sincerely,

Janet Greenwald for Citizens for Alternatives to Radioactive Dumping (CARD) and the Alliance for Environmental Strategies(AFES)

Address:

202 Harvard SE  
Alb NM 87106

PS Thanks to Southwest Research and Information Center and NM Nuclear Watch for assistance in compiling these comments



**SOUTHWEST RESEARCH AND INFORMATION CENTER**

**P.O. Box 4524 Albuquerque, NM 87196 505-262-1862 FAX: 505-262-1864 [www.sric.org](http://www.sric.org)**

November 12, 2015

Ricardo Maestas  
New Mexico Environment Department (NMED)  
2905 Rodeo Park Drive, Building 1  
Santa Fe, NM 87505

RE: WIPP Class 2 Permit Modification Request package

Dear Ricardo,

Southwest Research and Information Center (SRIC) provides the following comments on the Class 2 permit modification request package that was submitted by the permittees on September 8, 2015, according to their public notice.

SRIC appreciates that the permittees provided a draft of the proposed request and that representatives of the permittees as well as NMED met with SRIC and other citizen group representatives on May 27, 2015. SRIC continues to believe that such pre-submittal meetings are useful and supports continuing that "standard" practice in the future.

Nevertheless, there are several topics in the request package that should not be approved because the proposed modifications are not protective of human health and the environment and are not properly class 2 requests.

In addition, the Permittee's compliance history and the poor safety performance of WIPP requires more stringent, not less protective, permit provisions. Moreover, the fundamental failures of the permittees, particularly Nuclear Waste Partnership (NWP), raise serious concerns about whether that company can safely operate the facility and comply with permit provisions.

Given this situation, NMED should deny many portions of the request. NMED should also require the permittees to have a public process to discuss comprehensively the provisions of the permit that they intend to modify in order to re-start operations at WIPP. The public process should include one or more public meetings, similar to pre-submittal meetings, and discuss what permit modifications are required, whether there should be multiple requests or one or two "mega" requests, and the proper classification for those requests. Such a process could result in a better use of public and NMED resources than the piecemeal, unilateral approach that is being pursued.



### Compliance history

NMED must consider the permittees' compliance history, including violations of the Hazardous Waste Act or any permit condition, and may deny any permit modification based on that history. 74-4-4.2.D(6) NMSA. In its Administrative Orders of February 27, 2014; May 12, 2014; May 20, 2014; and the Compliance Order of December 6, 2014, NMED established that the permittees had violated multiple permit provisions over months prior to the February 2014 fire and radiation release events. Such violations, which have not been remedied in the more than 21 months since that time, must be weighed heavily in consideration of any permit modification requests. Given that history and current practice of non-compliance, the permittees must fully justify any class 2 or 3 permit modification requests. In the absence of such justification, requests should be denied.

### NWP's inadequate performance

NWP became the Management and Operating Contractor and a permittee on October 1, 2012. In the more than 37 months since then, the facility has operated for about 16 months. Because of the inadequate performance of NWP, the facility has not been receiving or disposing of waste for the past 21 months and will not do so for many months into the future. Based on that record, the ability of NWP to safely operate the facility is in serious doubt. For the majority of its time as operating contractor, and perhaps for the entire timeframe, NWP has been in violation of multiple permit provisions. Thus, the capability of NWP to comply with permit requirements is seriously in question since it has not demonstrated that it can do so. Given NWP's inadequate safety performance and lack of compliance with permit provisions, NMED should not reduce the stringency of the permit, which, in essence, rewards the permittees for violations. Multiple topics of the modification package would reduce the stringency of the permit and reduce protection of public health and the environment. Thus, those requests should be denied.

### WIPP's fundamental operating basis has been irrevocably violated

The WIPP operating philosophy is incorporated into the permit: "Start Clean, Stay Clean" (Attachment G-1e(2)(b)). But that philosophy and practice have been violated and can never again be achieved because of the substantial contamination of thousands of feet of tunnels in the underground hazardous waste disposal unit. As NMED Secretary Flynn has correctly stated, the fire and radiation release and the contamination were never supposed to happen. That fundamental promise to the public and premise for the permit has been irreparably violated. WIPP can no longer fulfill the "Start Clean, Stay Clean" principle that is part of its essential mission, the basis for public trust, and a fundamental operating basis for the permit. Weakening permit requirements will make it even more likely that additional "events" will occur.

Moreover, because of the changes in operating philosophy and practice, many of the permit modification requests would "substantially alter the facility or its operations" and, thus, are class 3 requests. 20 NMAC 4.1.900 (incorporating 40 CFR 270.42(d)(2)(iii)).

### Denial of permit modification request topics

Pursuant to 20 NMAC 4.1.900 (incorporating 40 CFR 270.42(b)(6)(i)(B)) and its historic practices, NMED may deny class 2 modification requests. SRIC strongly believes that at least four of the topics must be denied because they would weaken the stringency of permit requirements and reduce protection of human health and the environment. Thus, the four changes would not meet the requirements of the Hazardous Waste Act to provide such protections.

\* Topic 2 - Change the repository VOC monitoring locations

The request would eliminate the underground volatile organic compound (VOC) monitoring stations A and B. The primary reason given to move repository monitoring locations to the surface is because of the difficulty of VOC monitoring in the radiologically contaminated underground, including because sampling equipment might be radiologically contaminated (Request, p. 5). That contamination merits increased surface and underground monitoring, not the elimination of the underground monitoring. This proposed change is totally contrary to 15 years of WIPP permit requirements, which have always provided for two underground sampling locations. That monitoring detected carbon tetrachloride exposures above expected amounts in the underground starting in 2009 that resulted in operational changes and increased protection for workers and the public. Eliminating underground VOC monitoring would significantly reduce protection of human health and the environment, so the modification should be denied.

Because of air dispersion, air in the underground is considerably different than air that has passed through the exhaust shaft and out the surface exhaust. Measuring VOCs in the underground is a more accurate reflection of the exposures of workers and others in the underground. To support surface monitoring, the permittees rely on models that are not fully described, especially the URS, 2010 report, which is mentioned by not provided. (Request, p. C-2).

SRIC also strongly objects to the proposed change to the fundamental basis of underground VOC monitoring, which has been to measure VOCs in the underground air in relation to numerical concentrations of concern to protect workers and public health and the environment. The request is to measure VOCs only in the disposal rooms. In other areas of the underground there would be no monitoring stations. Instead, the underground program would be changed to surface monitoring as the basis for calculating the risk to “non-waste surface worker.” Attachment N-1b. The request even proposes to add the qualifier “may” to whether VOCs are in the underground air – Attachment N-1b, first line. Of course, as the permit has stated for more than 15 years, VOCs are in CH and RH waste that has been emplaced at WIPP and VOCs are continually released.

The request does not even mention the permittees’ supplemental ventilation system (SVS) that would exhaust some of the underground air through the Salt Handling Shaft. See Attachment 1. The permittees must provide a modification request that fully discusses the revised ventilation system, including, among other things, how VOCs will be monitored in the SVS.

SRIC believes that underground VOC monitoring is required for both the filtration mode and the SVS air in order to protect workers and public health and the environment. That VOC monitoring is not included in the Appendix C modeling, nor is the SVS discussed in the request, which is a gross incompleteness and inadequacy of the request, which requires its denial.

\* Topic 4: Change in the sampling duration for VOC Monitoring

As described in Topic 2 above, SRIC strongly objects to the proposed change in location from the underground to the surface for repository VOC monitoring. SRIC believes that this sampling duration request also must be denied because it is not adequately justified. The stated rationale for the change in sampling duration is that it “may remove some of the variability that is observed in the VOC results” (Request, p. 10). Variability is not the proper criterion to support such a change.

Protection of human health and the environment is the proper criterion, and the request does not specifically address that standard. If there are higher levels of VOCs during a normal work shift, as can be captured in the existing sampling duration, as compared to 24-hour duration, for which for the majority of the time there are no underground or surface workers, then the existing sampling duration should be maintained. The request does not provide verified data that the longer sampling is more protective of public or worker health, as compared with the sampling duration currently required.

The request also would change the duration of sampling in disposal rooms. Rather than six-hour samples, the duration would be “short-duration time-integrated samples,” which are not defined or justified. Such vague phrasing is not enforceable by NMED, a further reason to deny the change.

**\* Topic 5 - Revise the method of determining compliance with the surface non-waste worker environmental performance standard for air emissions**

The proposed modification is for a major change in determining compliance with air emissions for ten volatile organic compounds. The proposal would eliminate calculated “concentrations of concern” for VOCs, which reduces protection of public health and the environment. The proposal is extremely complex, so it should be considered as a class 3 modification request. For example, more than a page of the request is four technical formulas. The request also includes significant changes in the remedial actions required, all of which SRIC opposes. There is no adequate basis provided for any of the proposed remedial action changes, which are also vague and unenforceable. Again, these are substantial changes to facility operations that should be denied. If they are to be considered in the future, the changes should be considered as a class 3 modification request.

The permittees also underestimate the exposure risk for workers, as they use 10 years “based on typical work practices for employees at the WIPP site” (Request, p. 12). Such a number is clearly not justified nor conservative. First, the request includes no data on actual employee work practices to support the 10-year timeframe. Second, there is no limit on the number of years workers can be at WIPP. Thirdly, the permittees routinely point out that many workers have been at WIPP for more than 10 years, so that maximum exposure is more than ten years. Fourth, SRIC representatives visiting WIPP always encounter workers that have been on the job for 15 years or more. Since the permittees intend WIPP to operate for at least 30 years, at least that duration must be used.

Moreover, SRIC strongly objects to the permittees proposed risk level. Scientific and health data clearly show that a risk level of  $10^{-6}$  is more protective of public health and is a reasonable and achievable risk level. Given the multiple carcinogens that are in the WIPP wastes and the fact of substantial underground radiation contamination, which also is a carcinogen, can now continuously affect workers, human health and the environment for as long the site is open, the risk level should be more protective, including for the “non-waste surface worker.” The permittees have re-opened consideration of the risk levels for VOCs in their permit modification request, and a risk level of  $10^{-6}$  should be the basis for all VOC concentrations of concern or risk levels. The proposed risk levels for the surface non-waste worker in the modification request are an order of magnitude insufficient and should not be approved.

There is substantial support for this more stringent risk level in Environmental Protection Agency (EPA) practice. For example, in both cancer and non-cancer assessments, that agency has defined 1 in 1,000,000 excess risk as a de minimis risk level. Further, the President's Cancer Panel's April 2010 report states clearly that "The Panel was particularly concerned to find that the true burden of environmentally induced cancer has been grossly underestimated."<sup>1</sup> Thus, a more protective risk level of  $10^{-6}$  should be used for VOCs. Because of the complexity of understanding and establishing risk levels, the matter should be considered in a class 3 modification request.

In addition, some of the proposed "Recommended EPA Risk Factors" shown in Table 4.6.2.3 are not the same as shown in the EPA IRS database - <http://www2.epa.gov/iris>. The modification request does not explain those discrepancies. In addition, the Risk Factors proposed in Table 4.6.2.3 do not at all correlate with Appendix C. Both of these matters again demonstrate the complexity of the proposed change, which requires it be considered as a class 3 modification request.

\* Topic 6 - Remove the minimum running annual average (RAA) mine ventilation exhaust rate. The reason to eliminate the 260,000 standard cubic feet per minute (scfm) permit requirement, which has always been in the permit, is because it can no longer be met because WIPP's ventilation is limited to 60,000 scfm in filtration mode (Request, p. 6). That is not an adequate reason to eliminate a provision of the permit that protects human health and the environment, as well as underground workers. The request should be denied. Any request to change the RAA should be in a comprehensive class 3 permit modification that describes the new ventilation system and demonstrates that it would be at least as protective of public health and the environment during waste handling operations as the existing permit requirements.

SRIC has stated repeatedly during the permitting process, the permit renewal process, and modification requests that the primary concern is that adequate ventilation always be maintained in the Underground Hazardous Waste Disposal Units (HWDUs). The concern is reinforced by the measured levels of VOCs in the Underground HWDUs during the past six years prior to February 2014, during which time workers were exposed to higher levels of carbon tetrachloride than were contemplated when the permit was issued in 1999.

Now underground workers and the public could be chronically exposed to VOCs and radioactivity. The increased health effects of those carcinogens have not been studied in WIPP workers and the public (nor included in determining EPA IRIS risk levels). The ventilation rate is a key requirement for any WIPP operations and should be included in the permit. Ventilation also has an important element in worker exposures. The existing RAA is much more protective of human health and the environment than no RAA, as the permittees propose. The request would reduce protection of public health and the environment and should be denied.

Moreover, as the fire and radiation release demonstrated, the ventilation system does not fully control underground air flow as it is supposed to do. For example, air flow and smoke exhausted through the salt handling shaft during the February 5 fire, rather than out the exhaust shaft. The radiation release contaminated areas in the underground that were supposed to have had no air

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<sup>1</sup> [http://deainfo.nci.nih.gov/advisory/pcp/annualReports/pcp08-09rpt/PCP\\_Report\\_08-09\\_508.pdf](http://deainfo.nci.nih.gov/advisory/pcp/annualReports/pcp08-09rpt/PCP_Report_08-09_508.pdf), Cover Letter, p. 5 of PDF.

flow or were upstream from the described ventilation flow. Given those realities, the ventilation system is an essential part of the facility operations and the permit, and the minimum repository air flow requirements must be maintained.

#### Other Topics

**\* Topic 1 - Add TCE to the VOC target analyte list for VOC monitoring**

SRIC supports adding TCE to Table 4.4.1 and Table 4.6.3.2. SRIC also supports adding TCE in Table 4.6.2.3, but, as noted in Topic 5 above, SRIC objects to the values shown and removing the measured Concentrations of Concern.

**\* Topic 3 - Change the type of sampling equipment for VOC monitoring**

SRIC does not object conceptually to the changes in sampling equipment for VOC monitoring, because the requirements are to continue to meet EPA Compendium Method TO-15. However, the request does not provide sufficient detail to adequately support the modification. For example, the proposed sampling equipment has been used at WIPP (Request, p. 10), but there is no actual data provided comparing the performance and reliability of the proposed samplers with the existing sampling equipment. Second, there is no Quality Assurance data for the new sampling equipment. Third, the only technical citation is to Occupational Safety and Health Administration (OSHA) (incorrectly named as “Occupational and Health Administration” in footnote 8) Method Number: PV2120. However, that OSHA document states that the status of the method is “Partially validated.” The request does not explain how that is sufficient validation. Fourth, there is no specific discussion of the method in relation to EPA, not OSHA, requirements.

**\* Topic 7 – “Minor editorial changes”**

SRIC does not object to “minor editorial changes” that are properly class 1 modifications. However, many of the editorial changes cannot be approved because they relate to the substantive topics for which the requests must be denied. Rather than taking NMED resources to closely examine all of the supposed editorial changes, they should not be approved. Instead, after NMED’s determinations on the modification package, the permittees could submit a class 1 modification request to incorporate then necessary changes into the Permit.

Thank you very much for your careful consideration of, and your response to, these and all other comments.

Sincerely,

A handwritten signature in black ink, appearing to read "Don Hancock". The signature is fluid and cursive, with the first name "Don" and last name "Hancock" clearly distinguishable.

Don Hancock

cc: John Kieling



## DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 2, 2015

TO: Steven Stokes, Technical Director  
FROM: Dermot Winters, WIPP Cognizant Engineer  
SUBJECT: Waste Isolation Pilot Plant (WIPP) Activity Report for September 2015

**DNFSB Staff Activity:** S. Sircar, M. Dunlevy, P. Meyer, and D. Winters were onsite September 1-2 for site orientation in support of review of the WIPP Documented Safety Analysis Revision 5. R. Quirk was onsite September 14-18 performing site representative oversight duties. The Board's staff has averaged 3.0 man-weeks of oversight per month for the first 9 months of 2015.

**Annual Emergency Preparedness (EP) Exercise:** On September 16, WIPP held its annual full-scale exercise to demonstrate and evaluate their overall capability to recognize, respond, contain, and mitigate an emergency situation that may occur. Board staff member, R. Quirk, observed the exercise at the event scene and in the emergency operations center (EOC). The staff member judged the overall performance of the annual EP exercise to be adequate, although the EOC personnel over-characterized the drill accident event as a general emergency. The contractor plans to issue their report within the required 30 working days.

**Potentially Inadequate Safety Analysis (PISA):** The Waste Handling Building (WHB) Fire Suppression System (FSS) is operating in a degraded mode. This resulted in a PISA declaration, followed by a positive Unreviewed Safety Question determination (USQ) on September 18. An additional PISA was declared on September 14 regarding the lack of the required one degree floor slope in the remote-handling (RH) bay which is credited to direct spilled fuel away from the contact-handling (CH) bay. Absorbent socks have been placed along the roll-up and personnel doors between the bays to preclude entry of liquids into the CH bay. Members of the staff are tracking progress of both issues.

**Consolidated Evaluation of the Safety of the Situation (ESS):** In April 2015 DOE committed to consolidate nine ESSs into a simplified consolidated ESS document to reduce the likelihood of Technical Safety Requirement violations. The Board's staff reviewed the draft document and transmitted an agenda to support discussions in August. DOE submitted written responses to the agenda and members of the staff are evaluating the responses.

**Ventilation System Upgrades:** Progress continues on the installation of planned site ventilation system upgrades. All interim ventilation system (IVS) component repairs have been completed by the vendor with components scheduled to arrive back on site in October. Construction is complete on the concrete foundation pads. The supplemental ventilation system (SVS) fan is mechanically installed in the underground with electrical wiring planned for completion in October. The two systems are projected to be operable in early 2016. The IVS will upgrade the filtration capacity from 60 kcfm to 114 kcfm and the SVS will provide 130 kcfm of ventilation flow. Of note, once the SVS system becomes operable, emergency underground egress through the salt shaft will no longer be possible as the SVS exhausts out this shaft. The permanent ventilation system critical decision-1 conceptual design point is scheduled for October 30. Members of the staff are evaluating all three systems.