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

FEB 17 2016

OFFICE OF
AIR AND RADIATION

Mr. Todd Shrader
Carlsbad Field Office
U.S. Department of Energy
P.O. Box 3090
Carlsbad, New Mexico 88221-3090

Dear Mr. Shrader:

During the week of April 7, 2015, the U.S. Environmental Protection Agency performed an inspection of the Waste Isolation Pilot Plant (WIPP) as part of its continuing oversight program. This inspection was conducted under the authority of 40 CFR Part 191, Subpart A, to verify that the DOE continues to demonstrate compliance with the release standard found at 40 CFR 191.03, Subpart A. The Agency had conducted its previous inspection under Subpart A in April 2014 in response to the February 2014 unplanned radiological release. Prior to the incident, the most recent routine annual inspection was conducted in October 2013. During the April 2015 inspection, the facility was still undergoing active recovery and not emplacing waste. Therefore, although the inspection followed the format of a typical annual inspection, inspection activities were tailored to the current operational state of the facility.

Based on the inspection activities documented in the accompanying inspection report (E-docket #: EPA-HQ-OAR-2001-0012-0458), the EPA concludes that the DOE continues to adequately implement a radiological monitoring and sampling program for WIPP disposal operations in which it collects representative samples and appropriately performs calculations to estimate potential releases to the public. Two recommendations for WIPP Laboratories related to their analyses (automation/improving sample and data management) as well as one concern associated with sample filter handling are included in the report.

Copies of this inspection report are enclosed with this letter and will be placed in the EPA's public dockets on http://www.regulations.gov. If you have any questions regarding the enclosed report, please contact Jonathan Walsh at (202) 343-9238.

Sincerely,

Jonathan Edwards
Director
Radiation Protection Division

160213

E-DOCKET: EPA-HQ-OAR-2001-0012-0458

2015 - Subpart A Inspection Report

INSPECTION No. EPA-WIPP-4.07-09a
OF THE
WASTE ISOLATION PILOT PLANT
April 7-9, 2015

U. S. ENVIRONMENTAL PROTECTION AGENCY
Office of Radiation and Indoor Air
Center for Waste Management and Regulations
1200 Pennsylvania Avenue, NW
Washington, DC 20460

February 2016

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Attachments

1.0 Executive Summary

The U.S. Environmental Protection Agency (EPA) conducted an annual inspection of the Department of Energy (DOE) Waste Isolation Pilot Plant (WIPP) from April 7 to 9, 2015 as part of its continued oversight program. This inspection was conducted under the authority of 40 CFR Part 191, Subpart A, to verify that DOE continues to demonstrate compliance with the release standard found at 40 CFR 191.03, Subpart A. In April 2014, EPA conducted an inspection under Subpart A in response to the February 2014 unplanned radiological release. Prior to the incident, the most recent routine annual inspection was conducted in October 2013. During the April 2015 inspection, the facility was still undergoing active recovery and not emplacing waste. Therefore, although the inspection followed the format of a typical annual inspection, inspection activities were tailored to the current operational state of the facility.

EPA reviewed DOE's ability to monitor radioactive releases from the facility and inspected radiation sampling locations, equipment, and sample processing. EPA also reviewed the computational methods used to estimate dose to the public. EPA noted that many improvements have been made during facility recovery, including maintenance to air sampling equipment at both Station A and Station B, and the addition of radiological monitoring capability at Station B that transmits data in real time to the Central Monitoring Room (CMR). Improvements continue to be made to the environmental air monitoring network in response to concerns from EPA's incident inspection. EPA is encouraged that plans are underway to reestablish continuous radiological monitoring of the underground from the CMR.

A review of WIPP Laboratories during this inspection found that it produces high-quality analyses, but led to two recommendations to use automation to improve sample and data management. EPA followed up on the observation, made during the 2014 incident inspection, that air sample filters that would normally be composited and subjected to radiochemical analysis for compliance with National Emission Standards for Hazardous Air Pollutants (NESHAPs) were handled differently as a result of the incident. EPA found that although environmental staff made the best possible analysis of the available data, the decision made in the immediate aftermath of the event to discontinue radiological analysis of a key sample filter in favor of chemical forensics reduced the precision to which the release to the environment can be quantified. The potential impact is not great enough to challenge the conclusion that WIPP remains compliant with its release limits, but does warrant a review of emergency response procedures.

2.0 Inspection Scope

The scope of this inspection was to verify that throughout facility recovery, WIPP remains able to effectively capture, measure, and calculate radiation doses to members of the public during waste disposal operations. Inspection activities included an examination of monitoring and sampling equipment, the handling of samples, and the generation of analytical results by WIPP Laboratories. This inspection was conducted under the authority of 40 CFR Part 191, Subpart A.

During the 2014 incident inspection, EPA focused on the actions taken by DOE and DOE's management and operations contractor, Nuclear Waste Partnership (NWP), in response to the accidental release, in particular, WIPP's environmental sampling network and modeling of potential radiation dose to the public. In the 2015 Subpart A inspection, EPA revisited issues raised during the incident inspection, examined novel issues specific to facility recovery, and addressed the areas typically covered during a routine annual inspection.

3.0 Inspection Team, Observers, and Participants

The inspection team consisted of three EPA staff.

Inspection Team Member	Position	Affiliation
Jonathan Walsh	Inspector	EPA ORIA
Nick Stone	Inspector	EPA Region 6
Cindy White	Inspector	EPA ORIA

Numerous DOE staff and contractors participated in the inspection; below is a partial list.

Participant	Affiliation
Larry Madl	RES, Inspection Coordinator
Yen Kiang	RES, Observer
Robert Boyko	CTAC, Observer
Anderson Ward	CBFO, Observer
Jacqueline Davis	NWP
Clifford Fell	NWP
Rob Hayes	NWP
Ed Picazo	RES
Stewart Jones	RES

Rick Salness	RES
Mansour Akbarzadeh	WIPP Laboratories
Ginny Jones	WIPP Laboratories

Affiliations:
CBFO: DOE Carlsbad Field Office
CTAC: Carlsbad Technical Assistance Contractor
NWP: Nuclear Waste Partnership
RES: Regulatory and Environmental Services

4.0 Performance of the Inspection

The inspection began on Tuesday, April 7, 2015, with a brief opening meeting at the WIPP site. The EPA inspection team then reviewed procedures, interviewed site staff, and observed activities to verify the effective implementation of procedures relevant to Subpart A. These activities are described in detail below.

4.1 Stations A, B, and C

Station A samples unfiltered air exhausted from the WIPP underground before it passes through the High-Efficiency Particulate Air (HEPA) filtration units. Because the repository has operated only in filtration mode since the incident took place, samples taken at Station A are no longer representative of air exhausted to the environment. Rather, samples from Station B, downstream of the HEPA filters, reflect facility exhaust to the environment. Prior to the incident, maintenance of Station A to ensure representative sampling was a focal point of Subpart A inspections. Following the incident, maintenance of Station A became even more challenging due to contamination in the air exhaust shaft. Although it is no longer the primary point of compliance, the site has elected to continue maintenance of Station A. At the time of the inspection, deferred maintenance of the flow control equipment at Station A was actively taking place, and a procedure was in development for exchanging the shrouded probes. According to engineering staff, a video inspection of the exhaust shaft was also planned.

The team inspected Station A on the morning of April 8. Skid A-1 was switched off, and Skids A-2 and Skid A-3 were operating. Both operating skids had been calibrated in March 2015. The flow control equipment at Skid A-2 had been replaced due to occlusion with salt and other particulates, and all three sample splits were operating within the intended ranges for volumetric flow and pressure differential across the filter (~2 scf/m and <1 psi for each sample split). Similar work had not yet been performed on Skid A-3, which was reflected in its performance. Flow rates varied from 0.090-1.75 scf/m, and differential pressures from .90 to 4.69 psi, for the three sample splits.

The inspection team also visited Station B, which now samples facility exhaust. Skid B-1 was calibrated and operating correctly. The flow control equipment on Skid B-2 had been recently

upgraded, and a Canberra iCAM installed on one of the sample skids; it now provides real-time data to the Central Monitoring Room (CMR). This performance information was observed when the inspection team visited the CMR later that morning (JPW-2015-3).

Station C samples the exhaust from the Waste Handling Building (WHB), after it passes through banks of HEPA filters. The WHB was unaffected by the 2014 release of radioactivity, and no contamination has been found there. During this inspection, Station C was calibrated and operating correctly.

EPA placed heavy emphasis on environmental air sampling during the 2014 incident inspection and subsequent interactions with DOE. During the 2015 inspection, EPA was informed of two changes in the management of the environmental air samplers for the purpose of emergency response. Previously, Radiation Control (RadCon) personnel collected environmental filters during emergency situations, rather than Environmental Monitoring personnel, who collect filters during normal operations. During the 2014 incident, the change of responsibility led to some errors in sample tracking and documentation, and EPA suggested that this possibility could be reduced by using the Environmental Monitoring group to assist with sample collection during emergencies, or by having RadCon personnel collect samples more frequently during normal operations to ensure their familiarity with procedures. This concern was addressed in a presentation to the inspection team on the morning of April 8. Procedure WP 12-RE3002, Rad Eng. Off Site Air Sampling (Rev. 6), no longer requires a Radiological Control Technician (RCT) to collect environmental air filters in the event of an emergency. Environmental Monitoring staff who are responsible for routine sample filter collection are now qualified to accompany the RCT and collect those samples in an emergency situation, providing continuity between typical and emergency sample collection.

Additional improvements to the air sampling network include the creation of maintenance guides and log books for the environmental air samplers. The site is considering the addition of samplers nearer to the site in the north and east. The site is also deliberating dividing the network of environmental samplers into two groups – ambient low volume (AL) samplers, which will continue to collect samples to be analyzed and added to the baseline environmental monitoring data, and event evaluation (EE) samplers, which will allow flexibility during the response to any potential release. Filters would be regularly collected from the EE samplers, screened, weighed, and archived for one year, but analyzed only if necessary. Technology upgrades to the network, including digitally controlled samplers and remote operability checks, were being evaluated at the time of the inspection.

4.2 Consequence Analysis

On the afternoon of April 7, EPA inspectors met with Consequence Assessment staff in the Engineering building. No changes to the program were reported, and no incidents requiring consequence assessment modeling had taken place since the 2014 release. EPA reviewed multiple iterations of consequence analysis during its response to the release. Staff reported that more refined analysis of the incident had continued, with the intention of peer-reviewed

publication.

4.3 Underground Sampling

On the morning of April 9, the inspection team went underground. This was the first time that EPA staff had entered the repository since the incident. During past inspections, inspectors routinely observed the continuous air monitors (CAMs) placed at the exhaust of the active waste emplacement panel, and at Station D, which is located at the bottom of the exhaust shaft. These sampling locations are located in contamination areas, and their functionality was lost as a result of the radiological incident – due to a combination of contamination, filter occlusion, and a prolonged lack of personnel access for sample collection and maintenance. Canberra iCAMs are currently used in the underground by the RadCon program to detect contamination and protect workers, but are not connected to the CMR.

On April 8, Clifford Fell (NWP) described a preliminary design for a system that would reestablish real-time radiological monitoring in the underground. The system would replace the RADOS CAMs with a network of Canberra iCAM HDs that use a continuous filter, and are therefore less prone to mechanical failure. The monitors would be positioned along the S-1950 drift, near the regulators that separate the E-300 exhaust drift from the rest of the repository, and at the waste panel exhaust (in the configuration of the previous CAMs). All would transmit data and alarms in real time to the Central Monitoring Room.

4.4 WIPP Laboratories

EPA also inspected WIPP Laboratories, which supports annual NESHAP reporting and emergency response activities at WIPP. Cindy White led the inspection of WIPP Laboratories on the morning of April 9, 2015. Mansour Akbarzadeh, Laboratory Manager, and Ginny Jones, Quality Assurance Officer, attended the audit.

Mr. Akbarzadeh and Ms. Jones provided an introduction to WIPP Laboratories and an overview of the Carlsbad Emergency Management and Research Center (CEMRC) laboratory building, which houses WIPP Laboratories and is operated and maintained by New Mexico State University's College of Engineering. The facility is also shared with Los Alamos National Laboratory (LANL).

WIPP Laboratories is Department of Energy Laboratory Accreditation Program (DOELAP) accredited and is audited every three years. WIPP Labs also participates in DOE's Mixed Analyte Performance Evaluation Program (MAPEP) and the National Institute of Standards and Technology's (NIST) Radiochemistry Intercomparison Program (NRIP), for which acceptable criteria were achieved for the last two years.

A fully-executed quality system is in place and the records are very well maintained. Internal audits were performed on a quarterly basis by the Quality Assurance Officer and only minor

observations were noted. Several corrective action reports were reviewed and the system seems to work well. Follow-up and closures occur in a timely manner.

WIPP Laboratories has a well-organized and managed radioactive inventory system. Routine samples are disposed of 30 days after receipt at the laboratory, so there isn't a backlog of older samples stored on site. Data packages are very well organized and easy to read, and are kept for two years, after which they are archived. Data management seems to be mostly performed by hand and could be made easier and less error prone with some automation. WIPP Labs has a new commercially available off-the-shelf Laboratory Information Management System (LIMS), but it had not been fully implemented at the time of this audit. A review of the staff training records indicated good record-keeping and properly trained staff. Method validation records were also very well maintained and showed that its radiochemical procedures are robust and statistically sound.

A tour of the facility showed a state-of-the-art building with sample receiving, radiochemistry laboratories, instrument counting room and offices. The sample receiving and preparation area had adequate space to work, but a lot of sample documentation was performed by hand. The sample identification number(s) was hand-written on the sample container or bottle. There wasn't a barcode tracking system or other automated labeling system for the samples. The counting room contained alpha spectroscopy, gamma spectroscopy, liquid scintillation, and gas proportional counting systems. The daily checks and maintenance records on all instruments were up-to-date and detectors were tagged out-of-service as appropriate. Work was being performed in the radiochemistry laboratory, so the tour only allowed for viewing from the door/window.

According to Mr. Akbarzadeh, improvements have been made since the February 2014 radiological release to address issues encountered during the incident. These improvements include conducting weekly calls with staff from the WIPP site, hiring two new employees, reviewing and updating laboratory backup procedures and processes, ensuring that sufficient supplies are on hand for more than just routine work, and reviewing and updating analytical methods.

Overall, WIPP Laboratories is very well organized and cohesive. Its staff is properly trained, and its processes and procedures are well documented. The inspection led to two recommendations for improving sample and data management.

- Implement an automated or barcode labeling system for identification of samples. Currently the laboratory sample identification number is hand-written on the sample container which lends itself to mislabeling or sample mix-ups. Barcoding or other automated printing would help eliminate this problem.
- A LIMS system is available but it has not been fully implemented. It needs modification in order to function with WIPP Labs' sample flow and data management processes. Hand-entering data into spreadsheets or other types of

programs also lends itself to making mistakes. A well-designed LIMS would eliminate most of these issues.

4.5 Source Term Evaluation

All of the topical areas of the Subpart A inspection contribute to the calculation and reporting of radiation dose to the maximally exposed member of the public. During EPA's response to the 2014 incident, the Agency examined both preliminary calculations made using both the CAP-88 model for routine compliance (see *Environmental Protection Agency's Confirmatory Dose Calculations of the Department of Energy's Use of CAP88-PC for the February 2014 Radiological Emission Release at the Waste Isolation Pilot Plant*, EPA Air Docket A-98-49, Item II-B1-32; August 2014) and the National Atmospheric Release Advisory Center (NARAC) airborne release assessment model (see *Consequence Assessment Review Summary for the February 2014 Radiological Emission Release at the Waste Isolation Pilot Plant*, EPA Air Docket A-98-49, Item II-B1-33; August 2014). In both instances, the calculations were performed using conservative estimates of the radioactive source term, and the outcome of these investigations was the conclusion that the incident did not approach legal dose limits or threaten human health and safety. Annual reporting for 2014, reviewed as part of this inspection cycle, included refinements of the calculation of the total radioactive release and its inclusion in the annual source term.

One of the major concerns that resulted from the 2014 incident inspection (EPA Air Docket No. A-98-49, Item II-B3-129) was that routine collection and analysis of air exhaust samples from the facility became atypical during the event. At the time, it was known that some sample filters that would ordinarily be sent to WIPP Laboratories were sent to Savannah River and Sandia National Laboratories, and at least one filter that would ordinarily be subjected to radiological analysis for annual National Emissions Standards for Hazardous Air Pollutants (NESHAPs) compliance was sent for chemical analysis instead. In its report, EPA stated that DOE would need to work to make sure that analysis of the facility's air samples was as comparable as possible to previous analyses performed in support WIPP's compliance with the NESHAPs and 40 CFR Part 191 public dose limits.

On the afternoon of April 7, 2015, inspectors met with Ed Picazo (RES), the technical lead for preparing the annual confirmatory report, and Stewart Jones (RES), who were able to discuss the treatment of the release in calculations of potential public dose. Specifically, the discussion described the plan to calculate values for missing isotopic analyses using techniques described in the document "Determination and Use of Scaling Factors for Waste Characterization in Nuclear Power Plants" (IAEA Nuclear Energy Series No. NW-T-1.18). Specific data on the radionuclide source term for the formal calculation were still under review. Inspectors reviewed some of the radiochemistry data (paper data packages maintained at the WIPP site) that supported the calculation, and at the conclusion of the inspection visit, DOE committed to provide EPA with information related to the source term calculation prior to formal submission of the 2014 Annual

Periodic Confirmatory Measurement Compliance Report, referred to as the annual NESHAP report. In late May, DOE provided an advanced copy of the annual NESHAP report, which had been submitted to DOE headquarters for review and approval. The report allowed EPA to determine that the general approach of using complete radiochemical analyses combined with partial isotopic data and gross filter activities to calculate a source term was acceptable. EPA requested that DOE provide additional documentation to explain and support its source term calculation. The raw data packages and calculation spreadsheet were provided with a report entitled, "Supplemental Information Package to Support the Annual Periodic Confirmatory Measurement Compliance Report for the U.S. DOE WIPP CY 2014."

Radiochemical analyses of monthly composites of sample filters from Station A for a suite of radionuclides have been the basis of annual emissions calculations in the past. (When the facility is operating without HEPA filtration, Station A samples the air that is exhausted from the underground directly to the environment.) Several changes occurred in the aftermath of the release. When the incident occurred and the facility switched to ventilation mode, Station B (post-HEPA filtration) became the sampling point that represents air exhausted to the environment. In response to the release, sample filters were changed every eight hours, rather than weekly, until June 3, when the sample collection interval was extended to daily for the remainder of the calendar year. Table 1 is an excerpt from the spreadsheet used by RadCon to track filters from Station B:

Table 1: Excerpt from "NESHAPs Data2014 integrated 041715 final.XLS"

Station B, After the Filtration System												
Date/ Time Installed	**Date/ Time Removed**	**Filter ID**	**Alpha (dpm)**	**Beta (dpm)**	**First Count (date/time)**	**Alpha (dpm)**	**Beta (dpm)**	**Re-count (date/ time)**	**Alpha (dpm)**	**Beta (dpm)**	**Final Count (date/time)**
2/14/14 0754	2/15/14 0835	B130214 140754	28.2K	5877	021514/0850	Not Performed (Lab Analysis)			57K	<MDA	N/P
2/15/14 0835	2/15/14 1445	B130215 140835	36.2K	7340	021514/1134	Not Performed (Lab Analysis)			Filter sent to SRS for Non-Rad Analysis		
2/15/14 1445	2/15/14 2305	B130215 141445	671	142	021714/1056	Not Performed (Lab Analysis)			875 *	N/A	N/P
2/15/14 2305	2/16/14 0904	B130215 142305	300	152	021614/0932	253	63	021614/ 1127	258 *	N/A	N/P
2/16/14 0904	2/16/14 1705	B130216 140904	144	67	021614/1755	111	22	021714/ 1201	128 *	N/A	N/P
2/16/14 1705	2/17/14 0030	B130216 141705	72	54	021714/0046	62	18	021714/ 1203	53*	N/A	N/P
2/17/14 0030	2/17/14 0805	B130217 140030	43	26	021714/0930	30	23	021714/ 0955	31*	N/A	N/P
2/17/14 0805	2/17/14 1600	B130217 140805	78	35	021714/1650	58	20	021714/ 1958	52*	N/A	N/P
2/17/14 1600	2/18/14 0030	B130217 141600	65	55	021814/0051	45	18	021814/ 0423	706 *	N/A	N/P
2/18/14 0030	2/18/14 0901	B130218 140030	42	61	021814/0928	23	12	021814/ 1202	27*	N/A	N/P
2/18/14 0901	2/18/14 1655	B130218 140901	41	29	021814/1754	28	7	021914/ 0315	34*	N/A	N/P
2/18/14 1655	2/19/14 0105	B130218 141655	42	36	021914/0144	20	7	021914/ 0547	19*	N/A	N/P
2/19/14 0105	2/19/14 0900	B130219 140105	33	44	021914/0952	20	15	021914/ 1222	11	<MDA	030614/1730

In addition to the sample collection schedule, filter analysis changed throughout the incident response. The sample collected on the morning of February 15 represented the first eight hours of the release, and was sent to WIPP Laboratories for complete radiochemical analysis, which identified the release as americium and plutonium. The next sample collected on February 15 was screened for gross activity, and sent to the Savannah River Site, where chemical analysis, but no further radiological analysis, was performed. For the remainder of February, individual filters were analyzed for plutonium and americium only, at both WIPP Labs and Sandia. Complete radiochemical analysis resumed, together with the compositing of filters, in March.

Table 2 shows how batches of sample filters were handled. The percentage of reported americium is included, to show the relative significance of each group of filters to the release and to annual emissions. (Americium-241 (^{241}Am) accounted for approximately 93.2% of reported annual emissions, both by activity and by estimated dose.)

Table 2: Compilation of Radionuclide Emissions from the Underground Facility

Time period	**Sample Description**	**Analysis Type**	**Analysis performed**	**Lab Group Identifier**	**% of reported release (by ^{241}Am activity)**
January 1 – February 14	Station A monthly filter composites	Full radiochemistry	WIPP Laboratories	SDG-2014-062 SDG-2014-048	0.0
0754 February 14 – 0835 February 15	Station B single filter (24 hours)	Full radiochemistry	WIPP Laboratories	SDG-2014-067 Sample B130214140754	42.7
2/15/14 0835-2/15/14 1445	Station B single filter (8 hours)	Gross count	RadCon	Sample B130215140835	54.9
February 15 – February 19	Station B single filters	Partial radiochemistry (Am, Pu) (for each filter)	WIPP Laboratories	Lab Group SDG-2014-080	1.7
February 20 – February 28	Station B single filters	Partial radiochemistry (Am, Pu) (for each filter)	Sandia National Laboratory	N0023404 N0023405 N0023416 N0023417	0.4

March 2014-April 2014	Station B weekly filter composites	Full radiochemistry	WIPP Laboratories	SDG-2014-378 SDG-2014-385	0.3
May 2014	Station B biweekly filter composites	Full radiochemistry	WIPP Laboratories	SDG-2014-393 SDG-2014-396	0.0
June 2014-December 2014	Station B monthly filter composites	Full radiochemistry	WIPP Laboratories	SDG-2014-396 SDG-2015-015 SDG-2015-043	0.0

The NESHAPs report cites the use of IAEA Nuclear Energy Series No. NW-T-1.18, "Determination and Use of Scaling Factors for Waste Characterization in Nuclear Power Plants," to calculate missing isotopic values for Station B filters collected during February. For the filters which were analyzed for ^{241}Am, ^{238}Pu, and $^{239/240}$Pu, this approach is very reasonable. The isotopic ratios of the material released were well understood, both from filter samples and from waste inventory records. 93.2% of the reported dose was attributable to ^{241}Am, 6.3% to $^{239/240}$Pu, and 0.3% to ^{238}Pu. These key radionuclides were quantified by radiochemical analysis, and were used to estimate activities of the other tracked radionuclides: ^{90}Sr, ^{137}Cs, $^{233/234}$U, and ^{238}U. (NESHAPs report, p. 6) Reported emissions of the less abundant radionuclides are typically driven by the critical detection level value (set at two times the standard deviation of the total propagated radioanalytical uncertainty), which is reported whenever it is higher than the measured concentration. Reported values for strontium, cesium, and uranium were comparable to previous years' reporting, and ^{137}Cs and ^{90}Sr accounted for 0.2% of the reported dose in 2015.

The use of scaling to develop isotopic values for filter B130215140835 (collected on February 15) based on its gross counts, is more problematic. No radiochemical analysis was performed for that filter. Instead, the ratio of gross alpha screening measurements from the previous filter, B130214140754 (28,200 dpm), and from filter B130215140835 (36,300 dpm) was calculated. Results of radiochemical analyses from filter B130214140754 were then multiplied by this ratio, 1.29, to estimate isotopic values for filter B130215140835. Gross alpha counting is a useful screening tool, but problematic for quantifying releases, because there will be attenuation of alpha particles by both the filter media and particulate matter on the filter. This may be seen in the case of filter B130214140754 – although the gross alpha count was 28,200 dpm, summing the results of alpha spectrometry for individual radionuclides gives a total activity of the sample of 57,000 dpm (see Table 1). This effect should be more pronounced with greater particulate loading of the sample filter. It would be helpful if there were more samples which could be used to study the relationship between gross counts and filter activity, but these results are scaled based on a single sample. The scaled number represents the best interpretation of the data that was produced, but the use of the gross count introduces an unquantifiable error into the sample that represents more than half of the release, and therefore annual emissions. The decision made during the initial response not to perform further radiological analysis of this filter permanently limited the precision with which the release from the underground facility can be known.

5.0 Summary of Findings

During the inspection EPA examined DOE's activities over the past year. The inspection verified that DOE continues to implement procedures that allow it to accurately monitor and calculate possible radiation doses to members of the public due to WIPP site operation. The inspection checklist included as Attachment A specifically documents DOE's compliance with each reporting expectation set forth in EPA's WIPP Subpart A Guidance (402-R-97-001).

Ongoing facility recovery has resulted in many corrections and improvements at the WIPP site. EPA is encouraged by maintenance efforts at both Station A and Station B, by the addition of radiological monitoring capability at Station B that transmits data in real time to the CMR, and by plans to reestablish similar continuous radiological monitoring to the underground. Improvements continue to be made to the environmental air monitoring network in response to EPA's incident inspection. WIPP Laboratories continues to operate at a high level of quality, which could be strengthened further by moving to the automation of sample tracking and use of a Laboratory Information Management System. Based on the inspection activities documented in this report, EPA concludes that DOE continues to adequately implement a radiological monitoring and sampling program for WIPP disposal operations in which it collects representative samples and appropriately performs calculations to estimate potential releases to the public.

The results of this program are documented in the Annual Periodic Confirmatory Measurement Compliance Report for Calendar Year 2014 (RES 15-1485). The annual report, which includes the February 2014 release, reports a calculated annual effective dose equivalent (EDE) value to the maximally exposed individual of less than 5.9×10^{-03} millirem. The reported values in 2013 and 2012 resulting from normal operations were 7.39×10^{-06} and 1.06×10^{-05} millirem, respectively. The reported dose for 2014 is more than three orders of magnitude below the annual dose limits for compliance with 40 CFR Part 191, Subpart A and radionuclide NESHAP Subpart H even with the release of radioactivity from the incident.

EPA's only concern resulting from the 2015 inspection was the handling of sample filter B130215140835, which represents more than half of reported emissions for the year. The decision made during the 2014 release to discontinue radiological analysis in favor of chemical forensics significantly reduced the precision to which the release can be quantified. This does not invalidate the conclusions of the NESHAPs report or of the investigations that were performed during the incident, which determined that the risk to the public was low. However, site procedures need to be clearly structured so that environmental data is not lost or compromised as a result of any emergency response. WIPP has already made improvements to a similar end in its management of the environmental air sampling program.

Attachment A: Inspection Plan

Purpose:

EPA will verify that the Department of Energy (DOE) has accurately monitored and calculated possible radiation doses to members of the public, due to both normal operations and accidental releases that may have occurred during the last reporting period. This inspection is conducted under the authority of 40 CFR Part 191, Subpart A. This inspection is part of EPA's continued oversight to ensure that WIPP can, during the operational phase of management and storage of radioactive waste, comply with the limits expressed in 40 CFR 191.03.

Scope:

The scope of this inspection includes all activities performed by DOE at WIPP to measure and calculate any actual or potential radiation dose to members of the public during management and storage of radioactive waste, specifically during the past year of site operation. Inspection activities will include an examination of monitoring procedures and sampling equipment both on and off site, and in the underground.

The purpose of this inspection is to verify and confirm that DOE at WIPP has complied with the "Compliance reporting" expectations of EPA's GUIDANCE FOR THE IMPLEMENTATION OF EPA's STANDARDS FOR MANAGEMENT AND STORAGE OF TRANSURANIC WASTE (40 CFR Part 191, Subpart A) at the WASTE ISOLATION PILOT PLANT (402-R-97-001), Section 4.2, Page 15.

Focal Areas for this Year's Inspection:

EPA will follow up on the areas reviewed during the April 2014 incident inspection. EPA will review changes to WIPP's Subpart A compliance program as a result of the rad incident and recovery. As in past years, sampling equipment, lab procedures, and consequence assessment will be reviewed, with the goal of demonstrating that DOE continues to capture representative samples of facility effluent. This year's inspection will also document WIPP's progress on action items identified in its October 2014 *U.S. Department of Energy Plan for Addressing the Areas for Improvement Identified by the U.S. Environmental Protection Agency* and Corrective Action Plans.

Location:

This inspection will be held at the WIPP facility located twenty-six miles south east of Carlsbad, New Mexico and the surrounding vicinity as needed.

Duration:

EPA expects to complete its inspection in three days. Each day will begin with an opening meeting at 8:00 a.m. and end before 5:00 p.m. with a closeout session.

Dates: April 7-9, 2015.

Information Requested: EPA has received and is reviewing relevant documentation and procedures related to Subpart A, and will request additional documentation if needed.

Attachment B
Inspection Checklist
April 7-9, 2015

#	CHECKLIST QUESTION	April 2015	40 CFR 191.03 Subpart A Sat. = Satisfactory NA = Not Applicable	
	40 CFR 191.03 Compliance Standard	**EPA Citation**	**Comment (Objective Evidence)**	**Result**
	Does DOE "...provide reasonable assurance that the combined annual dose equivalent to any member of the public in the general environment resulting from discharges of radioactive material and direct radiation from such management and storage shall not exceed 25 millirems to the whole body and 75 millirems to any other critical organ." 40 CFR 191.03(b)	40 CFR 191.03 Subpart A - Environmental Standards for Management and Storage	DOE has demonstrated that it can capture, measure, and calculate releases to assure that the WIPP facility is and remains below these limits.	Sat.
	Scope of activities considered in determining compliance			
1	Does DOE demonstrate that all activities at the WIPP up until the point of disposal are considered in determining compliance? Activities include those at "all WIPP facilities, both at above-ground locations and in the underground disposal system" and those related to "arrival or receipt of waste, inspections of containers, unloading, and waste movement."	EPA 402-R-97-001 Section 2.3, Page 4	The Annual Site Environmental Report for 2013 (DOE/WIPP-14-3532) Executive Summary documents DOE's efforts to consider all activities that impact compliance. The Annual Periodic Confirmatory Measurement Compliance Report for Calendar Year 2014 (RES 15-1485, referred to as the annual NESHAP report) and inspection activities confirm that all waste handling activities are considered in determining compliance.	Sat.
2	Does DOE demonstrate that radiation doses to the public due to 1) actual normal operation and 2) any unplanned or accidental releases are examined?	EPA 402-R-97-001 Section 2.3, Page 5	Section 3.0 of the Implementation Plan for Subpart A (DOE/WIPP 00-3121, Rev. 4) documents how this requirement is met, both for normal operation and accidental releases. The annual NESHAP report for 2014 (RES 15-1485) demonstrates that emissions due to both normal operations and the accidental release were considered in examining radiation doses to the public.	Sat.
	Media considered in determining compliance			
3	Does DOE demonstrate that the air pathway is the credible release pathway?	EPA 402-R-97-001 Section 2.4, Page 5	Section 2.1 of the Implementation Plan for Subpart A describes the process by which the air pathway was established as the credible release pathway, and the use of environmental monitoring of other exposure pathways to confirm that this remains the case.(DOE/WIPP-00-3121, Rev. 4, p.8)	Sat.

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4	Does DOE demonstrate that other exposure mechanisms from an air release could include inhalation of contaminated air, immersion in a plume of radioactive particles, ingestion of soil on which contaminated particles have been deposited, swimming in ponds in which radionuclides have been deposited are considered?	EPA 402-R-97-001 Section 2.4, Page 5	Sections 2.1 and 3.5 of the Implementation Plan for Subpart A documents methods for measuring these potential exposure pathways (DOE/WIPP 00-3121, Rev. 4). Section 4.8 of the ASER documents the consideration of dose from these pathways (DOE/WIPP-14-3532). Annual NESHAP report (RES 15-1485) confirms that these exposure mechanisms are included in dose calculations.	Sat.
5	Is DOE monitoring the expected air exhaust pathway and performing environmental monitoring of other release points and exposure pathways to confirm air exhaust as the only release pathway?	EPA 402-R-97-001 Section 2.4, Page 5 and page 6.	Yes. Section 2.1 of the Implementation Plan for Subpart A explains DOE's plan to fulfill this requirement(DOE/WIPP-00-3121, Rev. 4). Annual Site Environmental Report Chapter 4 demonstrates that DOE implements groundwater surveillance, biota sampling and off-site air monitoring programs (DOE/WIPP-11-2225).	Sat.
	Boundary of compliance			
6	Does DOE demonstrate compliance at the "exclusive use area" boundary? If not, does DOE justify changing this boundary?	EPA 402-R-97-001 Section 2.5, Page 6. EPA 402-R-97-001 Section 2.5, Page 7	Section 3.1 of DOE/WIPP-00-3121 Rev. 4 states that the "Exclusive Use Area" will be used as the boundary for 40 CFR Part 191 Subpart A compliance.	Sat.
	Location of maximally exposed individual			
7	Does DOE examine radiation doses to individuals at any offsite point where there is a residence, school, business, or office? (Such as grazing, mining, or oil drilling in the vicinity.) "The location of the maximally exposed individual is the location where an actual individual lives or works who receives the maximum annual radiation dose from the source."	EPA 402-R-97-001 Section 2.6.1, Page 8	For Subpart A, DOE assumes that the member of the public resides, "… year-round at the fence line in the northwest sector" (DOE/WIPP-14-3532, Section 4.8.4.3). Section 1.3.2 of the ASER demonstrates that DOE examines population surrounding the site. The 2014 NESHAP Report (RES 15-1485) identifies Smith Ranch as the location of the maximally exposed individual. The nearest farms, dairies, and beef ranching activities are also considered.	Sat.

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8	Does DOE "analyze potential exposure pathways and examine demographic information and conduct field investigations to identify the location of actual individual who could be exposed via those pathways?"	EPA 402-R-97-001 Section 2.6.1, Page 8	Yes. See checklist Item 7.	Sat.
9	Does DOE "conduct separate analyses of potential dose received from each exposure pathway?" Then does DOE "assume that a member of the public resides at the single geographic point on the surface where the maximum dose would be received?"	EPA 402-R-97-001 Section 2.6.1, Page 8	Yes. See checklist Item 7.	**Sat.**
	Personal parameters	**EPA Citation**	**Comments (Objective Evidence)**	
10	Does DOE assume that the individual exhibits personal characteristics of the "reference man" when evaluating radiation dose to the maximally exposed individual?	EPA 402-R-97-001 Section 2.6.2, Page 8	Section 3.2 of the Implementation Plan for Subpart A describes the "reference man" parameters as described in the CAP88-PC computer code (DOE/WIPP 00-3121, Rev. 4). These parameters are confirmed on page 8 of the CAP-88 output file included in the 2012 NESHAP report (RES 15-1485).	Sat.
	Calculation of dose - Modeling – Parameters	**EPA Citation**	**Comments (Objective Evidence)**	
11	Does DOE provide both whole body radiation dose and critical organ radiation dose for the maximally exposed individual (or a hypothetical individual conservatively located at a point of higher exposure)?	EPA 402-R-97-001 Section 2.7.1, Page 8	Yes. The effective dose equivalent and table of organ dose equivalents is included in the 2012 annual NESHAP report (RES 15-1485, CAP-88 output file)	Sat.
12	Does DOE calculate radiation doses including all release points and reflecting evaluation of all exposure pathways?	EPA 402-R-97-001 Section 2.7.1, Page 8	Section 2.1 of DOE/WIPP-00-3121, Rev. 4 states that the air pathway is the most credible, but that other exposure pathways are monitored to confirm the air pathway. Annual NESHAP report (RES 15-1485) demonstrates that all release points are evaluated.	Sat.

#	CHECKLIST QUESTION	April 2015	40 CFR 191.03 Subpart A	
13	Does DOE use computer modeling to calculate radiation doses for compliance with the Subpart A standard?	EPA 402-R-97-001 Section 2.7.2, Page 9	Section 3.2 of DOE/WIPP-00-3121, Rev. 4 states that computer models will be used to calculate radiation doses during both routine operation and accidental releases.	Sat
14	Does DOE use CAP88-PC to perform dose calculations?	EPA 402-R-97-001 Section 2.7.2, Page 9	CAP88-PC is used for dose calculations for routine operations (DOE/WIPP-00-3121 Rev 4, Section 3.2). Annual NESHAP report demonstrates that DOE is using CAP88-PC.	Sat.
15	Does DOE use an alternate model for calculating radiation doses? If so, does DOE justify such usage?	EPA 402-R-97-001 Section 2.7.2, Page 10	DOE uses atmospheric dispersion codes (HOTSPOT or NARAC) to estimate potential radiation due to accidental releases (DOE/WIPP-00-3121 Rev 4, Section 3.2).	Sat.
16	Does DOE adequately support exposure parameters used in dose calculations?	EPA 402-R-97-001 Section 2.7.3, Page 10	Annual NESHAP report (RES 15-1485) includes CAP-88 output file, demonstrating that DOE is using appropriate parameters in dose calculations. Also see checklist items 7-10.	Sat.
17	Does DOE document that "conservative simplifying assumptions" are used in the radiation dose calculations?	EPA 402-R-97-001 Section 2.7.3, Page 10	DOE uses conservative assumptions to estimate worst-case dose to a maximally-exposed offsite individual (DOE/WIPP 00-3121, Rev. 4, Section 3.2).	Sat.
18	Are DOE's exposure parameters as conservative as the following? For a maximally exposed individual located at a residence, assumed continuous exposure (24 hours per day). For a maximally exposed individual located at a business, office, or school, assume exposure of 8 hours per day. Assume individuals consume 2 liters per day of drinking water from an underground source of drinking water. Assume inhalation rate for air to be $9x10^5$ cm^3/hr. Assume ingestion rate of meat to be 85 kg/yr. Assume ingestion rate of leafy vegetables to be 18 kg/yr. Assume ingestion of milk to be 112 liter/yr. Assume ingestion rate of produce to be 176 kg/yr	EPA 402-R-97-001 Section 2.7.3, Page 10	DOE uses these exact values as exposure parameters (DOE/WIPP 00-3121, Rev. 4, Section 3.2). The Annual NESHAP report CAP-88 output file demonstrates that DOE is using these parameters in dose calculations (RES 15-1485).	

#	CHECKLIST QUESTION	April 2015	40 CFR 191.03 Subpart A	
	Emissions and Environmental Monitoring - Air	**EPA Citation**	**Comments (Objective Evidence)**	**Result**
19	Does DOE demonstrate that effluent flow rate measurements are made using Reference Method 2 of Appendix A to 40 CFR Part 60 to determine velocity and volumetric flow rate for stacks and large vents?	EPA 402-R-97-001 Section 3.1, Page 11, (1(i))	Stations A and B use alternate methods approved by the Administrator, per Section 3.3(3) of the Subpart A Guidance (Nichols 1994). See checklist items 25, 27. Station C sampling was designed based on ANSI N.12-1969, Guide to Sampling Airborne Radioactive Materials in Nuclear Facilities from which Method 2 was derived (WP 12-RC.01, Rev. 9). DOE/WIPP 89-028, Section 1.3 confirms that "guidance was taken from . . . the CFR Title 40, Part 60, Appendix A, Reference Methods" and describes testing to establish the velocity profile for Station C.	Sat.
20	Does DOE demonstrate that effluent flow rate measurements are made using Reference Method 2a of Appendix A to 40 CFR 60 to measure flow rates through pipes and small vents?	EPA 402-R-97-001 Section 3.1, Page 11, (1(ii))	Not applicable at WIPP. Duct diameter associated with WIPP exhaust point exceeds the 40 CFR Part 60 requirements.	NA
21	Does DOE demonstrate that the frequency of flow rate measurements depend on the variability of the effluent flow rate? **Note:** For variable flow rates, continuous or frequent flow rate measurements are expected to be made. For relatively constant flow rates, only periodic measurements are expected.	EPA 402-R-97-001 Section 3.1, Page 11, (1(iii))	DOE has implemented continuous air monitoring at WIPP, and does not need to consider this requirement. (DOE/WIPP-00-3121, Rev. 4, Section 3.3, 3.3.1)	NA

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	Emissions and Environmental Monitoring - Air	**EPA Citation**	**Comments (Objective Evidence)**	**Result**
22	Does DOE demonstrate that radionuclides to be directly monitored or extracted, collected and measured using Reference Method 1 of Appendix A to 40 CFR Part 60 for selected monitoring or sampling sites?	EPA 402-R-97-001 Section 3.1, Page 11, (2(i))	Stations A and B use alternate methods approved by the Administrator, per Section 3.3(3) of the Subpart A Guidance (Nichols 1994). See checklist items 25, 27. Station C sampling was designed based on ANSI N.12-1969, Guide to Sampling Airborne Radioactive Materials in Nuclear Facilities from which Method 2 was derived (WP 12-RC.01, Rev. 9). DOE/WIPP 89-028, Section 1.3 confirms that "guidance was taken from . . . the CFR Title 40, Part 60, Appendix A, Reference Methods."	Sat.
23a	Does DOE demonstrate that the effluent stream is either "directly monitored continuously with an in-line detector capable of distinguishing relevant radionuclides," or alternately "continuously sampled such that analysis of filters or other collectors will provide an accurate estimate of emissions from a known flow rate during a fixed sampling time?"	EPA 402-R-97-001 Section 3.1, Page 11, (2(ii))	DOE implemented the latter sampling option, and continually collects samples and flow rate data to demonstrate compliance with 40 CFR Part 191 Subpart A. All sample filters are screened to determine that alpha and beta activity fall below set action levels, and are then submitted for analysis. As described in Section 3.3.3 of the Implementation Plan for Subpart A, DOE then uses periodic confirmatory measurements to demonstrate compliance with dose standards. Sections 3.5 and 3.3.5 document relevant radionuclides at WIPP. (DOE/WIPP 00-3121, Rev. 4)	NA
23b	Does DOE demonstrate that representative samples of the effluent stream are withdrawn from the sampling site? "…The need for continuous sampling is applicable to batch processes when the unit is in operation. Periodic sampling (grab samples) may be used in lieu of continuous sampling only with EPA's prior approval. Such approval may be granted in cases where continuous sampling is not practical and radionuclide emission rates are relatively constant. In such cases, EPA expects grab samples to be collected with sufficient frequency so as to provide a representative sample of the emissions."	EPA 402-R-97-001 Section 3.1, Page 11, (2(ii))	As stated in checklist item 23a, DOE samples continuously. After they are found to be below screening levels, all samples found to be representative are composited for periodic measurements (typically monthly for Station A, and quarterly for Stations B and C). This process is described by DOE/WIPP 97-2238, Rev. 10. The procedure Periodic Confirmatory Analysis, Reporting, and Compliance Activities (WP 12-RE3004, Rev. 5) describes the criteria for confirming that a filter sample is representative, and documents how to report and handle a sample which does not meet these requirements.	Sat.

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	Emissions and Environmental Monitoring - Air	**EPA Citation**	**Comments (Objective Evidence)**	**Result**
24	Does DOE demonstrate that radionuclides are collected and measured using procedures based on the principles of measurement described in Appendix B, Method 114 of 40 CFR 61? If not, does DOE demonstrate that the Administrator has approved the method used?	EPA 402-R-97-001 Section 3.1, Page 12, (2(iii))	Attachment 1 to the QAPP for Sampling Emissions (WP 12-RC.01, Rev. 10) documents both the requirements of Method 114, and where WIPP documentation reflects these principles.	Sat
25	If DOE is using the "Shrouded Probe", does DOE demonstrate that this alternative method is being used according to the guidance provide in "An Explanation of Particle Sampling in a Moving Gas Stream Within a Duct Using an Unshrouded and Shrouded Probe"?	EPA 402-R-97-001 Section 3.1, Page 12, (2(iii)(a))	An Assessment of the WIPP Shrouded Probe Against EPA Approval Criteria for Use of Single Point Sampling with the Shrouded Probe HA:98:0100 [Included in August 2000 Inspection Report, A-98-49, II-B3-12, EPA's Approval letter (Nichols 1994)] documents DOE's evaluation of the Shrouded Probe and its compliance with the EPA criteria. Single Point Representative Sampling with Shrouded Probes (LA-12612-MS) documents how the shrouded probe was qualified for use at WIPP.	Sat.
26	Does DOE's quality assurance program meet the performance requirements described in Appendix B, Method 114 of 40 CFR Part 61?	EPA 402-R-97-001 Section 3.1, Page 12,(2(iv))	QAPP for Sampling Emissions (WP 12-RC.01, Rev. 10) Section 1.0 documents DOE quality assurance requirements. These meet the requirements of 40 CFR Part 61. See Checklist Item 24.	Sat.
27	If it is impractical to measure the effluent flow rate in accordance with the method(s) in Section 3.1(1) or to monitor or sample extraction according to methods in Section 3.1(2) has DOE demonstrated that the use of alternative effluent flow rate measurement or site selection and sample extraction are appropriate and that the alternate method are used provided the following: (i) DOE shows that methods in Section 3.1(1) or (2) are impractical; (ii) DOE shows the alternative procedure will not significantly underestimate the emissions; (iii) DOE shows the alternative procedure is fully documented; and (iv) DOE has received prior approval from EPA.	EPA 402-R-97-001 Section 3.1(3)(i) to (3)(iv), Page 12	At Stations A and B, DOE uses alternate methods per Section 3.3(3) of the Subpart A Guidance (402-R-97-001). See checklist items 25 and 27. Single Point Representative Sampling with Shrouded Probes (LA-12612-MS) documents how the shrouded probe was technically qualified for use at WIPP. EPA's Approval letter (Nichols 1994) documents DOE's compliance with these criteria, and EPA's approval.	NA.

#	CHECKLIST QUESTION	April 2015	40 CFR 191.03 Subpart A	
	Emissions and Environmental Monitoring - Air	**EPA Citation**	**Comments (Objective Evidence)**	**Result**
28	Does DOE demonstrate that radionuclide emission measurements are in conformance with the methods in Section 3.1(1) and (2) to be made at all release points which have a potential to discharge radionuclides into the air in quantities which could cause a combined annual dose equivalent in excess of 1% of the dose limit in Subpart A?	EPA 402-R-97-001 Section 3.1, Page 12 and page 13, (4(i))	DOE/WIPP 00-3121, Rev. 4., Section 3.2 documents DOE's compliance with this requirement. All areas of a potential discharge are continuously sampled, although even in a worst-case accident scenario, 1% of the Subpart A dose limit is not expected to be reached. This requirement is also discussed in Sections 1.0 and 2.0 of DOE/WIPP 97-2238, Rev. 10.	Sat.
29	Does DOE demonstrate that all radionuclides which could contribute greater than 10% of the combined annual dose equivalent for a release point are being measured?	EPA 402-R-97-001 Section 3.1, Page 13, (4(i))	Section 3 of the Periodic Confirmatory Measurement Protocol (DOE/WIPP 97-2238, Rev. 10) states that the selected analytes "constitute approximately 98% of the dose due to the average source term for CH and RH wastes."	Sat.
30	If DOE uses alternative procedures to determine emissions, does DOE demonstrate that they have prior EPA approval?	EPA 402-R-97-001 Section 3.1, Page 13, (4(i))	DOE uses the shrouded sampling probe as an alternative method. EPA has formally approved this alternative method (Nichols, 1994).	NA
31	Does DOE demonstrate that for other release points which have a potential to release radionuclides into the air it has performed periodic confirmatory measurements to verify the low emissions?	EPA 402-R-97-001 Section 3.1, Page 13, (4(i))	DOE has no other points with a potential to release radionuclides. CH (DOE/WIPP-95-2065, Rev. 10) and RH (DOE/WIPP-06-3174, Rev. 0) Waste Documented Safety Analysis document these conclusions.	NA
32	Does DOE demonstrate that an evaluation has been done to evaluate the potential for radionuclide emissions for a release point?	EPA 402-R-97-001 Section 3.1, Page 13, (4(ii))	Yes. See checklist item 28.	NA
33	Does DOE demonstrate that in evaluating whether emissions must be measured for a given release point, estimated radionuclide release rates are based on discharge of effluent stream that would result if all pollution control equipment did not exist, but the facilities operations were otherwise normal?	EPA 402-R-97-001 Section 3.1, Page 13, (4(ii))	Stations B and C use pollution control equipment. However, because DOE has chosen to sample continuously at these locations, this requirement is not applicable.	Sat.

#	CHECKLIST QUESTION	April 2015	40 CFR 191.03 Subpart A	
	Environmental Measurements (Page 1)	**EPA Citation**	**Comments (Objective Evidence)**	**Result**
34	Does DOE demonstrate that environmental measurements of concentrations of radionuclides in air at the critical receptor locations are used as an alternative to air dispersion calculations in demonstrating compliance with the standard?	EPA 402-R-97-001 Section 3.1, Page 13, (5)	DOE does not use environmental monitoring as an alternative to comply with 40 CFR 191.03 Subpart A. DOE samples at release points.	NA
35	Does DOE demonstrate that air at the point of measurement is continuously sampled for collection of radionuclides if environmental measurements are used?	EPA 402-R-97-001 Section 3.1, Page 13, (5(i))	Section 3.1(5) of EPA 402-R-97-001 is not applicable. See checklist item 34.	NA
36	Does DOE demonstrate that the environmental measurement program is appropriately designed to collect and measure specifically those radionuclides which are major contributors to the annual radiation dose from the facility?	EPA 402-R-97-001 Section 3.1, Page 13, (5(ii))	Section 3.1(5) of EPA 402-R-97-001 is not applicable. See checklist item 34.	NA
37	Does DOE demonstrate that radionuclide concentrations which would cause an annual dose equivalent of 10% of the standard are readily detectable and distinguishable from background?	EPA 402-R-97-001 Section 3.1, Page 13, (5(iii))	Section 3.1(5) of EPA 402-R-97-001 is not applicable. See checklist item 34.	NA
38	Does DOE demonstrate that a quality assurance program that meets the performance requirements described in 40 CFR Part 61, Appendix B, Method 114 is conducted for environmental measurements?	EPA 402-R-97-001 Section 3.1, Page 13, (5(iv))	Section 3.1(5) of EPA 402-R-97-001 is not applicable. See checklist item 34.	NA
	Environmental Measurements (Page 2)	**EPA Citation**	**Comments (Objective Evidence)**	**Result**
39	Does DOE demonstrate that EPA has granted prior approval for the use of environmental measurements to demonstrate compliance with the standard?	EPA 402-R-97-001 Section 3.1, Page 13, (5(v))	DOE has not requested approval to use environmental measurements.	NA

#	CHECKLIST QUESTION	April 2015	40 CFR 191.03 Subpart A	
	Emissions and Environmental Monitoring - Other Media	**EPA Citation**	**Comments (Objective Evidence)**	**Result**
40	Does DOE demonstrate that environmental monitoring of other release points or critical receptor locations to confirm air exhaust as the only release pathway?	EPA 402-R-97-001 Section 3.2, Page 14.	Implementation Plan for Subpart A, Section 2.1 states; "However, to confirm that the air pathway is the only credible pathway for radiological releases, WIPP implements a radiological ground water surveillance program, biota sampling program and off-site radiological air monitoring program" (DOE/WIPP00-3121, Rev. 4). ASER Chapter 4 demonstrates that DOE's environmental program monitors other release points and critical receptor locations (DOE-WIPP 14-3532).	Sat.
	Compliance Reporting	**EPA Citation**	**Comments (Objective Evidence)**	**Result**
41	Does DOE demonstrate compliance with the Subpart A standard by showing that the annual radiation dose to any member of the public in the general environment falls below the regulatory limits?	EPA 402-R-97-001 Section 4.2, Page 15.	The Annual NESHAP report demonstrates that DOE reports results yearly, and that those results fall below regulatory limits. For calendar year 2014, the calculated effective dose equivalent to the maximally exposed individual of the public was less than $5.8x10^{-3}$ mrem.	Sat.
42	Does DOE report results of monitoring and the dose calculations for each reporting period?	EPA 402-R-97-001 Section 4.2, Page 15	Section 5.0 of DOE/WIPP 00-3121 documents DOE's plans to report annual results. The Annual NESHAP Report demonstrates that DOE reports results of monitoring and dose results yearly – see checklist item 41.	Sat.
43	Does DOE demonstrate that monitoring is performed each calendar year of facility operation, and that radiation doses are calculated after the end of each year?	EPA 402-R-97-001 Section 4.2, Page 15	Yes. See checklist item 42.	Sat.

#	CHECKLIST QUESTION	April 2015	40 CFR 191.03 Subpart A	
	Notification of construction or modification	**EPA Citation**	**Comments (Objective Evidence)**	**Result**
44	Does DOE demonstrate that they have provided the EPA written notification of any planned construction or modification to the WIPP facility, prior to commencing any such activity, if it results in an increase in the rate of emissions of radionuclides during operation?	EPA 402-R-97-001 Section 4.3, Page 16.	The Annual NESHAP Report includes a description of construction and modifications during each reporting period. None requiring advanced notice took place during 2014.	Sat.
45	Does DOE demonstrate that advanced notification was not needed for construction and modification if the radiation dose caused by all the emissions from the new construction or modification is less than 1% of the Subpart A dose limits?	EPA 402-R-97-001 Section 4.3, Page 16 and page 17.	Yes, this is accomplished by the Annual NESHAP Report. See checklist item 44.	Sat.
	Record Keeping	**EPA Citation**	**Comments (Objective Evidence)**	**Result**
46	Does DOE demonstrate documentation is sufficient to allow the Agency to verify the correctness of the determination made concerning the WIPP's compliance with Subpart A?	EPA 402-R-97-001 Section 4.4, Page 17.	Through its various documents, Subpart A implementation plan, its Annual NESHAP Report, and many procedures that support Subpart A activities, DOE demonstrates that documentation is sufficient to allow EPA to verify compliance with Subpart A.	Sat.

Attachment B
Table of Documents Reviewed
April 7-9, 2015

Citation	**Document Title**	**Subject Matter**	**Source**
	Legal and Technical Reference Documents		
EPA 402-R-97-001	Guidance For The Implementation of EPA's Standards For Management And Storage of Transuranic Waste (40 CFR Part 191, Subpart A) at the Waste Isolation Pilot Plant. EPA 402-R-97-001, January 1997	"WIPP Subpart A Guidance,"	EPA
DOCKET A-92-56, Item II-C-2	Memorandum of understanding between EPA and DOE, September 29, 1994	Agreement states that although not required, DOE will implement NESHAPs Subpart H regulations at the WIPP site until closure.	DOE/WIPP
DOE/WIPP 93-043	Effects of Salt Loading and Flow Blockage on the WIPP Shrouded Probe, by Chandra, Ortiz, McFarland, August 1993, DOE/WIPP 93-043	Report discusses the impact of salt loading on shrouded probe performance.	DOE/WIPP
DOE/WIPP 89-027	Evaluation Of The Station B Effluent Monitoring System In The Underground Exhaust Ventilation System At The WIPP, Sept 1990, DOE/WIPP 89-027	Documents testing at WIPP to evaluate the ability of Station B to collect representative samples.	DOE/WIPP
EEG-60	The Influence of Salt Aerosol On Alpha Radiation Detection By WIPP Continuous Air Monitors, by Bartlett and Walker, Jan 1996, EEG-60, DOE/AL/58309-60	Reports impact of salt deposits on monitor efficiency.	DOE/WIPP
DOE/WIPP 89-026	Evaluation Of The Station A Effluent Monitoring System In The Underground Exhaust Ventilation System At The WIPP, DOE/WIPP 89-026, Sept 1990	Documents testing at WIPP to evaluate the ability of Station A to collect representative samples.	DOE/WIPP
Rodgers et al., 1994	Single Point Aerosol Sampling: Evaluation of Mixing and Probe Performance In A Nuclear Stack, by Rodgers, Fairchild, Wood, Ortiz, Muyshondt, McFarland, July 1994	Compares performance of ANSI isokinetic with shrouded probes at DOE faculties.	DOE/WIPP
PNL-10816	Generic Air Sampler Probe Test, by Glissmeyer and Ligotke, Nov 1995, PNL-10816	Test of isokinetic and shrouded probes at Hanford. Tests show that shrouded probes deliver samples with significantly less particle-size bias.	DOE/WIPP
PNL-10148	Functional Requirements Document For Measuring Emissions Of Airborne Radioactive Materials, by Glissmeyer, Alvarez, Hoover, McFarland, Newton, Rodgers, Nov 1994, PNL-10148	States general functional requirements for system and procedures for measuring emissions.	DOE/WIPP
PNL-SA-25532	Changing Methodology For Measuring Airborne Radioactivity Discharges From Nuclear Facilities, by Glissmeyer and Ligotke, May 1995, PNL-SA-25532	Tests show single-point sampling (shrouded) probes are superior to ANSI style multiple-point probes.	DOE/WIPP

Nichols, 1994	EPA Shrouded Probe Approval. Letter from Mary Nichols to Raymond Pelletier, dated November 21, 1994.	Allows DOE to use the shrouded probe as an alternative measuring procedure.	DOE/WIPP
LA-12612-MS	Single-Point Representative Sampling with Shrouded Probes by McFarland and Rodgers, LA-12612-MS, August 1993	Describes shrouded probe testing requirements and test performed to qualify probe for use at WIPP.	DOE OSTI Document website.
McFarland, 1993	Air Sampling With Shrouded Probes At The WIPP Site, by McFarland, Sept 1993	Paper discussing the use of the shrouded probe at WIPP. Benefits of the shrouded probe are discussed.	DOE/WIPP
	DOE Procedural Documents		
WP 12-2, Rev 18	WIPP ALARA Program Manual, WP 12-2, Revision 18, 7/13/13	Describes organization and responsibilities of ALARA committee and coordinator.	DOE/WIPP
12-RL.01, Revision 19	Radiochemistry Quality Assurance Plan, 12-RL.01, Revision 19	Describes the management policy and organizational structure, and QA requirement for radiochemical analysis.	DOE/WIPP
DOE/WIPP 00-3121, Revision 4	Implementation Plan for 40 CFR 191, Subpart A DOE/WIPP 00-3121, Revision 4, December 17 2012	Outlines program at WIPP to show compliance with 40 CFR Part 191, Subpart A.	DOE/WIPP
DOE/WIPP 12-3489 (replaces 11-2225)	Waste Isolation Pilot Plant Annual Site Environmental Report for 2011, DOE/WIPP 12-3489, Rev. 0 September 2012	Results of the environmental monitoring program, in particular radiological measurements.	DOE/WIPP
DOE/WIPP 97-2238, Rev. 10	Periodic Confirmatory Measurement Protocol for the Waste Isolation Pilot Plant, DOE/WIPP 97-2238, Revision 10, January 2013	Used to explain the protocol used to perform periodic confirmatory measurements.	DOE/WIPP
DOE/WIPP 99-2194, Rev. 7	Waste Isolation Pilot Plant Environmental Monitoring Plan. DOE/WIPP 99-219, Rev 7, March 2012.	DOE environmental monitoring plans at the WIPP site. Of particular interest: Section 4.0, Dose Calculations, and 5.0, Environmental Monitoring Program.	DOE/WIPP
DOE/WIPP-06-3174 Rev 0, 03/06	WIPP RH Waste Documented Safety Analysis, Section 3.4.1.4. DOE/WIPP-06-3174 Rev 0, 03/06	This selection verifies that the air pathway is the only pathway of concern at the WIPP for RH waste.	DOE/WIPP.
DOE/WIPP-95-2065 Rev. 10, 11/06	WIPP CH Waste Documented Safety Analysis, Section 3.4.1.4. DOE/WIPP-95-2065 Rev. 10, 11/06	This selection verifies that the air pathway is the only pathway of concern at the WIPP for CH waste.	DOE/WIPP.
IC041072, Rev 9	Calibration of Effluent Monitoring Skids A1, A2, A3, B1 and B2 Flow Instrumentation, Maintenance Procedure, IC041072, Revision 9	Instructions for calibration of FAS skids A1, A2, A3, B1 and B2 flow instrumentation.	DOE/WIPP
IC041097, Rev 2	Calibration of Station C Flow Instrumentation, Maintenance Procedure IC041097, Revision 2	Instructions for calibration of Station C flow instrumentation.	DOE/WIPP

IC041098, Revision 5	U/G Exhaust Mass Flow Measurement System for Fans 700A, B & C, Maintenance Procedure, IC041098, Revision 5	Documents calibration verification test and alignment of U/G exhaust.	DOE/WIPP
IC413000, Revision 6	Station B Mass Flow Measurement System, Loop 41A001W2001, Maintenance Procedure, IC413000, Revision 6, 06/02/11	Documents calibration of Station B mass flow measurement system.	DOE/WIPP
PM364001, Revision 1	Predictive Maintenance to Determine Station A Probe Pull Frequency, Maintenance Procedure PM364001, Revision 1	Determine recommended frequency of Station A probe inspections based on meteorological data.	DOE/WIPP
PM364005, Revision 11	Inspection and Cleaning of Station “A” Sample Probes Bldg. 364, Maintenance Procedure, PM364005, Rev. 12,	Documents steps to inspect and clean Station A probes. "Determination of Probe Condition" requires that salt buildup "at the probe inlet should be no more than 2/3 of the area" and "blocking the shroud exhaust should be limited to no more than 1/3 of that area".	DOE/WIPP
WP 12-ER4903, Rev 16	Radiological Event Response, Emergency Response Procedure, WP 12-ER4903, Revision 15, 5/10/11	Procedure documents actions to be taken by CMRO, FSO, and Radcon if a potential or actual radioactive release takes place.	DOE/WIPP
WP 12-ER4916, Rev 1	Consequence Assessment Dose Projection, Technical Procedure, Rev 18, 10/5/12	Procedure for estimating the potential dose consequence from a release or suspected release of radioactive material, using Hotspot, NARAC, or hand calculations.	
WP 12-ER4916. Rev 20	Consequence Assessment Dose Projection, Technical Procedure WP 12-ER4916, Revision 20, 11/26/13	Documents procedure for estimating the potential dose consequence from a release or suspected release of radioactive material. Reviewed for consistency with Rev.16.	DOE/WIPP
WP 12-HP1305, Rev 11	Air Sampling Equipment, Technical Procedure WP 12-HP1305, Revision 10, 2/19/13	Instructions for the operation of fixed air monitoring equipment. Attachment 2 documents flow rates and alarm set points.	DOE/WIPP
WP 12-HP1306, Rev 8	Canberra Alpha Sentry Continuous Air Monitor, Technical Procedure WP 12-HP1306, Revision 8, 3/21/10	Instructions for operating the Canberra continuous air monitor equipment at waste revieving bays. Includes daily check sheets.	DOE/WIPP
WP 12-HP1307, Rev 12	Portable Instrument and Portal Monitor Operability Checks, Technical Procedure, WP 12-HP1307, Revision 12, 7/30/12	Instructions for operational checks of portable contamination instruments.	DOE/WIPP
WP 12-HP1308, Revision 4	Portable Alpha-6 Continuous Air Monitors, Technical Procedure WP 12-HP1308, Revision 4, 3/28/11	Instructions for operation of Portable Alpha-6 continuous air monitor.	DOE/WIPP

WP 12-HP3500, Revision 19	Airborne Radioactivity - Technical Procedure WP 12-HP3500, Revision 19, 01/24/12	Technical procedure. Provides instructions for analyzing, reporting, and trending results of air samples. Att. 5 contains Guide for Station A Filter Counting for Re-Entry into the U/G.	DOE/WIPP
WP 12-HP3700, Rev 4	Radiological Event Reporting, Management Control Procedure WP 12-HP3700, Revision 5, 2/7/13	Documents the first estimate of a possible release.	DOE/WIPP
WP 12-HP4000, Revision 7	Emergency Radiological Control Responses, Emergency and Alarm Response Procedure, WP 12-HP4000, Revision 7, 3/27/13	Addresses radiological contamination events which require an immediate stop work order.	DOE/WIPP
WP 12-RC.01, Rev 9	Quality Assurance Program Plan for Sampling Emissions of Radionuclides to the Ambient Air at the Waste Isolation Pilot Plant, WP 12-RC.01, Revision 9, 8/14/13	QA program for sampling air emissions at WIPP. Contains useful background information regarding the design and qualification of sampling systems at Stations A-D.	DOE/WIPP
WP 12-RE3002, Rev 3	Radiological Engineering Off-site Air Sampling - Technical Procedure WP 12-RE3002, Revision 3, 12/13/10	Instructions for collecting and documenting Low-Volume filter retrieval in response to a potential release.	DOE/WIPP
WP 12-RE3003, Revision 6	Radiological Release of Potentially Contaminated Materials, Waste, and Items - Management Control Procedure, WP 12-RE3003, Revision 5, 01/19/12	Instructions for evaluating materials, waste, and items which are to be released from the WIPP as non-radioactive material.	DOE/WIPP
WP 12-RE3004, Rev 5	Periodic Confirmatory Sampling, Reporting, and Compliance Activities, Management Control Procedure, WP 12-RE3004, Rev 5, 02/07/13	This procedure provides instructions for Radiological Engineers of the Radiological Controls Department to fulfill the requirements of NESHAPs.	DOE/WIPP
WP 12-RL1001, Rev 12	Sample Tracking and Custody, Technical Procedure, WP 12-RL1001, Revision 12	Instructions for documenting receipt and storage of samples in WIPP laboratory.	DOE/WIPP
WP 12-RL1002, Rev 10	Alpha Spectroscopy System Operation, Technical Procedure, WP 12-RL1002, Revision 10, 2/21/12	Direction for calibrating and operating the Canberra Alpha Spectroscopy System as interfaced with the Genie 2000.	DOE/WIPP
WP 12-RL1008, Rev 8	Establishing Gross Alpha and Gross Beta Self-Absorption Curves, Technical Procedure, WP 12-RL1008, Revision 8, 01/04/12	Instructions for preparing samples of known activity and known weight to generate self-absorption curves for each of the gas proportional counters.	DOE/WIPP
WP 12-RL1009, Rev 7	Gross Alpha and Gross Beta Activity in Air Filter, Soil, Water, Sludge, and Biota, Technical Procedure, WP 12-RL1009, Revision 7	Guidance for rapidly performing a variety of screening matrices for both high and low activity Radionuclides.	DOE/WIPP
WP 12-RL1010, Rev 14	Sample Preparation, Technical Procedure, WP 12-RL1010, Revision 14	Directions for preparing samples to determine activity of radionuclides.	DOE/WIPP

WP 12-RL1011, Rev 15	Elemental Separation - Strontium 90, Technical Procedure, WP 12-RL1011, Revision 15	Directions for performing elemental separation of strontium from samples.	DOE/WIPP
WP 12-RL1012, Rev 9	Elemental Separation - Transuranic Products, Technical Procedure, WP 12-RL1012, Revision 9, 05/07/12	Describes method for elemental separation and purification of actinide isotopes in samples.	DOE/WIPP
WP 12-RL1013, Rev 9	Sample Mounting, Technical Procedure, WP 12-RL1013, Revision 9, 09/12/07	Directions for electrodeposition sample mounting and neodymium fluoride coprecipitation sample mounting of actinides in preparation for alpha spectroscopy counting.	DOE/WIPP
WP 12-RL1014, Rev 8	Routine Laboratory Operations, Technical Procedure, WP 12-RL1014, Revision 8, 1/03/13	Instructions for routine laboratory operation.	DOE/WIPP
WP 12-RL1015, Rev 18	Canberra Alpha Analyst System Operation, Technical Procedure, WP 12-RL1015, Revision 18, 12/19/12	Directions for calibrating and operating the Canberra Alpha Analyst 32-chamber alpha spectroscopy system.	DOE/WIPP
WP 12-RL1016, Rev 14	Operation of the Oxford Series 5 Gas Proportional Counter, Technical Procedure, WP 12-RL1016, Revision 14	Guidance for the operation of the Oxford Series 5 Gas Proportional Counter. Editorial changes and instructions for a power outage made since 2010 inspection.	DOE/WIPP
WP 12-RL1200, Revision 1	Plutonium-241 Analysis, Technical Procedure, WP 12-RL1200, Revision 1, 10/13/11	Provides method for the analysis of Pu 241 in any matrix after preparation of the sample in accordance with WP 12-RL1012 and WP 12-RL1015.	DOE/WIPP
WP 12-RL1400, Rev 10	Radiochemistry Laboratory Waste Management, Technical Procedure, WP 12-RL1400, Revision 10, 05/26/11	Instructions for handling, management, and disposal of laboratory waste.	DOE/WIPP
WP 12-RL1550, Revision 13	Control of Radioactive Standards, Technical Procedure, WP 12-RL1550, Revision 13	Instructions for labeling, maintaining inventory, dilution of standards, completing standard logbook for new standards received, expired standards, depleted standards, and recertification of standards.	DOE/WIPP
WP 12-RL3002, Revision 10	Radiochemistry Laboratory Data Validation and Verification, Technical Procedure, WP 12-RL3002, Revision 10	Instructions for performing radiochemistry analytical data verification and validation by radiochemistry staff.	DOE/WIPP
WP 12-RL3003, Rev. 14	Data Reduction and Reporting, Technical Procedure, WP 12-RL3003, Revision 14	Instructions for processing laboratory data from the time of sample receipt to the reporting of final results.	DOE/WIPP
WP 13-1, Rev 33	Nuclear Waste Partnership LLC Quality Assurance Program Description, WP 13-1, Revision 33, 4/1/13	Identifies Federal and industry quality standards, and sets standards for WIPP QA programs.	DOE/WIPP

DOE/WIPP 99-3119, Rev 7	Compliance Monitoring Implementation Plan for 40 CFR 194.14(b), Assurance Requirement, DOE/WIPP 99-3119, Rev. 7, 04/12	Outlines monitoring activities at WIPP to demonstrate compliance with 40 CFR Part 191 and 40 CFR Part 194.	DOE/WIPP
	Documents Generated During Inspection		
JPW-2015-01	Agenda: EPA Annual WIPP Inspection, April 7 through 9, 2015	Daily agenda for site inspection.	DOE/WIPP
JPW-2015-02	Radiological Release Analyses. 4 pages.	Graphic detailing environmental sampling performed during 2014 release, and location of analyses for each sample type.	DOE/WIPP
JPW-2015-03	CMR Screen Shot.PDF	Screen capture from the Central Monitoring Room, showing flow rate and DAC-hr reading for Station B iCAM.	DOE/WIPP
RES 15-1485	Annual Periodic Confirmatory Measurement Compliance Report for the DOE WIPP for Calendar Year 2014, submitted 7/29/2015.	Annual NESHAP report. Enclosures include report, and CAP88-PC Version 3.0 output files for three separate runs for different source terms and receptor locations.	DOE/WIPP
	Supplemental Information Package to Support the Annual Periodic Confirmatory Measurement Compliance Report for the U.S. DOE WIPP CY 2014, submitted 9/01/2015.	Details the computation of the source term. Includes a narrative (Supplemental 2014 NESHAP Info Package Instructions.RTF), calculations spreadsheets (NESHAPs Data2014 integrated 041715 final.XLS) and laboratory data packages for the annual source term.	DOE/WIPP