WIPP RADIATION RELEASE
April 4, 2014

SRIC has carefully followed information about the radiation release from the Waste Isolation Pilot Plant (WIPP) that was first identified at approximately 11:13 pm on Friday, February 14, 2014. The release triggered the HEPA filtration system about 90 seconds later so that the ventilated air would be filtered before it was released into the environment through the exhaust shaft. We have been actively asking questions – many of which have not yet been answered - and gathering additional information about the contamination event, and have responded to numerous requests for information from the public and media.

The Department of Energy (DOE) WIPP website has a special section on the release and recovery. (http://www.wipp.energy.gov/WIPPRecovery/Recovery.html).

The New Mexico Environment Department (NMED) has established a website with background and current information about the release. (http://www.nmenv.state.nm.us/NMED/Issues/WIPP2014Docs.html).

The Environmental Protection Agency (EPA) has people that are temporarily at WIPP and provide some information about the release: (http://www.epa.gov/radiation/news/wipp-news.html).

What we know with some confidence

1. Apparently, one or more of the 258 contact-handled (CH) waste containers underground in Room 7 and Panel 7 (http://www.wipp.energy.gov/general/GenerateWippStatusReport.pdf) released radioactive and toxic chemicals. The presumed location of the release is about 1,500 feet from the continuous air monitor that triggered the filtration system. The release spread contaminants through more than 3,000 feet of tunnels, up the exhaust shaft (2,150 feet), into the environment, and to the air monitoring Station #107, approximately 3,000 feet northwest of the exhaust shaft. Thus, the release covered a distance of at least a mile and a half from the area of release to the Station #107. If the release came from Panel 6, which has more than 22,500 CH containers, it may be more difficult to determine many aspects of the release, though the distance that the contaminants would have traveled underground would have been greater.

2. In its modeling analysis of the release, DOE states: “The event took place starting at 2/14/14 at 23:14 and continued to 2/15/14 14:45.” (http://www.wipp.energy.gov/Special/Modeling%20Results.pdf). Thus, the release lasted for 15.5 hours. The same DOE document states that the peak time of the release was from 10-15 hours after it started (from approximately 10 am to 3 pm on February 15). See #6 below about later DOE sampling data. The same DOE modeling document also states: “A large shift in wind direction can be seen to occur around 8:30 AM on 2/15/14.” Meteorological data are now posted at:

(http://www.wipp.energy.gov/library/Information_Repository_A/Responses_to_Administrative_Order/Meteorological%20Data%20Feb%205_Mar9_2014.pdf).

3. The Station #107 filter, located about 0.6 mile from the exhaust shaft was removed on Sunday morning, February 16 at approximately 9:40 am. The Carlsbad Environmental Monitoring and Research Center (CEMRC) laboratory analyzed the filter and on Wednesday, February 19 reported that it found 0.64 becquerels (Bq) per cubic meter of air of Americum-241 and 0.046 Bq per cubic meter of air of Plutonium-239+240. (http://www.cemrc.org/2014/02/19/cemrc-detects-trace-amounts-radioactive-particles-air-sampling-station-near-wipp-facility/). Those measurements were consistent with waste in the WIPP underground. The DOE agrees that there was a release of radioactivity onto the surface.

4. CEMRC retrieved another filter from Station #107 on Tuesday, February 18. The laboratory analysis showed no detection of Plutonium 239+240 and 0.007 Bq of Americium-241. Samples from Station #106 (about 325 feet from the exhaust shaft) found 0.115 Bq of Plutonium 239+240 and 1.3 Bq of Americium-241. (http://www.cemrc.org/wp-content/uploads/2014/02/CEMRC-Ambient-Air-Sampling-Results-Following-2-14-14-Radiation-Detection-Event.pdf). On March 17, CEMRC reported: "the latest results show that the $^{239+240}$Pu activities have returned to previous background levels." (http://www.cemrc.org/2014/03/17/new-ambient-air-sampling-results-show-wipp-radiation-levels-continue-remain-low-levels/). CEMRC's most recent data (as of March 21), show 0.002 Bq of Americium-241 and non-detection of Plutonium 239+240 at Station #107. At Station #106 the amounts are 0.013 Bq of Americium-241 and non-detection of Plutonium 239+240. CEMRC's Station #108 (11.8 miles southeast of the exhaust shaft) recorded 0.002 Bq of Americium-241 and 0.002 Bq of Plutonium 239+240. Before February 14, the highest levels CEMRC recorded at those three stations were 0.0005 Bq of Americium-241 and 0.004 Bq of Plutonium 239+240. (http://www.cemrc.org/2014/03/17/new-ambient-air-sampling-results-show-wipp-radiation-levels-continue-remain-low-levels/).

5. On March 5, CEMRC reported results of the Exhaust Shaft Station A filter (ventilation air before the HEPA filtration) and the Station B filter (after filtration). The Station A filter removed on February 15 (the morning after the radiation alarm was triggered) showed 4,335.71 Bq per cubic meter of Am-241 and 671.61 Bq per cubic meter of Pu-239+240. Twenty-four hours after the event, the Station A filter measured 231.53 Bq/m^3 of Am-241 and 18.07 Bq/m^3 of Pu-239+240. (Note that the Am-241 amounts were increased from the levels earlier reported, based on more accurate alpha spectroscopy analysis.) By 12:50 am on February 22, the Station A filter was 0.15 Bq/m^3 of Am-241 and 0.016 Bq/m^3 of Pu-239+240. A Station B filter installed on the morning of February 14 was removed in the afternoon of February 18 and measured 2.3 Bq/m^3 of Am-241 and 0.2261 Bq/m^3 of Pu-239+240. As of the morning of February 22, the Station B filter was 2.52 Bq/m^3 of Am-241 and 0.0045 Bq/m^3 of Pu-239+240. (http://www.cemrc.org/wp-content/uploads/2014/03/Station-A-and-B-Activity-3-12-141.pdf). As of March 16 at just after midnight, CEMRC reported results at Station A of 0.011 Bq/m^3 of Am-241 and 0.0011 Bq/m^3 of Pu-239+240; while the measurements at Station B were 0.004 Bq/m^3 of Am-241 and 0.0004 Bq/m^3 of Pu-239+240. As of March 23 at just after midnight,

CEMRC reported results at Station A of 0.019 Bq/m^3 of Am-241 and 0.0019 Bq/m^3 of Pu-239+240; while the measurements at Station B were 0.0006 Bq/m^3 of Am-241 and 0.00004 Bq/m^3 of Pu-239+240. (http://www.cemrc.org/wp-content/uploads/2014/04/Station-A-and-B-Activity-thru-3-24-14.pdf).

6. As of mid-day on Thursday, February 20, DOE WIPP Manager Jose Franco reported some amounts of radiation were continuously registered in the continuous air monitors for Panel 7, but that the amounts were three orders of magnitude lower than the highest levels of 4.4 million disintegrations per minute (dpm). The 4.4 million dpm is what DOE originally reported, however, subsequent laboratory analysis calculated the amount at 8.2 million dpm of alpha radiation. On Thursday, March 13 at 4:10 pm, the Station A filter showed 368 dpm of alpha radiation and 57 dpm of beta radiation, the highest levels since February 17. After March 13 through March 26 at 8:35 am, the highest levels at Station A were 49 dpm of alpha radiation and 12 dpm of beta radiation, which occurred in the morning of March 18.
(http://www.wipp.energy.gov/Special/Station_A_4_3_14.pdf)

7. No workers were underground when the radiation leak was detected and none has been underground since that time. As of Monday, February 24, the expectation was that workers could go underground in two to three weeks to investigate the release. In the meantime, plans are being developed for the underground recovery effort and to determine the extent of the above ground contamination. On Thursday, February 27, Farok Sharif, then-President of Nuclear Waste Partnership (NWP, the operating contractor), reported that re-entry and recovery plan(s) had been submitted to DOE, which was reviewing them. After DOE review and approval, the re-entry process would start with two probes being sent to the underground. On Friday, March 7 and Saturday, March 8, two probes were sent down the air intake and salt handling shafts and took measurements.
(http://www.wipp.energy.gov/pr/2014/WIPP%20Updates_Underground%20Recovery%20Process%20Begins.pdf) The plan is for workers to re-enter the underground through the salt handling shaft and to investigate the situation to try to determine the source of the radiation release during the week of March 24.
(http://www.wipp.energy.gov/Special/WIPP%20Update%203_22_14.pdf). On March 25, workers inspected the hoists on the salt and air intake shafts and determined that there were no safety or mechanical problems, so that the two shafts could be used for the initial underground investigations.
(http://www.wipp.energy.gov/Special/WIPP%20Update%203_26_14.pdf). The intent is for the salt shaft to be the entrance location, with the air intake shaft being the required back-up shaft. At the March 27 Town Hall, it was stated that the initial entrance and establishment of a base camp would occur during the week of March 31, with up to 16 workers involved, all wearing protective equipment and having self-breathing apparatus. Two teams of 8 workers each entered the underground on April 2, reported that they encountered no radiation and set up a base camp that would be used for further investigations. (http://www.wipp.energy.gov/Special/WIPP%20Update%204_02_14.pdf)

8. On Wednesday, February 26, the 13 WIPP employees that had been at the WIPP site when the radiation was detected were notified that they had tested positive for internal radiological contamination, "predominantly americium-241." (http://www.wipp.energy.gov/Special/CBFO_Mgr_Letter.pdf). Those workers are having additional bioassay (urine and fecal) analyses. The location(s) where the 13 workers were has not been disclosed. On Wednesday, March 5, DOE reported that the urine analysis was negative (no radiological contamination). On Thursday, February 27, Farok Sharif stated that other workers that came to work on the morning of February 15 are having bioassay testing, and some additional workers are requesting to be tested. All workers that want to be tested will be tested. All workers that want to have lung and whole body counts at CEMRC also will be allowed to do so. Laboratory analysis of bioassay samples take one to two weeks. Mr. Sharif also stated that as of that date no workers have received chelating agents that could help remove the internal contamination. On Sunday, March 9, DOE announced that four additional workers that worked on February 15 had tested positively for internal radiation. (http://www.wipp.energy.gov/pr/2014/WIPP%20Updates_Underground%20Recovery%20Process%20Begins.pdf). The statement also erroneously reported: "There has been no detectable contamination in urine samples, which indicates contamination was not inhaled into the lungs." The next day that statement was "clarified." On March 12, DOE reported: "Preliminary fecal sample results for 17 personnel, announced earlier, indicated the presence of trace amounts of radioisotopes…. All have been entered into the bioassay program and will undergo whole body counts to determine the presence of isotopes in the lungs. To date, about 135 personnel have been entered into the bioassay program, including those who have requested testing. The next set of bioassay data is anticipated March 19." (http://www.wipp.energy.gov/Special/WIPP%20Update%203_12_14.pdf). Bioassay data on 150 workers are posted: (http://www.nmenv.state.nm.us/NMED/Issues/WIPP_docs/NamesExcludedEventConfirmatoryBioassaySchedule19March2014.pdf). On March 27 and at the Town Hall, DOE reported that, because of a second opinion of the outside dosimetry expert, three of the fecal samples that had been reported as negative were now considered positive. In addition, one of the urine samples that had been considered negative was now considered to be positive. Thus, four additional workers – making a total of 21 – have been told that they have tested positive for internal contamination. Apparently, neither DOE nor NWP have recommended that any of the workers seek medical treatment.

9. While Jose Franco of DOE has stated that hundreds of air, soil, and water samples have been taken, laboratory analysis of only some samples have been posted on the WIPP website. (http://www.wipp.energy.gov/WIPPRecovery/sampling_results.html). None of the laboratory analyses have detected any radioactivity, except what is considered to be background. Neither CEMRC, nor the NMED, have posted the laboratory analyses of the soil samples that they have taken.

10. On Wednesday, March 12, DOE announced that continuous air monitoring (CAM) is being installed at the Station B HEPA filters in the exhaust shaft by the end of the following week. According to the statement: "…an immediate alarm [would sound] in the

Control Room and prompt notification to employees if protective actions are required….Once the CAM is installed, personnel will begin returning to the WIPP site." (http://www.wipp.energy.gov/Special/WIPP%20Update%203_12_14.pdf). The CAM was installed on March 26 and will be tested for approximately one week. According to Roger Nelson of DOE, workers in radiation protection areas are wearing dosimeters.

11. Nineteen shipments of CH waste from LANL (4), INL (8), and Savannah River Site (SRS) (7) are being stored in the Parking Area Unit (PAU)(4 from INL and 4 from SRS), while other shipments and portions of those loads in the PAU are in the CH Bay of the Waste Handling Building. Those 41 packages of waste have 5,137.4 cubic feet or 145.3 cubic meters of waste. Those shipments arrived at WIPP between January 24 and February 6, but were not taken to the underground because of the vehicle fire on February 5 and the radiation leak. (http://www.nmenv.state.nm.us/NMED/Issues/WIPP_docs/AdminOrderWeeklyReportAndLetter3-17-2014.pdf). On February 26, DOE requested that NMED modify the WIPP operating permit so that, among other things, all of those shipments could stay on the surface at WIPP for a longer period of time than allowed by the permit. (http://www.wipp.energy.gov/library/Information_Repository_A/Extensions_of_Time/14-1427.pdf). On February 27, NMED approved the request. (http://www.nmenv.state.nm.us/NMED/Issues/WIPP2014Docs.html). As a result of the NMED Administrative Order, among other things, DOE must submit weekly reports that provided specific information. The Order provides that DOE must file for any additional extensions to keep the waste on the surface of WIPP by no later than May 7, 10 days before the current deadlines are reached. The Order also prevents WIPP from accepting off-site shipments and from returning to "normal operating status" without NMED's prior inspection and approval. The DOE Weekly Reports of March 14 and March 24 are posted. (http://www.wipp.energy.gov/library/Information_Repository_A/IR_2014.htm). On March 21, Jose Franco signed a Supplement Analysis that would allow up to 20 shipments from WIPP, plus approximately 120 truckloads from LANL and 280 shipments from INL to be stored at Waste Control Specialists (WCS), near Andrews, Texas, while WIPP is not operating. (http://energy.gov/nepa/downloads/eis-0026-sa-09-supplement-analysis). The shipments of LANL waste to WCS began on April 1 and are expected to continue until around June 30. (http://www.wipp.energy.gov/pr/2014/First%20LANL%20Shipment%20Arrives%20at%20WCS.pdf).

<u>What we do not know (among many other things)</u>

1. What caused the release.
2. What was the nature of the release that allowed some contaminants to travel more than a mile and a half.
3. What radionuclides in what amounts and what toxic chemicals in what amounts have been released.

4. What contaminants were released into the environment before the HEPA filtration system was triggered.
5. What contaminants in what amounts have been captured by the HEPA filters.
6. What contaminants in what amounts have not been captured by the HEPA filters.
7. Where all the contaminants that were not captured are, whether inside the WIPP boundary or outside the site area.
8. Whether the amount of the release and the location of all of the containments can be determined.
9. When radiation levels in the WIPP underground air will return to pre-release levels.
10. The amounts of contamination in the WIPP underground.
11. What underground decontamination will be done.
12. What amount of exposure to radiation and toxic chemicals the first workers going underground will receive.
13. What amount of exposure to radiation and toxic chemicals workers going underground will receive in the future.
14. What amount of exposure that workers on the surface have received.
15. What amount of exposure that workers on the surface will receive in the future.
16. What surface decontamination will be done.
17. What changes in the WIPP operation, monitoring, and safety culture will be implemented.