

# WIPP and Surplus Plutonium

National Academy of Sciences  
Surplus Plutonium Disposal Committee  
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# Briefly Discuss

- WIPP's Mission
- U.S. repository policy
- WIPP is not fully accomplishing its mission
- TRU waste remaining at sites
- Plutonium at WIPP
- Conclusions
- Recommendations

# WIPP's Mission

- “Start Clean, Stay Clean” to dispose of up to 175,564 m<sup>3</sup> of defense transuranic (TRU) waste
- Safely transport waste by truck through more than 20 states without serious accidents or releases
- Safely clean up TRU waste at DOE sites
- Safely close, decontaminate, and decommission the WIPP site beginning in about 2030 or earlier

# WIPP's Mission is not

- Storage, transportation, disposal of any defense high-level waste
- Storage, transportation, disposal of any spent nuclear fuel
- Storage, transportation, disposal of any commercial waste
- Storage, transportation, disposal of 34 metric tons of surplus plutonium

# Other repositories are necessary under existing laws

- Public Law 96-164, Section 213 of 1979
- Nuclear Waste Policy Act of 1982
- NWPA Amendments of 1987
- WIPP Land Withdrawal Act of 1992
- No state is willing to have the only repository

# Other repositories are necessary for technical reasons

- Multiple sites are needed for all existing wastes with more being generated every day, and with the ultimate amount, radioactivity, and timeframe unknown and unknowable for how much waste requires repositories
- If geologic disposal is viable, multiple sites should meet safety standards
- Reduce transportation risks and costs

# WIPP is not fulfilling its Mission

WIPP “lost”  
20,000+  
cubic meters  
of  
underground  
capacity  
before  
February  
2014

## WIPP PERMITTED VS. ACTUAL CAPACITY (in cubic meters) - As of February 5, 2014

	<u>CH-Permitted</u>	<u>Actual</u>	<u>% Used</u>	<u>RH-Permitted</u>	<u>Actual</u>	<u>% Used</u>
Panel 1	18,000	10,497	58.32%	0	0	
Panel 2	18,000	17,998	99.99%	0	0	
Panel 3	18,750	17,092	91.16%	0	0	
Panel 4	18,750	14,258	76.04%	356	176	49.44%
Panel 5	18,750	15,927	84.94%	445	235	52.81%
Panel 6	18,750	14,468	77.16%	534	214	40.07%
Panels 1-6	111,000	90,240	81.30%	1,335	625	46.82%
<b>Shortfall</b>		<b>20,760</b>			<b>710</b>	

### Notes:

"CH" is Contact-Handled waste; "RH" is Remote-Handled

"Permitted" refers to the capacity limits in the New Mexico WIPP permit

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# WIPP Capacity in Panels 7 & 8

## Panel 7

CH-TRU = ~8,100 m<sup>3</sup>

RH-TRU = 16 m<sup>3</sup> in canisters

## Panel 8

CH-TRU = 18,750 m<sup>3</sup>

RH-TRU = 650 m<sup>3</sup> in canisters

Additional CH Capacity shortfall = ~10,650 m<sup>3</sup>

Total CH Capacity shortfall = ~31,410 m<sup>3</sup>

Additional RH Capacity shortfall = 634 m<sup>3</sup>

Total RH Capacity shortfall = ~1,344 m<sup>3</sup>

# TRU Waste remaining at DOE sites

	CH	RH
Hanford - WA	27,500 m <sup>3</sup>	
INL - ID	21,700 m <sup>3</sup>	Total = 4,579 m <sup>3</sup>
Savannah River - SC	14,100 m <sup>3</sup>	
Los Alamos - NM	8,710 m <sup>3</sup>	
Oak Ridge - TN	1,930 m <sup>3</sup>	
Livermore - CA	880 m <sup>3</sup>	
Knolls - TN	698 m <sup>3</sup>	
Argonne - IL	168 m <sup>3</sup>	
Nevada - NSS	128 m <sup>3</sup>	
Sandia - NM	58 m <sup>3</sup>	
Material & Fuels - IL	54 m <sup>3</sup>	
SPRU - NY	6 m <sup>3</sup>	- WIPP Annual TRU Waste Inventory Report
NRD - NY	2 m <sup>3</sup>	
Lawrence Berkeley - CA	<1 m <sup>3</sup>	
	Total = 75,935 m <sup>3</sup>	

# WIPP not “Start Clean, Stay Clean”

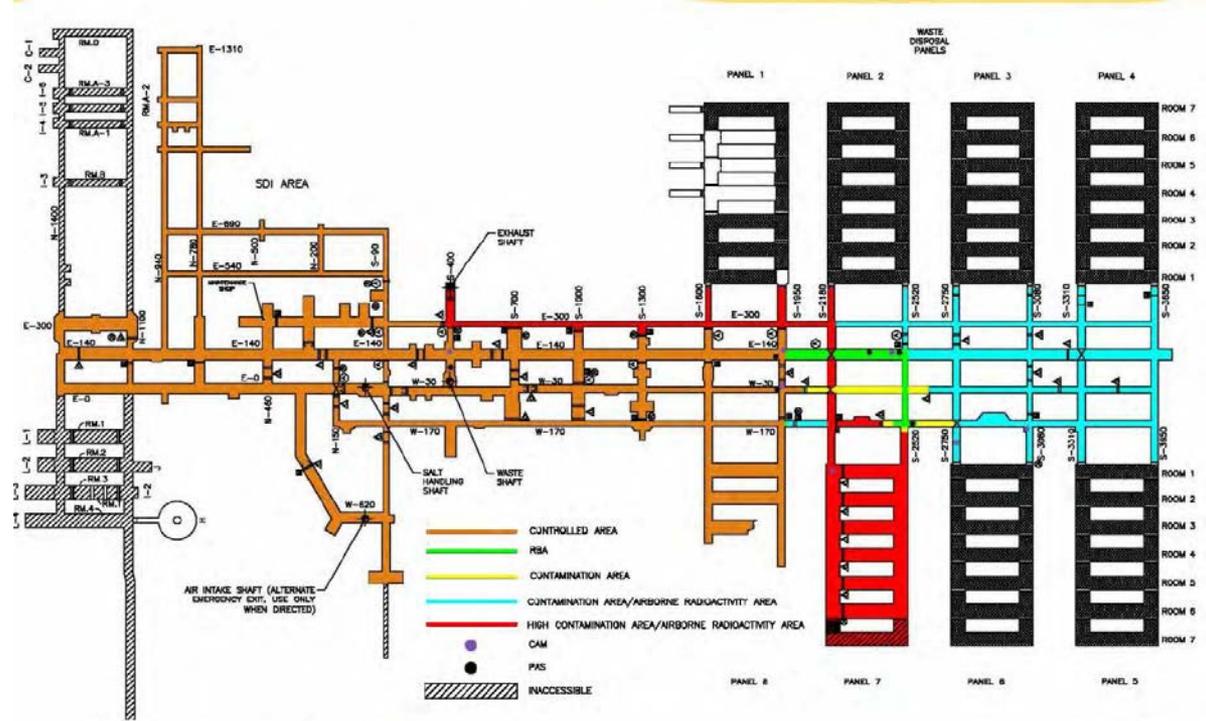
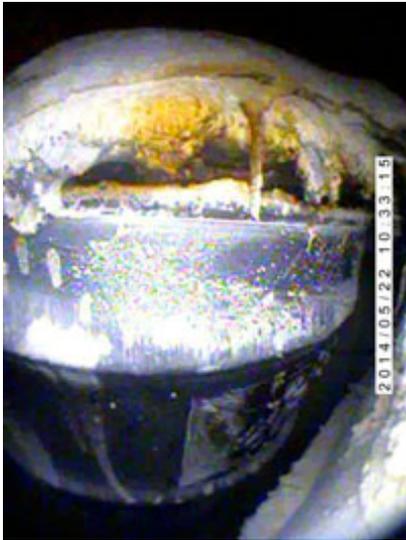
February 5,  
2014  
Underground  
Fire



# WIPP not “Start Clean, Stay Clean”

February 14,  
2014  
Radiation  
Release

> 8,000 linear feet of  
contaminated tunnels



# Safety for Underground Workers



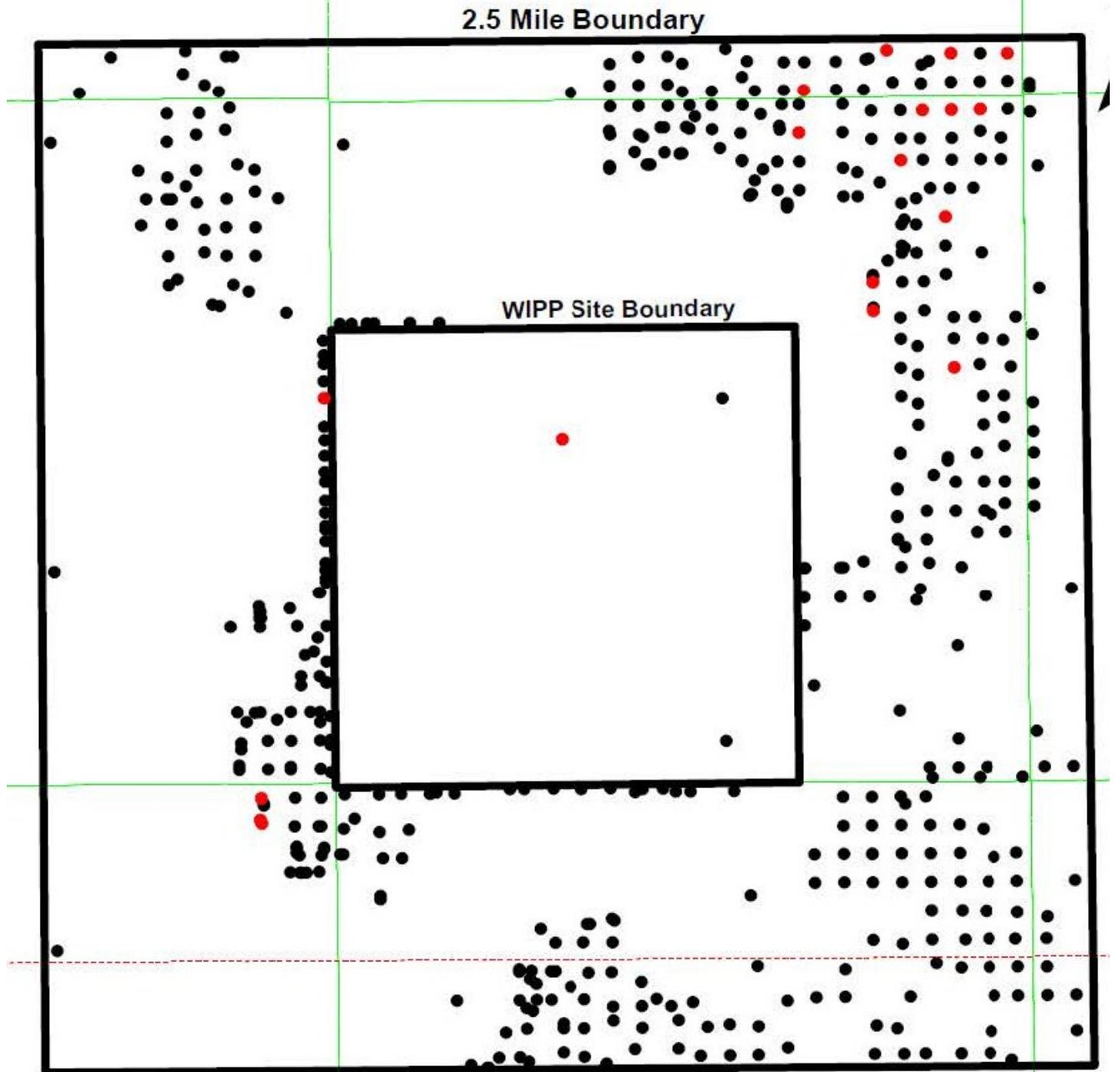
1999-Feb. 5, 2014

Now



WIPP will continue reduced operations until at least 2021

More than 500 oil and gas wells within 2.5 miles of WIPP boundary



# Plutonium Underground at WIPP

<b>Grams of Plutonium Isotopes Emplaced at WIPP per Calendar Year:</b>						
<b>Year</b>	<b>Pu238</b>	<b>Pu239</b>	<b>Pu240</b>	<b>Pu241</b>	<b>Pu242</b>	<b>Total Pu</b>
1999	34.40	75,573.04	4,709.37	111.82	17.39	<b>80,446.02</b>
2000	3.20	20,269.55	1,266.40	33.18	5.61	<b>21,577.94</b>
2001	81.26	673,979.56	41,467.17	1,161.12	239.35	<b>716,928.47</b>
2002	221.26	1,521,463.73	93,816.66	3,093.15	530.99	<b>1,619,125.78</b>
2003	117.61	600,932.43	38,004.40	1,494.77	444.32	<b>640,993.53</b>
2004	337.30	719,773.19	55,432.06	2,042.71	695.88	<b>778,281.15</b>
2005	1,122.15	226,411.47	16,503.95	598.38	175.19	<b>244,811.13</b>
2006	2,570.37	270,881.96	20,860.31	643.46	298.43	<b>295,254.52</b>
2007	2,491.82	189,878.01	13,701.61	367.78	215.55	<b>206,654.77</b>
2008	3,267.41	101,099.52	7,597.93	224.54	236.85	<b>112,426.25</b>
2009	2,926.97	134,888.41	9,201.11	222.64	392.85	<b>147,631.98</b>
2010	4,204.37	181,357.11	13,602.22	327.26	912.10	<b>200,403.05</b>
2011	5,485.56	225,074.36	17,075.84	387.84	1,211.03	<b>249,234.63</b>
2012	3,948.49	181,185.05	13,609.40	275.29	1,160.60	<b>200,178.82</b>
2013	994.17	163,115.01	12,023.75	254.26	461.80	<b>176,848.98</b>
2014	144.26	21,466.56	1,491.12	26.49	48.36	<b>23,176.79</b>
<b>Totals:</b>	<b>27,950.62</b>	<b>5,307,348.93</b>	<b>360,363.30</b>	<b>11,264.67</b>	<b>7,046.30</b>	<b>5,713,973.81</b>

# Conclusions

- WIPP had serious operational/safety issues before February 2014
- WIPP's current design has insufficient capacity for all existing TRU waste
- 34 MT of surplus plutonium is not in the WIPP mission, and expanding WIPP for that waste requires legal, regulatory, other changes
- Expanding WIPP's underground design puts waste closer to oil and gas wells, among other safety/compliance concerns

# Recommendations

- Congress should stop funding MOX
- The Committee should consider options to put SRS surplus plutonium in forms that can be safely and securely stored and inspected
- The Committee should consider the option of disposal of surplus plutonium in future repositories, not WIPP
- The Committee should acknowledge the 61.5 MT of excess plutonium, much more than the 34 MT in the Committee's task

# Contact Information

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