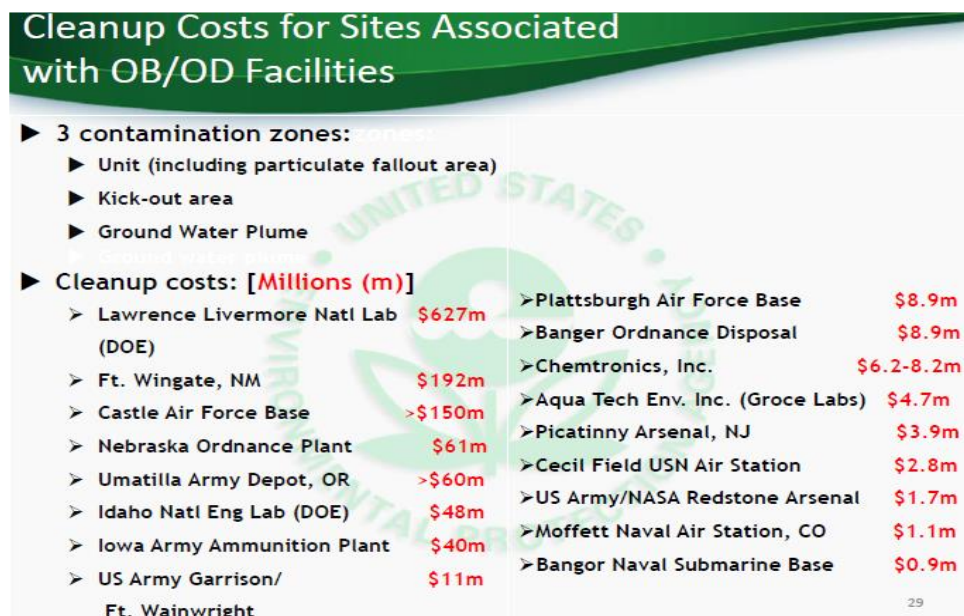


Environmental Remediation: Estimated Direct Costs Resulting from Open Burning/Open Detonation of Hazardous Energetic and Mixed Wastes

WORKING DOCUMENT as of 17 July 2023

Submitted by Laura Olah, Citizens for Safe Water Around Badger/Cease Fire Campaign



Cleanup Costs for Sites Associated with OB/OD Facilities.¹

The below table includes cleanup cost information for some former and active OB/OD military installations.² Although, the cleanup costs are for the entire installment and not just the OB/OD units, these figures still show the type of damage that is occurring at military installations and the significant costs and long timelines involved in remediating this damage. Further, the table does not include all active or former OB/OD sites, so the total numbers are undoubtedly an underestimate.

Former or Active OB/OD Facility	Cleanup Cost (as of 2015)	Expected Additional Cost	Expected Completion Date	Notes on OB/OD Units
Sierra Army Depot (CA) ³ (former)	\$101M	\$29.5M	2029	OB sites are under ongoing monitoring until 2035 to 2046 (depending on the site).
Ravenna Army Ammunition Plant (OH) ⁴ (former)	\$132M	\$26.8M	2031	OD area is under ongoing monitoring until 2047. Contaminants in soil at OD area include arsenic,

¹ Ken Shuster, EPA, Presentation to NAS at 29.

² ProPublica, Bombs in Your Backyard (Nov. 30, 2017), <https://projects.propublica.org/bombs/#>.

³ ProPublica, Sierra Army Depot, <https://projects.propublica.org/bombs/installation/CA9213820843002100>.

⁴ ProPublica, Ravenna Army Ammunition Plant, <https://projects.propublica.org/bombs/installation/OH5213820736002100>.

				cadmium, 2,4,6-trinitrotoluene. OB areas are under ongoing monitoring until 2047-49.
Fort McClellan (AL) ⁵ (former)	\$431M	\$11.3M	2046	
Pueblo Chemical Depot (CO) ⁶ (former)	\$182M	\$124M	2025	
Anniston Army Depot (AL) ⁷	\$86.7M	\$20.3M	2048	
Redstone Arsenal (AL) ⁸	\$393M	\$936M	2051	Former burn area is considered a medium risk because there is the potential for movement during storm events/flooding (during high water conditions discharges to Tennessee River).
Yuma Proving Ground (AZ) ⁹	\$28.4M	\$16.6M	2045	
Vandenberg AFB (CA) ¹⁰	\$350M	\$179M	2043	
Edwards AFB (CA) ¹¹	\$506M	\$437M	2099	
China Lake NAWS (CA) ¹²	\$127M	\$104M	2026	Soil at medium risk due to detected contaminants: naphthalene, cyanide, cadmium, acetone, benzene, barium, lead, RDX, and TNT.
Fort Carson (CO) ¹³	\$95.9M	\$12.1M	2030	
Eglin AFB (FL) ¹⁴	\$126M	\$37.9M	2045	
Kings Bay NSB (GA) ¹⁵	\$16.2M	\$3.87M	2018	
NSA Andersen Guam (GU) ¹⁶	\$36.9M	\$42M	2023	
Iowa Army Ammunition Plant (IA) ¹⁷	\$113M	\$45.9M	2047	Contaminated groundwater is likely discharging into local surface water (Spring Creek); contaminants include TNT, cadmium, lead, antimony, and manganese.
Crane NSWC (IN) ¹⁸	\$94.6M	\$35.4M	2020	Groundwater and surface water at high risk due to

⁵ ProPublica, Fort McClellan, <https://projects.propublica.org/bombs/installation/AL4213720562002100>.

⁶ ProPublica, Pueblo Chemical Depot, <https://projects.propublica.org/bombs/installation/CO8213820725002100>.

⁷ ProPublica, Anniston Army Depot, <https://projects.propublica.org/bombs/installation/AL4213820027002100>.

⁸ ProPublica, Redstone Arsenal, <https://projects.propublica.org/bombs/installation/AL4213820742002100>.

⁹ ProPublica, Yuma Proving Ground, <https://projects.propublica.org/bombs/installation/AZ9214120991002100>.

¹⁰ ProPublica, Vandenberg, <https://projects.propublica.org/bombs/installation/CA9571125149005700>.

¹¹ ProPublica, Edwards Air Force Base, <https://projects.propublica.org/bombs/installation/CA9571724504005700>.

¹² ProPublica, China Lake NAWS, <https://projects.propublica.org/bombs/installation/CA9170023152001700>.

¹³ ProPublica, Fort Carson, <https://projects.propublica.org/bombs/installation/CO8214020150002100>.

¹⁴ ProPublica, Eglin, <https://projects.propublica.org/bombs/installation/FL4571724366005700>.

¹⁵ ProPublica, Kings Bay NSB, <https://projects.propublica.org/bombs/installation/GA4170090001001700>.

¹⁶ ProPublica, NSA Andersen Guam, <https://projects.propublica.org/bombs/installation/GU9173099519001700>.

¹⁷ ProPublica, Iowa Army Ammunition Plant, <https://projects.propublica.org/bombs/installation/IA7213820445002100>.

¹⁸ ProPublica, Crane NSWC, <https://projects.propublica.org/bombs/installation/IN5170023500001700>.

				contamination with RDX. Soil contaminated with lead, RDX, and TNT.
Blue Grass Army Depot (KY) ¹⁹	\$21.9M	\$2.04M	2044	
Fort Polk (LA) ²⁰	\$39.3M	\$11.8M	2046	
Indian Head Naval Surface Warfare Center (MD) ²¹	\$81.7M	\$170M	2055	Sediment contaminated with arsenic and chromium. Groundwater contaminated with nitrobenzene.
Aberdeen Proving Ground (MD) ²²	\$660M	\$108M	2058	
Picatinny Arsenal (NJ) ²³	\$148M	\$86.4M	2099	
Holloman AFB (NM) ²⁴	\$108M	\$39.8M	2030	
Kirtland AFB (NM) ²⁵	\$219M	\$103M	2039	
Hawthorne Army Depot (NV) ²⁶	\$92.2M	\$134M	2047	
McAlester Army Ammunition Plant (OK) ²⁷	\$25.3M	\$4.73M	2045	
Letterkenny Army Depot (PA) ²⁸	\$152M	\$28M	2046	
Vieques (PR) ²⁹	\$196M	\$314M	2034	
Joint Base Charleston Weapons (SC) ³⁰	\$21.2M	\$74.8M	2045	Soil contaminated with arsenic, zinc, aluminum, selenium, and vanadium, among others.
Beaufort MCAS (SC) ³¹	\$20.8M	\$29M	2054	
Holston Army Ammunition Plant (TN) ³²	\$23.6M	\$10.4M	2017	
Milan Army Ammunition Plant (TN) ³³	\$191M	\$32M	2074	
JBSA-Camp Bullis (TX) ³⁴	\$5.66M	\$3.77M	2017	

¹⁹ ProPublica, Blue Grass Army Depot, <https://projects.propublica.org/bombs/installation/KY4213820105002100>.

²⁰ ProPublica, Fort Polk, <https://projects.propublica.org/bombs/installation/LA6214020716002100>.

²¹ ProPublica, Indian Head Naval Surface Warfare Center, <https://projects.propublica.org/bombs/installation/MD3170024109001700>.

²² ProPublica, Aberdeen Proving Ground, <https://projects.propublica.org/bombs/installation/MD3213821355002100>.

²³ ProPublica, Picatinny Arsenal, <https://projects.propublica.org/bombs/installation/NJ2213820704002100>.

²⁴ ProPublica, Holloman, <https://projects.propublica.org/bombs/installation/NM6572124422005700>.

²⁵ ProPublica, Kirtland, <https://projects.propublica.org/bombs/installation/NM6571824423005700>.

²⁶ ProPublica, Hawthorne Army Depot, <https://projects.propublica.org/bombs/installation/NV9213822950002100>.

²⁷ ProPublica, McAlester Army Ammunition Plant, <https://projects.propublica.org/bombs/installation/OK6213822951002100>.

²⁸ ProPublica, Letterkenny Army Depot, <https://projects.propublica.org/bombs/installation/PA3213820503002100>.

²⁹ ProPublica, Vieques East, <https://projects.propublica.org/bombs/installation/PR2170069321001700>.

³⁰ ProPublica, JB-Charleston Weapons, <https://projects.propublica.org/bombs/installation/SC4170022620005700>.

³¹ ProPublica, Beaufort MCAS, <https://projects.propublica.org/bombs/installation/SC4173023209001700>.

³² ProPublica, Holston Army Ammunition Plant, <https://projects.propublica.org/bombs/installation/TN4213820421002100>.

³³ ProPublica, Milan Army Ammunition Plant, <https://projects.propublica.org/bombs/installation/TN4213820582002100>.

³⁴ ProPublica, JBSA-Camp Bullis, <https://projects.propublica.org/bombs/installation/TX6211620133005700>.

Lone Star Army Ammunition Plant (TX) ³⁵	\$32M	\$4.34M	2036	
Tooele Army Depot (UT) ³⁶	\$155M	\$38.5M	2023	
Dugway Proving Ground (UT) ³⁷	\$168M	\$78.7M	2019	
Hill AFB (UT) ³⁸	\$501M	\$195M	2099	
Wallops Flight Facility (VA) ³⁹	\$13.8M	\$30.6M	2056	
Radford Army Ammunition Plant (VA) ⁴⁰	\$57.7M	\$15.2M	2017	
Dahlgren NSWC (VA) ⁴¹	\$77.7M	\$20.1M	2035	Groundwater and sediment at high risk; surface water at medium risk. Contaminants include lead, mercury, arsenic, nickel, cadmium, antimony, TCE, and more.
Allegany Ballistics Lab (WV) ⁴²	\$68.5M	\$36.9M	2046	Groundwater and soil at high risk due to contamination with mercury, lead, arsenic, TCE, and more.
Badger Army Ammunition Plant (WI) ⁴³	\$218M	\$74.5M	2045	Groundwater, soil and sediments and residential drinking water wells at high risk do to contamination from VOCs, all 6 isomers of the explosive dinitrotoluene (DNT), mercury, chromium, cadmium, sulfates, PFAS and more. Multiple former OB/OD areas are the source of multiple groundwater contaminant plumes that have impacted drinking water wells as much as 3 miles from former OB/OD areas.
Total:	\$6.1B	\$3.67B		

³⁵ ProPublica, Lone Star Army Ammunition Plant, <https://projects.propublica.org/bombs/installation/TX6213821831002100>.

³⁶ ProPublica, Tooele Army Depot, <https://projects.propublica.org/bombs/installation/UT8213820894002100>.

³⁷ ProPublica, Dugway Proving Ground, <https://projects.propublica.org/bombs/installation/UT8214120283002100>.

³⁸ ProPublica, Hill Air Force Base, <https://projects.propublica.org/bombs/installation/UT8571724350005700>.

³⁹ ProPublica, Wallops Flight Facility, <https://projects.propublica.org/bombs/installation/VA39799F1697009799>.

⁴⁰ ProPublica, Radford Army Ammunition Plant, <https://projects.propublica.org/bombs/installation/VA3213820730002100>.

⁴¹ ProPublica, Dahlgren NSWC, <https://projects.propublica.org/bombs/installation/VA3170024685001700>.

⁴² ProPublica, Allegany Ballistics Lab, <https://projects.propublica.org/bombs/installation/WV3170023691001700>.

⁴³ ProPublica, Badger Army Ammunition Plant, <https://projects.propublica.org/bombs/installation/WI5213820056002100#b=42.165551775272554,-93.82119948437499,47.60811717186224,-85.31778151562499&c=shrink>