

Health Effects of Air Emissions from Burning Munitions



Toxic pollutants are released when munitions are open burned, open detonated or incinerated. These toxic emissions endanger public health by contaminating air, groundwater and soils near open burning/open detonation (OB/OD) operations. Military personnel are often the most exposed to these toxic pollutants, along with nearby communities. Across the country, hundreds of communities and thousands of military personnel have felt the adverse effects of these toxic pollutants.

OB/OD of munitions and energetics causes the uncontrolled release of:

CARCINOGENS: Energetics such as DNT, RDX, and TNT are classified by EPA as probable human carcinogens. If you breathe air containing DNTs, they will enter your body through your lungs.¹ People can be exposed by skin contact with DNT-contaminated soil or by swallowing DNT-contaminated soil or dust. Such exposure would be more likely among young children playing in DNT-contaminated soil and/or placing it in their mouth. Carcinogenic organic compounds such as benzene are highly volatile and most exposure is through inhalation.^{2,3}

DEVELOPMENTAL NEUROTOXICANTS: Inorganics such as lead, arsenic, and mercury are chemicals that can damage the fetal and infant brain. Exposure to lead during pregnancy can cause adverse outcomes such as premature births, low birth weights, and birth defects. For babies and small children, lead exposure affects brain development and can cause permanent neurological impairments.⁴

ENDOCRINE DISRUPTORS: Endocrine disruptors are chemicals that may interfere with the body's endocrine system and produce adverse developmental, reproductive, neurological, and immune effects in both humans and wildlife.⁵ Endocrine disruptors released by OB/OD include dioxins, PAHs (polyaromatic hydrocarbons) and perchlorate. Perchlorate, the explosive main ingredient of rocket and missile fuel, interferes with thyroid functioning because it mimics iodide. Children whose mothers were exposed to perchlorate while pregnant may have lowered IQ, "mental retardation, loss of hearing and speech, or deficits in motor skills."⁶

PARTICLE POLLUTANTS: Ultrafine particulate matter are microscopic solids that are so small that they can lodge deep in the lungs, cross directly into the bloodstream, and travel throughout the body, causing serious health problems. Numerous scientific studies have linked particle pollution exposure to a variety of problems, including: premature death in people with heart or lung disease, irregular heartbeat, aggravated asthma, decreased lung function, and increased respiratory symptoms, such as irritation of the airways, coughing or difficulty breathing.⁷

RESPIRATORY IRRITANTS: Respiratory irritants such as sulphur dioxide or nitrogen oxides can cause inflammation or other adverse reactions in the respiratory system.

TOXIC METALS: Munitions constituents may contain as much as one or two percent heavy metals such as lead, cadmium, chromium, nickel, copper, and barium. Overexposure to toxic metals can impair function in the heart, liver, blood, intestines, kidneys and skin as well as disrupt the immune, endocrine, central nervous and peripheral nervous systems.⁸

Alaska Community Action on Toxics
Blue Ridge Environmental Defense League
California Communities Against Toxics
California Safe Schools
Camp Lejeune Community Assistance Panel
Center for Health, Environment & Justice
Center for Public Environmental Oversight
Central Trades & Labor Council of Shreveport and Vicinity, AFL-CIO
Citizen Action New Mexico
Citizens for Safe Water Around Badger
Citizens Task Force
CORALations
Crawford Stewardship Project
Defense Depot Memphis Tennessee
Concerned Citizen Committee
Environmental Patriots of the New River Valley
Environmentalists Against War
Florida Veterans for Common Sense
Food and Water Watch
Fort Ord Community Advisory Group
Gasp
Frederick Citizens for Bio-lab Safety
Friends United for a Safe Environment (FUSE, Inc.)
GAIA (Global Alliance for Incinerator Alternatives)
Greenaction for Health and Environmental Justice
Hoosier Chapter of the Sierra Club
International Dialogue on Underwater Munitions
Kentucky Environmental Foundation
Louisiana Bucket Brigade
Louisiana Environmental Action Network
Louisiana Progress Action
Lower Mississippi Riverkeeper
Midwest Environmental Advocates
Midwest Environmental Justice Organization
Moms Clean Air Force (National)
Moms Clean Air Force Tennessee
Moms Clean Air Force Virginia
Nukewatch/The Progressive Foundation
Peaceful Skies Coalition
Philadelphia Right To Know Committee
Physicians for Social Responsibility – Wisconsin
Protect All Children's Environment
Sierra Club (national)
Tennessee AFL-CIO Labor Council
Tennessee Clean Water Network
Tewa Women United
Texas Campaign for the Environment
Tribal Environmental Watch Alliance
Veterans for Common Sense
Vidas Viequenses Valen
Virginia Chapter Sierra Club
Valley Watch
Voluntary Cleanup Advisory Board
Volunteers for Environmental Health and Justice
Watauga Group of the Tennessee Chapter Sierra Club
Waukesha County Environmental Action League
WI Environmental Health Network



Massachusetts Military Reserve:

For several decades, the Massachusetts Military Reserve conducted open burning and open detonation of munitions, causing air pollution and “serious groundwater and soil contamination.” Scientific studies of the high cancer rates found in this area of Massachusetts found that women who lived closer to the military reserve and who lived there for longer periods of time had an increased risk of later developing breast cancer.⁹

Vieques, Puerto Rico:

For over sixty years, the military conducted open burning and open detonation on the island of Vieques in Puerto Rico. A scientific study that analyzed hair samples from the citizens of Vieques documented widespread contamination from the toxic metals released by open burning and open detonation: “34 percent of the population, about a third, had toxic levels of mercury, 55 percent were contaminated with lead, 69 percent with arsenic, 69 percent with cadmium, 90 percent with aluminum and antimony, whose toxic effects are similar to arsenic poisoning.” Children and teenagers in Vieques have a risk of developing cancer that is 2-3 times higher than in the rest of Puerto Rico. Rates of liver disease, heart disease, hypertension, and diabetes are significantly higher for the communities living on Vieques compared to similar populations in Puerto Rico.¹⁰

Open Burn Pits in Iraq and Afghanistan:

Veterans returning from Iraq and Afghanistan who were exposed to toxic smoke from the open burn pits there have been developing serious health problems. In 2014, Congress mandated that the Department of Veterans Affairs set up an Open Burn Pit Registry to track health affects among veterans who were exposed to the burn pits. An unclassified Army memo from 2011 stated that the high concentrations of air pollution from the open burn pits put veterans at risk for “reduced lung function or exacerbated chronic bronchitis, chronic obstructive pulmonary disease (COPD), asthma, atherosclerosis, or other cardiopulmonary diseases.”¹¹

¹ <http://www.atsdr.cdc.gov/PHS/PHS.asp?id=845&tid=165>

² https://www.epa.gov/sites/production/files/2015-02/documents/1998_emission_factors_for_the_disposal_of_energetic_materials_by_ob-od.pdf

³ <http://www.who.int/ipcs/features/benzene.pdf>

⁴ <http://www.atsdr.cdc.gov/csem/csem.asp?csem=7&po=10>

⁵ <http://www.niehs.nih.gov/health/topics/agents/endocrine/>

⁶ <https://www.epa.gov/sites/production/files/2015-03/documents/9546011.pdf>

⁷ <https://www3.epa.gov/pm/health.html>

⁸ <http://www.ehs.uconn.edu/Chemical/ToxicMetals-FactSheet.pdf>

⁹ Aschengrau, Ann, Sc.D., and David M. Ozonoff, M.D., M.P.H., Upper Cape Cancer Incidence Study Final Report, Boston University School of Public Health, September 1991, Viera, Verónica M., Thomas F. Webster, Janice, M. Weinberg, and Ann Aschengrau. Spatial-temporal analysis of breast cancer in upper Cape Cod, Massachusetts. *International Journal of Health Geographics* 2008 7:46, August 2008 <https://cumulis.epa.gov/supercpad/cursites/csinfo.cfm?id=0100960>

¹⁰ http://www.democracynow.org/2013/5/2/punishing_vieques_puerto_rico_struggles_with, <http://forusa.org/blogs/for/health-vieques-crisis-its-causes/8008>, <http://www.cnn.com/2010/US/02/01/vieques.illness.part.2/>

¹¹ <http://www.npr.org/sections/parallels/2015/12/18/455350571/u-s-veterans-burn-pits-created-toxic-clouds-that-led-to-ailments>, <https://www.wired.com/2012/05/bagram-health-risk/>

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