

July 20, 2015

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SENT BY ELECTRONIC MAIL

RE: Request for EPA Assistance in Assuring Compliance with TSCA Regulations in the Treatment of Explosives-Contaminated Wastes at the Holston Army Ammunition Plant, Tennessee

Dear Mr. Feely:

As the regulatory agency responsible for enforcing Toxic Substances Control Act (TSCA) regulations, we are requesting EPA's assistance in assuring that open air burning and thermal treatment (including heating) of explosives-contaminated wastes at Holston Army Ammunition Plant are in compliance with these regulations. PCBs (polychlorinated biphenyls) are the only chemical class specifically named in TSCA because Congress believed that the chemical and toxicological properties of PCBs posed a significant risk to public health and the environment.¹ TSCA also provides for the regulation of asbestos. EPA's immediate attention is requested as multiple sources at the site are currently active.

Human exposure to PCBs is a concern because of the wide range of adverse health effects including skin irritation, reproductive and developmental effects, immunologic effects, liver damage, and cancer. The developing fetus, infants, and children are the population groups most vulnerable to exposure. Exposure may impede the development of their brains, reproductive, immune, and endocrine systems. Emissions from open air burning may be expected to cause an increase in respiratory symptoms for individuals with asthma or other sensitive populations such as children or the elderly.²

¹ U.S. Environmental Protection Agency, TSCA Enforcement Program, accessed online July 7, 2015 at <http://www.epa.gov/region1/enforcement/tsc/>

² U.S. EPA, Region 5, *Comments on the Analysis, Preliminary Determination and Draft Plan on the Explosive Decontamination and Demolition at Badger Army Ammunition Plant (BAAAP) in Wisconsin*, September 22, 2003.

EPA has affirmed that dioxins (i.e., chlorinated dioxins and chlorinated furans) could be a byproduct from combustion of the PCBs found in buildings and demolition debris. In addition, polychlorinated dibenzofurans could also be formed and may be the predominant form.³

Because PCBs and dioxins are actually mixtures of semivolatile organic compounds with congeners that have a range of volatilities, PCBs and dioxins emitted to air will distribute between the vapor phase and the particulate phase (by adsorption onto particles). The vapor phase PCBs and dioxins are subject to direct uptake by the leafy parts of grass and crops; and the particulate matter can deposit onto crops and soil.⁴

Also, vapor phase and particulate PCBs and dioxins can diffuse into water bodies, deposit directly onto water bodies, and enter waterbodies via soil erosion and runoff. Both PCBs and dioxins are persistent in the environment and do not readily degrade. PCBs can travel long distances in the air (>10 miles) and deposit in areas far from where they were released.

In addition to direct exposure through inhalation, indirect pathways are possible and associated risks from these pathways could be higher.⁵ Examples of indirect pathways include uptake of PCBs and dioxins into edible crops and pasture grass, human consumption of edible crops, consumption of pasture grass by beef and dairy cattle and other livestock followed by human consumption of the livestock and milk, incidental soil ingestion and dermal contact with PCBs and dioxins in soil, uptake and bioaccumulation of PCBs by fish in waterbodies, and human consumption of fish.⁶

Holston Army Ammunition Plant

The open burning area for waste explosives and explosives-contaminated material at Holston Army Ammunition Plant is located approximately 0.85 miles from the closest facility boundary and approximately 1.5 miles from the closest resident, according to BAE Systems Ordnance Systems Inc. (OSI) – the operating contractor for Holston Army Ammunition Plant. The base is located at the headwaters of the Holston River at Kingsport, Tennessee.

In December 2011, officials with the Tennessee Division of Air Pollution Control reported observing ground level smoke from Holston lingering in the general area, impacting local air quality.⁷ On multiple occasions, community members have reported and photographed ground level smoke in neighboring residential areas that coincides with open burning at Holston. These observations indicate that residents are at risk for exposure to emissions from open air burning. It is also reasonable to expect that populations in closer proximity to the various source areas at Holston, such as onsite workers and other

³ U.S. EPA, Region 5, *Comments on the Analysis, Preliminary Determination and Draft Plan on the Explosive Decontamination and Demolition at Badger Army Ammunition Plant (BAAAP) in Wisconsin*, September 22, 2003.

⁴ U.S. EPA, Region 5, *Comments on the Analysis, Preliminary Determination and Draft Plan on the Explosive Decontamination and Demolition at Badger Army Ammunition Plant (BAAAP) in Wisconsin*, September 22, 2003.

⁵ U.S. EPA, Region 5, *Comments on the Analysis, Preliminary Determination and Draft Plan on the Explosive Decontamination and Demolition at Badger Army Ammunition Plant (BAAAP) in Wisconsin*, September 22, 2003.

⁶ U.S. EPA, Region 5, *Comments on the Analysis, Preliminary Determination and Draft Plan on the Explosive Decontamination and Demolition at Badger Army Ammunition Plant (BAAAP) in Wisconsin*, September 22, 2003.

⁷ Tennessee Department of Environment and Conservation, Tennessee Division of Air Pollution Control (DAPC), online database accessed July 7, 2015 at http://environment-online.state.tn.us:8080/pls/enf_reports/?p=19031:34251:7106768381034::NO:34251:P34251_ROW_ID:23734

personnel, are at increased risk for exposure to the uncontrolled release of pollutants from open air burning and thermal treatment activities.

There are three main types of wastes that are burned at Holston, according to OSI.⁸ The first is bulk raw explosives that have become contaminated through contact with the manufacturing floor or out-of-spec product unsuitable for use or reprocessing. This waste is burned normally each week in open burn pans.

The second type of waste consists of explosives-contaminated small articles such as plastic bags, paper towels, filters, personal protective equipment, and dewatering filter socks. This material is placed in a steel cage and is generally burned once a week even though it is permitted daily.⁹

The third type of waste is large articles that may be contaminated with explosives and includes **various materials, piping from buildings, process vessels, building demolition material including concrete**, and possibly **soil** surrounding these areas. This material is placed in large piles at the burning ground.¹⁰

Since many of the materials that are required to be thermally decontaminated are not combustible, large amounts of clean wood are used along with small quantities of kerosene or diesel to facilitate the burning of pile material.¹¹

Over the past several years OSI and the Army have been working on removing inoperable and decommissioned **equipment and structures** from the site. This has been a multi-year project and is approximately 50% complete, OSI has reported. The estimated completion date for the second phase of the demolition projects is in approximately three years.

The Holston Army Ammunition Plant is the major supplier of explosive materials – primarily RDX- and HMX-based products – to the U.S. Department of Defense, according to OSI. The EMCW (Energetic Material Contaminated Waste) generated is primarily composed of paper, plastic bags, pallets, boxes, liners, piping, and other items potentially contaminated with EM. In the past, EMCW disposal accounted for 92 percent all material disposed.¹² Flashing has been conducted outside the open burning grounds in decontamination ovens or in one of the EMCW piles.

⁸ BAE Systems Ordnance Systems Inc., Reviewed by HSAAP Staff, Correspondence to Tennessee Department of Environment and Conservation, Division of Air Pollution, Subject: BAE Systems Ordnance Systems Inc., Holston Army Ammunition Plant, Information Requested by TDEC for Open Burning Ground Sources 37-0028-10 and 37-0028-53, July 13, 2012.

⁹ BAE Systems Ordnance Systems Inc., Reviewed by HSAAP Staff, Correspondence to Tennessee Department of Environment and Conservation, Division of Air Pollution, Subject: BAE Systems Ordnance Systems Inc., Holston Army Ammunition Plant, Information Requested by TDEC for Open Burning Ground Sources 37-0028-10 and 37-0028-53, July 13, 2012.

¹⁰ BAE Systems Ordnance Systems Inc., Reviewed by HSAAP Staff, Correspondence to Tennessee Department of Environment and Conservation, Division of Air Pollution, Subject: BAE Systems Ordnance Systems Inc., Holston Army Ammunition Plant, Information Requested by TDEC for Open Burning Ground Sources 37-0028-10 and 37-0028-53, July 13, 2012.

¹¹ BAE Systems Ordnance Systems Inc., Reviewed by HSAAP Staff, Correspondence to Tennessee Department of Environment and Conservation, Division of Air Pollution, Subject: BAE Systems Ordnance Systems Inc., Holston Army Ammunition Plant, Information Requested by TDEC for Open Burning Ground Sources 37-0028-10 and 37-0028-53, July 13, 2012.

¹² U.S. Army Corps of Engineers, Alternatives for Open Burning/Open Detonation of Energetic Materials, Technical Report 98/104, August 1998, page 22.

Open Air Burning of Munitions-Contaminated Wastes as a Source of PCBs/Dioxin Releases

Beginning in 2000, the Army began pressing for approval to open air burn more than 1,000 excess buildings at Wisconsin's Badger Army Ammunition Plant (Badger) – a proposal that even the military acknowledged was not environmentally friendly.¹³ Studies by the U.S. Army Industrial Operations Command at Sunflower Army Ammunition Plant in Kansas confirmed that open burning of explosive-contaminated structures produces toxic emissions including “nitrous oxide, carbon monoxide, asbestos, lead vapors, lead particulates, zinc, polyaromatic hydrocarbons, and dioxins”.¹⁴

The Army study affirmed that during an open burn materials are “changed from a solid form and are released to the atmosphere where they will certainly be deposited over a large area resulting in contamination of soil and surface water”.¹⁵ Open air burning of excess structures would pose several potential risks including:

- Potential risks to workers posed by the inhalation of vapors and fugitive particulates during the burning of the building;¹⁶
- Potential risks to personnel and others who may be exposed to air borne vapors and dust generated during burning;¹⁷
- Potential risks to both human receptors and environmental receptors from the deposition of air borne particulates; these deposited materials could affect both soil and surface water bodies in the area surrounding the burn site.¹⁸

In 2002, the Army at Badger first reported that high levels of PCBs had been detected in paint in buildings at concentrations more than 400 times the federal threshold of 50 ppm (parts per million). In 2003, EPA Region 5 received a draft plan and request to burn buildings at Badger as a form of demolition. Open burning of excess structures would not only cause the uncontrolled release of PCBs, it would disperse dangerous levels of dioxins and furans to the environment – toxins that are known to accumulate in the food chain and cause birth defects in humans and animals.

CSWAB maintained that if the EPA approved open burning of regulated levels of PCBs at Badger that it would set a significant national precedent. The regional office agreed and the decision was referred to EPA headquarters in Washington, DC.

During the three years that EPA considered the Army's proposed open burning of PCB-contaminated buildings, CSWAB organized a strong national campaign opposing open burning that garnered support from more than 160 organizations. We traveled to Washington to meet with federal legislators and EPA

¹³ U.S. Army Industrial Operations Command, Plexus Scientific, Risk Analysis and Environmental Stabilization Plan for Excess Personal Property, Sunflower Army Ammunition Plant, Final, 29 July 1996, page 4-3.

¹⁴ Ibid.

¹⁵ U.S. Army Industrial Operations Command, Plexus Scientific, Risk Analysis and Environmental Stabilization Plan for Excess Personal Property, Sunflower Army Ammunition Plant, Final, 29 July 1996, page 5-4.

¹⁶ U.S. Army Industrial Operations Command, Plexus Scientific, Risk Analysis and Environmental Stabilization Plan for Excess Personal Property, Sunflower Army Ammunition Plant, Final, 29 July 1996.

¹⁷ U.S. Army Industrial Operations Command, Plexus Scientific, Risk Analysis and Environmental Stabilization Plan for Excess Personal Property, Sunflower Army Ammunition Plant, Final, 29 July 1996.

¹⁸ U.S. Army Industrial Operations Command, Plexus Scientific, Risk Analysis and Environmental Stabilization Plan for Excess Personal Property, Sunflower Army Ammunition Plant, Final, 29 July 1996.

headquarters, to Chicago to meet EPA officials there, and submitted dozens of Freedom of Information Act requests.

Our members sent in more than 1,400 postcards to the EPA, thousands of emails were sent to legislators, EPA officials, and the Wisconsin Department of Natural Resources (WDNR). National and local media attention – radio, television, and print – raised the visibility of the issue and our campaign. In addition to considerable citizen activism, there was significant local Congressional involvement.¹⁹ Prominent among them were U.S. Senator Russ Feingold, U.S. Senator Herbert Kohl and then-Congresswoman Tammy Baldwin.

With support from community members, we hired an expert on dioxins. We built and strengthened alliances with communities near other bases including the Ravenna Arsenal in Ohio, Indiana Army Ammunition Plant, Sunflower Army Ammunition Plant in Kansas, and others. Community members there helped to organize grassroots support for our shared campaign to protect human health and the environment.

Collectively, these actions prompted officials at Badger to explore non-thermal solutions and the Army successfully gained approval from the U.S. Department of Defense Explosives Safety Board for wet demolition of buildings that had been previously identified by the military as **highly sensitive**. Altogether, more than **1,300** explosives-contaminated buildings that were originally slated for open air burning were successfully decontaminated and demolished at Badger using this non-thermal alternative.

At the same time, the Army at Ohio's Ravenna Army Ammunition Plant abandoned plans to open air burn more than 100 buildings. At Iowa Army Ammunition Plant, the Army used chemical neutralization instead of burning to desensitize contaminated buildings. The Army utilized indirect heat to treat explosives-contaminated buildings (without PCBs) at Twin Cities Army Ammunition Plant in Minnesota.

In 2006, after extensive multi-program discussions, EPA Headquarters confirmed that the burning of buildings with regulated levels of PCBs was prohibited and could not be approved.²⁰ Ultimately, TSCA PCB issues and local citizen opposition stopped the Army's plans for open air burning.²¹

Thermal Treatment of Munitions-Contaminated Wastes as a Source of PCBs/Dioxin Releases

Thermal treatment of painted non-flammable objects is considered the source of unsafe levels of PCBs in soils at the Badger Army Ammunition Plant in Wisconsin. Following the detection of high levels of PCBs in paint on pipes, flanges, and other metal objects, CSWAB asked state regulators to require environmental testing for PCBs at the site of a former decontamination oven – a facility used to thermally treat metal objects for explosive contamination. During operation, resultant particulates and fumes from the oven were released directly to the open air with no treatment or emissions controls.

¹⁹ U.S. Environmental Protection Agency, Briefing Paper, Topic: Badger Army Ammunition Plant, Baraboo, Wisconsin, May 10, 2007.

²⁰ U.S. Environmental Protection Agency, Briefing Paper, Topic: Badger Army Ammunition Plant, Baraboo, Wisconsin, May 10, 2007.

²¹ U.S. Environmental Protection Agency, Briefing Paper, Topic: Badger Army Ammunition Plant, Baraboo, Wisconsin, May 10, 2007.

In 2005, testing by the Army detected Aroclor 1254 (a commercial PCB mixture) in adjacent soils at levels as high as 740 ug/kg, exceeding the EPA Region 9 Residential Preliminary Remedial Goal (PRG) of 220 ug/kg and “right at” the EPA Region 9 Industrial PRG of 740 ug/kg.

The WDNR has confirmed that temperatures in Badger’s decontamination oven were sufficient to volatilize PCBs and other contaminants. In correspondence to CSWAB, the WDNR wrote: “The primary PCB Aroclor used in paint was 1254 ... under heating at 450 degrees Fahrenheit it is likely that the Aroclor 1254 did volatilize out of the paint.”²²

In the past, paint manufacturers used from 5 to 12 percent PCBs in paints as a plasticizer. According to the Washington State Department of Ecology, lead, mercury, cadmium, and chromium were commonly used in paint as pigments and preservatives and are found in paint on older buildings. Arsenic was used as a pigment, a wood preservative, and as an anti-fouling ingredient. Barium was used as a pigment and a corrosion inhibitor. Latex paint produced before 1992 may contain mercury which was added as a fungicide.

Accordingly, analysis of paint on structures, pipes and other equipment at Badger Army Ammunition Plant detected elevated levels of arsenic, barium, cadmium, chromium, lead, mercury, silver and PCBs.²³ (A table with these test results is attached.)

If paint is found to contain asbestos, disposal could be subject to the asbestos NESHAP (National Emissions Standards for Hazardous Air Pollutants) regulations.²⁴ Regulators held that if 1% asbestos concentration was found to be entering the decontamination oven at Badger that asbestos abatement would be required, especially as heating can cause flaking of the paint with the potential for release of asbestos into the air.²⁵

In addition to paint, PCBs were also used in other building materials such as mastics, sealants, adhesives, and specialty coatings. PCBs were a common additive to caulk because of their water and chemical resistance, durability, and elasticity. Caulk containing PCBs was used in some buildings, including schools, primarily between 1950 and 1980.

Other significant potential sources of dioxins emissions include combustion of wood, plastics, and other building components. In some instances “several tons of wood” are burned to treat a very small amount of waste at Holston, according to officials with the Tennessee Division of Air Pollution Control.

²² Wisconsin Department of Natural Resources letter to Laura Olah, Executive Director, Citizens for Safe Water Around Badger, Subject: Decon Oven at the Badger Army Ammunition Plant, July 25, 2003.

²³ U.S. Army, Badger Army Ammunition Plant, Paint Analysis Data, table obtained from U.S. EPA Region V via FOIA request in 2009.

²⁴ U.S. Environmental Protection Agency, *EPA Comments on the Tests of PCB Releases During Burning Activities At Ravenna Army Ammunition Plant – Draft Phase 1 Test Plan*, September 28, 2005.

²⁵ U.S. EPA/Wisconsin DNR, Badger WAAP Meeting Minutes, June 4, 2008. Document obtained through CSWAB FOIA request to EPA Region 5.

Asbestos

As noted above, concrete and building demolition materials are specifically identified as thermally treated wastes at Holston by the operating contractor. Asbestos was historically added to a variety of building materials and is found in concrete and concrete-like products. In addition to asbestos in the concrete itself, asbestos can be present in materials used to coat the asbestos such as paints and asphalt type coatings. Some caulks, used to seal seams or joints, contain asbestos.

There can also be asbestos concrete pipes or transite siding (a fireproof composite material made of asbestos and cement), and cement ducts embedded in the concrete. Cement-like products used to patch or fill concrete and brick may contain asbestos. Literally hundreds of cement-based products used for insulation, masonry, stucco, finishing, roads, and other applications contain asbestos. In other words, even if the concrete does not contain asbestos that does not mean that there are not other asbestos containing products that may need to be addressed.

Hubbellite is the brand name for a poured seamless floor that entered the market in the 1940s and is an example of applied flooring that may contain asbestos. **Hubbellite applied to concrete floors at Wisconsin's Badger Army Ammunition Plant contained approximately 10 percent chrysotile or "white asbestos"**. Hubbellite is composed of a mixture of cement, limestone, copper and magnesium compounds, and proprietary additives. According to the manufacturer, Hubbellite flooring is fire resistant, chemical resistant (including solvents), non-sparking, and static-disseminating.²⁶

In 1998, the EPA issued a memo alerting industry and labor organizations of the potential for asbestos in "soft" concrete in the roofs of buildings. An inspection of a roof repair project on a government building revealed that the concrete material used for forming the roof surface in 1934 contained a high concentration of asbestos. Analysis of the concrete revealed it had an asbestos content of between two and 10% by weight.

Military Formulation of Super Powerhouse insulation cement (produced from 1957 to 1971) contained 5% chrysotile asbestos and was developed to conform to government specification. This product was manufactured and sold exclusively for U.S. government military installations. (The commercial formulation without asbestos continued in production.) Both products were dry, mixtures containing spun mineral-wool, hydraulic setting binders, clays and other ingredients. Its use in or on concrete is not known.

Questions:

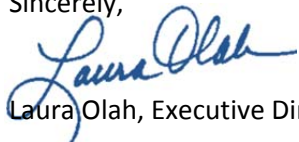
- Are all items and wastes subjected to open burning, thermal treatment or heating (as in a decontamination oven) at Holston Army Ammunition Plant **tested** for PCBs, asbestos and other TSCA-regulated substances? How is this documented and where can the public access this information and corresponding data?
- Is it possible that items and wastes containing regulated levels of PCBs, asbestos or other TSCA-regulated substances were subjected to open air burning, thermal treatment or or heating (as in a decontamination oven) at Holston in the **past**? How has this been addressed and where can the public access this information and corresponding data?

²⁶ Citizens for Safe Water Around Badger, *Asbestos in Concrete at U.S. Military Bases*, June 6, 2005. Accessed online at <http://cswab.org/asbestos-in-concrete-at-u-s-military-bases/>.

Recommendations:

- If comprehensive analysis for TSCA-regulated substances has not and is not being conducted, all open burning, thermal treatment and heating (as in a decontamination oven) of items and wastes at Holston should be **immediately** suspended until the Army can demonstrate full compliance with all applicable federal regulations.
- Consistent with EPA's Environmental Justice policies, the Agency should take active steps to promote community outreach and engagement. This should include regular public forums that provide community members with the opportunity to make recommendations, seek clarification, express concerns, and have their questions answered.

Sincerely,



Laura Olah, Executive Director

Below: Photographs (6)

Attached as .pdf files:

- Paint analysis data for PCBs and other parameters at Badger Army Ammunition Plant
- Defense Environment Alert, *EPA Rejects DOD Calls for Allow Open-Burning of PCB-Coated Materials*, August 29, 2006
- Record-Courier, *Burn at Ravenna Arsenal Not Likely - EPA Rejects Plan to Dispose of Buildings*, September 2, 2006

CC w/attachments:

Gina McCarthy, EPA Administrator
Cynthia Giles, Assistant Administrator, EPA Office of Enforcement and Compliance Assurance
Scott Gordon, U.S. EPA Federal Facilities Program, Region 4
U.S. Senator Lamar Alexander
U.S. Senator Bob Corker
U.S. Congressman Phil Roe MD
Governor Bill Haslam
Lt. Governor Ron Ramsey
State Representative Bud Hulsey
State Representative Jon Lundberg
Quincy Styke, Tennessee Department of Environment and Conservation
John C. Webb, Tennessee Department of Environment and Conservation
Ron Wilhoit, Tennessee Department of Environment and Conservation
Renée Victoria Hoyos, Tennessee Clean Water Network
Jane Williams, California Communities Against Toxics
Mark & Connie Toohey

Photographs of smoke affecting residential areas near Holston AAP, December 2011 and March 2013







Wet Demolition of Explosives-Contaminated Buildings

Badger Army Ammunition Plant

Photograph by U.S. Army, 2006. Obtained through the Freedom of Information Act by
Citizens for Safe Water Around Badger www.cswab.org