

10 March 2015

Army Response to U.S. Environmental Protection Agency's (EPA) Additional Questions

1. Can Army provide a SCWO [Super Critical Water Oxidation] expert from the ACWA [Program Executive Office (PEO), Assembled Chemical Weapons Alternatives] program to participate in the Community Dialogue Committee meeting this Wednesday? The community has many questions regarding how this technology was utilized in that program.

The Army will respond to specific technical questions regarding SCWO and other technologies where such responses are requested in writing by the EPA Dialogue Committee's point of contact. Information regarding the SCWO and iSCWO is provided below. The Army does not plan to have an expert appear in person before the Dialogue Committee. Also, please note that ACWA is an OSD, not an Army, responsibility; although the Army supports certain OSD efforts with respect to the ACWA program.

2. Is there an existing SCWO unit at McAlester Army Ammunition Plant (or elsewhere) that could be used during the Camp Minden cleanup? If so, please provide information regarding throughput, etc.

The SCWO developed by General Atomics and in use in Korea, as currently designed, has limited throughput. As indicated below (see Hydrolysis), M6 would need a preparation step such as grinding or alkaline hydrolysis to prepare an aqueous waste stream. The partial unit that was at Minden is not close to complete, but may be available if needed. The Army is currently using a SCWO for the destruction of pink water (explosive-contaminated water) in the Korea demilitarization facility. The Army had tentative plans for an iSCWO to demilitarize propellant, but those plans were overcome by costs to develop the capability, costs to operate per ton, and environmental permitting issues. The system operates at extremely high temperatures and pressures. The Army is not aware of operations that use an SCWO for destruction of propellant although some testing has been conducted by General Atomics with propellant.

The Blue Grass Chemical Agent-Destruction Pilot Plant (BGCAPP) SCWO is designed to process chemical agents and energetic hydrolysates currently stored at the Blue Grass Army Depot (BGAD). The Department of Defense Explosives

Safety Board (DDESB) has provided preliminary safety approval for the BGCAPP protective construction design and to start construction of the facility located at BGAD. The factors applying to this preliminary safety approval included, “The chemical agents and energetics will be destroyed using caustic hydrolysis processes. Further treatments of the hydrolysate using SCWO will convert the hydrolysates to non-toxic wastes.” The Deputy Director, ACWA, indicated that the systems at BGCAPP, which are designed and permitted to destroy chemical munitions, are not scheduled to be operational until 2020.

3. Is the Army planning to provide a response regarding the feasibility of the technologies to treat M6 presented to the Community Dialogue Committee by vendors last week?

The Army and the DDESB have provided input on technologies approved based on test results for use for specific purposes. The throughput limits addressed were provided by the vendor, the Army's Program Executive Office for Ammunition's Project Manager for Demilitarization, or the U.S. Army Material Agency's Joint Munitions Command's Associate Director, Office of Engineering and Demil Technology.

It would be inappropriate for the Army or DDESB to comment on technologies that have not been tested for an intended purpose. Both the DDESB and the Army coordinated on an Information Paper, which is dated 23 January 2015, concerning DDESB's Role in Approving Demilitarization Technology for Ammunition and Explosives (AE). Additionally, the DDESB and the Army coordinated on an Information Paper, dated 6 March 2015, concerning the DDESB Approval Process. This paper provided information about the process used within the DoD to help ensure the safety of its operations, its personnel, critical assets, and the public.

- Detonation Chambers - As previously indicated by the DDESB and the Army, the Controlled Detonation Chambers (e.g., DAVINCH, T-10) are not designed for the destruction of propellants and are not suitable, as currently designed, for destruction of M6 or other bulk propellants.
- Hydrolysis - This technology and process requires pre-processing (e.g., grinding down to powder, mixing with water to some low weight by volume ratio and injection into the system) of M6 for its use. As indicated, in the 6 March 2015 Information Paper, the DoD seeks to minimize handling of explosives to that absolutely necessary for safe and efficient

operations. Additionally, the handling of propellant requires specific facilities designed to eliminate potential for an inadvertent deflagration. With proper design and appropriate testing, use of hydrolysis may prove suitable.

- The DDESB has neither reviewed nor approved the General Dynamic's iSCWO system.
 - The DDESB has granted preliminary safety approval for the BGCAPP protective construction design and to start construction of the facility, located at BGAD. The factors applying to this preliminary approval included: "The chemical agent will be destroyed using hydrolysis processes that convert the toxic chemical agent to hydrolysates. Further treatments of the hydrolysate using Supper Critical Water Oxidation (SCWO) will convert it to non-toxic wastes."
- Thermal Destruction - There are three of four contractors that have proposed solutions. Each has lot of experience in handling and demilitarizing energetic materials. None of the proposed solutions has been tested for the purpose indicated. Thermal destruction technologies that contain emissions can be designed and tested for the intended purpose. The 23 January 2015 Information Paper and technology matrix address the Tactical Missile Demilitarization (TMD) system at Letterkenny that El Dorado designed. This system:
- Has been reviewed by the DDESB as part of a QD distance site plan.
 - Is designed for the destruction of rocket motors. However, the Army has no reason to believe that the proposed technology, as with other thermal-related technology proposals (e.g., CH2MHill's, U.S. Demil's, Clean Harbor's), could not be designed and tested to meet the requirements at Camp Minden.
- Open Burning - Over the past 5 years, propellant destruction projects (open burn) at organic depots total more than 27,700 tons of material destroyed. Propellant formulations identified primarily are M1, M6, and M30A1. Permitted open burning sites exist on Army facilities in Alabama, Indiana, Nevada, Oklahoma, Pennsylvania, Utah, and Virginia. These permits generally control conditions under which a burn may occur, the quantity of material burned per pan or burn and per day, etc. The EPA has emissions data available to inform public discussion.