

Camp Minden M6 and CBI Potential Technology Screening Information

Name of Technology	Please describe how your technology or process works and the equipment involved. Is this existing equipment or does it need to be fabricated? Is a donor explosive required?	Has your technology/ process been tested or used with M6, CBI, propellants, or similar materials? What permits or approvals do you have in hand? Describe actual uses, volumes treated, and results of tests or applications for M6 like materials.	Can your technology/ process be implemented on-site at Camp Minden? How long would it take to mobilize, install and be ready to treat material? Would it require any extra handling or preparation of the M6 and CBI? What are the key space and logistical requirements for your installation on-site including storage of residues/wastes?	What is the Destruction Efficiency of your process? What is the nature of the residues/wastes that will remain, and what processes/disposal/ recycling will be used for this residue/ waste? What percent volume reduction (or addition) is achieved?	What is the nature and composition of any emissions? How are emissions Monitored, captured, tested, treated and ultimately disposed? What potential hazards to workers, other on-base personnel and nearby residents should be considered and how are they managed?	What is the highest throughout you have achieved you're your process? What is the reasonable maximum daily capacity/ throughput you believe you could achieve at Camp Minden? What is the reliability and maintenance requirements of your equipment? Is it subject to weather?
Vendor Contact Information Website or link to additional information						

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<p>Methods for Dissolution and Neutralization of Solid Nitrocellulose Propellants and Plasticized Military Munitions</p> <p>Patent #: US 8,865,961 B2</p> <p>MuniRem Environmental, LLC. 111 Riverbend Road, Ste 270, Athens, GA 30602 (706) 202 4296 vnzungung@munirem.com</p>	<p>MuniRem Environmental (MRE) developed an innovative method to dissolve the different sized propellants (single, double and composite base) followed by rapid neutralization at ambient temperature. The cellulose is transformed to glucose and mannose primarily, with smaller amounts of arabinose and xylose sugars. The nitro groups on nitrocellulose are transformed to nitrite and nitrate primarily. The solid residues consist of cellulose. The process is a wet chemistry process in which organic solvents (alcohol or ketone), water and a hydroxide are the main reagents.</p>	<p>MRE developed the technology at the bench scale using commercial smokeless powder and field (pilot) tested at Indiana AAP on military grade double base propellants. Subsequently, MRE developed Propellant Destruction Kits (PDKs) for Army HQ for use to neutralize small amounts of propellant recovered at a beach in Hawaii.</p>	<p>MRE's technology is easily implemented on-site at Camp Minden. It will involve constructing multiple reactors (reaction tanks) for use in dissolution and destruction of the M6. There will be a space requirement of about 2 acres for the set-up which will include a biological treatment of the produced wastewater in lined lagoons.</p>	<p>The M6 propellant will be degraded to form wastewater and cellulosic solid residues. The M6 mass will be reduced by >95% leaving <5% non energetic solid residue (cellulose). The solid residue may be disposed at a landfill or combusted. The wastewater will be treated by a biodegradation process similar to wastewater treatment plant. There is no time to develop a process to recover energy from the sugars that are produced as by-products of the M6 destruction.</p>	<p>Air scrubbers will be installed to capture and treat the gases (NOX, NH3 and VOCs) emitted from the reaction tanks. Since the approach is a wet chemistry process and is exothermic, there is a slight chance of a runaway reaction. The latter will be mitigated in the design by constructing jacketed reaction tanks for efficient heat exchange.</p> <p>Additionally, air quality will be monitored in the treatment facility and workers will wear protective clothing for additional safety.</p>	<p>The throughput is estimated at 34,000 lbs per day. Multiple reaction tanks will be constructed and operated in parallel simultaneously. There will be a need to shutdown and repair a reactor occasionally, while the rest of the reactors remain in operation. Weather will not limit the operations at the processing plant.</p>
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