



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 6
1445 ROSS AVENUE, SUITE 1200
DALLAS, TX 75202-2733

3/18/2015

MEMORANDUM

SUBJECT: Request for Approval of an Amended Time-Critical Removal for M6 and CBI Propellant at the Explo Systems, Inc. Site, Minden, Webster Parish, Louisiana

FROM: Ronnie Crossland, Associate Director *Ronnie D Crossland*
Prevention and Response Branch, Superfund Division (6SF)

TO: Carl E. Edlund, P.E., Director
Superfund Division (6SF)

1. PURPOSE

This memorandum requests approval for an amended Time-Critical Removal Action pursuant to the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), as amended, 42 U.S.C. §§9601 et seq., at the Explo Systems Inc. Site located near Minden, LA. The action includes the removal of all explosives and other hazardous materials stored on the Camp Minden Louisiana Military Department base. The conditions are rapidly deteriorating and the Time-Critical Removal Action, insofar as the M6 propellant and Clean Burning Igniter is concerned, needs to be initiated and completed as soon as possible.

On October 28, 2014, a Time Critical Removal Action Memorandum was signed that provided the basis for action by private companies (General Dynamics, Hercules, and ATK) to conduct removal actions for material that they owned and for the Louisiana Military Department to conduct Removal Actions on the M6 and CBI that they owned. Also on October 28, 2014, the United States Army (Army), the Louisiana Military Department (LMD), the Louisiana Department of Environmental Quality (LDEQ) and EPA Region 6 signed an Administrative Order on Consent (AOC) that includes payment for, and the conduct of removal response actions needed to dispose of 15-16 million pounds of M6 propellant and 320,000 pounds of Clean Burning Igniter (CBI).

This amendment documents new information regarding alternative methods to destroy the M6 and CBI onsite. This information was identified through a process that strongly involved members of the community, and the State of Louisiana. This amendment makes it possible to use technologies in addition to what was previously proposed for onsite destruction. This amended action memorandum does not modify the removal action selections governing the clean-up of explosives and materials by General Dynamics-OTS, Alliant Techsystems, Inc. and Hercules.

This action meets the criteria for initiating a removal action under the National Contingency Plan (NCP), 40 CFR §300.415.

II. SITE CONDITIONS AND BACKGROUND

CERCLIS NO: LAR000072223
Category of Removal: Time - Critical
Site ID: #A6GH
Latitude: 32.549683° N,
Longitude: - 93.411066° W

A. Site Description

1. Removal Site Evaluation

The Site is located on Camp Minden, formerly known as the Louisiana Army Ammunition Plant (LAAP). The LAAP was established in 1942 and its' primary function was to load, assemble, and pack munitions, and manufacture ammunition metal parts. Burning and demolition activities were also performed to destroy explosives and explosive wastes generated by manufacturing of munitions. The Camp Minden Property is now under the control of the Louisiana Military Department (LMD) and serves as a training base of the Louisiana Military Department and Louisiana National Guard. Explo Systems, Inc. leased a portion of Camp Minden from the State of Louisiana designated as "S-line." S-line occupies approximately 110 acres of the 14,995 acres of Camp Minden. The Site includes the areas of Camp Minden where Explo conducted operations and stored explosives; specifically, S-Line and the magazine storage areas designated as L-1, L-2, L-3, and L-4, which encompass approximately 216, 218, 276, and 57 acres, respectively.

LAAP was placed on the National Priorities List (NPL) on March 13, 1989, based on soil, surface water, and ground water contaminated with trinitrotoluene (TNT) and other explosives. Construction of all NPL remedies was completed September 30, 2010. The operation at Explo Systems is unrelated to the contamination that led to the NPL listing. The NPL designation occurred in 1989, prior to Explo's demilitarization contracts that generated the explosive materials currently located at Camp Minden.

On or about January 1, 2005, the United States Army (Army) transferred ownership of the LAAP to the State of Louisiana. The LMD was designated to accept the property on behalf of the State of Louisiana. The property was re-named Camp Minden, Louisiana. The LMD is authorized by the State of Louisiana to lease the State's real property at Camp Minden. The LMD entered into leasing agreements with Explo Systems, Inc. (Explo), which allowed Explo to use a portion of the property, certain magazines, and buildings to perform activities required under various demilitarization contracts between Explo and the Army and other private corporations.

Explo operated under several contracts with the Army (i.e., November 16, 2006 and March 24, 2010) or subcontract agreements with parties such as General Dynamics-OTS (i.e., August 28, 2008 and March 4, 2012) for the demilitarization or dismantling of munitions. One

process included the dismantling of 750 lb. and 2,000 lb. bombs and recovering the enclosed explosives, the metals found in the bombs, and other materials used for packing and transport of the weapons or charges. Explo also demilitarized 155mm Propelling Charges (D533 Charge, Propelling 155 M119A2/ammunition used in howitzers) under a direct contract with the Department of Defense. Demilitarization of the 155mm Propelling Charges is the origin of the M6 propellant improperly stored by Explo Systems. The improper storage of the M6 propellant and other explosive materials resulted in an explosion at the Site.

On 15 October 2012, a magazine containing approximately 124,190 lbs. of black powder and a tractor trailer containing 42,240 lbs of M6 propellant exploded. A magazine is an earth covered structure built to store ammunition and explosives. The explosion shattered windows in Minden, LA, 4 miles away and generated a 7,000-foot mushroom cloud. The explosion completely destroyed the magazine and trailer containing the material, damaged 11 railcars, and released unburned M6 propellant over ¼ mile from the site of the explosion requiring remediation. Explo contracted an explosives contractor to remediate the area and LMD and LSP provided oversight.

On 27 November 2012, the Louisiana State Police (LSP) executed a search warrant at the Explo Systems site and identified approximately 10 million lbs. of improperly and illegally stored M6 propellant and other explosives. M6 propellant was stored in 60 lb. paper boxes, 100-140 lb. paper drums/barrels, and 880 lb. super sacks throughout the buildings, hallways, and outside the facility where it was exposed to the elements (i.e. heat, wind, and rain). From November 2012 to May 2013, Explo Systems employees, under the direction of LSP, relocated approximately 10 million lbs. unsecured M6 propellant and other explosives into storage magazines at Camp Minden. (Approximately 5 million lbs. of M6 propellant was already stored within the storage magazines.)

Total estimated hazardous and/or explosive materials stored within the storage magazines and at the Explo Site at Camp Minden:

- 15-16 million lbs. of M6 propellant
- 320,000 lbs. of Clean Burning Igniter (CBI)
- 1.817 million lbs. of an aluminum/TNT mixture, from processed Tritonal
- 661,000 lbs. of Nitrocellulose
- 128 lbs. of black powder
- 200 lbs. of Composition H6
- Four 50-gallon drums of ammonium perchlorate
- Two 50-gallon drums and 3-50 lb. boxes of Explosive D (ammonium picrate)
- 109,000 lbs. of M30 propellant
- Small volume of Red Water (water contaminated with TNT)
- Effluent associated with the Super Critical Water Oxidation Unit (SCWO)

The inventory listed above was initially provided to the LMD by Explo Systems, Inc.,

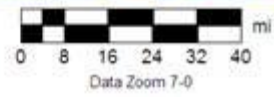
and later modified by a representative from the U.S. Army Technical Center for Explosives Safety (USATCES) during Technical Assistance Visits (TAV) performed at the Explo Site, and documented by April 18, 2013, and June 20, 2013, Reports. Overall, approximately 18,000,000 pounds of M6 propellant and other explosives were stored within 97 magazines (currently 92) at Camp Minden that required removal and disposal. While magazines are the safest place to store the explosives, the magazines are not in good condition. The magazines are deteriorating which increases the risk of an explosion. Currently, extensive and intrusive vegetation on the tops and sides of the magazines is impacting the structural integrity of the magazines allowing the intrusion of moisture into the magazines.

2. Physical Location

The Site encompasses S-Line, located at 1600 Java Road, Minden, LA 71055-7924, and the magazine storage areas L-1, L-2, L-3, and L-4 within the boundaries of Camp Minden. The site encompasses approximately 877 acres. On Camp Minden, there are two other companies with operations similar to Explo Systems. Java Road is the northern boundary of the Explo Systems lease. The remaining areas that border the Explo facility consist of undeveloped forested land. The town of Doyline, with an estimated population of 800 people, is located less than 4,000 feet south of the Explo facility. A railroad switching and storage yard is approximately 500 feet to the northwest of the Site. Paved roads and tank trails traverse Camp Minden. While Camp Minden is fenced and patrolled by on-duty National Guardsmen, deer hunting is allowed by permit on the base. The Louisiana Military Department Youth Challenge Program (school) and the Webster Parish Prison are also located on Camp Minden. Should a magazine of explosives detonate, the level of potential risk to the facilities, activities, and personnel at Camp Minden is dependent upon the location of the specific magazine and the exact proximity of the population or facility at the time of the explosion.



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3. Site Characteristics

The facility at Camp Minden that Explo leased from LMD is called S-Line and like most of the buildings at Camp Minden, it was built in the 1940s. The various buildings within S-line were designed for various manufacturing processes, labs, and loading areas. The buildings were separated with the intent of separating explosives process areas from each other and ultimately controlling the propagation of an explosion. Long enclosed hallways connect the individual buildings allowing the movement of the hazardous and/or explosive materials to remain indoors. Several of the buildings are protected by engineered berms designed to mitigate and stop the propagation of a potential explosion. S-Line was designed for explosives manufacturing and utilized by Explo for demilitarization and processing of explosive materials. Storage of explosives at S-Line, other than material currently in process, violated State and Federal Statute.

The processing equipment at S-Line consists of an aluminum crushing line, two sets of bomb demilitarization equipment (for 750 lb. and 2,000 lb. bombs), a melt-pour to extract the TNT from the demilitarized bombs, and a heating process for extracting TNT from Red Water.

During the action overseen by the Louisiana State Police, Explo moved the unsecured explosives (discovered on November 27, 2012) to explosive storage magazines. Explosives from Explo occupied 97 magazines at Camp Minden, currently 92 magazines. The magazines storing the explosives are located in explosive storage areas known as L-1, L-2, L-3, and L-4. Three configurations of explosives magazines exist at Camp Minden. Each magazine holds a maximum of 125,000 lbs. or 300,000 lbs. of explosives, depending on the configuration of the magazine, the type of packaging, and type of explosives stored within each magazine. The magazines are deteriorating which increases the risk of an explosion. Currently, extensive and intrusive vegetation on the tops and sides of the magazines is impacting the structural integrity of the magazines allowing the intrusion of moisture into the magazines.



Explo Systems, Inc.,
S-Line, Camp Minden



Magazine Area

4. Releases or Threatened Release into the Environment of a Hazardous Substance, Pollutant or Contaminant

Approximately 18,000,000 pounds of explosives were abandoned by Explo at the Site. The types of explosive materials include: M6 propellant, clean burning igniter (CBI), Tritonal, M30 propellant, H6, nitrocellulose, ammonium picrate, and black powder. Each of the explosive materials stored at the Site are classified as toxic through dermal absorption, ingestion, and inhalation.

The M6 propellant is a mixture of nitrocellulose, dinitrotoluene, dibutylphthalate, and diphenylamine. This mixture, primarily due to the nitrocellulose is extremely reactive and is characteristic hazardous waste, D003, as defined by 40 CFR §261.23. Dinitrotoluene and dibutylphthalate are listed hazardous substances under 40 CFR §302.4. Dinitrotoluene is also a characteristic hazardous waste, D030, under 40 CFR §261.24. According to 40 CFR §261.21, the characteristic of ignitability is defined as, "Ignitable wastes can create fires under certain conditions, are spontaneously combustible, or have a flash point less than 60 °C (140 °F)" Nitrocellulose has a flash point of 12 °C (53 °F). Nitrocellulose alone or in the mixture of M6 propellant can auto-ignite or spontaneously combust, also defined under the characteristic of ignitability. The diphenylamine is a stabilizer. Characteristic hazardous waste are hazardous substances under CERCLA Section 101(14), 42 U.S.C. § 9601(14).

The CBI is a mixture of nitrocellulose and diphenylamine. CBI does not contain dinitrotoluene. This mixture, primarily due to the nitrocellulose is extremely reactive and is characteristic hazardous waste, D003, as defined by 40 CFR §261.23. Dibutylphthalate is a listed hazardous substances under 40 CFR §302.4. According to 40 CFR §261.21, the characteristic of ignitability is defined as, “Ignitable wastes can create fires under certain conditions, are spontaneously combustible, or have a flash point less than 60 °C (140 °F)” Nitrocellulose has a flash point of 12 °C (53 °F). Nitrocellulose alone or in the mixture of CBI propellant can auto-ignite or spontaneously combust, also defined under the characteristic of ignitability. The diphenylamine is a stabilizer. Characteristic hazardous waste are hazardous substances under CERCLA Section 101(14), 42 U.S.C. § 9601(14).

Reactivity or exhibiting reactive characteristics is defined in 40 CFR §261.23 as “unstable under "normal" conditions. Reactive materials can cause explosions, toxic fumes, gases, or vapors when heated, compressed, or mixed with water.” M6 propellant and CBI are “unstable under ‘normal conditions.’” Specifically, M6 propellant and CBI can auto-ignite or combust spontaneously due to their inherent chemical properties.

Hazardous substances are designated in Section 101(14) of CERCLA, 42 U.S.C. §9601(14) and 40 CFR §302.4.

5. NPL Status

LAAP was placed on the National Priorities List (NPL) on March 13, 1989, based on soil, surface water, and ground water contaminated with trinitrotoluene (TNT) and other explosives. Construction of all NPL remedies was completed September 30, 2010. The operation at Explo Systems is unrelated to the contamination that led to the NPL listing.

An Assessment to determine if the Explo Systems Inc. Site qualifies for the NPL or if the Site poses a threat to ongoing NPL site remediation activities is still underway.

6. Maps, Pictures and Other Graphic Representations

Attachment 1 Enforcement Attachment

Attachment 2 Material Safety Data Sheet for M6 Propellant.

Attachment 3 Material Safety Data Sheet for Clean Burning Igniter (CBI)

Attachment 4 Military Explosives, Department of the Army Technical Manual.

Attachment 5 Handbook on the Management of Munitions Response Actions, EPA OSWER, Interim Final.

Attachment 6 Ammunition Handbook: Tactics, Techniques, and Procedures for Munitions Handlers, Department of the Army.

Attachment 7 Prediction of Safe Life of Propellants, Picatinny Arsenal.

Attachment 8 Propellant Management Guide, U.S. Army Defense Ammunition Center.

Attachment 9 LMD Request for Assistance from DOD and Response to Request.

Attachment 10 Explosive Safety Board reports to LMD – April & June 2013

Attachment 11 Explosive Safety Board report to LMD December 2015
Attachment 12 Explosive Safety Board report to EPA March, 2015
Attachment 13 LSP and LMD Incident Report – October 2012 Explosion
Attachment 14 Site Photographs
Attachment 15 Inventory of Camp Minden Explosive Storage Magazines – Explo Explosives

B. Other Actions to Date

1. Previous Actions

On 15 October 2012, a magazine containing approximately 124,190 lbs. of black powder and a tractor trailer containing 42,240 lbs of M6 propellant exploded. The explosion shattered windows in Minden, LA, 4 miles away and generated a 7,000-foot mushroom cloud. The explosion completely destroyed the magazine and trailer containing the material, damaged 11 railcars, and released unburned M6 propellant over ¼ mile from the site of the explosion requiring remediation. Explo contracted an explosives contractor to remediate the area and LMD and LSP provided oversight.

On 27 November 2012, LSP executed a search warrant at the Explo Systems site. LSP identified approximately 10 million lbs. of improperly and illegally stored M6 Propellant and other explosives throughout the buildings, hallways, and outside the Explo facility that were exposed to the elements (i.e. heat, wind, and rain).

From 28 November – 20 May 2013, LSP and Explo employees relocated the previously unsecured M6 Propellant (approximately 10 million lbs.) and other explosive materials within the magazines at Camp Minden. From 30 November – 7 December 2012, the town of Doyline, LA (approximately 400 homes) was evacuated during operational hours. Also, the Youth Challenge Program (school) at Camp Minden was evacuated as well as all non-essential personnel and operations at Camp Minden while the volume of unsecured M6 propellant required a minimum of a 4,000-foot safe distance, due to risk of explosion. The Webster Parish Prison at Camp Minden conducted shelter-in-place while operations to secure the explosives occurred.

While materials were being moved into the magazines, on February 5, 2013, the LMD Adjutant General formally requested assistance with the transportation and storage of the explosives associated with Explo Systems from the Secretary of Defense. That request was denied by the Secretary of the Army on May 12, 2013, citing the prohibitions for the storage, treatment, or disposal of any hazardous materials not owned by DoD in 10 USC§ 2692.

On April 2-3, 2013, at the request of the LMD, a team from the USATCES, led by the Army's Military Representative to the DoD Explosives Safety Board (DDESB) conducted a safety assessment of the hazards associated with the M6 propellant at EXPLO Systems, Incorporated at Camp Minden, LA. During May 7 to 9, 2013, the team from the USATCES and the DDESB conducted another Technical Assistance Visit (TAV), at the request of the LMD and LSP, to evaluate the explosive hazards associated with Explo Systems, including the Explo facility at "S-Line" and the storage magazines at Camp Minden. The reports generated by the

team from USATCES/DDESB included concerns about the stability of the M6 propellant due to loss of lot integrity, improper storage conditions, and lack of a stability monitoring program. The USATCES/DDESB team recommended the disposal of the propellant and other explosives by open burn/open detonation (OBOD) at Camp Minden. During a meeting on August 1, 2013, the TAV, DoD representative indicated the likelihood of a magazine explosion increases within the next 2-10 years due to instability concerns (e.g., the stability of the explosives cannot be guaranteed due to the loss of lot integrity and identity, improper storage exposing propellant to heat and moisture) associated with the explosives at the Site. Conditions in the magazines are deteriorating faster than expected which increases the risk of explosion.

On 5 August, 2013 the Bureau of Alcohol, Tobacco, Firearms, and Explosives (ATF) revoked Explo Systems, Inc. explosives licenses as a result of the indictments of Explo's management and employees by the State of Louisiana. Without a valid explosives license, Explo Systems was restricted from the control of explosives, thus impeding the handling, shipping, possessing or otherwise dealing with explosives 18 U.S.C. § 842(i).

On August 12, 2013, Explo filed for Chapter 11 Bankruptcy and the proceedings for the reorganization of the company, and reconciliation of debts is proceeding. However, on September 30, 2013, ownership of the estimated 18 million lbs. of explosives was transferred to the LMD in Bankruptcy court proceedings.

On January 30, 2014, an Administrative Settlement Agreement and Order on Consent for Removal Action (AOC) between EPA Region 6 and General Dynamics/Alliant Techsystems (ATK) went into effect. The AOC included an agreement for General Dynamics/ATK to remove and dispose of the following hazardous/explosive substances at Camp Minden:

- 200 lbs. of Composition H6
- 109, 000 lbs of M30 propellant
- All nitrocellulose in containers identified as being shipped by ATK or at ATK's direction from any ATK facility to the Site
- All Pit Powder in containers identified as being shipped by St. Mark's Powder or at St. Mark's Powder's direction from any St. Mark's Powder facility to the Site
- 1.817-2.2 million lbs. of tritonal mixed with tar/aluminum and TNT mixture and 133,836 pounds of "tritonal and tar mixture."

On March 18, 2014, EPA issued a Unilateral Administrative Order (UAO) under RCRA 7003 to the Department of the Army/DoD requiring the Army to perform a removal action on the 15-16 million lbs. of M6 propellant stored at Camp Minden.

On June 3, 2014, LDEQ issued a RCRA Order to the Army to compel them to take the necessary action at the Site.

EPA re-commenced negotiations with the Army, LMD and LDEQ on July 9, 2014. Previous attempts to negotiate an AOC with the parties were not successful. On October, 28,

2014, an AOC was agreed to and finalized by EPA, the Army, LMD and LDEQ.

On November 13, 2014, a public meeting was held in Minden. Residents and local elected officials voiced their concern about the manner in which onsite destruction was described. On December 3, the ESB conducted another Technical Assistance Visit and participated in a bench scale burn of the M6. The ESB TAV report from that visit contains recommendations for the priority of treatment or disposal of the various containers. The ESB recommended addressing the 880-pound supersacks first. The ESB stressed that the lack of a stability monitoring program could not predict the amount of time remaining for the safe handling of the M6 and CBI. They also cautioned about the aggressive proposed schedule. The ESB previously stated that the stability of the propellants could not be known after August 2015. That date of August 2015 was the initial target date to have all the M6 and CBI destroyed.

Louisiana Military Department (LMD) solicited bids from contractors to conduct onsite destruction at the Site. That solicitation began on December 8, 2014. The decision to conduct onsite destruction was included in the negotiated AOC from October 28, 2014.

On December 16, 2014, another public meeting was held in Minden. Local Residents and other interested parties opposed the manner in which onsite destruction was described. Specifically, there was concern about the amount of dinitrotoluene remaining in the emissions. Although the air dispersion model, OBODM, predicted a result of 0.000014% of the Louisiana ambient air quality standards, the discussion focused on the threat from the dinitrotoluene.

On January 14, 2015, the State of Louisiana sent a letter to EPA regarding the procedure that led to the selection of onsite destruction (controlled open burning). On January 15, 2015, EPA responded to the State of Louisiana letter and stated the AOC would be suspended 90 days to allow the State additional time to assess alternative technologies for onsite destruction. On January 29, 2015, Louisiana Military Department and LDEQ agreed that additional public input should be sought. Therefore, additional public participation (Dialogue Committee) was initiated. From February through March 2015, this public participation process identified and considered a wide range of alternative clean-up technologies. The public participation involved discussing operational information, availability, applicability, and other factors regarding destruction methods.

2. Current Actions

Approximately 15.6 million pounds of M6 and 320,000 pounds of CBI are currently secured within 92 explosive storage magazines at Camp Minden and are currently owned by the LMD. A stability monitoring program is not in place for the explosives stored at Camp Minden due to the safety risk of handling the potentially unstable explosives. The deterioration of the stability of the explosives continually increases the risk of auto-detonation of the explosives and a magazine explosion similar to that of October 2012.

The Dialogue Committee Facilitators submitted a report to EPA on March 12, 2015. The State is expected to consider the information as they complete the procurement of the contractor

to handle the onsite destruction of the M6 and CBI.

LMD continues to monitor the magazines to look for abnormalities that could cause concern. An additional TAV visit by the DDESB was conducted on March 9 – 11, 2015, to assess certain containers that have been damaged by moisture in the magazines.

C. State and Local Authorities' Roles

1. State and Local Actions to Date

From November 27, 2012 – May 20, 2013, LSP was the lead for directing and overseeing the relocation of unsecured explosives to the magazines by Explo employees. Based on the recommendation of the USATCES/DDESB team, the LSP disposed of approximately 16,000 lbs. of M6 propellant by open burning. The recommendation for emergency disposal was based on stability concerns of that Lot of propellant. On June 18, 2013, LSP arrested Explo Systems' managers/employees who were indicted by the Webster Parish Grand Jury for reckless handling of explosives, failure to properly mark explosives, unlawful storage of explosives, failure to obtain magazine license, failure to keep a proper inventory of explosives, and conspiracy on all counts. After the arrest and indictment of Explo Systems' employees, their explosive handling licenses with the State of Louisiana were revoked. LSP continues to support site activities in a safety and regulatory oversight role, when requested.

On February 5, 2013, the LMD Adjutant General formally requested assistance with the transportation and storage of the explosives associated with Explo Systems from the Secretary of Defense. That request was denied by the Secretary of the Army on May 12, 2013, citing the prohibitions for the storage, treatment, or disposal of any hazardous materials not owned by DoD in 10 USC§ 2692. The Army did offer the continued technical assistance of the DoD Explosives Safety Board and the U.S. Army Technical Center for Explosives Safety. On September 6, 2013, the State of Louisiana declared a State of Emergency at Camp Minden. Subsequent emergency declarations have been issued by the Louisiana State Governor's Office, maintaining the emergency declaration through March 2014. The LMD obtained ownership of the 18 million lbs. of explosives through Bankruptcy proceedings and requested funding from the National Guard Bureau to dispose of the explosives on September 12, 2013. The request for funding was denied. On October 29, 2013, the LMD submitted a Defense Support to Civilian Authorities (DSCA) Request to the DOD/U.S. Army for assistance with the removal and disposal of the explosives at Camp Minden from the Secretary of Defense. On December 10, 2013, the Secretary of the Army responded by denying the DSCA request made by LMD.

On June 3, 2014, The Louisiana Department of Environmental Quality (LDEQ) issued an Administrative Order to the Department of the Army requiring the Army to comply with the RCRA 7003 UAO issued by the EPA on March 18, 2014. The LDEQ continues to coordinate with EPA's RCRA and Superfund program.

On June 5, 2014, the LSP, in coordination with the LMD, conducted a training exercise which consumed the 128 lbs. of black powder previously owned by Explo Systems and listed on the inventory provided by the ESB.

On August 18 – 22, 2014, a contractor for LMD disposed of three 50 lb. boxes of ammonium picrate, 56 – 50 lb. buckets of TNT contaminated sludge (2,800 lbs.), and 35- 30 gallon drums of Red Water (1,050 gallons). The 2,800 lbs. of TNT contaminated sludge and the 1,050 gallons of Red Water completed the removal of the Red Water listed on the inventory provided by the ESB. LMD's contractor disposed of the materials onsite through open burning. All residue and packaging from the burning was analyzed and will be disposed of at an appropriately permitted facility. All operations were conducted in coordination with LDEQ, LSP, and EPA. A final report of the operations is pending.

General Atomics, the prime contractor to DoD, who subcontracted Explo for the testing and operation of the SCWO at Camp Minden continues to negotiate with LMD and LDEQ for the removal of the SCWO equipment and associated effluent and chemicals. The remaining four 50-gallon drums of ammonium perchlorate (solution) and two 50-gallon drums of ammonium picrate (solution) were utilized in the SCWO process by Explo and are included in the negotiations for decontamination and removal of SCWO equipment and associated chemicals. LMD and LDEQ received a draft Work Plan from General Atomics on September 5, 2014, and will coordinate with EPA as negotiations proceed.

2. Potential for Continued State/Local Response

On July 9, 2014, negotiations among the parties re-commenced with the goal of entering into an AOC for the disposal of the M6 and CBI. The October 28, 2014, AOC was signed by the Army, LMD, LDEQ, and EPA. The United States, on behalf of the Army, will pay for 100% of the costs to destroy the M6 propellant and CBI. The LMD agreed to perform the removal work needed to destroy the M6 propellant and CBI and dispose of the small quantities of other explosives and chemical wastes not addressed by the other two AOCs.

On June 3, 2014, The Louisiana Department of Environmental Quality (LDEQ) issued an Administrative Order to the Department of the Army requiring the Army to comply with the RCRA 7003 UAO issued by the EPA on March 18, 2014. The LDEQ continues to coordinate with EPA's RCRA and Superfund program. EPA withdrew its RCRA 7003 Order against the Army, and LDEQ also agreed to withdraw its State Order against the Army, in accordance with the terms of the October 28, 2014, AOC signed by the parties.

III. THREATS TO PUBLIC HEALTH OR WELFARE OR THE ENVIRONMENT, AND STATUTORY AND REGULATORY AUTHORITIES

A. Threats to Public Health or Welfare

The current conditions at the Site meet the following factors which indicate that the Site is a threat to the public health, welfare and the environment and a removal action is appropriate under Section 300.415(b)(2) of the National Contingency Plan. Any or all of these factors may be present at the Site yet any one of these factors may determine the appropriateness of a removal action.

1. Weather Conditions that May Cause Hazardous Substances or Pollutants or Contaminants to Migrate or be Released. NCP Section 300.415(b)(2)(v)

Camp Minden consists of 14,995 acres of pine forest, including extensive overgrowth around and on the earthen covering of the magazines. The area is suffering from severe drought conditions, yet recent rains have encouraged grass growth. Thirty-two grass fires occurred on Camp Minden during 2012 that required the base's fire brigade to respond. Large pine trees and/or heavy vegetation are growing on the tops and sides of the bunkers. A lightning strike has the potential to ignite the dense vegetation and threaten one or more of the magazines. A burning cinder or spark from a nearby fire could be sufficient to ignite the explosives if it were introduced into the magazine. Also, any explosives in transport from any magazine have the potential to ignite if exposed to a lightning strike or fire in the vicinity. The impacts of the explosion of one magazine in October 2012 extended up to 4-miles from Camp Minden. Although the magazines are designed to limit the propagation of explosions, an explosion of one magazine will be felt at least 4-miles away, and the explosion of multiple magazines could affect populations beyond a 4-mile radius.

Large pine trees and/or heavy vegetation are growing on the tops and sides of the magazines. The roots from the trees and/or vegetation may have breached the concrete ceiling and walls of the magazine, and thereby compromised the structural integrity of the magazines. Compromised magazines may not function and perform as originally designed and intended. Recent observations during Site visits show that some of the magazines are exposing the explosives to excess moisture, and humidity. Compromised magazines could introduce not only excess moisture and humidity, but also heat if a fire burned the vegetation on-top or surrounding the magazines. This introduction of heat could ignite the explosives stored within the magazines. Site observations also show that these conditions are accelerating the degradation of the storage containers within the magazines.

A magazine explosion due to auto-ignition of the M6 propellant, and other explosives or ignition sources is predicted to result in damage similar to or more catastrophic than the October 2012 explosion. On October 15, 2012, the explosion of one storage magazine and a tractor trailer containing black powder and M6 propellant at the Site shattered windows in Minden, LA (approximately 4 miles northeast), and generated a 7,000-foot mushroom cloud. The explosion resulted in the complete destruction of the storage magazine containing the material, the tractor trailer parked outside the magazine, damage to 11 railcars, and the release of unconsumed M6 propellant over ¼ mile from the site of the explosion. Based upon the recommendation provided in the DoD ESB April 18, 2013, Report, a specific lot of approximately 16,000 lbs. of M6 propellant identified as unstable, was destroyed (i.e., via open burning) by the LSP.

2. Threat of Fire or Explosion. NCP Section 300.415(b)(2)(vi)

The primary threat from the M6 and CBI stored in the magazines at Camp Minden is the explosion potential. Blast/explosion models created by the USATCES/DDESB Team showed that the town of Doyline, Youth Challenge Program School, Webster Parish Prison, and Command Center for LANG at Camp Minden were within the danger zone where property damage, injury, and potential casualties were expected from the unsecured explosives at the Explo Site. The relocation of the M6 propellant into magazines mitigated the impact from a large chain-reaction explosion, but did not eliminate the threat as the explosion of a storage magazine has impacted the surrounding population, property, and environment.

The M6 and CBI processed by Explo Systems is comprised of mostly of nitrocellulose, which is subject to degradation with aging, the end result being spontaneous combustion. Chemical ingredients known as stabilizers are added to the M6 and CBI to prevent self-ignition. The stabilizers degrade or deteriorate over time and exposure to heat accelerates the degradation or deterioration of the stabilizers. For these reasons, the Army mandates a propellant stability monitoring program for propellants it owns or stores to periodically test this and similar types of propellant stability.

The USATCES/DDESB report dated April 18, 2013, stated that “the preponderance of evidence indicates that the probability of an explosives event directly related to the long-term storage of M6 propellant at Minden is likely... These factors, combined with nitro-cellulose's (sic) ability to auto-ignite, increase the probability of a detonation within a storage structure at Camp Minden.” Based on these concerns, the USATCES/DDESB Report recommended that the M6 propellant stored in the magazines undergo disposal or consumption rather than long-term storage due to stability concerns.

The second USATCES/DDESB report (dated June 13, 2013) stated that, “Low stability content can result in auto-ignition of propellant in storage, causing a detonation. At Camp Minden, Explo's operations appear to have resulted in the loss of lot identity for the M6 propellant that Explo has in storage. Explo's packaging configurations (e.g., incorrect lot markings on containers and outer-packs, multiple markings); storage procedures, which exposed some of the packaged propellant to the environment; and packaging process, which may have mixed lots led the technical assistance visit team to conclude that lot identity was, at a minimum, questionable. Explo did not have an adequate propellant stability monitoring program in place. Although the transfer of M6 propellant to earth covered storage has reduced the risk to public safety, an explosive event (i.e., a detonation) from auto-ignition is very possible without a propellant stability monitoring program in place to track the propellant's stabilizer content and address potentially unstable propellant.”

As stated in the U.S. Army publication titled *Prediction of Safe Life of Propellants*, “...artillery propellants are subject to degradation with aging, the end result being spontaneous ignition.” As propellant ages, the stabilizers in the propellants decrease. According to The U.S. Army Defense Ammunition Center's *Propellant Management Guide*, “Stabilizers are chemical

ingredients added to propellant to prevent auto-ignition during the propellant's expected useful life." Exposure to heat accelerates the decrease of stabilizer. The improper storage practices of the M6 propellant at the Explo Site exposed the propellant to heat and weathering that increased the reduction of stabilizer in the material. According to the *Propellant Management Guide*, "nitrate ester-based propellants (principally nitrocellulose-based ones) have the propensity to self-ignite (auto-ignite) without warning while in static storage; catastrophic losses can result," with low percentage of stabilizer.

The stability monitoring program employed by Explo was inadequate according to the USATCES/DDESB Reports. Due to the mixing of the "Lots" assigned to the M6 propellant by Explo Systems, Inc., per the U.S Army's Propellant Monitoring Program detailed in the *Propellant Management Guide*, Explo cannot adequately predict the degradation of the propellant by Lot Number. The *Prediction of Safe Life of Propellants* states that, "the measurement of residual stabilizer content offers the best means of establishing the stability potential of these materials." The USATCES/DDESB team recommended reinstatement of a Propellant Stability Program of the M6 Propellant to predict stability issues within the 15 million lbs. of M6 propellant stored at Camp Minden. The stability cannot be guaranteed unless the explosives are tested.

Due to the need to secure the explosives within magazines in order to reduce the explosive potential and risk to the public, the LSP and Explo Systems stored the maximum capacity of M6 propellant and other explosives within the magazines at Camp Minden. Magazine space was limited, thus requiring the co-location of different explosives, stacking of pallets of explosives on top of each other, and allowing for little to no aisle or space to access the explosives within the magazines. The majority of the magazines contain multiple types of explosives co-located within each magazine. Although the explosives are stored in separate containers, they are not segregated in separate magazines. This increases the amount of handling and risk of detonation due to the movement of explosives to gain access to other explosive types.

In addition to the concerns associated with the stability of the M6 propellant, the storage conditions of the explosives also contribute to the potential for another explosion. Within the magazines, the M6 propellant and other explosives are stored in cardboard boxes and drums on pallets that are stacked 3-5 pallets high in many cases. The added weight of stacked pallets increases the pressure or compression on the explosives increasing the risk of auto-ignition or detonation. Also, some of the packaging which is bearing the weight of pallets of explosives stacked on top of each other is in poor condition and is prone to releasing the explosives contained inside.

Large pine trees and/or heavy vegetation are growing on the tops and sides of the bunkers. The pine trees' roots could breach the concrete ceiling and walls of the magazine, thus compromising the structural integrity of the magazine, and preventing the magazine from performing as intended. Compromised magazine integrity due to tree roots could introduce moisture as well as heat if a fire burned the vegetation on-top or surrounding the magazine. This introduction of heat could ignite the explosives stored within the magazine. A magazine explosion due to auto-ignition of the M6 propellant or other ignition source is predicted to result

in similar damage to the October 2012 explosion. However, if the magazine is structurally damaged, propagation of explosions to other magazines and/or greater damage due to uncontrolled explosive force could occur.

IV. ENDANGERMENT DETERMINATION

Actual or threatened releases of hazardous substances, pollutants or contaminants from this Site, if not addressed by implementing the response action selected in this Action Memorandum, will present an imminent and substantial endangerment to the public health, welfare, or the environment. The magazine that exploded in October 2012 caused shattered windows in Minden, LA, 4 miles away. The explosion completely destroyed the magazine, damaged 11 rail cars, and released unburned M6 propellant over ¼ mile from the site of the explosion.

The likelihood of an explosion within one or more of the magazines increases each day. The response action needed to address the explosives is estimated to take a minimum of 12 months. As such, the M6 propellant and other explosives disposition process must commence immediately. The damage may be catastrophic should these materials auto-ignite. The DoD Explosives Safety Board stated the likelihood of an explosion increases greatly within a time-frame as short as two years from August 1, 2013.

The primary threat from the explosive materials stored in the magazines at Camp Minden is the explosion potential. Blast/explosion models created by the DoD ESB Team showed that the town of Doyline, the Youth Challenge Program School, the Webster Parish Prison, and Command Center for LANG at Camp Minden were within the danger zone where property damage, injury, and potential casualties were expected from the unsecured explosives at the Explo Site. The relocation of the M6 propellant into magazines mitigated the impact from a large chain-reaction explosion, but did not eliminate the threat to surrounding the population, property, and environment.

V. PROPOSED ACTIONS

A. Proposed actions

1. Proposed Action Description

The February 23, 2015, Army TAV report cautioned against unnecessary handling and recommended only handling the propellant once. Therefore, the selected response action for this site is onsite destruction of the M6 and CBI. The October 28, 2014, Action Memorandum proposed onsite destruction as the response action for the disposal of the M6 and CBI. Onsite destruction was identified as an appropriate method of disposal for the unstable M6 and CBI because: it was a technology that could be implemented in a short time frame to address the urgent situation at Camp Minden, an evaluation of other technologies did not identify sufficient capacity to address the material in a short time frame, and onsite destruction could be implemented and meet environmental requirements.

When the concept of onsite destruction by controlled open burning was announced, it was strongly opposed by many residents, interest groups and elected officials. On January 14, 2015 the Louisiana National Guard and the Louisiana Department of Environmental Quality wrote to EPA that they had not been provided the opportunity to select alternative disposal technologies or review the selection process. On January 15, 2015, EPA announced a 90 day period for the examination of alternative remedies. EPA initiated additional public participation (Dialogue Committee). EPA and the U.S. Army participated as ex-officio. The work of this group was to bring individual views to EPA but not to function as a FACA. Between February 10, 2015, and March 11, 2015, the participants reviewed a wide range of alternative clean-up technologies. The group evaluated some two dozen potential onsite destruction technologies. At the end of the dialogue, discussions by the community members centered on a half dozen potential technologies; however, none of the possible technologies were rejected by the participants and the participants agreed that each had benefits as well as drawbacks.

On February 23, 2015, the Army issued its report from a Technical Assistance Visit (TAV) to Camp Minden. In this report, the Army stated that the “TAV team cautioned against the aggressive nature of the proposed schedule for the destruction of M6 propellant.”

Based the identification of new technologies, vendors of different technologies providing updated information on availability and timing, along with the TAV Team’s concern with the aggressiveness of the proposed schedule, EPA recognizes the possibility that one or more alternative disposal methods might be utilized to safely and rapidly dispose of the M6 and CBI stored at Camp Minden. Due to the impending risk of explosion, any unnecessary handling, repackaging, shipping, or processing is not recommended. When evaluating a potential contractor, the Louisiana National Guard should consider the attributes for a successful approach identified in the March 13, 2013 “Dialogue Committee Facilitators’ Report” to the extent it is consistent with state procurement requirements. The destruction of propellant must be started and completed as soon as possible. Upon submission of the removal work plan by the Louisiana

National Guard, EPA will evaluate and approve the plan to achieve onsite destruction of the M6 and CBI.

This Removal Action also includes development of Contingency Plans, Health and Safety Plans, Community Involvement Plans and environmental oversight of the disposition method that includes air monitoring and sampling in proximity to the operations, at the perimeter, and within the surrounding communities. Samples of soil and groundwater will be taken before and after the operations. Any contamination will be removed. The treatment area will be restored.

2. Contribution to Remedial Performance

A remedial action is not planned for the Site at this time; however any remedial action that occurs will be consistent with the ongoing NPL clean-up at the Site. If any remedial action should occur the proposed removal action is consistent with the remedial action as it removes the source of the contamination.

3. Description of Alternative Technologies

The following onsite destruction technologies were highlighted based upon the discussions of the Dialogue Committee and may be evaluated as an alternative to onsite destruction by controlled open burning and any other applicable technologies to achieve the onsite destruction of the M6 and CBI. All of these approaches are also amenable to the installation of emission and/or effluent controls:

- Contained Burning with Pollution Controls
- Hydrolysis with treatment/disposal of effluent and solid wastes
- Microwave Reactor
- Rotary Kiln
- Supercritical Water Oxidation Units and
- Tunnel Furnaces

4. Applicable or Relevant and Appropriate Requirements (ARAR)

This removal action will be conducted to eliminate the actual or potential release of hazardous substances, pollutants, or contaminants to the environment, pursuant to CERCLA, 42 U.S.C. §9601 *et seq.*, and in a manner consistent with the National Contingency Plan (NCP), 40 CFR Part 300, as required at 33 U.S.C. §1321(c)(2) and 42 U.S.C. §9605. Pursuant to 40 CFR Part 300.415(j), fund-financed removal actions under CERCLA §104 and removal actions pursuant to CERCLA §106 shall, to the extent practicable considering the exigencies of the situation, attain the applicable or relevant and appropriate requirements under Federal and State environmental laws. The substantive provisions in site-specific ARARs for this site include: 40 C.F.R. Part 264, Subpart X operations, maintenance, monitoring, performance, closure and post-closure requirements; 40 C.F.R. Part 264 Subpart EE storage, and 40 C.F.R. § 265.382 Open Burn procedures and location requirements. To-be-considered (TBC) guidance includes:

explosives storage handling, and disposal procedures listed in *Military Explosives*, Department of the Army Technical Manual, *Handbook on the Management of Munitions Response Actions*; EPA OSWER, *Interim Final*; *Ammunition Handbook: Tactics, Techniques, and Procedures for Munitions Handlers*; Department of the Army, *Prediction of Safe Life of Propellants*, Picatinny Arsenal; *Reports of Explosives Safety Assistance Visits (March and April 2013)*, Department of the Army Explosives Safety Board; and the Louisiana Administrative Code, Title 55, Part I, Chapter 15 – Explosives Code.

Should the response action generate hazardous waste residues requiring off-site disposal, the RCRA waste analysis requirements found at 40 C.F.R. §§ 261.20 and 261.30; the RCRA manifesting requirements found at 40 C.F.R. §§ 262.20; and the RCRA packaging and labeling requirements found at 40 C.F.R. §§ 262.30, may be appropriate for this action. All off-site transportation of hazardous waste will be performed in conformity with RCRA and U.S. Department of Transportation requirements. See generally 40 C.F.R. Part 263. All hazardous substances removed for off-site disposal shall be disposed at a facility in compliance with environmental laws and regulations, as determined by EPA, under 40 C.F.R. §§ 300.440.

Depending on the technology chosen, substantive provisions found in the following regulations may apply:

- a) Standards for Incinerators at 40 CFR 264, Subpart O;
- b) Land Disposal Restrictions under 40 CFR Part 268; and
- c) National Pollutant Discharge Elimination System (NPDES) standards under 40 CFR Section 122.

5. Project Schedule

The action includes the removal of M6 and CBI stored on the Camp Minden. The placement of the contract should be finalized quickly and information sent to the EPA OSC for consent.

It is estimated that it will take several months for the contractor to mobilize and set up before operations are underway. After the concern for public safety, the time needed to complete the disposal of the M6 and CBI is a critical factor. Care should be taken for materials handling and worker safety. It is anticipated that the duration of action will be one year with the possibility of two years.

VII. EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN

The stabilizers in the explosives will continue to degrade. The explosives will become more and more unstable and the likelihood of auto-ignition will increase. In addition, the instability will also increase the chances of chain reactions. It will be more likely that explosives stored in adjacent magazines will explode. The October 15, 2012 explosion completely destroyed the magazine and impacted populations within a 4-mile radius. Multiple magazines

involved will increase the radius of destruction and injury.

VIII. OUTSTANDING POLICY ISSUES

There are no outstanding policy issues associated with this site.

IX. ENFORCEMENT

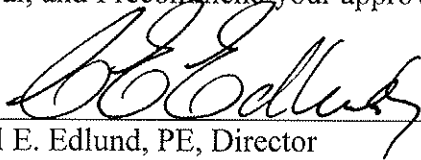
The Army and the LMD signed an AOC that includes the payment for, and the conduct of removal response actions needed to address approximately 15 -16 million pounds of explosives and other hazardous materials.

X. RECOMMENDATION

This decision document represents the selected removal action for the Explo Systems, Inc. Site in Minden, Webster Parish, LA, developed in accordance with CERCLA as amended, and not inconsistent with the NCP. This decision is based on the administrative record for the Site.

Conditions at the Site meet the criteria as defined by 40 CFR Section 300.415(b) of the NCP for a removal, and I recommend your approval of the proposed removal action.

APPROVED



DATE

March 18, 2015

Carl E. Edlund, PE, Director
Superfund Division (6SF)
U.S. Environmental Protection Agency, Region 6