Final

Supplemental Programmatic Environmental Assessment for Energetics-Contaminated Facilities in Support of the U.S. Army Materiel Command Building Demolition Program

Prepared for

U.S. Army Materiel Command

and Program Executive Office Ammunition

November 2015

SUPPLEMENTAL PROGRAMMATIC ENVIRONMENTAL ASSESSMENT ORGANIZATION

In April 2014, Headquarters, U.S. Army Materiel Command (AMC) released the Final Programmatic Environmental Assessment (PEA) for the AMC Building Demolition Program and Draft Finding of No Significant Impact (FNSI) to the public to assess the impacts of removing unneeded or unused facilities at AMC installations across the United States. That PEA assessed the environmental impacts of nonexplosive-contaminated facilities and laid the framework for installations to apply the analysis of the PEA to facility removal actions. Upon the closing of the public comment period, the AMC G3/4 signed the FNSI (USACE 2014).

The 2014 Building Demo PEA did not assess the environmental impacts of removal of unneeded or unused facilities that contained explosive residue. This Supplemental PEA (SPEA) assesses the environmental impact of removing facilities containing explosives and supplements the 2014 Final PEA and signed FNSI. The 2014 Final PEA and FNSI are hereby incorporated by reference into this SPEA (USACE 2014).

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ACRONYMS AND ABBREVIATIONS

ACM	asbestos-containing material
AMC	U.S. Army Materiel Command
BMP	best management practice
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
DA	U.S. Department of the Army
EA	Environmental Assessment
EIS	Environmental Impact Statement
EM	Engineer Manual
ESP	Explosives Site Plan
ESQD	Explosive Safety Quantity-Distance
ESS	Explosives Safety Submission
FNSI	Finding of No Significant Impact
HGD	hot gas decontamination
MEC	munitions and explosives of concern
NC	nitrocellulose
NEPA	National Environmental Policy Act of 1969
NG	nitroglycerin
NOA	Notice of Availability
NPDES	National Pollutant Discharge Elimination System
NQ	nitroguanidine
PAM	pamphlet
PEA	Programmatic Environmental Assessment
PETN	pentaerythritol tetranitrate
RCRA	Resource Conservation and Recovery Act
RDX	cyclotrimethylenetrinitramine; “Research Department Explosive”
REC	Record of Environmental Consideration
SPEA	Supplemental Programmatic Environmental Assessment
SWPPP	Stormwater Pollution Prevention Plan
TCS	thermal convection system
USACE	U.S. Army Corps of Engineers
UXO	unexploded ordnance

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SECTION 1.0 PURPOSE OF AND NEED FOR THE PROPOSED ACTION AND DECISION TO BE MADE

1.1 INTRODUCTION

This Supplemental Programmatic Environmental Assessment (SPEA) pertains to a program of the U.S. Army Materiel Command (AMC) to remove energetics-contaminated unused and unneeded facilities from the real property inventories of AMC installations. When used in concert with the 2014 Final Programmatic Environmental Assessment (PEA) for the U.S. Army Materiel Command Building Demolition Program, this SPEA provides programmatic environmental impact analysis of the suite of conventional industrial base facilities across AMC (USACE 2014).

1.2 PURPOSE AND NEED OF THE PROPOSED ACTION

The purpose of the Proposed Action is to reduce energetic-contaminated excess facilities and structures on AMC installations. Implementing the Proposed Action would reduce fixed facility costs (i.e., utilities), save energy, reduce risks from structural deterioration, return the area to its natural setting, and make otherwise idle areas of an installation available for productive reuse.

1.3 SCOPE OF ENVIRONMENTAL ANALYSIS AND DECISION TO BE MADE

This SPEA provides decision makers and the public with the likely environmental consequences of the Proposed Action and alternatives.

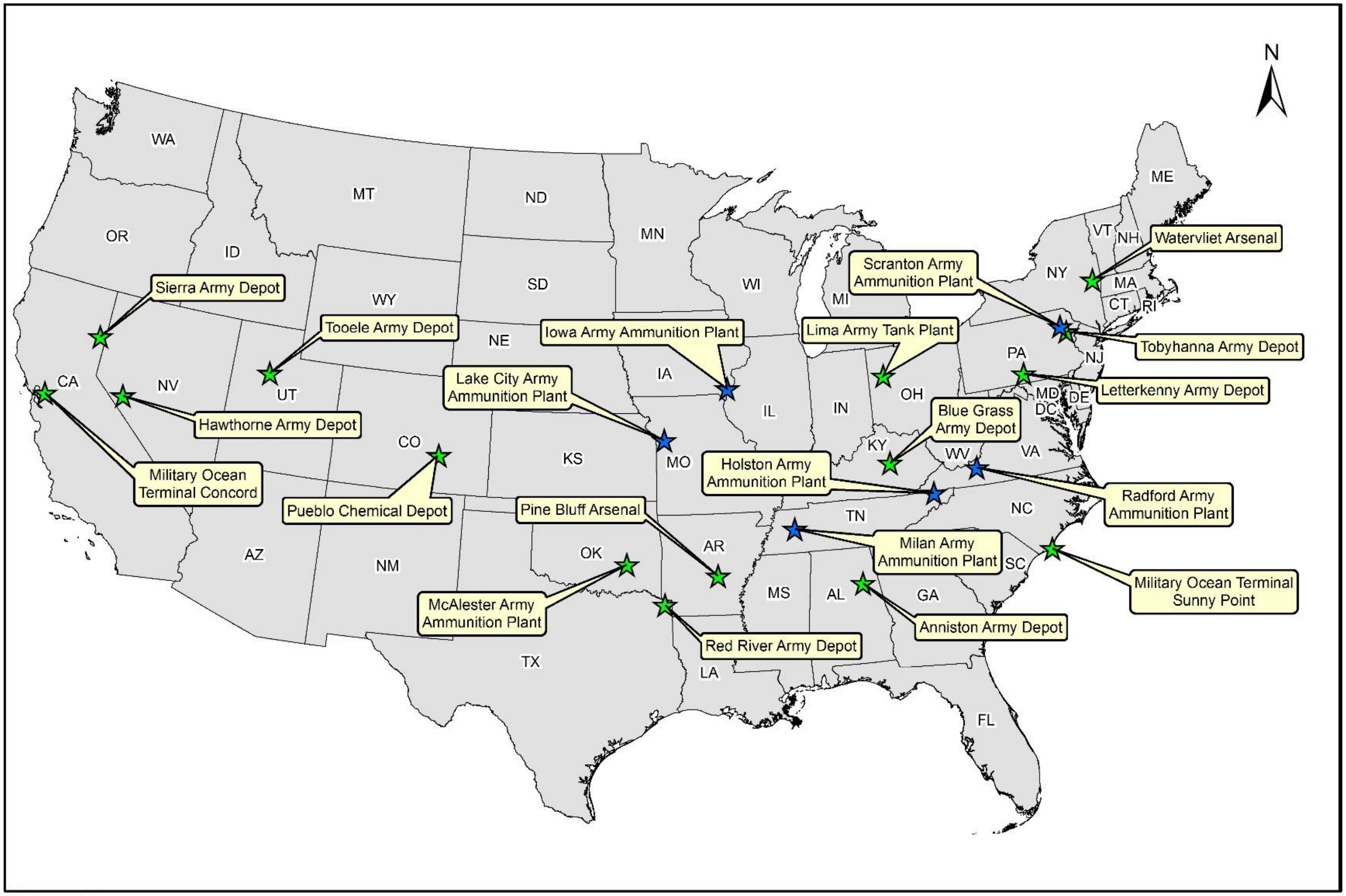
Figure 1-1 provides the locations of the AMC installations assessed in the 2014 PEA (USACE 2014); this SPEA covers energetic-contaminated facilities across that same span of installations.

The Proposed Action is evaluated with respect to each resource area as referenced in the PEA (USACE 2014).

This SPEA provides an updated checklist that AMC installations can use to complete the National Environmental Policy Act of 1969 (NEPA) (Title 42 of the U.S. Code §§ 4321–4347) documentation for each energetics-contaminated facility to be demolished (appendix A). The checklist identifies building-specific actions that will need to be completed before energetics-contaminated facilities demolition can occur.

Every remediation and demolition project will require additional NEPA assessment tiered from this SPEA—either a Record of Environmental Consideration (REC) (if the SPEA adequately analyzes the potential environmental effects of demolishing the facility) or a supplemental Environmental Assessment (EA) or possibly an Environmental Impact Statement (EIS) that focuses on resource areas with potential impacts not addressed in this SPEA or the original PEA (USACE 2014).

If this SPEA analysis indicates that implementing the Proposed Action would not result in significant environmental impacts, a Finding of No Significant Impact (FNSI) would be prepared. If significant environmental impacts that cannot be mitigated would result, an EIS would be prepared or the Proposed Action would be abandoned and no action would be taken.



LEGEND

- ★ Facilities Reduction Program, Operations and Maintenance Authorization Installation
- ★ Layaway of Industrial Facilities Installation

Figure 1-1 – Locations of AMC Installations

1.4 PUBLIC INVOLVEMENT

The Army invites public participation in the NEPA process as referenced in the PEA. Public participation notices, opportunities, and comment timeframes with respect to this SPEA and decision making on the Proposed Action are guided by Title 32 of the *Code of Federal Regulations* (CFR) Part 651 and as referenced in the PEA (USACE 2014).

This document can be downloaded at http://www.amc.army.mil/amc/environmental.html.

Instructions for commenting on the SPEA and the FNSI are provided on the same Web page. Comments must be received by 30 days from the publication of the Notice of Availability in the local paper.

Preparation of this SPEA includes subject matter experts' consideration of all comments received from agencies, organizations, and individuals.

SECTION 2.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

The Proposed Action encompasses a multiyear project to remove energetics-contaminated unused and unneeded facilities from AMC installations. For the purposes of this document, the term “energetics” is used to cover a broad range of explosive, propellant, and pyrotechnic compounds anticipated to be present at those facilities. The Army would determine the number and identification of facilities to be removed at each installation annually based upon mission priorities and funding.

This SPEA analyzes two alternatives—the Proposed Action and the No Action Alternative—for potential impacts.

2.1 PROPOSED ACTION

The Proposed Action is to remediate energetic contamination existing in facilities and to remove such unused and unneeded facilities from the real property inventories of AMC installations. Demolition likely will be required as part of the remediation of some affected buildings or parts of buildings because of the extent to which they are contaminated.

The types of facilities and ancillary structures that would be remediated, demolished, and/ or removed vary from installation to installation, but in general they can be categorized as referenced in the PEA (USACE 2014).

The facilities to be demolished would be assessed for the presence of energetics contamination. If no energetics contamination is discovered in a structure slated for demolition, the structure would be demolished using a conventional method. If energetic contamination is identified, remediation of the structure and any safe energetic removal and/or treatment would be accomplished prior to demolition. If the energetics contamination is “significant” and its extent and the presence of equipment/piping are substantial enough that remediation alone is not possible, remediation and demolition would proceed simultaneously so that demolition is a part of the remediation. In all cases, installations would provide the required notification to the appropriate agencies using the building(s) prior to any abatement and demolition activities.

This SPEA addresses energetic contamination that is found in the building materials, equipment, piping, sumps, drains, and other substructures or in sub-slab soils and that is the direct result of past manufacturing and storage operations.

Energetics-contaminated facilities to be demolished have been or would be assessed for energetics contamination. Appropriate means and methods for rendering the facility safe and remediation would be determined prior any demolition activities. Contaminated sub-slab soil removed during remediation and/or demolition activities will be remediated under the installation’s environmental restoration program. Delineation and treatment of soil and ground water contamination—either energetic-contaminated or otherwise—that might be present below a building’s foundation, concrete slab, and underground features would be addressed under each installation’s ongoing environmental remediation program.

In rare instances, the only remediation possible would be open burning of the facility. That method, however, would be the very last resort due to current restrictions on it in most states. Any required open burn projects would require additional permitting and documentation prior to initiation to comply with state and/or local regulatory requirements associated with open burning.

2.2 NO ACTION ALTERNATIVE

Under the No Action Alternative, current projects would not continue to develop as planned and the action proposed in this SPEA would not be taken. No remediation or demolition of the identified buildings in disrepair would occur at AMC sites under this alternative. Potentially hazardous conditions in those buildings would remain and the areas occupied by the buildings would not be returned to their natural setting. Structural and energetics hazards would remain in place.

Although this alternative does not satisfy the purpose and need for long-range expansion, it is included in the environmental analysis to provide a baseline for comparison with the Proposed Action and is analyzed in accordance with Council on Environmental Quality (CEQ) regulations for implementing NEPA.

This alternative would eliminate unavoidable adverse short- and long-term impacts associated with the Proposed Action, but it would not satisfy the selection criteria established under the purpose and need for this project, resulting in the following:

- Ongoing maintenance costs for outdated and unsafe facilities;
- Failure to meet the goals of the Department of the Army's (DA's) Facility Investment Strategy and the Army 2020 Plan; and
- Failure to prepare the participating installations and their facilities for the future.

2.3 ALTERNATIVES ELIMINATED FROM FURTHER STUDY

As part of the NEPA process, potential alternatives to the Proposed Action must be evaluated. For alternatives to be considered reasonable and warrant further detailed analysis, they must be affordable and implementable and must meet the purpose of and need for the Proposed Action.

One alternative would be to renovate the facilities for reuse rather than demolishing them. This alternative was eliminated from further consideration because, in some cases, it is not possible nor is it economically feasible to completely remediate the energetic compounds from contaminated buildings without demolition being a part of remediation. The continued presence of energetic compounds would put future occupants at risk. Maintaining the facilities for an undetermined period of time and renovating them to appropriate construction and equipment standards for a specific use in the future would be cost-prohibitive given the poor condition of many of the facilities and the fact that their sizes and configurations are not appropriate for current needs. Therefore, this SPEA does not evaluate this alternative.

SECTION 3.0 AFFECTED ENVIRONMENT AND CONSEQUENCES

The PEA discusses the affected environment and environmental consequences of all affected resources that could potentially be affected by the AMC building demolition program. For most resource areas, the affected environment and analysis presented in the PEA is incorporated by reference into this SPEA and the discussions are not repeated. The resource areas that are not discussed further in the SPEA are mentioned in section 3.1. Sections 3.2 through 3.6 present information on the affected environment and environmental consequences for those resource areas that would reasonably be expected to be affected by the removal and disposal of energetic contamination from facilities to be removed under the AMC building demolition program. The energetics of concern for this analysis are described in section 3.6.1.1 and appendix B of this SPEA (USACE 2014).

3.1 RESOURCE AREAS ELIMINATED FROM FURTHER CONSIDERATION

Resource areas eliminated from consideration in the PEA—and, therefore, not addressed in this SPEA—are land use, aesthetics and visual resources, airspace, and socioeconomics. Resource areas adequately addressed in the PEA are wetlands (section 3.6), biological resources (section 3.7), cultural resources (section 3.8), traffic and transportation systems (section 3.9), and utilities (section 3.10). This SPEA does not address those resource areas any further. The following hazardous materials and waste topics were addressed adequately in the PEA and are discussed no further in this SPEA: pesticides, polychlorinated biphenyls, lead-based paint, asbestos-containing material (ACM), and radioactive materials (USACE 2014).

3.2 AIR QUALITY

3.2.1 Affected Environment

The affected environment for air quality is discussed in the PEA and remains unchanged for the purposes of the SPEA. The PEA covers the regulatory framework under which the Proposed Action would be executed in accordance with local, state, and federal air quality regulations (USACE 2014).

3.2.2 Environmental Consequences

3.2.2.1 Proposed Action

The Proposed Action would be considered to have a significant adverse impact on air quality only if the demolition of a building with energetics, by whatever means, led to a violation of an air operating permit.

Short-term minor adverse effects on air quality would be expected if energetic-contaminated facilities were demolished under the AMC Building Demolition Program in accordance with regulatory and permit requirements. The short-term effects would result from airborne dust and other pollutants generated during demolition activities. Using an open burning approach in particular would be expected to result in a local short-term increase in air pollution. No new or modified stationary sources of air pollutants would be established at any AMC installation as part of the Proposed Action.

Each AMC installation would obtain the required air permits to destroy the energetics in a facility through thermal convection, thermal treatment, or open burning (thermal destruction). Thermal processes consist of heating the energetic compound to a high enough temperature to thermally decompose it, rendering it nonexplosive for purposes of handling and disposal. Thermal convection typically occurs in a mobile chamber.

If the energetics in a facility could not be safely destroyed through thermal convection or thermal treatment, burning the facility in place (i.e., thermal destruction) might be required. If required, AMC installation personnel would obtain an open burn permit that includes burn-in-place building demolition allowances to demolish any facility through open burning. If a building was determined to require burn-in-place destruction of energetics, an air quality analysis would be conducted using the U.S. Environmental Protection Agency's approved regulatory model AERMOD or an equivalent modeling program.

As described in detail in the PEA, under the General Conformity Rule, federal agencies must work with states in a nonattainment or maintenance area to ensure that federal actions conform to the states' air quality plans. The General Conformity Rule, however, does not apply to projects of the size considered under the AMC Building Demolition Program. The total direct and indirect emissions resulting from the demolition of any individual facility or group of facilities on an AMC installation would be below the applicability threshold of 100 tons per year of each pollutant, regardless of the location of the installation, pollutant(s) of interest, or severity of nonattainment. Moderate changes in the quantity and types of equipment used during the demolition process would not substantially affect the quantities of air pollutants emitted and would not change the determination under the General Conformity Rule or level of effects under NEPA. Detailed emission calculations and a Record of Non-Applicability of the General Conformity Rule are provided in appendix B of the PEA (USACE 2014).

3.2.2.2 No Action Alternative

No changes in air pollutant emissions would be expected if the No Action Alternative was implemented. No facilities would be cleared of energetic contamination and no changes in operations would take place. A general conformity analysis and the permitting of stationary sources would not be required. Under the No Action Alternative, unused facilities would be minimally maintained and would be expected to deteriorate over time. Deterioration of energetic materials that volatize or become unstable over time would be expected to create hazardous air quality conditions inside some buildings.

3.3 NOISE

3.3.1 Affected Environment

The affected environment for noise is described in the PEA and remains unchanged for the purposes of the SPEA. The PEA summarizes noise-related guidance, and a list of noise regulations applicable to areas surrounding the AMC installations is provided in appendix C of the PEA (USACE 2014).

3.3.2 Environmental Consequences

3.3.2.1 Proposed Action

The Proposed Action would be considered to have a significant adverse impact on the noise environment if the project would substantially increase the ambient noise levels in adjoining areas. A noise increase of 10 decibels is perceived as a doubling of noise, and is generally considered substantial.

Short-term minor adverse effects on the noise environment would be expected from implementing the Proposed Action. Thermal convection, thermal treatment, and open burning would cause localized short-term elevations in noise. No long-term changes in the overall noise environment would be expected from destroying energetics in AMC facilities under the Building Demolition Program.

The processes of thermal convection, thermal treatment, and open burning would be expected to have little effect on the noise environment. Minor explosions could occur, but the locations of AMC installations in primarily rural areas would minimize the effect of the occurrences on surrounding environments. If explosions were expected during the energetics destruction process of any facility and they were expected to be heard off-post, neighboring residents would be informed of the planned operation beforehand.

3.3.2.2 No Action Alternative

Under the No Action Alternative, no effect on the noise environment would be expected and no changes to the noise environment would result. No facilities would be cleared of energetic contamination, and no changes in operations would take place.

3.4 SOILS

3.4.1 Affected Environment

The affected environment for soils is discussed in the PEA and remains unchanged for the purposes of the SPEA (USACE 2014). AMC installations with energetic-contaminated facilities are located across the continental United States. Soil types and conditions vary from state to state, from installation to installation, and within an installation; and meaningful generalizations about the soil types that exist in locations where the Proposed Action would be implemented cannot be made. Because the Proposed Action would involve removing structures primarily from industrial and administrative areas of AMC installations, most of the soils on the affected land would have been previously disturbed.

3.4.2 Environmental Consequences

3.4.2.1 Proposed Action

The Proposed Action would be considered to have a significant adverse impact on soils if:

- it could cause substantial soil loss or compaction to the extent that establishing native vegetation within two growing seasons would be precluded on a land area larger than 1,000 acres;
- it could cause a loss of soil productivity from construction activities through converting pervious ground to impervious ground on more than 5 percent of installation land; or
- energetics were released into site soils during building demolition.

Short-term minor adverse effects on soils would be expected from implementing the Proposed Action. Soil excavation associated with implementing the Proposed Action is anticipated to be limited to what would be required for removal of concrete slabs or foundations and subsurface features, including subsurface utilities. Those activities would not generate excess soil that would need to be disposed of off-site. After the subsurface features have been removed, the disturbed area would be graded to promote positive drainage and preclude ponding. If contamination is found under the building slab, the soil and any energetics material would be remediated as part of the existing environmental restoration programs under the

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the Resource Conservation and Recovery Act (RCRA), or state programs, as appropriate. Thus, it is anticipated that the Proposed Action would result in negligible-to-minor short-term adverse impacts on soils. Some long-term minor beneficial impacts to soils could be expected if—after energetics-contaminated buildings and slabs are demolished—previously impervious surfaces were converted to pervious surfaces. Removing energetics contamination from contaminated buildings, foundations, and subsurface features would eliminate the possibility of a release of the contaminants to surrounding soil.

A discussion of effects on soils of the Proposed Action is provided in the PEA. Removal of energetic-contaminated subsurface features would occur as part of the overall facility demolition action, as described in the PEA. Therefore, the discussion of effects on soils in the PEA applies equally to the Proposed Action of the SPEA. Best management practices (BMPs) for controlling erosion during demolition and site restoration activities would be implemented, so the Proposed Action would not be expected to have a significant adverse effect on soils at any AMC installation. As described in the PEA, the National Pollutant Discharge Elimination System (NPDES) Program requires that stormwater runoff from construction sites be permitted. Decontamination and demolition of buildings with energetics contamination would fall under NPDES requirements, which are discussed further in the PEA (USACE 2014).

3.4.2.2 No Action Alternative

Short-term and long-term minor adverse effects would be expected from implementing the No Action Alternative. Unused buildings would continue to deteriorate over time, which would increase the likelihood of an uncontrolled release of energetic compounds.

3.5 WATER RESOURCES

3.5.1 Affected Environment

The affected environment for water resources is discussed in the PEA and remains unchanged for the purposes of the SPEA. Water resources include ground water, surface water, and stormwater potentially affected by the Proposed Action. Evaluation of water resources examines the impact on the quantity and quality of each resource as a result of the planned activity. As described in the PEA, AMC installations are located in a variety of geographic areas, including desert, coastal, coastal plain, and temperate forest environments. Given the variety of installation environments, generalizations about the water resources on the individual installations cannot be made (USACE 2014).

3.5.2 Environmental Consequences

3.5.2.1 Proposed Action

The Proposed Action would be considered to have a significant adverse impact on water resources (i.e., surface water or ground water) if it would cause:

- an exceedance of a Total Maximum Daily Load;
- a change in the impairment status of a surface water; or
- an unpermitted direct impact on a water of the United States.

The Proposed Action also would be expected to result in a long-term beneficial effect on ground and surface waters. Removing energetic contamination from contaminated buildings and subsurface features would eliminate the possibility of a release of the contaminants to surface and ground waters. Any contaminants released during the energetics removal process would be contained at the work site by using state-approved BMPs.

As explained in the PEA (USACE 2014), each AMC installation would prepare and implement a Stormwater Pollution Prevention Plan (SWPPP) (or similar document as required by state regulations) for stormwater discharges associated with the demolition activity before initiating any facility removal action, including any removal of energetics contamination. Provided that an SWPPP has been approved and implemented, runoff of stormwater and pollutants from a construction site would be considered to be in compliance with regulatory requirements and not to cause an impairment of surface or ground waters. Additional evaluation of water resources under NEPA would be required if the project was within the buffer zone or riparian area of a surface water.

A minor adverse effect on ground and surface water would be possible in the event of a spill during energetics remediation. A Spill Containment Plan would be in place to mitigate the consequences should a spill occur.

3.5.2.2 No Action Alternative

No effect on water resources would be expected under the No Action Alternative. No facilities would be removed, so no ground or soil disturbance that could lead to sediment deposition in surface waters would occur and no facility-removal equipment that could leak pollutants would be used. Short-term and long-term minor adverse effects would be expected from implementing the No Action Alternative. Unused buildings would continue to deteriorate over time, which would increase the likelihood of an uncontrolled release of energetic compounds.

3.6 HAZARDOUS MATERIALS AND HAZARDOUS WASTE

3.6.1 Affected Environment

Hazardous substances are defined under CERCLA and hazardous wastes are defined under RCRA. Hazardous substances and wastes include the energetics that are the subject of the Proposed Action. The types of energetic and explosive materials that could be encountered in the facilities during the Proposed Action are described in this section.

Facilities at some installations might be affected by ongoing environmental restoration programs or investigation and remediation in accordance with CERCLA and RCRA. If any of those facilities are energetic-contaminated, they would be addressed under and/or coordinated with the appropriate program before undergoing energetic contamination remediation and demolition under the Proposed Action.

3.6.1.1 Munitions and Explosives of Concern

Munitions and explosives of concern (MEC) include military munitions that could potentially pose unique explosive safety risks. AMC facilities could contain unexploded ordnance (UXO), discarded military munitions, and explosive constituents that are present in concentrations high enough to pose an explosive hazard. Material potentially presenting an explosive hazard—such as explosive, propellant, or pyrotechnic residues—could be encountered in facilities that were once used to produce, package, store, and test these materials. Because many of the facilities proposed for demolition were used in producing munitions, encountering MEC is a possibility.

3.6.1.1.1 Types of Energetics

The types of materials that could be encountered are described in the sections below and illustrated in Figure 3-1. Appendix B briefly describes energetics that could be encountered in buildings that were used for manufacturing, loading, or storing those products and that would be remediated and demolished under the AMC Building Demolition Program.

Primary explosives: Priming, or "first fire," materials are the first explosive material initiated in an explosive train (or event) and are used to initiate the detonation of less sensitive high explosives. Primary explosives or initiators explode or detonate when they are heated or subjected to shock. They do not burn since they often do not contain the elements necessary for combustion. They include diazodinitrophenol, lead azide, lead styphnate, and mercury fulminate. Dry, undecomposed nitrocellulose (NC) and nitroglycerin (NG), although not technically primary explosives, should be considered as primary explosives.

Secondary explosives: Secondary explosives are typically much more difficult to detonate than primary explosives. High explosives, the most common secondary explosives, are chemical compositions that when initiated by a suitable stimulus (i.e., a primary explosive), disassociate almost instantaneously into other more stable components. Typical high explosives that are widely used in explosive devices are high melting explosive, pentaerythritol tetranitrate (PETN), cyclotrimethylenetrinitramine (RDX), tetryl, and trinitrotoluene. For initiation of the most commonly used materials, RDX and PETN, a shock impact of 3,000–5,000 meters per second is required and can only be generated by another explosive material. For this reason, explosive devices in which RDX or PETN is used as a main charge contain an explosive train consisting of three units: a primer, a booster, and the high-explosive main charge.

Pyrotechnics: Pyrotechnic substances do not rely on oxygen from external sources to sustain their reaction.

Propellants: A propellant is a chemical substance used in the production of energy or pressurized gas that is subsequently used to create movement of a projectile or other object. Common propellants used by the Army are 1,2,4-butanetriol trinitrate, Ball Powder propellant, diethylene glycol dinitrate, dinitrotoluenes, NC, NG, nitroguanidine (NQ), and smokeless powder.

Solid propellants containing NC are divided into the following three classes based on the presence of added energetics:

- Single-base propellants contain NC as the sole energetics material;
- Double-base propellants contain NC impregnated with an organic nitrate such as NG; and
- Triple-base propellants include NC and NG in combination with NQ. Additional ingredients include compounds that modify burn rate, binders or plasticizers that facilitate loading the propellant into the shell, and compounds that enhance propellant stability during storage.

3.6.2 Environmental Consequences

3.6.2.1 Proposed Action

The Proposed Action would be considered to have a significant adverse impact on the environment from the presence of energetic materials if it:

- resulted in noncompliance with applicable local, state, and federal regulations for handling of hazardous or toxic substances;

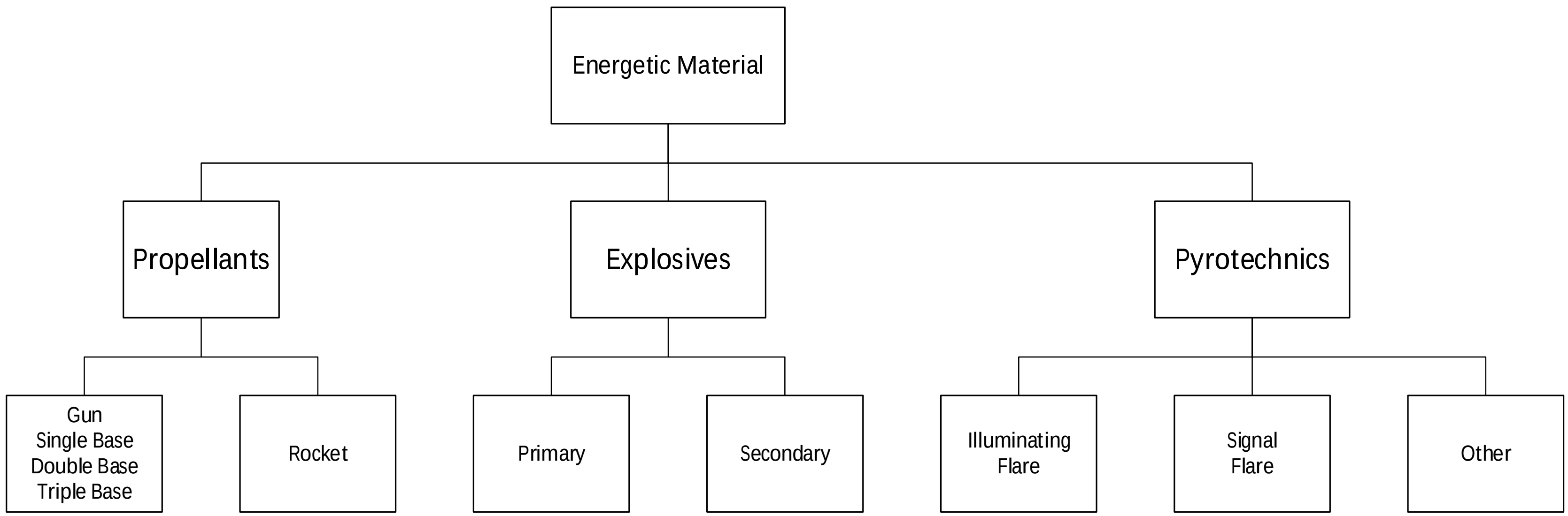


Figure 3-1 – Classification of Energetics Materials

- increased the amount of hazardous waste generated beyond the waste management capacity of the permitted storage area at the installation or the identified and applicable waste treatment or disposal facility; or
- disturbed previously stable contaminated waste sites, causing adverse effects on ecological and human health by creating exposure pathways.

Prior to building demolition activities, every structure proposed for demolition would undergo a thorough process of removing energetic and explosive contamination except in cases in which demolition of the affected parts would be required as part of the remediation. During this process, the Army would ensure that no contamination is released into the environment by following the steps below for each building being proposed for demolition under the AMC Building Demolition Program:

1. Assess and test each building in accordance with the Explosives Site Plan (ESP) to determine the potential for explosive hazards in accordance with DA Pamphlet (PAM) 385-64, *Ammunition and Explosives Safety Standards* (DA 2011); and U.S. Army Corps of Engineers (USACE) Engineer Manual (EM) 385-1-97, *Explosives—Safety and Health Requirements Manual* (USACE 2008).
2. Classify each building as to the appropriate energetics or explosives contamination category.
3. Strictly adhere to an Explosives Safety Submission (ESS), ESP, or equivalent document prepared for the decontamination and demolition activity, including maintaining minimum separation distances.
4. Initiate and complete remediation at each facility, including removal and/or remediation of all energetic contamination in the interior and exterior portions, and remediation, removal, and disposal of equipment and piping (including equipment and material for recycling and ACM).
5. If necessary, remediate and/or remove building slabs, foundations, and subsurface features following the procedures outlined in USACE EM 385-1-97 (USACE 2008).

The evaluation of the energetic contamination is described in the sections below.

3.6.2.1.1 Initial Building Evaluation and Categorization

Before a building is demolished, it would be assessed and tested to determine the potential for explosive hazards as well as whether and to what level remediation would be required. Additional evaluation would include reviews of records related to the structure's construction, renovation, maintenance, and historical use; and targeted sampling of portions of the structure most likely to be contaminated with energetic or explosive compounds. Facilities would be assessed for the level of explosives contamination present using guidance found in chapter 19 of DA PAM 385-64 and chapter 5 of USACE EM 385-1-97 (DA 2011; USACE 2008).

Upon completion of the assessment, the building would be classified as belonging to one of three energetics or explosives contamination categories:

- Significant explosives contamination—A building classified in this contamination category exhibits extensive release and/or migration of significant amounts of energetics or explosives in the building and its installed equipment. Depending on the specific operation, such migration could have been caused by the release of explosives in solid, liquid, or vapor form. Explosive residues can migrate into inaccessible areas such as cracks, voids, behind wall and roof panels, drains, roof rafters, and porous surfaces. Visual inspection of inaccessible surfaces would be performed following guidance in section I.5.B. of EM 385-1-97 (USACE 2008), by either disassembly or specialized equipment (e.g., borescope pipe inspectors). A coordinated and concurrent effort between the remediation of the explosive hazards and removal/disposal of all ACM and other regulated materials from the structure would be required by the UXO team to avoid a potential release of regulated materials.

- Limited explosives contamination—A building classified in this contamination category has a limited presence of energetics or explosives caused by minor releases in the immediate operating area with very little migration. During visual inspection of the building, it would not be necessary to inspect inaccessible surfaces because explosive migration into those areas is very unlikely. UXO construction support during standard demolition is recommended for a building assigned to this category.
- Nonexplosive Building—A building classified in this contamination category has no energetics or explosives hazard identified. The building is available for standard demolition.

Remediation would be initiated and completed at each facility prior to demolition. Demolition likely will be required as part of the remediation of some affected buildings or parts of buildings because of the extent to which they are contaminated. All energetics contamination in the interior and exterior portions (including equipment and piping) would be remediated and the equipment and piping would be removed and disposed. A general energetics evaluation and predemolition decision process is provided in Figure 3-2.

No adverse effects related to energetic and explosive compounds would be expected during activities associated with initial building evaluation and categorization. Those processes cause minimal disturbance to energetic contaminants in a facility and are primarily data collection activities.

3.6.2.1.2 Remediation Activities

An ESS or equivalent document would be prepared detailing the Explosive Safety Quantity-Distance (ESQD) for minimum separation distances to be maintained during the remediation and demolition portions of the project. Appropriate remediation activities would be initiated and completed at each facility. All energetic contamination in the interior and exterior portions of each building (including equipment and piping) would be remediated, removed, and disposed. The end state of each remediated building would be an interior/exterior free of energetics residue, leaving the remaining structure in a safe condition for conventional demolition, except in cases in which demolition of the affected parts is required as part of the remediation.

Common remediation techniques are described in the following paragraphs.

Thermal treatment/destruction: Depending on the category and quantity of energetics present in structures and debris, one of several thermal treatments could be used: hot gas decontamination (HGD), a mobile thermal convection system (TCS), burning removed materials at a burning ground, or burning in place as a last resort. HGD was developed as an environmentally safe alternative to decontaminating equipment and buildings contaminated with energetics. The method involves sealing and insulating the structures, heating with a hot gas stream to 260 degrees Celsius (500 degrees Fahrenheit), volatilizing the energetic contaminants, and destroying them in an afterburner exhausted through a particulate filter. Because of the type and character of the constituents of the off-gas, at some sites it might be necessary to contain, collect, and further treat the gaseous discharge to meet environmental

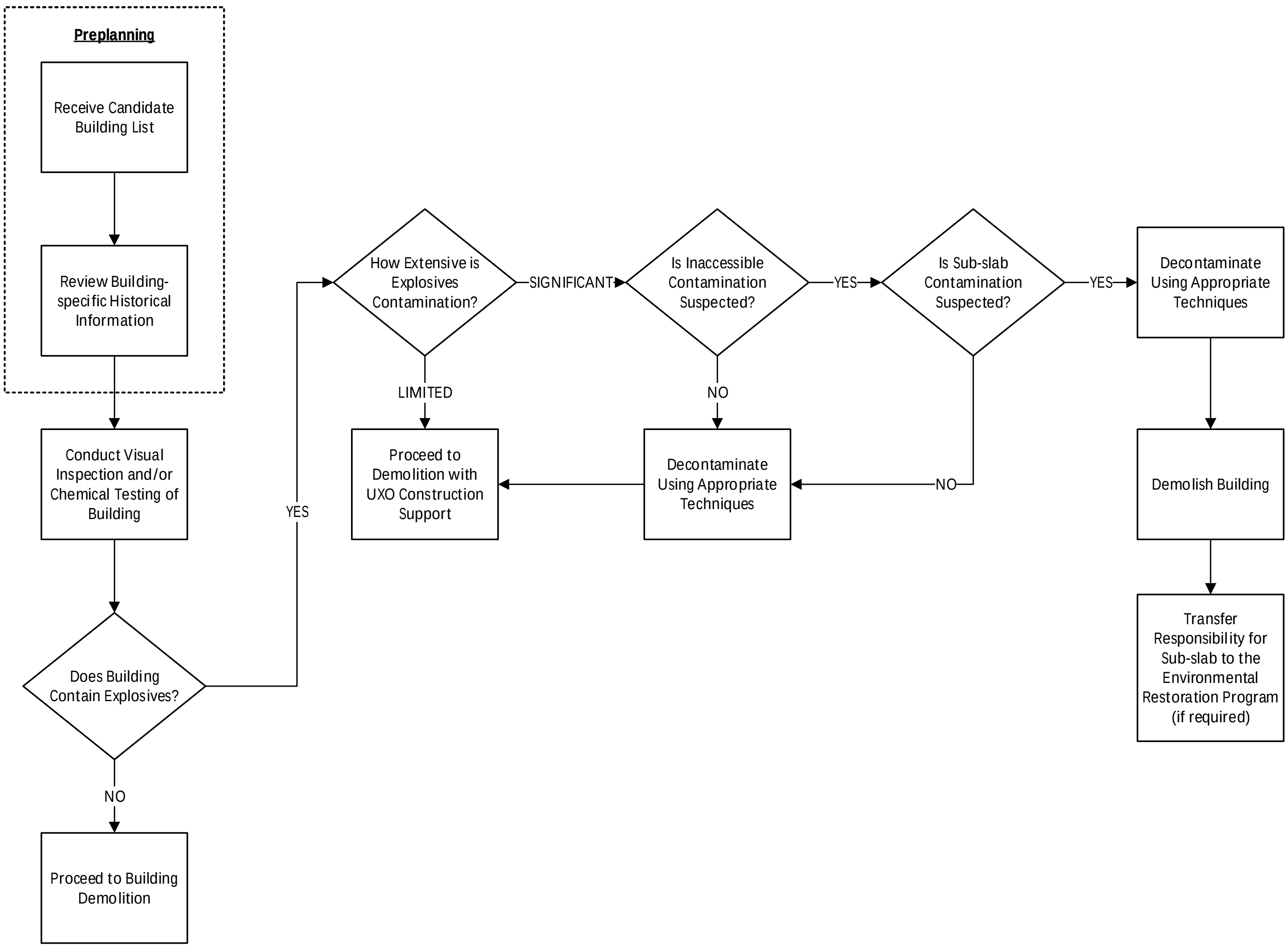


Figure 3-2 – Energetics Evaluation Diagram

regulatory stipulations. HGD is applicable to equipment, scrap material, and buildings or structures, including masonry and metallic structures.

TCS is a portable unit that works in a similar manner to HGD with the addition of pumps, fans, or other mechanical means to force heated air into or through a material to desensitize energetics in an enclosed chamber. TCS is often the method of choice to remotely desensitize and decontaminate building materials, debris, and equipment, rendering them safe to demolish, reuse, or recycle. TCS typically incorporates the capability to operate and monitor the system at a remote distance.

Burning removed building materials and equipment at a burning ground would be conducted in compliance with the installation ESS. Burning-in-place remediation would follow the procedures outlined in section 1.5.C.01 of USACE EM 385-1-97 (USACE 2008). As previously noted, burning in place would be used only as a last resort and only after all required permits have been obtained.

No adverse effects related to energetic and explosive compounds would be expected during thermal treatment or destruction activities because the contaminants would be completely destroyed. Using such methods, however, would result in short-term minor adverse effects on air quality (see section 3.2). Burning in place generally requires a state permit and it is expected that additional NEPA review would be required for any facility to be cleared of energetics contamination by burning it in place.

Other decontamination techniques: Other techniques commonly used to decontaminate energetics-contaminated processing equipment, machinery, storage bins, and other interior building surfaces can be used to decontaminate buildings prior to demolition. The processes include wiping with a damp cloth, washing with soap and water or appropriate cleaning agent or solvent, or steam cleaning. Additionally, chemical or biological treatment can be used to treat energetics contamination. Chemical oxidation, chemical reduction, and biological treatment all work by adding an amendment to stimulate the breakdown of the energetic compounds and render the material nonhazardous for disposal or reuse as appropriate. One or more of these processes can be used prior to demolition where the activity is deemed necessary and cost-effective based in specific conditions. Any new decontamination procedures might require additional NEPA review if they are to be considered for implementation. The disadvantage of some techniques is that wastewater must be collected and treated in accordance with applicable environmental regulatory requirements that often add significant cost to the project.

Building foundations and subsurface features: If the characterization or assessment of a building indicates the presence or suspected presence of energetic-contaminated foundation (including slab, footing walls, and aboveground walls), the installation would be required to develop and submit an ESS or equivalent document for the decontamination of those features. If the presence of primary explosives is suspected below a slab, the procedures outlined in section I.5.C.01.01(a)(1) of EM 385-1-97 would be followed to remove the slab (USACE 2008). Ultimately, all building slabs would be removed and each building site would be restored to its natural grade. If operational energetics contamination in the soil is discovered during the removal of the foundation or other subgrade feature, the impacted soil would be remediated under the installation's environmental restoration program.

No adverse effects related to foundations or subsurface features contaminated with energetic and explosive compounds would be expected during removal activities. Contaminated foundations or subsurface features would be managed in accordance with required planning documents and established procedures. Short-term minor adverse effects on air quality and site soils could occur from breaking or crushing slabs and exposing potentially contaminated soil. Adverse effects on air quality and soil are described in sections 3.2 and 3.4. Removing energetic contamination from buildings, foundations, and subsurface features would eliminate the possibility of a future uncontrolled release.

3.6.2.1.3 Demolition Activities

An ESS or equivalent document would be prepared detailing the ESQD for minimum separation distances to be maintained during the remediation and demolition portions of the project. Demolition activities would include debris removal and/or conventional wet demolition.

Debris removal: The debris to be removed consists of loose debris left in the buildings and building materials resulting from demolition. Loose debris includes desks, chairs, and equipment. Both loose and demolition debris would be removed after an assessment is made of the explosive hazard potential and handled accordance with the ESS or equivalent document. Following any required remediation, debris would be removed and discarded in accordance with applicable state and federal regulations.

No adverse effects related to energetic and explosive compounds would be expected during debris removal activities. Energetic-contaminated debris would be treated as described above in accordance with all applicable regulatory requirements to safely destroy the contaminants in a controlled manner so that no migration of contamination into the environment would occur. Uncontaminated debris would be disposed of as detailed in the PEA (USACE 2104). The incineration or thermal destruction of loose debris contaminated with energetics would result in short-term minor adverse effects on air quality (see section 3.2).

Conventional wet demolition: Explosive safety precautions would be maintained during all structural demolition. Conventional wet demolition would be attempted only on structures that represent a very low risk of unintentional detonation when wet methods are used. The ESQD arc specified in the ESS would be employed during the demolition of each building and slab, foundation, and sub-slab feature. As noted in the PEA, some equipment and various structural components would be removed and properly disposed of before demolition, including equipment and material for recycling and ACM (USACE 2014). The section of a structure to be demolished would be completely dampened with water and periodically wetted throughout the demolition operation using fire hydrants, fire trucks, and water trucks. Engineering controls to manage runoff would be used to prevent the spread of contamination and would include erosion and sediment control practices (e.g., sediment trapping, filtering, and other BMPs). Demolition work would proceed from top to bottom, working from the exterior to the interior of each structure. This procedure can be accomplished in stages to allow for additional wetting and energetic material inspection and decontamination.

Short-term minor adverse effects related to energetic and explosive compounds could occur during conventional wet demolition. The short-term effects could result from the use of water that could run off or impact site soils. Such effects would be managed by implementing BMPs presented in the ESS for each building.

Additionally, all hazardous waste generated from each building would be managed (to include handling, transport, and disposal) in accordance with applicable local, state, and federal regulations, resulting in no adverse impacts. Hazardous waste generated from demolition would not exceed permitted quantities. Minor spills of petroleum, oil, and lubricant from equipment used during decontamination and demolition operations would have negligible environmental effects.

All such spills would be cleaned up using appropriate BMPs in adherence with a Spill Containment Plan. Contractors would be responsible for handling all hazardous materials in accordance with federal and state regulations.

Long-term minor beneficial effects would be expected from the demolition of buildings contaminated with explosive and energetic compounds. Demolishing the buildings would eliminate potential sources of contamination that, if released, could expose personnel to contaminants or impact site soils and ground water.

3.6.2.2 No Action Alternative

Short- and long-term minor adverse effects would be expected from implementing the No Action Alternative. Unused and unneeded buildings containing explosive and energetic compounds would continue to deteriorate over time, which would increase the likelihood of an uncontrolled release of hazardous substances into the environment. The continued presence of explosive and energetic compounds would put personnel conducting caretaking activities at the buildings at risk of exposure to the materials.

3.7 CUMULATIVE EFFECTS

For the purposes of this SPEA, significant adverse cumulative impacts would occur if incremental impacts of the Proposed Action, added to the environmental impacts of past, present, and reasonably foreseeable future actions, exceeded significance thresholds for resources at an installation and the surrounding region. The analysis in the SPEA indicates that the Proposed Action would be expected to have a short-term adverse effect on the following resource areas: air quality, noise, and soils.

Air Quality. Each state takes into account the effects of all past, present, and reasonably foreseeable future emissions during the development of the State Implementation Plan. In developing the plan, the state accounts for all significant stationary, area, and mobile emission sources. Estimated emissions generated by the Proposed Action would be de minimis, and it is understood that activities of this limited size and nature would not contribute significantly to adverse cumulative effects on air quality.

Noise. Noise generated by the Proposed Action would last only for the duration of the demolition activity and would generally be confined to the installation on which the demolition activity occurs. No long-term effect on the noise environment would result from implementing the Proposed Action, and no demolition activity would have a long-term effect on the general noise environment. No cumulative effects on noise, therefore, would occur from implementing the Proposed Action.

Soils. Impacts on soils are localized to the area of disturbance. Implementing the Proposed Action would not affect soils surrounding the area where a demolition activity is occurring and would not affect the characteristics of soils. No cumulative effects on soils, therefore, would occur from implementing the Proposed Action.

SECTION 4.0 FINDINGS AND CONCLUSIONS

4.1 FINDINGS

The SPEA identifies and evaluates the effects of removing energetics-contaminated facilities from AMC installation real property inventories under the Building Demolition Program. The Proposed Action to remediate and demolish contaminated facilities and the No Action Alternative are evaluated. Table 4-1 summarizes and compares the consequences of the Proposed Action and the No Action Alternative addressed in the SPEA.

Implementing the Proposed Action would not be expected to result in significant environmental impacts. Preparation of an EIS, therefore, is not required, and a FNSI will be published in accordance with 32 CFR Part 651, *Environmental Effects of Army Actions*; NEPA; and the CEQ regulations implementing NEPA (40 CFR Part 1500).

AMC installations proceeding with remediation and demolition of energetic-contaminated facilities under this SPEA would assess the potential adverse effects of each proposed remediation action on all potentially affected human and natural resources. Every remediation action would require additional NEPA assessment tiered from this SPEA and the associated PEA—either a REC (if the SPEA and PEA adequately analyze the potential environmental effects of energetics remediation and facility demolition), a supplemental EA that focuses on resource areas with potential impacts not adequately addressed in this SPEA or the PEA, or an EIS (USACE 2014).

4.2 MITIGATION MEASURES AND BEST MANAGEMENT PRACTICES

This SPEA does not identify mitigation measures associated with implementing the Proposed Action. No mitigation measures are required.

BMPs would be implemented before, during, and after energetic remediation actions as required under regulation and Army policy, or as prudent considering the circumstances of individual remediation actions. BMPs are discussed in the SPEA under the appropriate resource area. Each remediation action would be individually evaluated for compliance with the SPEA and, at that time, the need for any site-specific BMPs would be determined.

4.3 CONCLUSIONS

On the basis of the analysis, the Proposed Action would have no significant adverse effects on the natural or human environment. Preparation of an EIS is not required; issuance of a FNSI is appropriate.

Table 4-1. Summary of Potential Environmental Consequences.

Resource Area	Proposed Action	No Action Alternative
Air quality	Short-term minor adverse	No effect
Noise	Short-term minor adverse	No effect
Soils	Short-term minor adverse Long-term minor beneficial	Short-term minor adverse Long-term minor adverse
Water resources	Long-term minor beneficial	Short-term minor adverse Long-term minor adverse
Hazardous materials and hazardous waste	Short-term minor adverse Long-term minor beneficial	Long-term minor adverse

SECTION 5.0 REFERENCES

DA (Department of the Army). 2011. *Ammunition and Explosives Safety Standards.* (Pamphlet) DA Pam 385-64. Department of the Army, Headquarters, Washington, DC.

USACE (U.S. Army Corps of Engineers). 2008. *Explosives—Safety and Health Requirements Manual*. EM 385-1-97. U.S. Army Corps of Engineers, Washington, DC.

USACE (U.S. Army Corps of Engineers). 2014. *Final Programmatic Environmental Assessment for the U.S. Army Materiel Command Building Demolition Program*. Prepared for U.S. Army Materiel Command by U.S. Army Corps of Engineers, Mobile District, Mobile, AL.

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Appendix A

Environmental Checklist and Record of Environmental Consideration

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ENVIRONMENTAL CHECKLIST FOR AMC BUILDING DEMOLITION UNDER THE FACILITIES REDUCTION PROGRAM (FRP) AND LAYAWAY INDUSTRIAL FACILITIES (LIF) PROGRAM

Complete this checklist for activities proposed under the Army Materiel Command (AMC) Building Demolition Program. Its purpose is to determine whether individual facility removal actions are covered under the Programmatic Environmental Assessment (PEA) for the AMC Building Demolition Program or the Supplemental Programmatic Environmental Assessment (SPEA) for the AMC Building Demolition Program. The answers provided in part B of this checklist indicate either compliance with the PEA and SPEA, the LIF Program, or other demolition programs or the need for additional documentation. If the applicable sections of the checklist have been completed and indicate that the Proposed Action qualifies for coverage under the PEA, a Record of Environmental Consideration can be prepared for the action and the action can proceed. If the checklist indicates the need for additional analysis, or if the Proposed Action is not otherwise covered under the PEA, then the need for further National Environmental Policy Act (NEPA) analysis will need to be assessed.

The resource areas reviewed and discussed in the PEA/SPEA must be assessed individually for each proposed building demolition action. The checklist includes all resource areas included in the PEA: land use, aesthetics and visual resources, airspace, air quality, noise, soils, water resources, wetlands, biological resources, cultural resources, socioeconomics (including environmental justice and the protection of children), traffic and transportation systems, utilities, and hazardous materials and hazardous waste. Resource areas eliminated from further consideration in the PEA—land use, aesthetics and visual resources, airspace, and socioeconomics—are included in the checklist to capture the effects of any building demolition actions to which the resource areas are relevant.

PART A BACKGROUND INFORMATION

1. Project name: ______________________________
2. Project description: ______________________________
3. Project location: ______________________________
4. Project manager: ______________________________
5. Phone number: ______________________________
6. Email address: ______________________________
7. Project contact (if different from project manager): ______________________________
8. Proposed project start date and duration: ______________________________
9. Date this checklist was completed: ______________________________
10. **Compliance with the PEA/SPEA.** The following must be true to use the PEA/SPEA as the NEPA analysis for the proposed building demolition action: Is the Proposed Action part of the AMC Building Demolition Program?
    ☐ YES ☐ NO

Comments:

11. Stand-alone or Umbrella Project.
    The Proposed Action can either be the demolition of a single building (i.e., a stand-alone project) or include the demolition of more than one facility but be considered a single project and be permitted collectively (i.e., an umbrella project).

Is this a stand-alone project? ☐ YES ☐ NO

If yes, respond to each of the statements in part B (below) as they pertain to the individual facility to be removed.

Comments:

Is this an umbrella project? ☐ YES ☐ NO

If yes, respond to each of the statements in part B (below) as they pertain to the project that includes all the facilities to be removed under the Proposed Action.

Comments:

PART B ENVIRONMENTAL RESOURCE ANALYSIS

Upon completion of the proposed building demolition action and any associated follow-on activities (e.g., site revegetation), which of the following statements would be true and which would be false?

If any of the following statements are false for the proposed project, then additional analysis under NEPA could be required.

B.1. Review of Resource Areas Eliminated from Further Consideration

B.1.1. Land Use

a. The action will not create a land use incompatibility. ☐ TRUE ☐ FALSE
If FALSE, please explain.

b. The action will comply with the installation's land use plan (if applicable). ☐ TRUE ☐ FALSE
If FALSE, please explain.

B.1.2. Aesthetics and Visual Resources

a. The action will not adversely affect a valued scenic view or sensitive aesthetic or visual resource. ☐ TRUE ☐ FALSE
If FALSE, please explain.

b. The action will comply with the installation's design guide (if applicable). ☐ TRUE ☐ FALSE
If FALSE, please explain.

B.1.3. Airspace

a. The action will not violate any airspace regulation. ☐ TRUE ☐ FALSE
If FALSE, please explain.

B.1.4. Socioeconomics, Environmental Justice, and Protection of Children

a. The action will not cause a long-term loss or displacement of recreational opportunities and resources. ☐ TRUE ☐ FALSE
If FALSE, please explain.

b. The action will not exceed the Rational Threshold Value (RTV) (obtained using the Army's EIFS model) or historical precedent for past economic fluctuation for employment and regional income (as estimated by an acceptable economic model such as IMPLAN or REMI). ☐ TRUE ☐ FALSE
If FALSE, please explain.

c. The action will not have a disproportionate adverse economic, social, or health impact on a minority or low-income population. ☐ TRUE ☐ FALSE
If FALSE, please explain.

d. The action will not create a disproportionate environmental health or safety risk to children. ☐ TRUE ☐ FALSE
If FALSE, please explain.

B.2. Review of Other Resource Areas

B.2.1. Air Quality

a. The action will not violate the installation's air operating permit. ☐ TRUE ☐ FALSE
If FALSE, please explain. ____
If the use of best management practices (BMPs) cannot bring the emissions within regulatory limits, contact the state air quality agency for further assistance.

b. No new or modified stationary sources of air pollutants would be established at any AMC installation as part of the Proposed Action. ☐ TRUE ☐ FALSE
If FALSE, please explain. ____
Each AMC installation would obtain the required air permits based on the remediation method used to destroy energetic compounds.

c. Burning the facility in place (i.e., thermal destruction) is not required. ☐ TRUE ☐ FALSE
If FALSE, please explain. ____
If burning is required, obtain an open burn permit that allows burn-in-place building demolition and conduct an air quality analysis using the U.S. Environmental Protection Agency's approved regulatory model, AERMOD, or equivalent modeling program to ensure compliance.

d. The demolition project will not remove more than 1 million gross square feet per year in a nonattainment area. ☐ TRUE ☐ FALSE
If FALSE, please explain. ____
Estimate the total emissions of criteria pollutants for the project to determine whether they will still be less than *de minimis*. If not, consider dividing the project into separate phases that can be accomplished over multiple years.

B.2.2. Noise

a. The project will not have demolition activities within 800 feet of the installation boundary for more than 1 year.
☐ TRUE ☐ FALSE
If FALSE, please explain. ________________
Determine the distance from the project site to the nearest noise-sensitive receptor (e.g., church, school). If the distance is more than 800 feet, the project can proceed. If it is less than 800 feet, consider dividing the project into phases with quiet periods between the phases or using BMPs to minimize off-post noise.

b. The project will not have blasting activities for which a blast management plan that addresses noise and vibration is needed. ☐ TRUE ☐ FALSE
If FALSE, please explain. ________________
Ensure that the population potentially affected by the noise is informed of when blasting activities will occur, what level of noise and vibration they might experience, and how to contact the installation to report damage.

B.2.3. Soils and Water Resources

a. The action will be permitted under a construction general stormwater permit and an approved erosion and sediment control plan (for actions that will result in total ground disturbance of 1 acre or more).
☐ TRUE ☐ FALSE
If FALSE, please explain. ________________
Ground-disturbing activities that disturb less than 1 acre total do not need coverage under a construction general stormwater permit. Actions that disturb 1 acre or more must be permitted; contact the state agency to obtain a permit.

b. The action will not violate a National Pollutant Discharge Elimination System (NPDES) stormwater permit.
☐ TRUE ☐ FALSE
If FALSE, please explain. ________________
Contact the state water quality agency to determine how surface waters and stormwater runoff can be controlled sufficiently to ensure that no NPDES permits are violated.

c. The action will not occur within a floodplain. ☐ TRUE ☐ FALSE
If FALSE, please explain. ________________
Executive Order (EO) 11988, *Floodplain Management*, requires federal agencies to avoid to the extent possible adverse impacts on floodplains and to avoid direct and indirect support of floodplain development when a practicable alternative exists. Because the proposed project involves removing a structure from a floodplain, compliance with the EO is not an issue. To ensure safety during the project, schedule it outside a time when flooding might occur and ensure that the ground is stabilized before flooding occurs.

d. The action will not cause an exceedance of a Total Maximum Daily Load (TMDL). ☐ TRUE ☐ FALSE
If FALSE, please explain. ________________
Contact the state water quality agency to determine how to protect the affected surface water sufficiently to ensure that the TMDL is not exceeded.

e. The action will not cause a change in the impairment status of a surface water. ☐ TRUE ☐ FALSE
If FALSE, please explain.________________
Contact the state water quality agency to determine how to protect the affected surface water sufficiently during project activities to minimize any impairment.

f. The action will not require a Clean Water Act (CWA) section 401 water quality certification.
☐ TRUE ☐ FALSE
If FALSE, please explain.________________
Obtain a CWA section 401 water quality certification if required by the state agency.

g. The action will not occur in a coastal zone and require a Coastal Zone Management Act (CZMA) federal consistency determination. ☐ TRUE ☐ FALSE
If FALSE, please explain.________________
If the action occurs in a coastal zone and requires a CZMA federal consistency determination, one must be prepared and submitted to the state coastal zone management agency.

B.2.4. Biological Resources and Wetlands

a. The action will not adversely affect a federal or state protected plant or animal species. ☐ TRUE ☐ FALSE
If FALSE, please explain.________________
Contact the appropriate agency (U.S. Fish and Wildlife Service, National Marine Fisheries Service, or state wildlife agency) for species-specific guidance. Consider scheduling the project outside the animal's breeding and nesting season or relocating a plant to an appropriate location.

b. The action will comply with installation-specific tree replacement and other natural resources protection policies.
☐ TRUE ☐ FALSE
If FALSE, please explain.________________
Contact the installation natural resources manager for guidance on complying with natural resources protection policies.

c. The action will not cause the unpermitted loss or destruction of more than 1 acre of jurisdictional wetlands.
☐ TRUE ☐ FALSE

If FALSE, please explain.____________________

Complete a wetland delineation of the project site. Obtain a CWA section 404 permit from the U.S. Army Corps of Engineers. If permitted, you might have to mitigate any wetland loss to ensure compliance with the permit.

B.2.5. Cultural Resources

a. The action will not result in the demolition of a building or structure that is included in the Program Comments for Cold War Era Unaccompanied Personnel Housing, World War II and Cold War Era (1939–1974) Ammunition Storage Facilities; or for World War II and Cold War Era (1939–1974) Army Ammunition Production Facilities and Plants. ☐ TRUE ☐ FALSE

If FALSE, please explain.____________________

Consult the installation integrated cultural resources management plan's (ICRMP's) building inventory to determine the National Register of Historic Places (NRHP) status of the building(s) to be demolished.

b. The action will not result in the demolition of buildings or structures that are eligible for or listed on the NRHP not covered by a program comment or by the World War II Temporary Buildings Programmatic Agreement.
☐ TRUE ☐ FALSE

If FALSE, please explain.____________________

Consult the installation ICRMP's building inventory to determine the NRHP status of the building(s) to be demolished.

c. The action will not adversely affect a historic district that is eligible for or listed on the NRHP.
☐ TRUE ☐ FALSE

If FALSE, please explain.____________________

Section 106 compliance must be initiated with the State Historic Preservation Office (SHPO). Consult the installation's ICRMP and/or consult with the SHPO for further guidance on how to proceed.

B.2.6. Traffic and Transportation Systems

a. The demolition project will not create any long-term road closures or traffic delays. ☐ TRUE ☐ FALSE

If FALSE, please explain.____________________

Reroute construction traffic to minimize impacts on the surrounding road network. Contact the state transportation agency for guidance on how to minimize impacts on the road network.

B.2.7. Utilities

a. The action will not cause an exceedance of the existing capacity of an element of infrastructure.
☐ TRUE ☐ FALSE

If FALSE, please explain.____________________

Impose temporary restrictions on use of the utility (e.g., water, electricity) wherever possible on the installation to avoid an exceedance. Determine what conservation measures can be used to minimize project use of the utility.

b. The action will not violate a regulatory limit of any infrastructure system. ☐ TRUE ☐ FALSE

If FALSE, please explain.____________________

Contact the appropriate state agency to determine whether an exception to the limit can be made.

B.2.8. Hazardous Substances and Hazardous Waste

a. The action will not disturb known or create new contaminated sites that would be subject to regulatory control—including soil contamination, underground storage tanks, spills, and burial pits within the area that would be disturbed during the proposed demolition. ☐ TRUE ☐ FALSE

If FALSE, please explain.____________________

Coordinate with the installation Environmental Affairs Division to ensure that site assessments (record searches, soil gas surveys, monitoring well documentation, or other sample results) that could indicate the presence of contamination within the footprint of the proposed demolition have been thoroughly reviewed.

b. The building and ancillary structures to be demolished are absent of hazardous substances and wastes (i.e., asbestos-containing materials, lead-based paint, polychlorinated biphenyls, explosive residues, radioactive material, and other regulated materials) or the project has been permitted by the state to proceed with one or more known hazardous substances in place. ☐ TRUE ☐ FALSE

If FALSE, please explain.____________________

Coordinate with the installation Environmental Affairs Division to determine whether abatement or remediation is necessary.

c. The action will not cause a violation of a law or regulation governing hazardous substances or wastes or an installation hazardous waste permit. ☐ TRUE ☐ FALSE

If FALSE, please explain.____________________

Coordinate with the installation Environmental Affairs Division and regulatory agencies as necessary.

d.	The building being addressed is not the subject of an ongoing environmental investigation, remediation, demolition, or restoration in accordance with the Comprehensive Environmental Response, Compensation and Liability Act and Resource Conservation and Recovery Act. ☐ TRUE ☐ FALSE **If FALSE**, please explain.____
e.	All potential impacts attributable to hazardous materials and hazardous wastes are adequately addressed in the PEA and/or the SPEA. ☐ TRUE ☐ FALSE **If FALSE**, please explain.____ Coordinate with the installation Environmental Division to identify and initiate any additional NEPA requirements.

Record of Environmental Consideration (REC)

To (Environmental Officer): ____

From (Proponent): ____

Project title: ____

Brief description:

____

____

____

Anticipated date of proposed action (mm/yyyy): ______/___________

Anticipated duration (months): _________________

Reason for using a REC (choose one):

a. Adequately covered in the *Programmatic Environmental Assessment for the U.S. Army Materiel Command Building Demolition Program*, as supplemented by the Supplemental Programmatic Environmental Assessment for Energetics-Contaminated Facilities in Support of the U.S. Army Materiel Command Building Demolition Program, dated _______________________, as applicable.
b. Adequately covered in the *Supplemental Programmatic Environmental Assessment for Energetics-Contaminated Facilities in Support of the U.S. Army Materiel Command Building Demolition Program,* dated __________________.
c. Categorically excluded under the provisions of CX (__)(__), 32 CFR Part 651, Appendix B (and no extraordinary circumstances, as defined in 32 CFR 651.29(b)(1)–(14), exist) because:

____

____

____

_________________________ ____

Date Project Proponent

_________________________ ____

Date Installation Environmental Coordinator

Appendix B

Energetics Potentially Found at AMC Installations

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Appendix B
Energetics Potentially Found at AMC Installations

Product Name	Type	Description
Lead Azide (products: Primer Mix NOL #130, RD-1333)	Primary Explosive	Lead azide is an inorganic compound. It is used in detonators to initiate secondary explosives. In a commercially usable form, it is a white to buff powder. Lead azide is highly sensitive and usually handled and stored under water in insulated rubber containers. It will explode after a fall of around 150 mm (6 in) or in the presence of a static discharge of 7 millijoules.
Lead Styphnate (products: Primer Mix NOL #130)	Primary Explosive	Lead styphnate whose name is derived from styphnic acid, is an explosive used as a component in primer and detonator mixtures for less sensitive secondary explosives. Lead styphnate is particularly sensitive to fire and the discharge of static electricity. When dry, it can readily detonate by static discharges from the human body.
Potassium Chlorate / Perchlorate	Primary Explosive	Potassium chlorate was one key ingredient in early firearms percussion caps (primers). It continues in that application, where not supplanted by potassium perchlorate. Potassium chlorate based propellants are more efficient than traditional gunpowder and are less susceptible to damage by water. Mixes of potassium chlorate with plasticizers (such as wax) were the most common type of plastic explosive used, often filling grenades and other munitions. When used in explosives as an oxidizer, the explosive is low order meaning it burns rapidly rather than explodes. When mixed with a plasticizer, it may become high order, requiring a blasting cap to detonate properly. Potassium chlorate is rarely used in explosives now, as it is considered too sensitive for most uses.
Tetrazene (Primer) (products: Primer Mix NOL #130)	Primary Explosive	Tetrazene is used as explosive or a dentonator. Tetrazenes are suitable as propellants or gas-generating agents thanks to their high thermal stability and low temperature of explosion.Tetrazene is often used as an explosive or detonator due to its high reactivity and sensitivity.
Antimony Sulfide (products: Primer Mix NOL #130)	Primary Explosive	Antimony trisulfide Sb_2S_3 is found in nature as the crystalline mineral stibnite and the amorphous red mineral metastibnite. It is manufactured for use in safety matches, military ammunition, explosives and fireworks.
Barium Nitrate (products: Baratol & Primer Mix NOL #130)	Primary Explosive	Baratol is an explosive composed of barium nitrate, TNT and binder; the high density of barium nitrate results in baratol being quite dense as well. Barium nitrate mixed with aluminium powder, a formula for flash powder, is highly explosive. It is mixed with thermite to form Thermate-TH3, used in military thermite grenades.

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Energetics Potentially Found at AMC Installations

Product Name	Type	Description
Calcium Silicide	Primary Explosive	Calcium silicide, also called calcium disilicide, is an inorganic compound. It is a whitish or dark grey to black solid matter with melting point 1033 °C. It is insoluble in water, but may decompose when subjected to moisture, evolving hydrogen and producing calcium hydroxide. It is flammable and may ignite spontaneously in air. In pyrotechnics, it is used as fuel to make special mixtures, e.g., for production of smokes, in flash compositions, and in percussion caps. Silicon-based fuels are used in some time delay mixtures, e.g., for controlling of explosive bolts, hand grenades, and infrared decoys.
Lead Mononitroresorcinate (LMNR)	Primary Explosive	Commonly used priming explosive materials. An initiating explosive shipped as a slurry or wet mass of reddish-brown crystals. May explode due to shock, heat, flame, or friction if dried. The primary hazard is the blast of an instantaneous explosion and not flying projectiles and fragments.
Trinitroresorcinol (TNR)	Primary Explosive	A yellowish, crystalline solid. May explode under exposure to heat or fire. Primary hazard is blast of an instantaneous explosion, not flying projectiles or fragments. Used as a priming agent. Very sensitive to heat. Water is added to lessen the explosion hazard.
DBX-1	Primary Explosive	DBX-1 (Copper(I) 5-nitrotetrazolate) was developed as a Green primary explosive that could serve as a replacement for lead azide (LA), a widely used explosive that has fallen out of favor due to its toxicity and chemical compatibility issues. DBX-1 relies on a precursor material known as sodium 5-nitrotetraozole, or NaNT, which is difficult to synthesize, making the production process dangerous as it generates micro-detonations or loss of chemical reactors.
KDNP	Primary Explosive	KDNP (4,6-dinitro-7-hydroxybenzofuroxan, potassium salt) was developed as a Green primary explosive as suitable drop-in replacement for lead styphnate in a variety of ordnance applications. KDNP is easily prepared, has excellent thermal stability and has safety and performance properties, which are equivalent to or exceed those for lead styphnate.

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Product Name	Type	Description
Zirconium / Zirconium-Nickel	Primary Explosive	The combustibility of zirconium increases as the average particle size decreases, but othe r variables, such as moisture content, also affect its ease of ignition. Pieces of zirconium can withstand extremely high temperatures without igniting, whereas clouds of dust in which the average particle size is 3 microns have ignited at room temperature. Dust clouds of larger particle size can be readily ignited if an ignition source is present, and such explosions can occur in atmospheres of carbon dioxide or nitrogen as well as in air. Zirconium dust will ignite in carbon dioxide at approximately 621°C (1,150°F) and nitrogen at approximately 788°C (1,450°F). Tests have also indicated that layers of 3-micron-diameter dust are susceptible to spontaneous ignitiion. Zirconium carbide – used in some rocket fuels, also a combustion instability suppressant. Zirconium(II) hydride – together with potassium perchlorate it is used in some igniters.
Picric Acid (TNB)	Primary Explosives - older	Picric acid is the chemical compound formally called 2,4,6-trinitrophenol (TNP). This yellow crystalline solid is one of the most acidic phenols. Picric acid has been used in munitions and explosives. Explosive D aka Dunnite is the ammonium salt of picric acid, more powerful but less stable than the more common explosive TNT (which is produced in a similar process to picric acid but with toluene as the feedstock).
Barium Styphnate	Primary Explosive	The barium salt of 2,4,6-trinitroresorcinol. Shipped as a slurry or wet mass of orange-yellow crystals. Shock, heat, flame or friction may cause explosion if dried out. The primary hazard is blast of instantaneous explosion and not flying projectiles and fragments.
Trinitrobenzene (TNB)	Primary Explosive	1,3,5-Trinitrobenzene is a high explosive, being moderately explosive in liquid form and extremely explosive in its dry powder form. It has a clear to light yellow sludgy appearance. It will detonate under strong shock. High temperatures, whether by sudden heating of any quantity, or by the accumulation of heat when large quantities are burning, will also cause detonation.

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Product Name	Type	Description
RDX [products: Cyclatol, PBX (various), PBXN (various), Comp CH-6, HBX-1, CXM-AF-5, CXM-7, CXM-AF-7, AFX 757, AFX 795C4, Comp A3/A4/A5, Comp B4/B5, Pentolite 50/50, H6]	Secondary Explosive	RDX is an explosive nitroamine widely used in military and industrial applications. It was developed as an explosive which was more powerful than TNT. RDX is stable in storage and is considered one of the most powerful and brisant of the military high explosives. Cyclotol is an explosive consisting of castable mixtures of RDX and TNT. It is related to the more common Composition B, which is roughly 60% RDX and 40% TNT; various compositions of Cyclotol contain from 65% to 80% RDX.
HMX (products: Octol, LX-14, CXM-11, AFX-1282, PBX (various) & PBXN (various))	Secondary Explosive	HMX, also called octogen, is a powerful and relatively insensitive nitroamine high explosive, chemically related to RDX.
TNT (products: H6, Baratol, Boracitol, Cyclatol, HBX-1, Tetrytol, Tritonal, Destex, Amatol, Octol, Pentolite, Comp B/B4/B5)	Secondary Explosive	TNT is a yellow-colored solid best known as a useful explosive material with convenient handling properties. The explosive yield of TNT is considered to be the standard measure of strength of bombs and other explosives.TNT is valued partly because of its insensitivity to shock and friction, which reduces the risk of accidental detonation, compared to other more sensitive high explosives such as nitroglycerin. TNT melts at 80 °C (176 °F), far below the temperature at which it will spontaneously detonate, allowing it to be poured as well as safely combined with other explosives. Baratol is an explosive made of a mixture of TNT and barium nitrate, with a small quantity of paraffin wax. Boracitol: 60% boric acid, 40% TNT (typical). Cyclotol is an explosive consisting of castable mixtures of RDX and TNT containing from 65% to 80% RDX. HBX, is an explosive used as a bursting charge and contains a mixture of RDX, nitrocellulose, calcuim chloride, calcium silicate TNT, aluminum and wax. Tetrytol is a high explosive, comprising a mixture of Tetryl and TNT. Typically, the proportion of ingredients (by weight) is approximately 70% tetryl and 30% TNT.

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Product Name	Type	Description
PETN (products: Pentolite 50/50, flexible explosive)	Secondary Explosive	Pentaerythritol tetranitrate (PETN), also known as PENT, PENTA, or TEN, is the nitrate ester of pentaerythritol and is structurally very similar to nitroglycerin. PENTA refers to the five carbon atoms of the neopentane skeleton. PETN is one of the most powerful explosive materials known, with a relative effectiveness factor of 1.66. When mixed with a plasticizer, PETN forms a plastic explosive. It is also used as a component of pentolite, a 50/50 blend with TNT. As a mixture with RDX and other minor additives, it forms another plastic explosive called Semtex.The most common use of PETN is as an explosive with high brisance. It is more difficult to detonate than primary explosives, so dropping or igniting it will typically not cause an explosion (at atmospheric pressure it is difficult to ignite and burns relatively slowly), but is more sensitive to shock and friction than other secondary explosives such as TNT or tetryl. Under certain conditions a deflagration to detonation transition can occur. It is rarely used alone, but primarily used in booster and bursting charges of small caliber ammunition, in upper charges of detonators in some land mines and shells, and as the explosive core of detonation cord. PETN is the least stable of the common military explosives, but can be stored without significant deterioration for longer than nitroglycerin or nitrocellulose.
Ammonium Nitrate (products: Amatol)	Secondary Explosive	Ammonium nitrate is a white crystalline solid and is highly soluble in water. Amatol is a highly explosive material made from a mixture of TNT and ammonium nitrate.
Nitroguanidine (Picrite) (products: Triple base propellant, IMX-101)	Secondary Explosive	Nitroguanidine is a colorless, crystalline solid that melts at 232 °C and decomposes at 250 °C. It is not flammable and is a low-sensitivity explosive; however, its detonation velocity is high. Nitroguanidine is used as an explosive propellant, notably in triple-base smokeless powder. The nitroguanidine reduces the propellant's flash and flame temperature without sacrificing chamber pressure.
TATB (products: PBX (various) & PBXN (various))	Secondary Explosive	TATB is a powerful explosive (somewhat less powerful than RDX, but more than TNT), but it is extremely insensitive to shock, vibration, fire, or impact. Because it is so difficult to detonate by accident, even under severe conditions, it has become preferred for applications where extreme safety is required. TATB is normally used as the explosive ingredient in plastic bonded explosive compositions, such as PBX.

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Product Name	Type	Description
Tetryl (products: Tetrytol)	Secondary Explosive	Tetryl is a sensitive explosive compound used to make detonators and explosive booster charges. Tetryl is a sensitive secondary high explosive used as a booster, a small charge placed next to the detonator in order to propagate detonation into the main explosive charge. Tetrytol is a high explosive, comprising a mixture of Tetryl and TNT. Typically, the proportion of ingredients (by weight) is approximately 70% tetryl and 30% TNT.
Black Powder	Secondary Explosive or Propellant	Gunpowder, also known as black powder, is a chemical explosive—the earliest known. It is a mixture of sulfur, charcoal, and potassium nitrate (saltpeter). The sulfur and charcoal act as fuels, and the saltpeter is an oxidizer. Because of its burning properties and the amount of heat and gas volume that it generates, gunpowder has been widely used as a propellant in firearms and as a pyrotechnics. Gunpowder is classified as a low explosive because of its relatively slow decomposition rate and consequently low brisance.
Boron Potassium Nitrate	Secondary Explosive	Boron potassium nitrate is commonly used priming explosive materials. It is a common igniter formula is BPN, $BKNO_3$, or boron – potassium nitrate, a mixture of 25% boron and 75% potassium nitrate by weight. It is used e.g. by NASA. It is thermally stable, stable in vacuum, and its burn rate is independent of pressure. In comparison with black powder, BPN burns significantly hotter and leaves more of solid residues.
Mercury Fulminate	Primary Explosive	Mercury(II) fulminate, or $Hg(CNO)_2$, is a primary explosive. It is highly sensitive to friction and shock and is mainly used as a trigger for other explosives in percussion caps and blasting caps. Mercury(II) cyanate, though its formula is identical, has a different atomic arrangement; the cyanate and fulminate anions are isomers. First used as a priming composition in small copper caps after the 1830s, mercury fulminate quickly replaced flints as a means to ignite black powder charges in muzzle-loading firearms. Later, during the late 19th century and most of the 20th century, mercury fulminate or potassium chlorate became widely used in primers for self-contained rifle and pistol ammunition. Mercury fulminate has the distinct advantage over potassium chlorate of being noncorrosive, but it is known to weaken with time. Today, mercury fulminate has been replaced in primers by more efficient chemical substances.

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Product Name	Type	Description
HNS (products: Exploding Foil Initiators (EFIs))	Secondary Explosive	Hexanitrostilbene (HNS), also called JD-X, is an organic compound with the formula $[(O_2N)_3C_6H_2CH]_2$. It is a yellow-orange solid. It is used as a heat resistant high explosive. It is produced by oxidizing trinitrotoluene (TNT) with a solution of sodium hypochlorite. HNS boasts a higher insensitivity to heat than TNT, and like TNT it is insensitive to impact. When casting TNT, HNS is added at 0.5% to form erratic micro-crystals within the TNT, which prevent cracking. Because of its insensitivity but high explosive properties, HNS is used in space missions.
Diazodinitrophenol (DDNP)	Primary Explosive	Diazodinitrophenol (DDNP) is a yellowish brown powder. It is soluble in acetic acid, acetone, concentrated hydrochloric acid, most non-polar solvents and is slightly soluble in water. A solution of cold sodium hydroxide may be used to destroy it. DDNP may be desensitized by immersing it in water, as it does not react in water at normal temperature. It is less sensitive to impact but more powerful than mercury fulminate and lead azide. The sensitivity of DDNP to friction is much less than that of mercury fulminate, but it is approximately that of lead azide. DDNP is used with other materials to form priming mixtures, particularly where a high sensitivity to flame or heat is desired. DDNP is often used as an initiating explosive in propellant primer devices and is a substitute for lead styphnate in what are termed "non-toxic" (lead free) priming explosive compositions.
DXN-1	Primary Explosive	DXN-1 is a white to light tan crystal. It was developed in the 1980's and was used as an initiating explosive component in the APOBS fuzes. It has higher explosive output than lead azide.
Dinitroanisole (DNAN) (products: IMX-101, IMX-104, PAX-21, PAX41 & PAX-48)	Secondary Explosive	2,4-Dinitroanisole (DNAN) is a low sensitivity explosive organic compound. 2,4-Dinitroanisole is used as an explosive replacing TNT. It is used in explosive mixtures such as IMX-101, IMX-104, PAX-48, PAX-21 and PAX-41 in the spider grenade. It can be melted and cast more safely.
NTO (products: IMX-101, IMX-104, PAX-21 & PAX-48)	Secondary Explosive	Dinitrogen tetroxide (NTO), commonly referred to as nitrogen tetroxide, is the chemical compound N_2O_4. Dinitrogen tetroxide is a powerful oxidizer that is hypergolic (spontaneously reacts) upon contact with various forms of hydrazine, which makes the pair a popular bipropellant for rockets.

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Product Name	Type	Description
Nitrocellulose (NC)	Secondary Explosive - EM-385 suggests treating as Primary Explosive; also used as a propellant	Nitrocellulose (also: NC, cellulose nitrate, flash paper, flash cotton, guncotton, flash string) is a highly flammable compound formed by nitrating cellulose through exposure to nitric acid or another powerful nitrating agent. When used as a propellant or low-order explosive.
Nitroglycerin	Secondary Explosive - EM-385 suggests treating as Primary Explosive; also used as a propellant	Nitroglycerin (NG), also known as nitroglycerine, trinitroglycerin (TNG), trinitroglycerine, nitro, glyceryl trinitrate (GTN), or 1,2,3-trinitroxypropane, is a heavy, colorless, oily, explosive liquid. Nitroglycerin is also a major component in double-based smokeless gunpowders used by reloaders. Combined with nitrocellulose, there are hundreds of (powder) combinations used by rifle, pistol, and shotgun reloaders. Large quantities of nitroglycerin were manufactured during World War I and World War II for use as military propellants and in military engineering work. Nitroglycerin was also used as an ingredient in military propellants for use in firearms.
Phosphorous (red and white)	Pyrotechnics	White phosphorus is a translucent waxy solid that quickly becomes yellow when exposed to light. It is highly flammable and pyrophoric (self-igniting) upon contact with air as well as toxic. White phosphorus ignite at about 30 °C. White phosphorus is used in incendiary weapons and to make some military smoke screens, ignites spontaneously in air. Red phosphorus may be formed by heating white phosphorus to 300°C (482 °F) in the absence of air or by exposing white phosphorus to sunlight. Red phosphorus does not ignite in air at temperatures below 240 °C. Red phospherous is used in caps and also used in matches and some military infrared flares.

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Product Name	Type	Description
Magnesium Powders	Pyrotechnics	Magnesium powder and potassium nitrate have been used to produce flash powder. Magnesium based compositions degrade over long periods of time, as magnesium does not form a passivating oxide coating, meaning the metallic Mg will slowly react with atmospheric oxygen and moisture. In military pyrotechnics involving magnesium fuels, external oxygen can be excluded by using hermetically sealed canisters. A flash composition designed specifically to generate flares that are exceptionally bright in the infrared portion of the spectrum use a mixture of pyro grade magnesium and powdered polytetrafluoroethylene. These flares are used as decoys from aircraft that might be subject to heat-seeking missile fire.
Titanium Dioxide	Pyrotechnics	Titanium produces hot particles, increases sensitivity to impact and friction; sometimes the Ti_4Al_6V alloy is used which gives a bit brighter white sparks; together with potassium perchlorate it is used in some pyrotechnic igniters; coarse powder produces beautiful branching blue-white sparks. Titanium(II) hydride – together with potassium perchlorate it is used in some igniters.
Sulfur Powders	Pyrotechnics	Sulfur – ignition promoter, increases burn rate; increases sensitivity to temperature, impact and friction, dangerous in combination with chlorates; commonly used with nitrates; used as an additive; may contain residual acids, combination with carbonates or other alkaline stabilizers is advised in acid-sensitive compositions.
Potassium Perchlorate / Potassium Nitrate (products: Benite)	Pyrotechnics	Potassium perchlorate is the inorganic salt with the chemical formula $KClO_4$. Like other perchlorates, this salt is a strong oxidizer although it usually reacts very slowly with organic substances. This usually obtained as a colorless, crystalline solid is a common oxidizer used in fireworks, ammunition percussion caps, explosive primers, and is used variously in propellants, flash compositions, stars, and sparklers. It has been used as a solid rocket propellant, although in that application it has mostly been replaced by the higher performance ammonium perchlorate. Potassium nitrate is a chemical compound with the chemical formula KNO_3. It is an ionic salt of potassium ions K+ and nitrate ions NO_3^-. It occurs as a mineral niter and is a natural solid source of nitrogen. Potassium nitrate is one of several nitrogen-containing compounds collectively referred to as saltpeter. Major uses of potassium nitrate are in rocket propellants and fireworks. It is one of the major constituents of gunpowder (blackpowder).

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Product Name	Type	Description
Aluminum Powders	Pyrotechnics	Aluminum powder can produce spectacularly exothermic oxidation-reduction reactions. Aluminum can be mixed with a metal oxide and the resulting powder will burn brilliantly and release a tremendous amount of energy in a very short period of time. This chemical reaction has been used to produce flash powder, in which aluminum and potassium perchlorate react vigorously together to produce a bang and a flash. Iron oxide powder and aluminum powder, when mixed, form thermite, which produces a great deal of light and a tremendous amount of heat. Aluminum hydride is unstable for storage (decomposes easily with humidity) and reacts dangerously in contact with water.
Calcium Resinate (incendiary)	Pyrotechnics	Calcium resinate is used as alternative to perchlorates and a binder in pyrotenics. It is a yellowish white, amorphous powder that is soluble in acid, insoluble in water; made by boiling rosin with calcium hydroxide and filtering, or by fusion of melted rosin with hydrated lime. The M276 is a violet-tipped dim tracer that uses composition R 440, which is barium peroxide, strontium peroxide, calcium resinate, and magnesium carbonate.
Ammonium Perchlorate (products: AFX 575 & PAX-21)	Pyrotechnics	Ammonium perchlorate is an inorganic compound with the formula NH_4ClO_4. It is the salt of perchloric acid and ammonia. It is a powerful oxidizer, which explains its main use in solid propellants.The primary use of ammonium perchlorate is in making solid fuel propellants. When AP is mixed with a fuel (like a powdered aluminum and/or with an elastomeric binder), it can generate self-sustained combustion at far under atmospheric pressure. It is an important oxidizer with a decades-long history of use in solid rocket propellants. Ammonium perchlorate is used in the AFX 575 & PAX-21 as an oxidizer.
Strontium Nitrate	Pyrotechnics	Strontium nitrate is an inorganic compound with the formula $Sr(NO_3)_2$. This colourless solid is used as a colorant (red) in pyrotechnics and is also used as an oxidizer in pyrotechnics. Like many other strontium salts, strontium nitrate is used to produce a rich red flame in fireworks and road flares. The oxidizing properties of this salt are advantageous in such applications.

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Product Name	Type	Description
Barium Chromate	Pyrotechnics	Barium chromate, named barium tetraoxochromate(VI) by the IUPAC, is a yellow sand-like powder with the formula $BaCrO_4$. It is a known oxidizing agent and produces a green flame when heated, a result of the barium ions. Barium chromate is an oxidizing agent, making it useful as a burn rate modifier in pyrotechnic compositions. It is especially useful in delay compositions such as delay fuses.
Magnesium and Aluminum Alloy Powder (Magnalium)	Pyrotechnics	Magnalium is an aluminium alloy with magnesium and small amounts of copper, nickel, and tin. Some alloys, intended for particular uses at the cost of poor corrosion resistance, may consist of up to 50% magnesium. It finds use in engineering and pyrotechnics. The alloy is flammable when powdered, are more resistant to corrosion than pure magnesium, and are more reactive than pure aluminium and are therefore used in pyrotechnics as a metal fuel and to produce sparks. Magnalium powder also burns with a crackling sound if burnt by itself and provides a good compromise between the reactivity of magnesium and the stability of aluminium.
Boron Powder	Pyrotechnics	Boron powder is primarily used as a high temperature ignition composition in electric matches, primes, first fires and delay elements, in place of thermite, in rockets, in green pyrotechnic flares.
Ball powder (products: small caliber ammunition)	Propellants	Ball propellant is a form of nitrocellulose used in small arms cartridges. It has been trademarked as Ball Powder by Olin Corporation Ball propellant can be manufactured more rapidly with greater safety and lesser expense than extruded propellants. Ball propellant was first used to load military small arms cartridges during World War II and has been manufactured for sale to handloading civilians since 1960.
Dinitrotoluene	Propellants	2,4-Dinitrotoluene (DNT) is used in the production of smokeless powders, as a plasticizer in rocket propellants and as a gelatinizing and waterproofing agent. Both dinitrotoluene isomers (2,4-DNT and 2,6-DNT) may occur as impurities during manufacture of TNT. Both 2,4- and 2,6-DNT have similar chemical properties.

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Product Name	Type	Description
Diethylene Glycol Dinitrate (DEGDN)	Propellants	Diethylene glycol dinitrate is a nitrated alcohol ester. While chemically similar to a number of powerful high explosives, pure diethylene glycol dinitrate is extremely hard to initiate and will not propagate a detonation wave. Mixed with nitrocellulose and extruded under pressure, diethylene glycol dinitrate forms a tough colloid whose characteristics (good specific impulse, moderate burn rate and temperature, great resistance to accidental ignition and casual handling) make it well suited as a smokeless powder for artillery and a solid propellant for rocketry. It was widely used in this capacity during World War II. It also found use as a "productive" desensitizer (one that contributes to the overall power of the explosion rather than having a neutral or negative effect) in nitroglycerine and nitroglycol-based explosives such as dynamite and blasting gelatin. It is also used as plasticizer for energetic materials.
Butanetriol (1,2,4-Butanetriol trinitrate [BTTN])	Propellants	1,2,4-Butanetriol trinitrate (BTTN), also called butanetriol trinitrate, is an important military propellant. It is a colorless to brown explosive liquid. BTTN is used as a propellant in virtually all single-stage missiles used by the United States, including the Hellfire. It is less volatile, less sensitive to shock, and more thermally stable than nitroglycerine, for which it is a promising replacement. BTTN as a propellant is often used in a mixture with nitroglycerin. The mixture can be made by co-nitration of butanetriol and glycerol. BTTN is also used as a plasticizer in some nitrocellulose based propellants.

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Product Name	Type	Description
Smokeless Powder	Propellants	Smokeless powder is the name given to a number of propellants used in firearms and artillery that produce negligible smoke when fired, unlike the black powder they replaced.Currently, propellants using nitrocellulose (detonation velocity 7,300 m/s [23,950 ft/s]) (typically an ether-alcohol colloid of nitrocellulose) as the sole explosive propellant ingredient are described as single-base powder. Propellants mixtures containing nitrocellulose and nitroglycerin (detonation velocity 7,700 m/s [25,260 ft/s]) as explosive propellant ingredients are known as double-base powder. During the 1930s triple-base propellant containing nitrocellulose, nitroglycerin, and a substantial quantity of nitroguanidine (detonation velocity 8,200 m/s [26,900 ft/s]) as explosive propellant ingredients was developed. These propellant mixtures have reduced flash and flame temperature without sacrificing chamber pressure compared to single and double base propellants, albeit at the cost of more smoke.

Note:

This list contains the most common anticipated compounds used or stored at AMC installations. However, it is not a comprehensive list of all possible compounds.

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Appendix C

Finding of No Significant Impact

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DRAFT FINDING OF NO SIGNIFICANT IMPACT

SUPPLEMENTAL PROGRAMMATIC ENVIRONMENTAL ASSESSMENT FOR ENERGETICS-CONTAMINATED BUILDINGS FOR THE U.S. ARMY MATERIEL COMMAND BUILDING DEMOLITION PROGRAM

1. PROPOSED ACTION: The Proposed Action and subject of this Supplemental Programmatic Environmental Assessment (SPEA), which is hereby incorporated by reference, is the removal of unused and unneeded energetics (explosive)-contaminated facilities from the real property inventories of AMC installations. Implementing the Proposed Action would reduce fixed facility costs (i.e., utilities), save energy, reduce risks from structural deterioration, and make otherwise idle areas of an installation available for productive reuse.

2. ALTERNATIVES CONSIDERED: During the preparation of this SPEA, no reasonable alternatives to the Proposed Action were identified. The only alternative to the Proposed Action was to renovate the facilities for reuse rather than demolish them, but that alternative was found to be unreasonable and unsafe and was dismissed from further consideration. Both the Proposed Action and the No Action Alternative are evaluated in the SPEA. The SPEA characterizes the likely environmental impacts—including impacts on human health—that could result from implementing the Proposed Action or the No Action Alternative.

3. ENVIRONMENTAL CONSEQUENCES AND MITIGATION MEASURES: It is unlikely that significant adverse environmental impacts would result from implementing the Proposed Action. The Proposed Action includes adherence to existing applicable health, safety, and environmental regulations. Each facility to be demolished would be analyzed under the National Environmental Policy Act before being demolished. Implementing standard best management practices during the demolition of individual facilities would mitigate risk to people and ensure environmental protection.

4. FACTORS CONSIDERED IN THE FINDING OF NO SIGNIFICANT IMPACT: The SPEA discusses the nature of the Proposed Action and the likely environmental effects on all relevant resource areas associated with its implementation.

5. PUBLIC REVIEW AND COMMENT: The SPEA and Draft Finding of No Significant Impact (FNSI) were available for public review and comment for a period of 30 days. A Notice of Availability (NOA) of the documents was published in the local newspaper serving each of the 21 installations covered by this SPEA. The documents were made available at each installation as well as electronically at http://www.amc.army.mil/amc/environmental.html. Copies of the documents also were available for review at local libraries in the town closest to each of the 21 installations covered by this SPEA. Interested parties were invited to submit comments on the SPEA and Draft FNSI by mail to Headquarters Army Materiel Command, Environmental Division (AMCOL-IE), Redstone Arsenal, AL 35898, or by electronic mail at http://www.amc.army.mil/amc/environmental.html. All comments had to be submitted not later than 30 days after publication of the NOA. At the conclusion of the public review and comment period, all public comments submitted were reviewed and addressed prior to a final determination by the Army as to whether to publish this Draft FNSI as a Final FNSI or issue a Notice of Intent to prepare an Environmental Impact Statement (EIS).

6. CONCLUSIONS: Based upon my review of the facts and the analysis presented in the SPEA, I conclude that implementing the Proposed Action would have no significant direct, indirect, or cumulative impacts on the quality of the natural or human environment; and that, consequently, the analysis in the SPEA supports a FNSI. Preparation of an EIS is not required. Not implementing the Proposed Action would eliminate the negligible-to-minor environmental effects associated with its implementation but would increase energy use and maintenance costs and make idle land unavailable for future use on AMC installations.

General Clark W. LeMasters, Jr. Date

Major General, USA
Deputy Chief of Staff
for Operations and Logistics, G-3/4