

Final Addendum 1 to the Explosive Safety Submission (ESS) for Building Demolition at the Badger Army Ammunition Plant

1. **Definitions:** The following definitions apply to the addendum:
 - 1.1. *Structures.* Structures include the primary superstructure of buildings and all associated components including, but not limited to, decks, docks, stairways, partitions, flooring, etc.
 - 1.2. *Contamination.* The presence of explosives/explosive residue in, on, or about equipment, structures, and real estate that have been used in or exposed to explosive operations (TB 700-4).
 - 1.3. *Decontamination.* The partial or complete removal, neutralization, or destruction of explosives/explosive residue by flashing, steaming, washing, neutralization, or other approved desensitizing methods (TB 700-4).
2. **Background:** DDESB Memo dated 14 August 2003 approved the ESS submitted to perform explosive disassembly of equipment, thermal decomposition of explosives, and demolition and removal of 10 buildings at the Badger Army Ammunition Plant (BAAAP). This addendum is required since the basic approach to the demolition of selected structures is being changed.

This addendum proposes demolition and disposal of selected BAAAP structures known or suspected to present an explosive hazard (3X and 5X structures) by conventional wet demolition methods. The 82 structures (see Appendix A) are located within the BALL POWDER[®] (Smokeless Powder) and Paste (Rocket Propellant) Production Areas. The Army selected these structures based on its ability to safely remove the structures by conventional wet demolition methods and the pending transfer of portions of BAAAP. A synopsis of changes to the approved ESS, otherwise referred to as the basic ESS, is provided below. Each change will be described more fully in subsequent paragraphs.

- 2.1. **Conventional Wet Demolition versus Thermal Decomposition.** Public concerns regarding air quality and regulatory concerns with the thermal decomposition (burning) of structures known or suspected to contain high concentrations of explosive residues (contamination) led to the selection of certain BAAAP structures for dismantling using a conventional wet demolition process. In the case where visible and accessible high levels of contamination exist, a decontamination process followed by wet demolition will occur.
- 2.2. **Selected Structures.** Based on historical documents, production use, and previous contamination inspections and recommendations, 82 structures are proposed to be demolished at BAAAP using conventional wet demolition methods. The foundations, slabs, and all associated underground utilities will not be removed, at this time. However, these components will be subjected to

explosive hazard inspections and post demolition sampling and analyses prior to consideration of the pending transfer of these portions of BAAAP.

2.3. Additional Explosive Safety Quantity Distance (ESQD) Arcs. ESQDs have been established for each structure to be demolished per DOD 6055.9 - Std. The default distance of 1,250 feet, as specified in the original ESS for all tasks requiring explosive safety consideration, will be used.

3. **Structures Selected for Conventional Wet Demolition:** Each of the 82 structures selected for wet demolition has been inspected by credentialed UXO Safety Officers (UXOSOs) and Senior UXO Supervisors (SUXOSs) for contamination from four separate contractors on four separate occasions. The contractors include MKM Engineers, Inc. (MKM), Plexus Scientific Corporation (Plexus), SpecPro, Inc. (SpecPro), and Shaw Environmental, Inc. (Shaw). SpecPro and Shaw recently completed joint inspections to further define potential contamination hazards within the 82 selected structures. The current levels of contamination have been certified by SpecPro and Shaw and comply with Department of the Army IOCP 385-1. All certifications that do not present an explosive hazard (5X) have been verified by Army.

Previous inspections have shown that these structures have relatively low contamination with explosive residues (e.g., smokeless powder and rocket paste). The structures are recommended for conventional wet demolition methods due to their low risk of ignition hazard. The selected structures are located within a portion of each production line where contamination by explosive residues may exist, but at very low levels. Propellants entered this portion of the production line in a stable condition as finished grains where screening, bagging, canning, and storage occurred.

None of the selected structures have been found, either through historical documentation or visual inspection, to contain nitroglycerin or nitrocellulose. The extent of contamination is limited to very small amounts of residual cylindrical grains and chips lying on the floors, within cracks and exposed wall spaces. Removing visible grains and chips by the simple means of adequately wetting and picking the material up by hand, packaging, and transporting them per the basic ESS, would lessen or possibly eliminate the potential explosive hazards. Small amounts of contamination have also been identified by visual and/or field test methods around areas where equipment may have been handled, on power switches, on and under kick plates, under door sills, and within crevices of structural wood components. Careful disassembly of such equipment and structures and decontamination of explosive residues will lessen or possibly eliminate potential explosive hazards.

Representative photos of each type of structure are provided in Appendix B. A detailed description of each type of structure and safety concerns associated with them is provided as follows:

- 3.1. 1725 Series – Air Dry Houses: Each Air Dry House is comprised of 4 individual structures; the main Air Dry House, heater structure, mechanical structure, and

elevator structure. Covered buggies filled with finished propellant grains (solvent removed) were transported from the Water Dry Houses to the Air Dry Houses. The buggies were raised by lift truck to the second floor loading platform and emptied into 10,000-gallon, open top, air dry tanks. Air, heated to 130 degrees Fahrenheit, was forced through the grains at 3,500 cubic feet per minute for 12 hours to dry them. The grains were again placed into covered buggies for transport to the Pre-Blending Houses.

Spilled propellant grains and settled dusts are of primary explosive safety concern within these structures. The wood framed structure is exposed on the interior of these structures and inaccessible areas are limited to structural member joints and wood floor planks. The propellant drying bays consist of concrete floors and walls with a subsurface drain in the center of the floor. These bays were subjected to wash down after production so residual contamination can be expected to exist within obscure cracks within the foundation and slab and within the subsurface drains. All concrete foundation, slabs, subsurface drains, and in this case, walls (as they are part of the foundation structure) will remain in-place. However, the wood framed portions of the structures were dry swept after production and suspect areas of concern reveal the visible propellants which can be easily accessed and removed by hand in accordance with the procedures outlined in Paragraph 6.

The heater and mechanical structures reveal no evidence of contamination. The elevator structure may reveal propellant grains under the lift truck and within the lift truck components. Small portions of the lift truck will be carefully dismantled in accordance with procedures outlined in Section 6.0 and thoroughly inspected for contamination and decontaminated as required.

- 3.2. 1850 Series – Screen Houses: Each Screen House is comprised of 3 individual structures; the main Screen House, motor structure, and heater structure. Bagged powder was transported to the main Screen House on buggies to be screened. The powder was dumped into a hopper, above a shaker screen, and the desired granulation passed through the shaker screen leaving foreign materials behind. A second screen retained the powder grains passed by the first screen while dust, graphite, etc. passed through to a bottom pan. The powder grains were then weighed into bags and transported to the Rest Houses by covered buggies.

Spilled propellant grains and settling dusts are of primary explosive safety concern within these structures. The wood framed structures are enclosed on their interior by plywood walls and ceilings with taped joints and composite tongue and groove wood planks, paper, plywood, hubbelite, and vinyl flooring. Suspect deposit areas are limited to structural member joints and cracks within the composite flooring. These structures were dry swept after production and do not contain subsurface drains. The composite floors rest on concrete piers which will remain in-place. The interior portions of the structures including the

shaker screen wooden supports reveal the visible propellants which can be easily accessed and removed by hand in accordance with the procedures outlined in Paragraph 6. The motor and heater structures reveal no evidence of contamination.

- 3.3. 1750 Series – Rest Houses: Each Rest House is comprised of 1 individual structure. Bagged powder was transported to the Rest Houses on covered buggies from the Screen, Glaze, or Pre Blend Houses. The bagged powder was stored here until 30 batches of powder have accumulated. After laboratory and ballistics approval, batches were assigned lots, loaded onto buggies, and transported to the Final Blending Houses.

Residual dusts are of primary explosive safety concern within these structures. The wood framed structures are enclosed on their interior by plywood walls and ceilings with taped joints and composite wood planks, paper, and conductive rubber flooring. The entire perimeter of the floor is skirted with a 2" x 8" kick plate. These structures were dry swept after production and do not contain subsurface drains. The composite floors rest on concrete piers which will remain in-place. Visible propellants were not identified within these structures, however, the kick plates tested positive with Drop-Ex® field test kits. The kick plates can be removed by hand in accordance with the procedures outlined in Paragraph 6. Inspection and decontamination of visible energetic materials behind the kick plates will remove any explosive safety hazard associated with these structures.

- 3.4. 1885 Series – Box Storage: Each Box Storage structure is comprised of 1 individual structure separated into two portions; mechanical room and storage warehouse. Empty powder cans were stored here prior to going through box wash and repair. The cans were for use at the Can Pack House.

Residual dusts are of primary explosive safety concern within these structures. The wood framed structures are exposed on their interior walls and ceilings. The floors are concrete with a subsurface drain in the center of the floor. These structures were subjected to wash down after production so residual contamination may be expected to exist within obscure cracks within the foundation and slab and within the subsurface drains. All concrete foundation, slabs, subsurface drains will remain in-place.

- 3.5. 6709 Series – Pre Dry Houses: Each Pre Dry House is comprised of 2 individual structures; the main Pre Dry House and blower structure. Bags of rocket paste (approximately 36 bags) at approximately 26% to 30% moisture were delivered from the Final Mix House on buggy trucks. The bags were placed on drying racks and exposed to forced air at 120 degrees Fahrenheit for approximately 72 hours to achieve 7% to 9% moisture. The dried rocket paste was then transported to the Paste Breaker Blender Houses by buggy trucks.

Residual dusts and structural integrity are of primary safety concern within these structures. Visible paste has been identified on the wooden drying racks and under door sills. The wood framed structures are enclosed by steel sheeting on their interior walls and ceilings. The floors are concrete with composite hubbelite flooring and a subsurface drain in the center of the floor. These structures were subjected to wash down after production so residual contamination may be expected to exist within obscure cracks within the foundation and slab and within the subsurface drains. All concrete foundation, slabs, subsurface drains will remain in-place. The visible paste can be easily accessed and removed by hand in accordance with the procedures outlined in Paragraph 6. The blower structures reveal no evidence of contamination.

All large equipment associated with the 82 selected structures has already been inspected and determined not to present an explosive hazard. Regardless of classification, this equipment will be transported to the onsite Decontamination Oven for flashing. Small equipment items have shown positive contamination results by EXPRAY® and/or Drop-Ex® field test kits on the power switches and other areas where they may have been handled. This equipment would require a simple wipe-down and then transported to the Decontamination Oven for flashing. Due to Porous Rule 1, as defined by Department of Army IOCP 385-1, wooden components of the structures are not required to be determined not to present an explosive hazard (5X). These components will be carefully disassembled, by hand, or carefully removed by conventional wet demolition methods and disposed of within the BAAAP onsite permitted landfill.

Additionally, Wisconsin Department of Natural Resources (WDNR) requires removal and disposal of all asbestos containing materials (ACM). Structurally, the proposed structures selected for conventional wet demolition would be stripped of all structure materials (ACM) to merely wood frame and panel. Any unknown visible and accessible energetic materials would likely be encountered during ACM removal operations. If energetic materials are encountered, all operations will immediately cease and the structure will be decontaminated per the detailed procedures outlined below.

4. **Explosive Safety Quantity Distance Arcs:** ESQD maps are provided in Appendix C. Consistent with Section 6.0 of the basic ESS, the maps maintain the 1,250-foot arcs around all structures determined to present an explosive hazard (classified at the 1X or 3X). The 1,250-foot arc will be strictly maintained during all work activities involving decontamination, ACM removal, and/or demolition work. Only essential project personnel will be authorized for entry into the arc during work activities. Safety and security provisions have been established to maintain the integrity of the arc. These provisions are as follows:
 - 4.1. All potential access points to the arc will be barricaded with high visibility construction barricades as shown in Appendix D.

- 4.2. The BAAAP is controlled by a single security gate on the west side of the plant (Gate 1) and a single security gate on the east side of the plant (Gate 8). The BAAAP employs 24-hour guard security service. On a daily basis, the security service will be provided with a site map identifying locations of exclusion arc and procedures. This map will also contain contact information to obtain authorized access into the arc. An example of this map is provided in Appendix D.
- 4.3. Both the Site Manager and SUXOS will be contacted for authorized entry into the arc. There will be a single entry/egress location at the arc perimeter. This location will be equipped with an entry/egress signature log and vehicle identification markers. This location, as well as the arc perimeter, will be periodically patrolled by project personnel.
- 4.4. Work performed within the arc will not begin until a checklist has been completed and signed by the SUXOS or UXO Technician III. This checklist is provided in Appendix D.
- 4.5. All authorized personnel entering the arc will log-in and place a high visibility vehicle marker on their vehicle. If the arc is breached by unauthorized personnel, all operations will immediately cease, BAAAP security will be contacted, and these personnel will be escorted from the arc prior to commencing with the work.
- 4.6. Upon leaving the arc, all personnel will log-out. The signature log will be maintained and monitored by the Site Manager and SUXOS.
- 4.7. All work activities performed within the arc will employ the direct supervision of a UXO Technician III.
- 4.8. A safe evacuation route will be observed by all personnel prior to commencing with work activities within the arc. Should an evacuation be required, all personnel will meet at a pre-designated location. This location will typically be the entry/egress location at the arc perimeter but no closer than 1,250 feet.
- 4.9. Only essential personnel, who shall be limited to a demolition equipment operator, haul truck operator, water truck operator, abatement team members, and required UXO personnel per Paragraphs 6.2 and 7.5 below, will be allowed within the arc. In addition, construction teams performing work within the arc will maintain a minimum 200-foot safe separation distance.
5. **Structure Inspections:** Prior to commencing any work under this proposal, each structure will be inspected and assigned a level of contamination in accordance with IAW IOC PAM 385-1. The inspections and building certifications will be performed as follows:

- 5.1. At a minimum, one SUXOS and one UXO qualified personnel qualified in accordance with U.S. Army Engineering and Support Center, Huntsville (USACESCH) EP 1110-1-18 will perform all inspections.
- 5.2. All available historical documents, including but not limited to, previous building assessments and inspections, as-built drawings, standard operating procedures, maintenance logs, production logs, and personal interviews will be reviewed and coordinated with inspection plans.
- 5.3. The list of BAAAP structures that require inspection is attached as Appendix A. Underground utilities (i.e., pipelines, sewers, and other utility conduits), concrete foundations, and concrete building slabs will not be removed at this time. Therefore, energetic materials inspections will be limited to surficial inspection, including above ground sewer inlets potentially impacted by the work.
- 5.4. Prior to energetic materials inspections, a professional engineer will complete an engineering inspection in accordance with OSHA 29 CFR 1926.850-1926.860 of each structure to document the structural condition. The structural integrity inspection will identify areas of unsafe concern. If a structure is deemed structurally unsafe to enter, engineering controls will be considered, as directed by the SUXOS, to remove the unsafe condition. If engineering controls cannot feasibly remove the unsafe condition, remote procedures may be used to disassemble the structure to a point where energetic materials inspection is possible or the structure will be recommended for thermal decomposition.
- 5.5. Each structure will be visually inspected externally and internally. All accessible and potential contamination deposit areas (i.e., edges, cracks, baseboards, open voids, wall spaces, attics, etc.) will be visually inspected. EXPRAY® and/or Drop-Ex® field test kits will be used to inspect surfaces, cracks, and equipment for energetic material contamination.
- 5.6. Some structures may require some careful disassembly of floor planks, sill plates, etc. to complete the inspection. Careful disassembly will be conducted by hand with non-sparking tools as required. The SUXOS will determine whether disassembly is required based on information provided by historical documents, previous structure inspections, and the potential for contamination to be present. Disassembly will be conducted only to the extent necessary to ascertain the presence of contamination. Once contamination is found, no further disassembly will be conducted until decontamination procedures are performed.
- 5.7. Inaccessible areas will be inspected by methods recommended by the SUXOS. These methods may include careful disassembly of wallboards and equipment. Remote methods will be employed, when the SUXOS determines them to be required. Inaccessible piping will be inspected by an intrinsically safe

boroscope equipped with a cool light during the inspection process. The boroscope can be used to inspect vessels, pipes, and void spaces that would otherwise be inaccessible. There is no limitation on use of the scope.

- 5.8. If energetic materials are encountered during the inspection which will be considered a safety hazard to complete the inspection, the material may be picked up, packaged, transported, and stored in Building No. 9102-3 located on the BAAAP as designated in the basic ESS.
 - 5.9. If, during an energetic materials inspection, the inspection team discovers a structurally unsafe condition, the inspection will immediately be stopped and procedures outlined in Paragraph 5.4 will be implemented.
 - 5.10. Upon completion of energetic materials inspections, the SUXOS will provide the Army with a certification document (provided in Appendix E) for each structure inspected. The certification document will address the level of contamination to include, but not limited to, interiors, exteriors, and supporting structures. Each structure may contain varying levels of contamination classifications. These certifications will be continuously monitored during any disassembly of the structure and may be modified at any time if conditions change.
6. **Energetic Material Decontamination Methods:** All energetic materials decontamination, packaging, and transport activities and procedures will be conducted in accordance with provisions provided in this paragraph. Only UXO personnel qualified as a minimum UXO Technician III under the provisions of EP 1110-1-18 may perform decontamination of visible and accessible energetic materials. Other personnel who have had energetic materials recognition and safety training may assist in the removal of contaminated materials and equipment under the direct supervision of personnel with a minimum qualification of UXO Technician III. Specific implementation of energetic materials decontamination activities will be accomplished by the following procedure:
- 6.1. All energetic materials decontamination activities will be conducted within a 1,250-foot ESQD arc in accordance with Paragraph 4.
 - 6.2. Only personnel essential to energetic materials decontamination operations will be authorized within the ESQD arc during the decontamination work. Essential decontamination team personnel will typically consist of one SUXOS teamed with no more than two UXO trained personnel and one UXO Technician III teamed with no more than two UXO trained personnel. Each team will maintain a minimum 200-foot safe separation distance between their respective decontamination activities at all times.
 - 6.3. Engineering controls for sufficient access to the areas to be decontaminated (i.e., man walks, scaffolding, and step ladders) may be installed as required.

Accessible and visible energetic material will be wetted by the use of a garden sprayer filled with water and a small amount of surfactant. This material will be collected with non-sparking tools (i.e., plastic trowels, plastic shovels, plastic brooms, sponges, dry/wet vacuum, etc.). These materials will be packaged in anti-static plastic bags with a small amount of water to keep it damped and placed into metal containers.

- 6.4. All collected energetic materials will be transported and stored in the cited igloo identified in Section 6.3 of the basic ESS, building designation 9102-3. If the collected material is grossly mixed with incidental building materials or is mixed with asbestos or hazardous waste, it will be disposed as hazardous material at an offsite permitted hazardous waste disposal facility. All other collected energetic materials will be disposed in accordance with Section 8.0 of the basic ESS. The 788th Ordnance Company of the Explosive Ordnance Disposal (EOD) Center located at Fort McCoy, Wisconsin will be the responsible party for disposing of all recovered energetic materials. EOD will only be required to dispose of, or detonate, high concentrations of energetic materials. Incidental building waste will be mitigated, to the extent possible, from the packaged energetic material.
- 6.5. Anticipated quantities of recovered energetic materials from the structures proposed for demolition is a total NEW of 30 pounds. In accordance with Paragraph 6.3 of the basic ESS, the total quantity of stored explosive material will not exceed 150 pounds NEW. During demolition activities, if recovered energetic materials approach a NEW of 100 pounds, the 788th Ordnance Company will be contacted for energetic material disposal before the stored amount reaches a NEW of 150 pounds.
- 6.6. All packaging and transportation of energetic materials across public transportation systems will be accomplished in accordance with the U.S. Department of Transportation (USDOT), Title 49 CFR, Part 173
- 6.7. Each structure, or type of structure within a production group, may require unique attention to its current conditions. Therefore each structure will be evaluated separately and an overall approach to its decontamination will incorporate an independent work plan as designed by the SUXOS and essential project personnel. This work plan will be reviewed and understood by project personnel prior to work plan implementation. An example of an independent work plan is provided in Appendix F.
- 6.8. If utility piping and infrastructure components exist that may contain energetic material and are visually inaccessible to determine, they will be removed by use of remote cutting shears. The piping and/or infrastructure will be supported on a minimum of three sides prior to remote operations. The remote shears will be positioned at either end of the pipe portion to be cut. All personnel will clear the ESQD arc to a hardened trailer. The hardened trailer will house the remote controls. Upon removal, these items will be packaged, transported, and stored in the cited igloo 9102-3 located on the BAAAP as designated in the basic ESS.

This material will undergo hydro jet pressure washing prior to eventual flashing in the Decontamination Oven.

7. **Conventional Wet Demolition Methods:** Explosive safety precautions will be maintained during all structure demolition. A process flow diagram of the procedures that will be employed in the demolition process is provided as Figure 1 to maintain explosive safety. Specific procedures for conventional wet demolition is provided as follows:
 - 7.1. Conventional wet demolition methods will be implemented on the selected structures and as authorized by the SUXOS. Only structures which can be decontaminated to a minimum 3X level of contamination, may be demolished using conventional wet demolition methods.
 - 7.2. Each structure will employ the 1,250-foot ESQD arc identified in Appendix C. The ESQD arcs will be strictly maintained in accordance with Paragraph 4.
 - 7.3. Each structure, or type of structure within a production group, may require unique attention to its current conditions. Therefore each structure will be evaluated separately and an overall approach to its demolition will incorporate an independent work plan as designed by the SUXOS and essential project personnel. This work plan will be reviewed and understood by project personnel prior to work plan implementation.
 - 7.4. Several contaminated components can be safely removed by hand. These components will be removed before mechanical demolition occurs. For example, kick plates skirt the entire lower interior wall section of the 1750 series Rest Houses. These kick plates tested positive with EXPRAY® and/or Drop-Ex® field test kits and remaining surfaces of the structure tested negative. In this case, the kick plates may be removed manually with non-sparking tools and disposed of at the onsite permitted landfill and the structure may be considered not to present an explosive hazard.
 - 7.5. If required for inaccessible and suspect areas of concern, as determined by the SUXOS, the operator(s) will be equipped with a hardened excavator with an extended 60-foot arm. The hardened excavator will be armored with a front shield consisting of a 1 ½-inch lexan window mounted to a ¼-inch steel plate shield. Overhead protection will include a ¾-inch sheet of plywood and a layer of sandbags attached to the cab roof.
 - 7.6. The entire section of structure to be demolished will be completely dampened with water and will continue throughout the entire operation. This will be accomplished by utilizing active fire hydrants and/or water trucks and applying a continuous spray or as often as required to keep the structure materials wet. Collection points will be established prior to demolition for any runoff contamination. These collection points will be equipped with items such as

plastic buckets, chemical absorbent cloths, pillows, absorbent socks and erosion control items such as silt fence and hay bales.

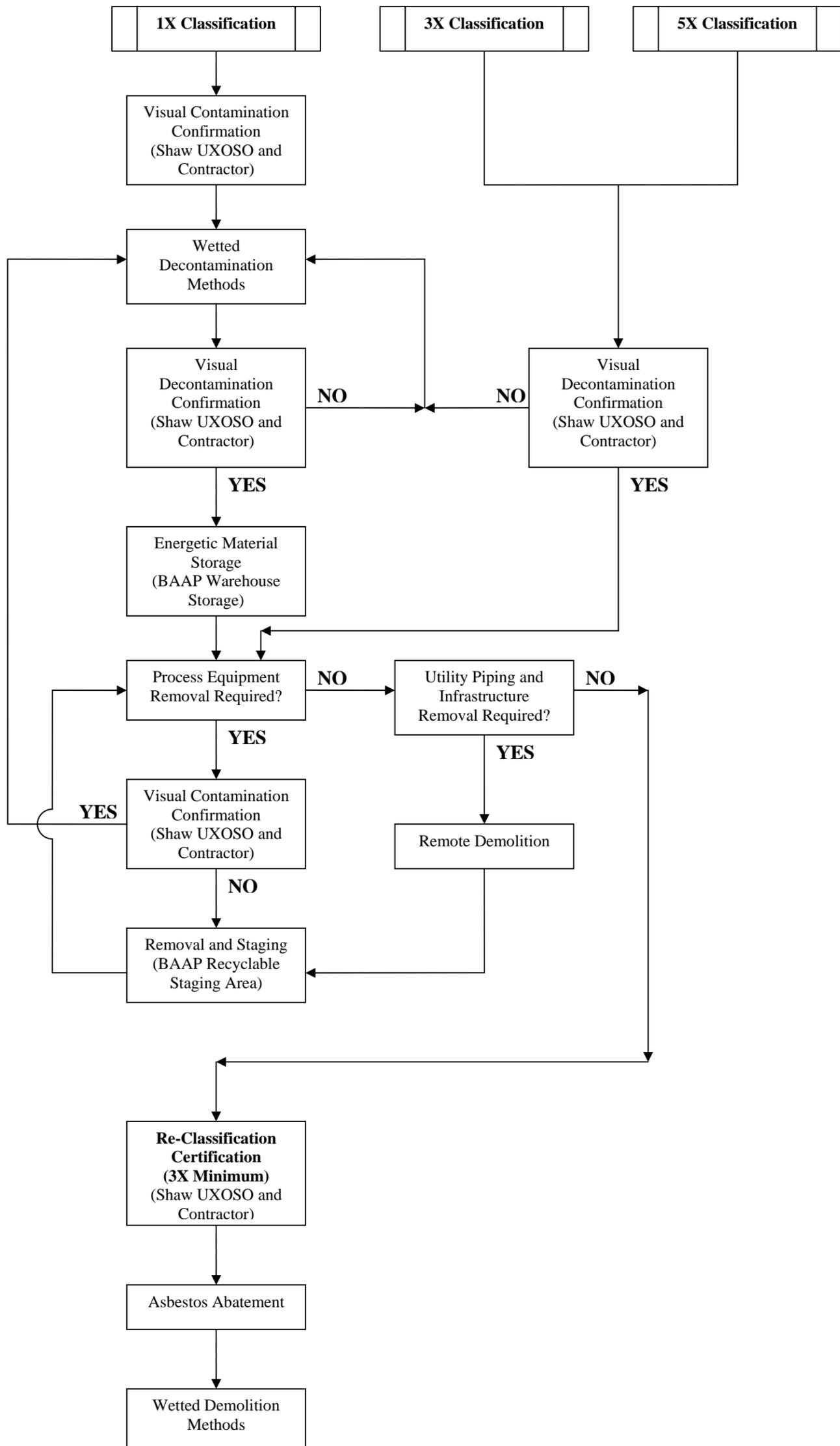
- 7.7. Demolition work will proceed from top to bottom, working from the outside of each structure. Roofing materials and surfaces have been determined not to present an explosive hazard. To the extent practical, the roof and exterior walls will be demolished inward, in a controlled manner, creating a pile of debris over the existing slab/foundation. This procedure may be accomplished in stages to allow for additional wetting and energetic materials inspections, as required.
- 7.8. At the direction of the qualified UXO personnel, small portions of the structure may be carefully removed for additional energetic materials inspections. For example, a small portion of roofing may be removed to inspect inaccessible attic spaces or an exterior portion of wall may be carefully removed to inspect inaccessible wall spaces.
- 7.9. Additional wetting operations and additional energetic materials inspections will continue throughout the demolition operation. All demolition activities will cease during periods for this to be accomplished.
- 7.10. An unmanned dump truck will be stationed near the demolition site for direct loading of structure materials. The dump truck operator will be stationed at the ESQD arc perimeter until demolition filling operations have ceased.
- 7.11. If visible evidence of contamination is discovered during demolition operations, the operations will immediately cease. Demolition team members will exit the demolition area and UXO personnel will be contacted. The structure will be inspected and decontaminated as required. Upon removal of all visible contaminants, all non-essential personnel will exit to the arc perimeter and demolition operations will commence.
- 7.12. If, at the sole discretion of the SUXOS, a structure is determined unsafe due to potential explosive hazards, the structure will be recommended for either thermal decomposition or remote demolition in accordance with provisions outlined in the basic ESS.
- 7.13. Salvageable equipment will be inspected for energetic and hazardous materials before and after removal. If visible energetic materials are identified, the accessible materials will be removed in accordance with Paragraph 6.3 and transported to the cited igloo 9102-3 located on the BAAAP as designated in the basic ESS. Equipment identified with energetic materials contamination will undergo hydro jet pressure washing prior to eventual flashing in the Decontamination Oven. If hazardous materials are identified within or on salvageable equipment, the contractor will determine if decontamination of the hazardous materials is feasible. If feasible, the equipment will be decontaminated and transported to the Decontamination Oven for flashing. If

not feasible, the equipment will be transported to the onsite BAAAP permitted landfill for disposal.

- 7.14. If salvageable equipment is flashed, the SUXOS contractor (SpecPro, Inc.) will inspect the equipment to determine if it presents an explosive hazard. If contamination remains, the equipment will either be flashed again or transported to the onsite landfill for disposal. If the equipment can be verified as not presenting an explosive hazard, it may be released from Department of Defense control for unrestricted use. All remaining demolition debris will be transported to the onsite permitted landfill for disposal.

FIGURES

**FIGURE 1
DEMOLITION PROCESS FLOW DIAGRAM**



APPENDIX A

**SUMMARY OF BUILDING STRUCTURES
SELECTED FOR ASBESTOS ABATEMENT, DEMOLITION, AND
DISPOSAL**

Current Contamination Level
Selected Building Structures at BAAAP

5/26/2005

	A	B	C	D	E	F	G
1	Structure	TYPE	SHAW INTERIOR	SHAW EXTERIOR	SHAW DECK/DOCKS	INSP DATE	RE-CLASS DATE
2	1975-04	Powder Line House (Extension)	N/A	N/A	5X	4/18/2005	
3	1725-13	Air Dry House (Heater Building)	5X	5X	N/A	4/18/2005	
4	1850-01	Screening House (Motor Building)	5X	5X	N/A	4/13/2005	
5	1850-01	Screening House (Heater Building)	5X	5X	N/A	4/13/2005	
6	1850-02	Screening House (Motor Building)	5X	5X	N/A	4/13/2005	
7	1850-02	Screening House (Heater Building)	5X	5X	N/A	4/13/2005	
8	1850-03	Screening House (Motor Building)	5X	5X	N/A	4/13/2005	
9	1850-03	Screening House (Heater Building)	5X	5X	N/A	4/13/2005	
10	1850-04	Screening House (Heater Building)	5X	5X	N/A	4/13/2005	
11	1850-04	Screening House (Motor Building)	5X	5X	N/A	4/13/2005	
12	1850-05	Screening House (Heater Building)	5X	5X	N/A	4/18/2005	
13	1850-05	Screening House (Motor Building)	5X	5X	N/A	4/18/2005	
14	1850-06	Screening House (Heater Building)	5X	5X	N/A	4/18/2005	
15	1850-06	Screening House (Motor Building)	5X	5X	N/A	4/18/2005	
16	1850-07	Screening House (Heater Building)	5X	5X	N/A	4/18/2005	
17	1850-07	Screening House (Motor Building)	5X	5X	N/A	4/18/2005	
18	1850-08	Screening House (Heater Building)	5X	5X	N/A	4/18/2005	
19	1850-08	Screening House (Motor Building)	5X	5X	N/A	4/18/2005	
20	1885-02	Box Store House (Extension)	5X	5X	N/A	5/2/2005	
21	6709-05	Pre Dry House (Blower Building)	5X	5X	N/A	4/11/2005	
22	6709-07	Pre Dry House (Blower Building)	5X	5X	N/A	4/11/2005	
23	6709-09	Pre Dry House (Blower Building)	5X	5X	N/A	4/12/2005	
24	6709-11	Pre Dry House (Blower Building)	5X	5X	N/A	4/11/2005	
25	6709-12	Pre Dry House (Blower Building)	5X	5X	N/A	4/11/2005	
26	6709-14	Pre Dry House (Blower Building)	5X	5X	N/A	4/11/2005	
27	6709-15	Pre Dry House (Blower Building)	5X	5X	N/A	4/11/2005	
28	6709-17	Pre Dry House (Blower Building)	5X	5X	N/A	4/11/2005	
29	6709-18	Pre Dry House (Blower Building)	5X	5X	N/A	4/11/2005	
30	6709-21	Pre Dry House (Blower Building)	5X	5X	N/A	4/11/2005	
31	6709-22	Pre Dry House (Blower Building)	5X	5X	N/A	4/11/2005	
32	6709-23	Pre Dry House (Blower Building)	5X	5X	N/A	4/11/2005	
33	6709-25	Pre Dry House (Blower Building)	5X	5X	N/A	4/11/2005	
34	6709-26	Pre Dry House (Blower Building)	5X	5X	N/A	4/11/2005	
35	6709-27	Pre Dry House (Blower Building)	5X	5X	N/A	4/11/2005	
36	1725-13	Air Dry House (Mechanical Building)	5X	5X	5X	4/19/2005	

Current Contamination Level
Selected Building Structures at BAAAP

5/26/2005

	A	B	C	D	E	F	G
1	Structure	TYPE	SHAW INTERIOR	SHAW EXTERIOR	SHAW DECK/DOCKS	INSP DATE	RE-CLASS DATE
37	1725-14	Air Dry House (Mechanical Building)	5X	5X	5X	4/18/2005	
38	1750-01	Rest House	5X	5X	5X	4/19/2005	5/17/2005
39	1750-02	Rest House	5X	5X	5X	4/20/2005	5/17/2005
40	1750-06	Rest House	5X	5X	5X	4/20/2005	5/17/2005
41	1750-07	Rest House	5X	5X	5X	4/19/2005	5/17/2005
42	1750-08	Rest House	5X	5X	5X	4/19/2005	5/17/2005
43	1750-09	Rest House	5X	5X	5X	4/20/2005	5/17/2005
44	1750-10	Rest House	5X	5X	5X	4/19/2005	5/17/2005
45	1750-11	Rest House	5X	5X	5X	4/19/2005	5/17/2005
46	1750-12	Rest House	5X	5X	5X	4/20/2005	5/17/2005
47	1885-02	Box Store House	3X south end 5X north end	5X	5X	4/12/2005	
48	1725-14	Air Dry House (Heater Building)	3X	5X	N/A	4/19/2005	
49	1852-04	Screen Store House	3X	5X	N/A	4/19/2005	
50	1852-05	Screen Store House	3X	5X	N/A	4/13/2005	
51	1975-04	Powder Line Office	3X	5X	N/A	4/18/2005	
52	6709-22	Pre Dry House	3X	5X	5X BARRICADE	4/11/2005	
53	1725-13	Air Dry House (Elevator)	3X	5X	5X	4/18/2005	
54	1750-03	Rest House	3X	5X	5X	4/20/2005	5/17/2005
55	1750-04	Rest House	3X	5X	5X	4/19/2005	5/17/2005
56	1750-05	Rest House	3X	5X	5X	4/19/2005	5/17/2005
57	1750-13	Rest House	3X	5X	5X	4/20/2005	
58	1750-15	Rest House	3X	5X	5X	4/20/2005	
59	1750-16	Rest House	3X	5X	5X	4/20/2005	
60	1750-17	Rest House	3X	5X	5X	4/20/2005	
61	1750-18	Rest House	3X	5X	5X	4/20/2005	
62	1750-19	Rest House	3X	5X	5X	4/20/2005	
63	1750-20	Rest House	3X	5X	5X	4/20/2005	
64	1750-21	Rest House	3X	5X	5X	4/20/2005	
65	1750-23	Rest House	3X	5X	5X	4/20/2005	
66	1750-24	Rest House	3X	5X	5X	4/20/2005	
67	1885-03	Box Store House	3X	5X	5X	4/12/2005	
68	1725-14	Air Dry House (Elevator)	3X	5X	3X	4/19/2005	
69	6709-14	Pre Dry House	3X	N/A	N/A	4/11/2005	
70	6709-15	Pre Dry House	3X	N/A	N/A	4/11/2005	
71	6709-17	Pre Dry House	3X	N/A	N/A	4/11/2005	

Current Contamination Level
Selected Building Structures at BAAAP

5/26/2005

	A	B	C	D	E	F	G
1	Structure	TYPE	SHAW INTERIOR	SHAW EXTERIOR	SHAW DECK/DOCKS	INSP DATE	RE-CLASS DATE
72	6709-18	Pre Dry House	3X	N/A	N/A	4/11/2005	
73	1850-01	Screening House	1X	5X	N/A	4/13/2005	
74	1850-02	Screening House	1X	5X	N/A	4/13/2005	
75	1850-03	Screening House	1X	5X	N/A	4/13/2005	
76	1850-04	Screening House	1X	5X	N/A	4/18/2005	
77	1850-05	Screening House	1X	5X	N/A	4/18/2005	
78	1850-06	Screening House	1X	5X	N/A	4/18/2005	
79	1850-07	Screening House	1X	5X	N/A	4/18/2005	
80	1850-08	Screening House	1X	5X	N/A	4/13/2005	
81	1975-06	Bag Turning House	1X	5X	N/A	4/13/2005	
82	6709-11	Pre Dry House	1X	5X	N/A	4/11/2005	
83	6709-21	Pre Dry House	1X	5X	N/A	4/12/2005	
84	1750-14	Rest House	1X	5X	5X	4/20/2005	
85	1750-22	Rest House	1X	5X	5X	4/20/2005	
86	8005-00	Rest House	1X	5X	5X	4/19/2005	
87	1725-13	Air Dry House	1X	5X	3X	4/18/2005	
88	1725-14	Air Dry House	1X	5X	1X	4/19/2005	
89							
90	TOTAL 5X:		44	82	32		
91	TOTAL 3X:		26	0	2		
92	TOTAL 1X:		16	0	1		
93	TOTAL INDIVIDUAL STRUCTURES:		86	82	35		

APPENDIX B

REPRESENTATIVE PHOTOS OF SELECTED STRUCTURES

1725 Series – Air Dry Houses



**Heater Building
(5X)**

**Air Dry House
(1X)**

**Elevator/Mechanical
Buildings (5X / 1X)**



Spilled propellant grains and settling dusts are of primary explosive safety concern within these buildings. The wood framed structure is exposed on the interior and visually inaccessible areas are limited to structural member joints and wood floor planks. The propellant drying bays consist of concrete floors and walls with a subsurface drain in the center of the floor. These bays were subjected to wash down after production so residual explosive contamination can be expected to exist within obscure cracks within the foundation and slab and within the subsurface drains. However, all concrete foundation, slabs, subsurface drains, and in this case, walls (as they are part of the foundation structure) will remain in-place. The wood framed portions of the buildings were dry swept after production and suspect areas of concern reveal the visible propellants which can be easily accessed and removed by hand in accordance with the procedures outlined in Paragraph 6.0.

The heater and mechanical buildings reveal no evidence of explosive contamination and are classified 5X. The elevator building may reveal propellant grains under the lift truck and within the lift truck components. Small portions of the lift truck will be carefully dismantled in accordance with procedures outlined in Section 7.0 and thoroughly inspected for explosive contamination and decontaminated as required.

1850 Series – Screen Houses



**Motor Building
(5X)**

**Air Dry House
(1X)**

**Heater Building
(not shown) (5X)**

**Plywood Walls and
Ceilings with Taped
Joints**

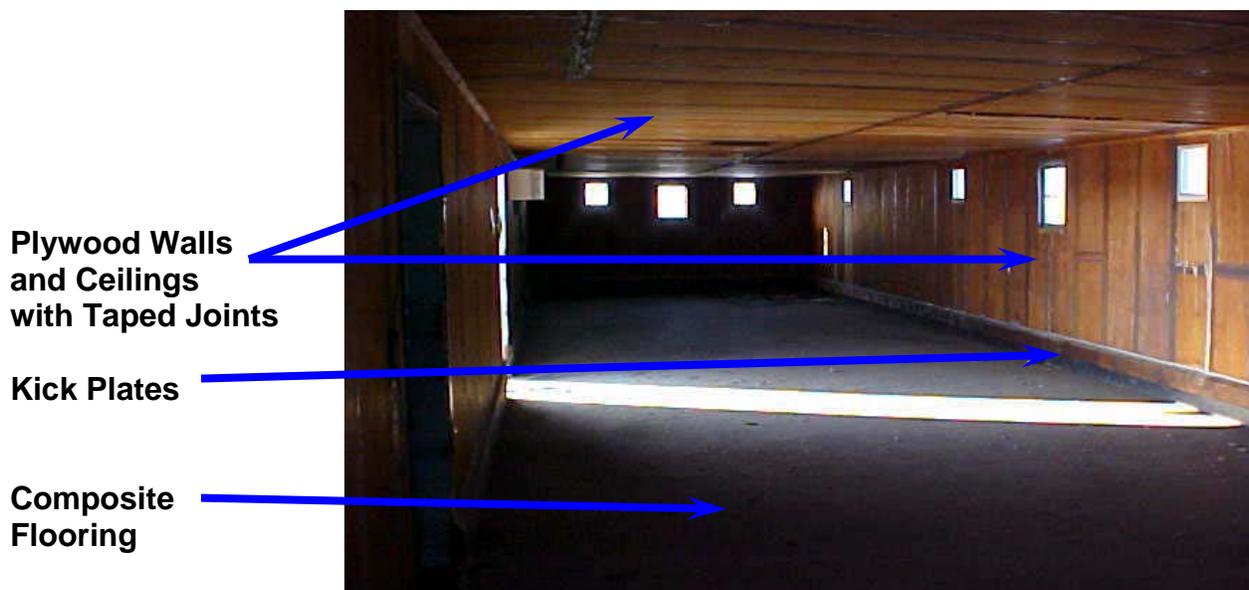
**Shaker Screen
Support Structures**

Composite Floor



Spilled propellant grains and settling dusts are of primary explosive safety concern within these buildings. The wood framed structures are enclosed on their interior by plywood walls and ceilings with taped joints and composite tongue and groove wood planks, paper, plywood, hubbelite, and vinyl flooring. Suspect deposit areas are limited to structural member joints and cracks within the composite flooring. These buildings were dry swept after production and do not contain subsurface drains. The composite floors rest on concrete piers which will remain in-place. The interior portions of the buildings including the shaker screen wooden supports reveal the visible propellants which can be easily accessed and removed by hand in accordance with the procedures outlined in Paragraph 6.0. The motor and heater buildings reveal no evidence of explosive contamination and are classified 5X.

1750 Series – Rest Houses



Residual dusts are of primary explosive safety concern within these buildings. The wood framed structures are enclosed on their interior by plywood walls and ceilings with taped joints and composite wood planks, paper, and conductive rubber flooring. The entire perimeter of the floor is skirted with a 2" x 8" kick plate. These buildings were dry swept after production and do not contain subsurface drains. The composite floors rest on concrete piers which will remain in-place. Visible propellants were not identified within these buildings, however, the kick plates tested positive with Drop-Ex® field test kits. The kick plates can be removed by hand in accordance with the procedures outlined in Paragraph 6.0. Inspection and decontamination of visible energetic materials behind the kick plates will remove any explosive safety hazard associated with these buildings.

1885 Series – Box Storage



Residual dusts are of primary explosive safety concern within these buildings. The wood framed structures are exposed on their interior walls and ceilings. The floors are concrete with a subsurface drain in the center of the floor. These buildings were subjected to wash down after production so residual explosive contamination may be expected to exist within obscure cracks within the foundation and slab and within the subsurface drains. All concrete foundation, slabs, subsurface drains will remain in-place.

6709 Series – Pre Dry Houses



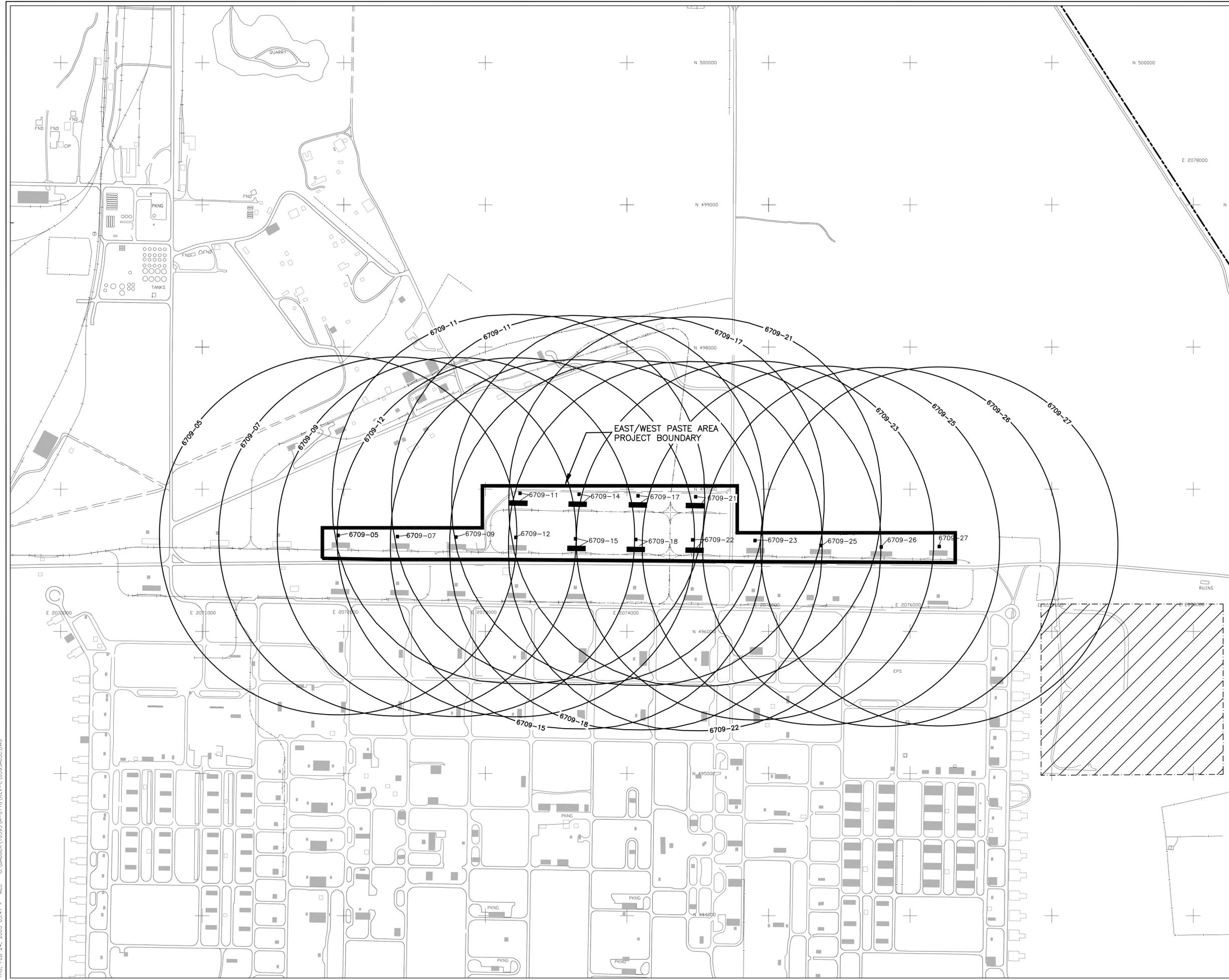
Drying Racks
(1X)



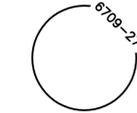
Residual dusts and structural integrity are of primary safety concern within these buildings. Visible paste has been identified on the wooden drying racks and under door sills. The wood framed structures are enclosed by steel sheeting on their interior walls and ceilings. The floors are concrete with composite hubbelite flooring and a subsurface drain in the center of the floor. These buildings were subjected to wash down after production so residual explosive contamination may be expected to exist within obscure cracks within the foundation and slab and within the subsurface drains. All concrete foundation, slabs, subsurface drains will remain in-place. The visible paste can be easily accessed and removed by hand in accordance with the procedures outlined in Paragraph 6.0. The blower buildings reveal no evidence of explosive contamination and are classified 5X.

APPENDIX C

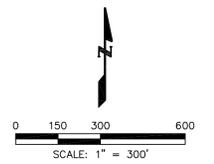
EXPLOSIVE SAFETY QUANTITY DISTANCE ARCS



LEGEND

-  PROJECT AREA BOUNDARY
-  BAAP LANDFILL NO. 6 BOUNDARY
-  BADGER ARMY AMMUNITION PLANT PROPERTY BOUNDARY
-  QUANTITY DISTANCE (QD) BOUNDARIES AND BUILDING NUMBER
-  BUILDING AND BUILDING NUMBER

EAST/WEST PASTE AREA
PROJECT BOUNDARY



C	ISSUED TO ARMY AND AGENCIES	CMB	DJR	02/25/05
B	ISSUED TO ARMY AND AGENCIES	CMB	DJR	01/11/05
A	ISSUED TO ARMY	CMB	DJR	12/10/04
REVISION	DESCRIPTION	CHECKED	APPROVED	DATE

**U.S. ARMY
CORPS OF ENGINEERS
OMAHA DISTRICT**

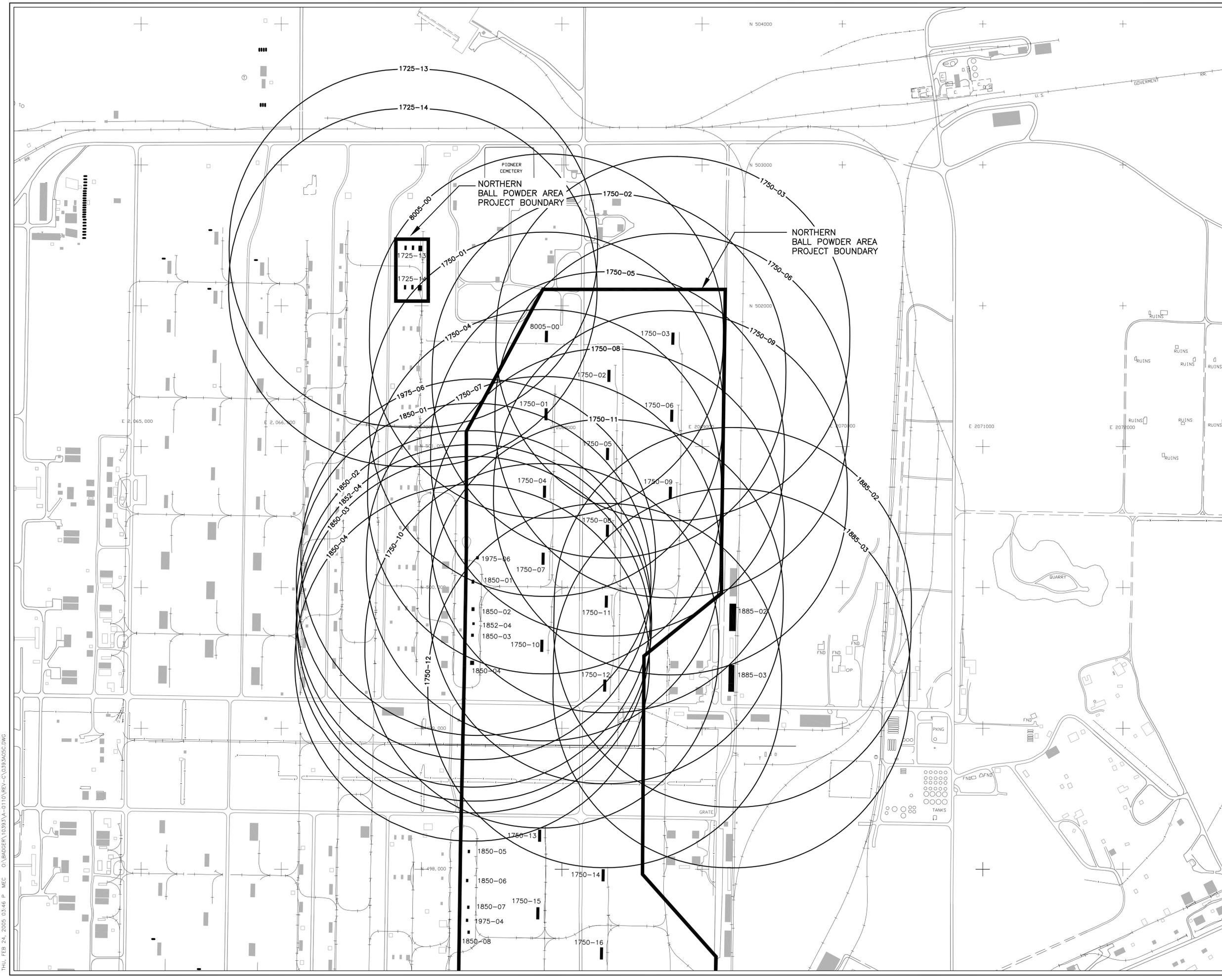
BADGER ARMY AMMUNITION PLANT

DRAWING NUMBER	EAST/WEST PASTE AREA QUANTITY DISTANCE (QD) BOUNDARIES			
1				

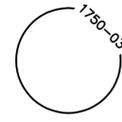
 **Shaw Environmental, Inc.**

DESIGNED	CMB	12/07/04	CHECKED	CMB	12/08/04	PROJECT NO.	110393.0110	REV.	C	FILE NAME	0393A05C
DRAWN	MEC	12/07/04	APPROVED	DJR	12/08/04						

THU, FEB 24, 2005 03:47 P. MEC C:\BADGER\10393\A-0110\REV-C\0393A05C.DWG



LEGEND

-  PROJECT AREA BOUNDARY
-  QUANTITY DISTANCE (QD) BOUNDARIES AND BUILDING NUMBER
-  BUILDING AND BUILDING NUMBER

C	ISSUED TO ARMY AND AGENCIES	CMB	DJR	02/25/05
B	ISSUED TO ARMY AND AGENCIES	CMB	DJR	01/11/05
A	ISSUED TO ARMY	CMB	DJR	12/10/04
REVISION	DESCRIPTION	CHECKED	APPROVED	DATE

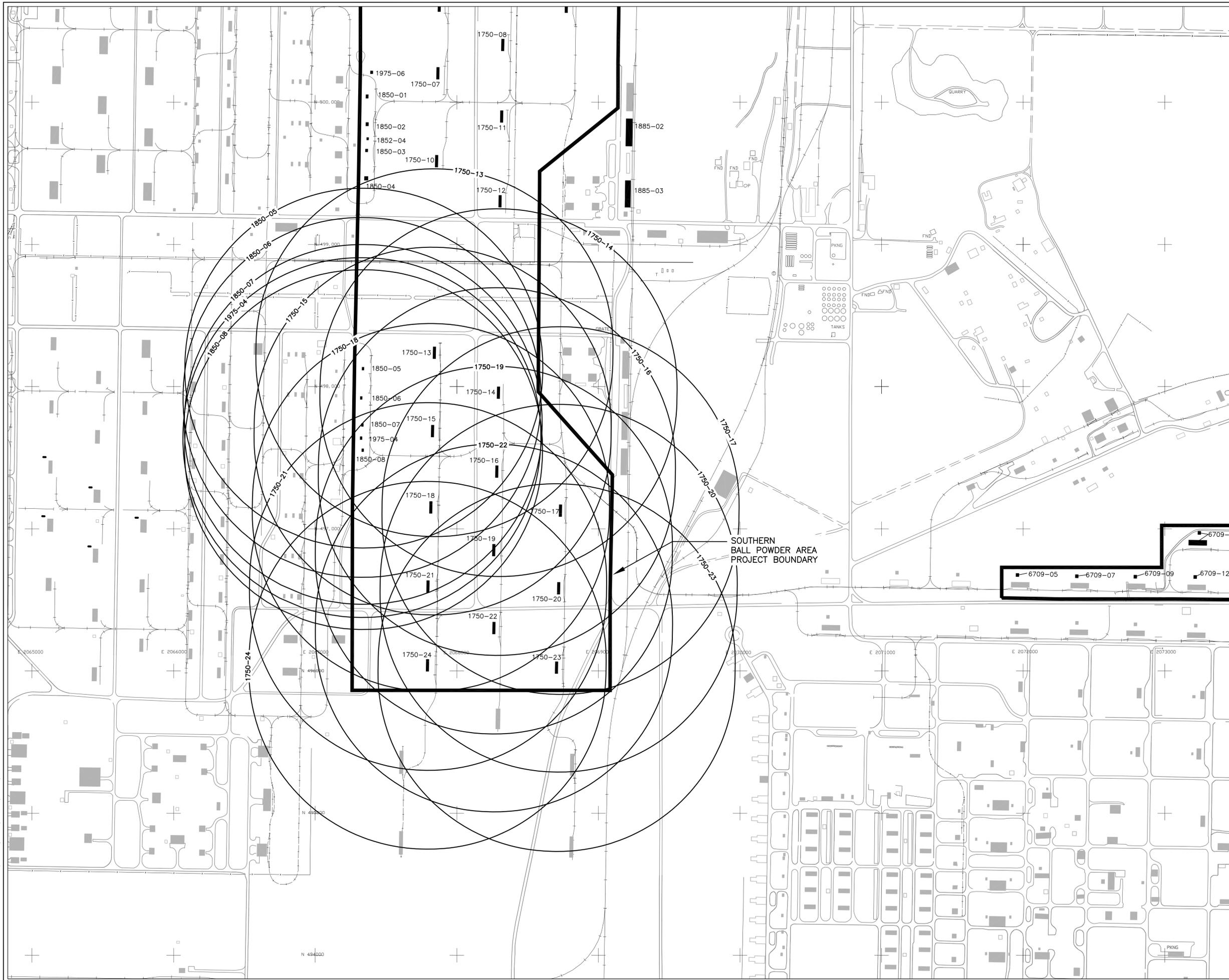

**U.S. ARMY
CORPS OF ENGINEERS
OMAHA DISTRICT**

BADGER ARMY AMMUNITION PLANT

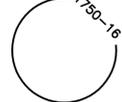
DRAWING NUMBER	2			
	NORTHERN BALL POWDER AREA QUANTITY DISTANCE (QD) BOUNDARIES			

		Shaw Environmental, Inc.						
DESIGNED	BY	DATE	CHECKED	BY	DATE	PROJECT NO.	REV.	FILE NAME
DRAWN	MEC	12/07/04	APPROVED	DJR	12/08/04	110393.0110	C	0393A05C

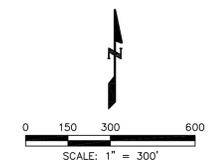
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LEGEND

-  PROJECT AREA BOUNDARY
-  QUANTITY DISTANCE (QD) BOUNDARIES AND BUILDING NUMBER
-  BUILDING AND BUILDING NUMBER

SOUTHERN BALL POWDER AREA PROJECT BOUNDARY



C	ISSUED TO ARMY AND AGENCIES	CMB	DJR	02/25/05
B	ISSUED TO ARMY AND AGENCIES	CMB	DJR	01/11/05
A	ISSUED TO ARMY	CMB	DJR	12/10/04
REVISION	DESCRIPTION	CHECKED	APPROVED	DATE

 **U.S. ARMY CORPS OF ENGINEERS OMAHA DISTRICT**

BADGER ARMY AMMUNITION PLANT

DRAWING NUMBER **3**
SOUTHERN BALL POWDER AREA QUANTITY DISTANCE (QD) BOUNDARIES

 **Shaw Environmental, Inc.**

DESIGNED	CMB	12/07/04	CHECKED	CMB	12/08/04	PROJECT NO.	110393.0110	REV.	C	FILE NAME	0393A05C
DRAWN	MEC	12/07/04	APPROVED	DJR	12/08/04						

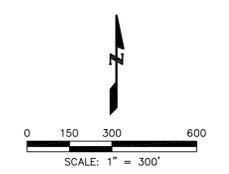
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THU, FEB 24, 2005 03:47 P. MEC O:\BADGER\10393\A-0110\REV-C\0393A05C.DWG



LEGEND

- PROJECT AREA BOUNDARY
- BAAP LANDFILL NO. 6 BOUNDARY
- BADGER ARMY AMMUNITION PLANT PROPERTY BOUNDARY
- 278 DECON OVEN
- QUANTITY DISTANCE (QD) BOUNDARIES AND BUILDING NUMBER
- BUILDING AND BUILDING NUMBER



C	ISSUED TO ARMY AND AGENCIES	CMB	DJR	02/25/05
B	ISSUED TO ARMY AND AGENCIES	CMB	DJR	01/11/05
A	ISSUED TO ARMY	CMB	DJR	12/10/04
REVISION	DESCRIPTION	CHECKED	APPROVED	DATE

**U.S. ARMY
CORPS OF ENGINEERS
OMAHA DISTRICT**

BADGER ARMY AMMUNITION PLANT

DRAWING NUMBER **4**
DECON OVEN/SALVAGE MATERIAL STAGING AREA
QUANTITY DISTANCE (QD) BOUNDARIES

Shaw Environmental, Inc.

DESIGNED	CMB	12/07/04	CHECKED	CMB	12/08/04	PROJECT NO.	110393.0110	REV.	C	FILE NAME	0393A05C
DRAWN	MEC	12/07/04	APPROVED	DJR	12/08/04						

APPENDIX E

**BUILDING CONTAMINATION CLASSIFICATION
CERTIFICATION**



**BUILDING/STRUCTURE CONTAMINATION CLASSIFICATION CERTIFICATION
BADGER ARMY AMMUNITON PLANT**

Date:

Building Number:

Building Name:

Interior superstructure level of contamination:

Exterior superstructure level of contamination:

Decks or Docks:

Exterior stairways or structures:

Foundation and piers:

Comments:

I certify the above building and/or structure(s) to be contaminated to the level of contamination indicated in accordance with Department of the Army, TB 700-4, dated Oct. 1978.

_____ Date: _____
Michael W. Clemens, Senior UXO Supervisor, SHAW Environmental, Inc.

_____ Date: _____
Donald E. Vender, Senior UXO Supervisor, SpecPro Environmental Services, Inc.

I have verified that the above building and/or structure(s) meets the contamination level certified above in accordance with Department of the Army, TB 700-4, dated Oct. 1978.

_____ Date: _____
U.S. Army Authorized Representative



**BUILDING/STRUCTURE CONTAMINATION CLASSIFICATION CERTIFICATION
BADGER ARMY AMMUNITION PLANT**

Certification Change

Date:

Building Number:

Building Name:

Interior superstructure level of contamination:

Exterior superstructure level of contamination:

Decks or Docks:

Exterior stairways or structures:

Foundation and piers:

I certify the above building and/or structure to be contaminated to the level of contamination indicated in accordance with Department of the Army, TB 700-4, dated Oct. 1978.

Comments:

_____ Date: _____
Michael W. Clemens, Senior UXO Supervisor, SHAW Environmental, Inc.

_____ Date: _____
Donald E. Vender, Senior UXO Supervisor, SpecPro Environmental Services, Inc.

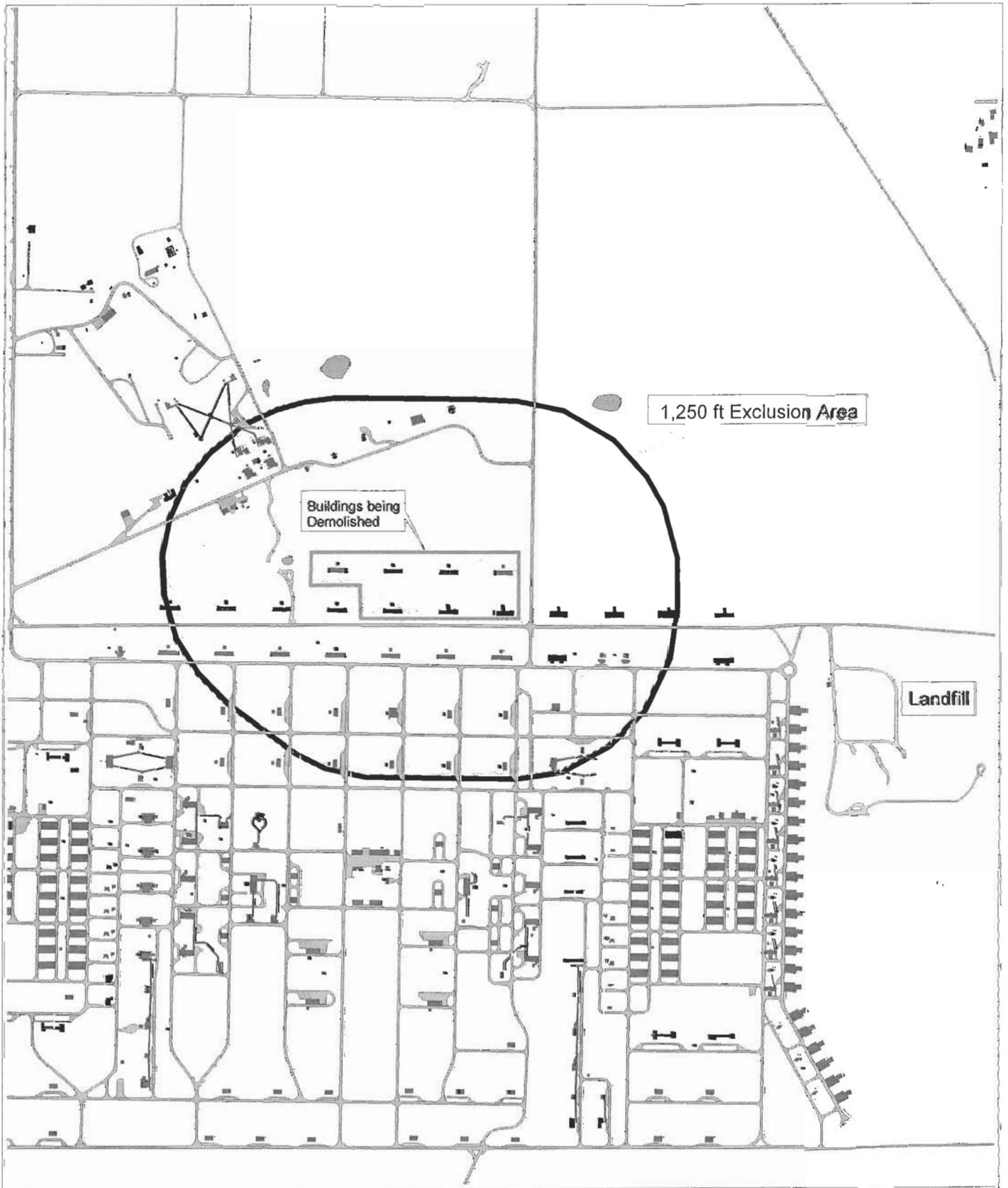
I have verified that the above building and/or structure meets the contamination level certified above in accordance with Department of the Army, TB 700-4, dated Oct. 1978.

_____ Date: _____
U.S. Army Authorized Representative

APPENDIX D

**EXPLOSIVE SAFETY QUANTITY DISTANCE ARC
SECURITY AND SAFETY PROVISIONS**

6709 Exclusion Area 1,250' Quantity Distance Composite Buffer Badger Army Ammunition Plant





05/05/2005

1250' QD ARC PRE OPERATION CHECK LIST

Date: _____

Location: _____

- Building entrance and exit safe for quick escape.

Comments: _____

- Area in front of building free of debris which could create a hazard to personnel

Comments: _____

- Secondary 200' safe team separation distances established within the 1250' QD arc with high visibility demarcation markers

Comments: _____

- QD arc barricades up and inspected by safety officer or UXOSO

Comments: _____

- QD arc closed to public admittance

Comments: _____

- All personnel inside QD arc logged into access log at entrance to the QD arc

Comments: _____

- Proper PPE in place

Comments: _____

- Vehicle inspections completed

Comments: _____

- Non sparking tools inspected

Comments: _____

- Fire extinguishers in place

Comments: _____

- Metal cans for energetic material on site

Comments: _____

- Sprayers with Alconox/water mix checked

Comments: _____

- Grounds checked where vacuums will be needed

Comments: _____

- Security notified of operations and location

Comments: _____

- Daily activity map provided to Security

Comments: _____

- Demolition permit at work location

Comments: _____

Signature of Site Safety Officer or UXO Safety Officer

APPENDIX F
INDEPENDENT WORK PLAN EXAMPLE

6709-XX Pre Dry House Building Decontamination, Removal, Security and Safety Plan

This document is prepared to outline a systematic way to decontaminate and remove energetic material (EM) and 3X equipment from subject buildings. Shaw UXO personnel will remove all visible energetic material, SpecPro team members trained in the safety and recognition of energetic materials will perform all non energetic removal procedures under the supervision of Shaw UXO personnel.

NOTE: Prior to entering any buildings the UXO Supervisor must insure that the buildings are safe for entry. Special procedures will be put into place in conjunction with SpecPro to safely demolish the buildings while checking for energetic materials.

1. **Remove any visible energetic material from areas where work crews will be walking or passing i.e. wall, ceiling, or floor.**
 - a. Because these buildings are above grade on slabs up to 24" above ground, methods to climb up into the buildings will be employed.
 - b. Wet the EM with a hand sprayer filled with water and a small amount of Alconox.
 - c. Using non sparking tools carefully pick up with a sponge or plastic putty knife.
 - d. Put EM in metal container with small amount of water in bottom.

2. **Remove any visible energetic material from drying racks.**
 - a. Wet the EM with a hand sprayer.
 - b. Using non sparking tools carefully remove with a sponge or plastic putty knife.
 - c. Put EM in metal container with small amount of water in the bottom.

3. **Disassemble drying racks**
 - a. Wet racks with hand sprayers filled with water and small amount of Alconox.
 - b. Using non sparking tools disassemble drying racks.
 - c. If necessary to cut with hand saw the rack will be continuously wetted during the cutting operation.
 - d. Provide support for rack above cut and cut slowly, continuously wetting cut area.
 - e. Wear half face mask when cutting to prevent inhalation of sawdust products.

4. **Remove drying racks from building**
 - a. Two personnel will carry the racks out of the building to haul trucks or load them directly on a haul truck backed up to the door. **NOTE:** Never block direct access from the building with haul trucks.
 - b. Once the racks are removed they will be direct loaded into haul trucks.
 - c. The haul trucks will transport the racks directly to the landfill.
 - d. No haul truck will remain filled with 3X materials overnight
 - e. All racks will be direct covered at the landfill. **NOTE:** Do not wait till end of day to cover 3X materials at the landfill

5. **Sill plate removal.**
 - a. After removal of all equipment from the building;
 - b. Remove all sill plates using wetted methods and non sparking tools.
 - c. If any energetic material is found use wetted methods and non sparking sponges and plastic putty knives to clean up the material.
 - d. Any material which is stuck to the wood sill will be removed using a plastic putty knife.
 - e. The material will be saturated with water Alconox mix before removal.
 - f. Put EM in metal container with small amount of water in the bottom.
 - g. Transport sill plates to landfill for direct cover

6. **Packaging and Transport of EM**
 - a. After containerizing EM the containers will be transported by SpecPro to the authorized magazine.
 - b. Fill out a transfer document signed by SpecPro.

7. **Safety and Security**
 - a. A 1250' QD arc will be in place prior to any energetic material or 3X removal operations.
 - b. All work will cease if the QD arc is breached by unauthorized personnel.
 - c. All personnel will sign into the QD arc.
 - d. Ensure 200' safe separation distance between working crews.
 - e. No two crews will work on the same building.
 - f. All 3X and 1X removal/decontamination will be under the supervision of a UXO Tech III at a minimum.
 - g. A maximum of three personnel including the UXO Supervisor will be allowed inside a building.
 - h. Fire extinguishers will be available at the entrance of each building exit. The extinguisher will be within easy reach of the UXO Supervisor.
 - i. The UXO supervisor will not perform physical work during removal operations.
 - j. A safe evacuation route will be observed by all personnel prior to commencing work.

8. **PPE**
 - a. All personnel conducting 3X or 1X materials removal/decontamination will wear;
 - i. Tyvec,
 - ii. Steel toe boots,
 - iii. Leather gloves
 - iv. Nitrile gloves
 - v. Safety glasses. **Note:** For personnel working inside buildings clear safety glasses must be worn.
 - b. Hard hats **will not be worn** while removing energetic materials and equipment unless an overhead hazard exists. If the hard hat must be worn it will be securely fastened on the head with strap.
 - c. Half face respirators will be worn at a minimum when cutting any wood or being exposed to dusts.
 - d. PPE coveralls and nitrile gloves will be removed after exiting the building.
 - e. The PPE will be placed in a plastic bag for disposal with 3X material at the landfill.
 - f. Hands will be washed after removal of the nitrile gloves.