

**ENVIRONMENTAL ANALYSIS AND DECISION ON THE NEED  
FOR AN ENVIRONMENTAL IMPACT STATEMENT (EIS)**

Department of Natural Resources (DNR) Form 1600-8 Rev. 6-2001

<b>Region or Bureau</b> South Central Region
<b>Type List Designation</b> Type II action

NOTE TO REVIEWERS: This document is a DNR environmental analysis that evaluates probable environmental effects and decides on the need for an EIS. The attached analysis includes a description of the proposal and the affected environment. The DNR has reviewed the attachments and, upon certification, accepts responsibility for their scope and content to fulfill requirements in s. NR 150.22, Wis. Adm. Code. Your comments should address completeness, accuracy or the EIS decision. For your comments to be considered, they must be received by the contact person before 4:30 p.m., January 21, 2011

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**Applicant:** U.S. Department of the Army, Badger Army Ammunition Plant

**Address:** 2 Badger Road, Baraboo, WI 53913-5000

**Title of Proposal:** Feasibility Report Contiguous Addition to Landfill 3646 Badger Army Ammunition Plant

**Location:** County: Sauk, Town: Merrimac Township

**Township Range Section(s):** SE ¼ of the NW ¼ and the SW ¼ of the NE ¼ of Section 7, T10N, R7E.

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## PROJECT SUMMARY

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### 1. *Brief overview of the proposal including DNR actions, public costs and funding*

The Badger Army Ammunition Plant (BAAAP) is located in south-central Wisconsin between the cities of Baraboo and Sauk City in Sauk County (see Map 1). A contractor-operated facility, BAAAP is owned by the Department of the Army (the Army) and is operated by SpecPro, Inc. (SpecPro). BAAAP was developed and operated as a production facility for powder propellants between 1942 and 1975. In March 2003, the U.S. General Services Administration (GSA) published a Final Environmental Impact Statement (EIS) that proposed disposal of BAAAP. The plant was decommissioned and listed as surplus. Since that time, the Army has been demolishing and disposing of the extensive plant infrastructure, which has included approximately 1450 buildings, railroad lines, water and sewer lines, a heating plant, roadways and bunkers in preparation for transferring the property to various public entities.

The Badger property consists of 7,275.24 surveyed acres, bordered by Devil's Lake State Park to the north, U.S. Highway 12 to the west, and State Highway 78 and Lake Wisconsin to the south and east. In 2006, the future property owners reached agreement for dispersing the property. The Bureau of Indian Affairs/Ho-Chunk Nation will be conveyed 1,552.68 acres. The Bluffview Sanitary District will receive 163.68 acres; the Town of Sumpter will receive 3.59 acres; and the WI Department of Transportation will receive 59.88 acres. The USDA Dairy Forage Research Center has been conveyed 2,106.93 acres. The Department of Natural Resources (the Department) will receive a total of 3,386.71 acres. In 2010, 1853.9 acres were transferred to the Department. See Map 2 for details.

On behalf of the Army, SpecPro has proposed to construct a 750,000-cubic-yard expansion adjacent to the western boundary of the existing, active construction and demolition landfill (DNR License #3646, see Map 3). The proposed expansion is necessary to accommodate the remaining non-hazardous waste material that is expected to be generated from the clean up and transfer of the BAAAP property to future owners. The Army has committed to funding the construction and operating costs of the proposed landfill expansion. The existing landfill is located at the northeast corner of the East Rocket Area in the east-central portion of BAAAP. Most of the area that would be occupied by the expansion is currently being used to stage landfill construction materials (soils) and store equipment used for ongoing landfill operations. It is likely that there would be a significant increase in painted concrete wastes entering the landfill expansion as compared to prior disposal in either the closed (#3118) or active (#3646) landfills. Some of the paint historically used at BAAAP has been shown to contain polychlorinated biphenyls (PCBs) and lead at varying concentrations. Also, at a separate location on the BAAAP property, one previously approved clay borrow area would be excavated to provide materials for landfill construction. Any sand needed for landfill construction purposes would be obtained from a commercial supplier. If additional borrow areas were needed in the future, then a Plan of Operation Modification Request would need to be submitted to the Department for review.

In accordance with s. 1.11, Wis. Stats. and ch. NR150, Wis. Adm. Code, an Environmental Assessment (EA) is required for regulatory approval of the proposed landfill expansion because its design capacity exceeds 500,000 cubic yards. Army regulation (AR) 200-3 also requires an Environmental Analysis of Army actions affecting human health and the environment.

The vision for the future of the Badger Army Ammunition Plant was laid out in the 2001 Badger Reuse Committee Report. Integral to this vision is a commitment to collaborative land management

with the other property owners at Badger: Ho-Chunk Nation, USDA Dairy Forage Research Center, and Bluffview Sanitary District. The Badger Oversight Management Commission has been created to facilitate this collaboration. The Department intends to develop the Master Plan in consultation with the Ho-Chunk Nation, USDA, other stakeholder organizations, and the general public. The Master Plan will determine which public uses will be allowed on this property and what type of development will need to be completed to support those uses.

In 2012, the Department plans to begin engaging the public in a planning process to establish the Master Plan for the property. In the interim, the Department has initiated pre-planning including compilation of biotic inventories, regional analysis, and development of status reports. The Department anticipates bringing the proposed Master Plan to the Natural Resources Board before 2016, when the Army is scheduled to leave. A separate EA will be developed as part of the master planning process, and will focus on overall land protection, management, recreational use and facility development across the property.

This EA focuses on the potential environmental impacts directly and indirectly associated with the proposed landfill expansion. However, there are also numerous non landfill-related activities being completed or planned at BAAAP. Information on these non landfill-related activities is described in Appendices A through G, listed below. References to appropriate appendices are given throughout the main body of the EA.

- Appendix A: Reuse of Construction Materials at BAAAP
- Appendix B: Badger Reuse Plan
- Appendix C: Natural Resources at BAAAP
- Appendix D: Water Supply Systems at BAAAP
- Appendix E: Hazardous Substance Releases at BAAAP
- Appendix F: Neotenic Tiger Salamanders
- Appendix G: Wastewater Treatment Plan for BAAAP

### **Information Repositories**

The substantial volume of information referenced but not attached to this Environmental Assessment is made available at the repositories that the Army maintains at the Prairie du Sac library, the Sauk City library and at the Badger plant itself. The repositories at the libraries can be viewed during normal library hours. The repository at the Badger plant may be viewed by appointment by calling 608/643-3361.

## ***2. Purpose and Need***

Additional landfill space is needed for the safe disposal of non-hazardous construction and demolition debris and non-hazardous contaminated soils as the Army continues to demolish the extensive infrastructure at BAAAP in preparation for future property transfers. The scope of demolition and remediation activities at BAAAP have changed over time as the Army has greatly increased the amount of infrastructure targeted for demolition and disposal, along with the discovery of some additional areas of contamination (such as the volatile organic compound-contaminated plant sewer lines). SpecPro estimates that the site life of the landfill expansion would be approximately 5 years, although the exact site life would be dependent upon the volume and types of waste encountered during cleanup activities. The Army and various interested parties would pursue recycling and reuse

projects for useable materials wherever possible (see Appendix A). However, the success of recycling and reuse efforts would be somewhat dependent upon external factors such as recyclables markets and the availability of recycling and reuse projects. Irrespective of recycling efforts, it is likely that the BAAAP facility has greater than 750,000 cubic yards of additional demolition waste that could be placed in the proposed landfill expansion.

### **Badger Reuse Plan**

The March 28, 2001 Badger Army Ammunition Plant Reuse Plan was developed by numerous environmental, governmental, tribal, business, landowner, and other parties interested in achieving a community-based plan for reuse of the ammunition plant (see Appendix B). The plan establishes nine predominant values, each with numerous criteria, for activities affecting the property. The landfill expansion proposal addressed in this assessment relates specifically to Value 2, which directs the federal government to complete the highest quality cleanup of the Badger property in a timely manner. Value 2 of the Reuse Plan also directs the federal government to retain all cleanup responsibilities and liabilities associated with decommissioning of the plant. The landfill expansion proposal conforms to this criterion by providing for the environmentally sound disposal of debris and non-hazardous contaminated materials that would be generated by the continued demolition of the plant.

The landfill proposal conforms to other applicable values and criteria of the Reuse Plan as well. As described elsewhere in this assessment, no historically significant buildings or infrastructure would be affected (Value 3), sustainable agriculture opportunities would not be affected (Value 6), and economic stability and sustainability in local municipalities would either be enhanced or would not be affected (Value 9). The proposal would affect criteria listed under Value 7 of the Plan, regarding protection and enhancement of the natural landscape and geological features, including visual impact to the property. Upon closure, the proposed landfill elevation would be approximately 40-50 feet above the natural terrain. However, any visual impact would be localized. The Department would require that all areas disturbed during construction of the landfill expansion be re-vegetated, consistent with the eventual master plan for the property and with Department-approved work plans for restoration.

The Future Use Concept Map of the Reuse Plan (see map in Appendix B) indicates that the proposed landfill expansion would be located within an area targeted for ecosystem restoration and conservation. The proposed landfill expansion site would be restored in accordance with an approved restoration plan that would be based upon the final uses proposed by the Reuse Plan.

### ***3. Authorities and Approvals (list local, state and federal permits or approvals required)***

#### **Landfill and Borrow Sites**

The first major steps in the landfill siting process are the Army's submittal of their Feasibility Report and the Department's determination on that report. The procedures for a feasibility determination include: a review of the completeness of the information supplied by the Army, the preparation of an environmental assessment (EA) requiring input from numerous programs within the Department, a determination about whether an environmental impact statement (EIS) is necessary, and an opportunity for public comment. Public comments are reviewed at any time, however after the public notice is issued, there is a formal 30-day public comment period. During this period, the public may request an informational hearing. Also during the comment period, the public may request a contested case hearing on the feasibility report approval for the landfill (but there is no such provision for the

EA). Sections 289.26 and 289.27, Wis. Stats. describe the informational and contested case hearing provisions for a proposed landfill expansion project.

After the comment period and review of public comments, the Department decides whether to approve or deny the feasibility report. If the feasibility report is approved, the Army would then request and receive Department approval of a Plan of Operation, which is the next step in the siting process. The Plan of Operation provides the technical specifications of the landfill expansion based on criteria established by the feasibility review. The Plan of Operation also contains restoration/reclamation plans for soil borrow areas. If the Plan of Operation is approved, construction may begin. Department staff would inspect the landfill expansion during its construction, and afterward, approval of a construction documentation report would be required before any waste could be placed in the landfill expansion. The Feasibility Report and the Plan of Operation Report are required under ss. 289.23 and 289.30, Wis. Stats.

The Army has previously requested a reduction in the number of exploratory soil borings and groundwater monitoring wells and the amount of water quality testing needed as part of the feasibility study to be completed for this landfill expansion. The reductions were requested in the Army's Alternative Geotechnical Investigation (AGI) Plan, dated March 3, 2010. The Department's approval of the AGI Plan was based on the significant amount of similar information previously collected for the current active landfill (License #3646) and the closed landfill (License #3118) that are in proximity to the proposed expansion. The Department has also granted BAAAP a conditional approval for disposal of asbestos-containing material in the active landfill. The same requirements for asbestos disposal in the proposed landfill expansion would be included in any Plan of Operation approval issued for the proposed expansion (See Sections 7 and 16 below).

Two deviations from the standard landfill design required by ch. NR 504, Wis. Adm. Code are proposed. The first is to allow the use of high density polyethylene (HDPE) for the leachate collection and transfer piping system, instead of schedule 80 polyvinyl chloride (PVC) as required by s. NR504.06(5)(c) Wis. Adm. Code. The second is to allow the use of one leachate headwell per phase instead of two as normally required by s. NR 504.09(2)(i), Wis. Adm. Code. These design deviations were allowed for the existing active landfill (Lic. #3646) and are not expected to result in any environmental impacts.

The proposed landfill expansion meets all of the locational requirements specified by s. NR 504.04(3), Wis. Adm. Code for the siting of a landfill because it lies beyond the following regulatory boundaries:

- ◆ 1200 feet of any public or private water supply well,
- ◆ 1000 feet of a navigable lake, pond or flowage,
- ◆ 300 feet of a navigable river or stream,
- ◆ a floodplain,
- ◆ 1000 feet of the right-of-way of any state trunk highway, interstate, federal aid primary highway,
- ◆ 1000 feet of an existing public park,
- ◆ 200 feet of a fault that has had displacement in Holocene (recent) time,
- ◆ a seismic impact zone,
- ◆ any other geologically unstable area.

In addition, the landfill expansion would not contain putrescible waste, and therefore, would not present a bird hazard to aircraft.

As this document will discuss, the proposal has the potential to meet the performance standards for a solid waste landfill specified by ch. NR 504.04(4), Wis. Adm. Code for the following reasons:

#### Landfill Expansion Site

- (1) If the landfill expansion is designed, operated and monitored to approved Department standards there would be no reasonable probability that significant deleterious impacts would occur to wetlands, surface water quality, or groundwater quality or quantity.
- (2) Because the expansion would not contain putrescible waste there would be little or no explosive gas migration away from the waste. Furthermore, passive gas vents would be included as part of the cap design to allow any gas generated to escape to the atmosphere.
- (3) Required ongoing monitoring would reduce or eliminate the possibility that air emissions of any hazardous air contaminant would exceed standards without Departmental action.
- (4) No historical or archaeological artifacts or sites, and no critical habitat occur at the site.

#### Clay Borrow Area

Clay borrow material for construction of the landfill would be excavated from a previously approved borrow area at BAAAP. The “Coal Yard Clay Borrow Site” (Coal Yard) has sufficient clay to complete construction of the first phase of the proposed expansion. If additional clay borrow sources were needed for liner construction in subsequent phases, the Army would be required to submit a Plan of Operation modification request for approval of any additional borrow sources. According to the Army, there is additional clay available in areas adjacent to the Coal Yard clay borrow source. The approved clay borrow excavation would not harm wetlands, surface water or critical habitat, and does not contain historical or archaeological artifacts or sites, thereby meeting the regulatory requirements for the siting of non-commercial borrow areas. Any sand needed during the initial construction of the proposed phases would be purchased from an off-site commercial source.

For aspects of the proposal that concern restoration of the landfill expansion and soil borrow areas, the Department would require that the Army conform to any guidance and approved work plans developed for restoration of each site. Reclamation and restoration activities would be required to conform as well to the Badger Reuse Plan, to the BAAAP master plan when it is developed, and to the requirements of ch. NR 135 Wis. Adm. Code, concerning the restoration of nonmetallic mine sites.

### **Additional Permits and Approvals**

#### Air

Fugitive Dust air emissions are regulated under s. NR 415.04, Wis. Adm. Code, which states that no person may allow any materials to be handled or transported without taking precautions to prevent particulate matter from becoming airborne. Nor may a person allow a structure or road to be used, constructed, altered, repaired, or demolished without taking such precautions.

Given that this landfill expansion is intended solely for inorganic, non-hazardous demolition material and contaminated soil, and will not contain putrescible waste, minimal organic air emissions are expected.

Aside from fugitive dust emissions (estimated at less than 6.0 tons per year), which are already addressed by s. NR 415.04, Wis. Adm. Code, there are no other significant air emissions expected from this landfill and therefore it would not be subject to permitting requirements under the Air Program.

### Water

Erosion control and stormwater management coverage are required according to ch. 283, Wis. Stats., and ch. NR 216, Wis. Adm. Code.

No water regulation permits would be needed for the clay borrow or landfill expansion sites according to ss. 30.123, 30.19, 30.195 and 30.20, Wis. Stats. No jurisdictional wetlands would be affected and no federal Section 404 Army Corps Permit or Section 401 Water Quality Certification would be required.

No Wisconsin Pollutant Discharge Elimination System (WPDES) Permit per ch. 283, Wis. Stats., would be required for the landfill expansion if leachate is discharged to the wastewater treatment plant, as planned.

### Endangered Resources

No incidental take of federal or state endangered or threatened species is expected to occur through this project, therefore no state or federal incidental take permits would be required.

### Local Approvals

As required by s. 289.22, Wis. Stats., BAAAP has contacted the affected local municipalities: Sauk County, the Town of Merrimac and the Town of Sumpter. Based on the responses BAAAP received, there are no applicable local approvals required for the proposed landfill expansion.

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## PROPOSED PHYSICAL CHANGES

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### *4. Manipulation of Terrestrial Resources (include relevant quantities - sq. ft., cu. yard, etc.)*

The proposed landfill expansion would increase the overall capacity of the active landfill (License #3646) at BAAAP by an additional 750,000 cubic yards. As of September 30, 2010 the active landfill had approximately 330,000 cubic yards of capacity remaining from the originally approved 900,000 cubic yard capacity. It should be noted here that the Army has thus far decided to forego the filling of Department-approved vertical Phase 6 at the active landfill (#3646), which has the effect of reducing the previously approved capacity of 900,000 cubic yards to an approximate final capacity of 700,000 cubic yards. Thus, the final expected capacity of landfill License #3646, including the proposed expansion would be 1.45 million cubic yards, assuming that already approved Phase 6 of the existing landfill (#3646) is not developed.

The proposed landfill expansion would require the excavation of approximately 14 acres to a depth of approximately 20-25 feet. The full expanded footprint would be rectangular in shape with dimensions of approximately 600 feet by 1000 feet. The expansion would be built in 5 phases starting at the eastern most side of the expansion and proceeding westward. Each phase would have an approximate dimension of 600 feet by 200 feet. Areas adjacent to the landfill expansion would be disturbed for access roads, soil stockpiles, environmental monitoring wells and equipment, and piping. All together, the active landfill, proposed landfill expansion, the closed landfill (License #3118) and infrastructure supporting these landfills, would affect approximately 110 contiguous acres of the BAAAP property. The maximum elevation of landfill #3646 when closed is expected to be less than 930 feet above mean sea level (MSL), which would be approximately 40-50 feet above the nearby terrain, again assuming approved Phase 6 of the existing landfill (#3646) is not developed.

At a separate location on the BAAAP property, one previously approved clay borrow area totaling approximately 10 acres would continue to be excavated. This borrow area would provide clay materials needed for the construction and closure of the landfill expansion. The Coal Yard Clay Borrow Site would be excavated first. Chapter NR 512.15(1), Wis. Adm. Code, requires an applicant for a new landfill to identify a borrow source that contains enough clay that meets the required clay specifications to enable the construction of the liner and cap of the first phase of a proposed landfill (or in this case the first phase of expansion). SpecPro has estimated that the clay needs for the liner and cap of the first phase of the proposed landfill expansion would be approximately 30,000 cubic yards. It is estimated that the Coal Yard has approximately 40,000 cubic yards of clay remaining. When additional clay is needed, the Army has estimated that approximately 100,000 cubic yards of additional clay resources is present in areas adjacent to the approved Coal Yard borrow source. The Army estimates it would take approximately 4,500 cubic yards of sand to construct the drainage blanket in the first expansion phase and that it would take approximately 9,000 cubic yards of sand to construct the cover system for the expansion. The Army indicates that they would purchase any sand needed to fulfill the constructions needs of the expansion from an off-site commercial source. Any additional proposed borrow areas would be reviewed for compliance with ch. NR 512.15, Wis. Adm. Code.

### **Landfill Use and Design**

Generally, waste going into the proposed landfill expansion would be similar to that currently disposed of in the active landfill, although the Army has indicated that there would likely be an

increase in the disposal of materials that were painted with paint containing polychlorinated biphenyls (PCBs) and lead, as discussed below. The primary waste material for disposal would consist of construction and demolition debris from the removal of various buildings and infrastructure on the property (treated and painted wood, shingles, unpainted and painted concrete) and non-hazardous contaminated soil from various remedial actions. As estimated by the Army, the primary waste stream would comprise approximately 79% of the entire waste stream by volume. The secondary waste stream would consist of landfill cover materials (chipped waste wood, non-hazardous contaminated soil), and other earthen (soil) debris (approximately 15% of waste stream), friable and non-friable asbestos products (approximately 5% of waste stream), and non-putrescible office waste (approximately 1% of waste stream).

Some of the demolition debris that would be disposed of was painted long ago with paint that contained PCBs and lead. Materials that contain PCBs over specified threshold concentrations are also regulated under the Federal Toxic Substances Control Act (TSCA). The Army is currently in discussions with the U.S. Environmental Protection Agency (EPA) regarding how to appropriately sample, analyze and characterize this debris, and to what extent. Generally, the Army will need to determine if PCB-containing wastes are defined as “PCB bulk product waste” or “PCB remediation waste”, per 40 CFR (Code of Federal Regulations), Section 761.3. How the material is defined and the concentration of PCBs that have been detected in the material will help the Army determine their disposal options for that material. “PCB bulk product wastes” are specifically allowed to be disposed of in a licensed municipal or non-municipal non-hazardous landfill per 40 CFR, Section 761.62(b)(i). It is likely that there would be a significant increase in painted concrete wastes entering the landfill expansion as compared to prior disposal in either the closed (#3118) or active (#3646) landfills. Some of the paint historically used at BAAAP has been shown to contain PCBs and lead at varying concentrations. Only non-hazardous waste material can be disposed of in the existing landfill, and the same would be true of the proposed landfill expansion.

BAAAP will not be allowed to dispose of any putrescible waste, such as cafeteria waste, that is not associated with demolition, deconstruction or other remedial operations.

The proposed landfill expansion would be designed to be a total containment facility, having a composite liner with 4 feet of compacted clay overlain by a 60-mil geomembrane and an engineered leachate collection system similar in design to the existing landfill leachate collection system. At the active landfill, leachate is removed by the collection system and is pumped to a force main that hooks into an existing sewer line which sends the leachate directly to the wastewater treatment plant.

The landfill expansion would be developed and closed in phases from east to west as the site fills. Depending on the volume of additional waste disposed of, it may be unnecessary to develop all five proposed phases of the expansion. The proposed final cover system from bottom to top is: one foot of sand (grading layer and gas venting layer), two feet of compacted clay, a 40-mil geomembrane, one foot sand drainage layer, a geotextile, 18 inches of rooting zone soil and six inches of topsoil. Although landfill gas generation is expected to be minimal due to the non-putrescible waste material, the proposal does include a passive venting system designed to prevent any gas generated by decomposition of the waste from becoming concentrated within the landfill.

## **5. *Manipulation of Aquatic Resources (include relevant quantities - cfs, acre feet, MGD, etc.)***

The 10-acre Coal Yard clay borrow source is located in the northwest corner of the BAAAP property, in an area where some fine grained near-surface soils exhibit naturally poor drainage. It is likely that the limited potential for infiltration through the remaining fine grained soils at the Coal Yard could have the effect of creating an artificial pond and/or wetland once excavation activities were

completed. The Army has indicated that the Coal Yard clay borrow area will be reclaimed as a storm water retention basin, pond, or wetland once all of the useable clay has been removed.

#### **6. *Buildings, Treatment Units, Roads and Other Structures (include size of facilities, road miles, etc.)***

The proposed landfill expansion would utilize existing BAAAP roads during its construction and operation, and no associated buildings would need to be constructed to service additional landfill activities. The only associated construction proposed would be connecting the proposed expansion to the existing force main on the north side of the landfill running west to an existing, functional sewer line. In the proposed design, leachate would be gravity drained out of the landfill expansion then transferred through the force main and discharged to the wastewater treatment plant.

#### **Reuse of Demolition Materials**

The Army continues to recycle demolition materials wherever possible. The various infrastructure components that have potential for reuse include shingles, lumber, various metals and concrete. Concrete is the most reusable material at the facility, with estimates of available material as high as 1,300,000 tons. Recycled, crushed concrete was used as road base and fill for the State Highway (STH) 78 project, which utilized 28,200 tons of recycled concrete to reconstruct approximately 8.6 miles of roadway between County Highway Z and the Village of Merrimac. Additional opportunities to recycle concrete may occur with other local road building projects, including the proposed realignment of a short section of United States Highway (USH) 12 adjacent to BAAAP in 2011. Other re-useable materials that have been recycled by the Army, but in lesser amounts, include lumber from buildings and steel from buildings and railroad tracks. The Army has also researched possibly providing railroad ties for biofuel-related electricity generation.

See Appendix A for a discussion of reuse of facilities and materials at BAAAP.

#### **7. *Emissions and Discharges (include relevant characteristics and quantities)***

The primary air contaminant expected would be particulate matter in the form of fugitive dust, generated from truck traffic and soil handling. Maximum theoretical emissions of fugitive dust are estimated to be less than 6.0 tons per year. Owners and operators are required by s. NR 415.04, Wis. Adm. Code, to take precautions to minimize fugitive dust. Such precautions shall include, but not be limited to:

- Use, where possible, of water or chemicals for control of dust in the demolition of existing buildings or structures, or construction operations.
- Application of asphalt, water, suitable chemicals or plastic covering on dirt roads, material stockpiles and other surfaces which can create airborne dust, provided such application does not create a hydrocarbon, odor or water pollution problem.
- Covering or securing of materials likely to become airborne while being moved on public roads, railroads or navigable waters.
- The paving or maintenance of roadway areas so as not to create air pollution.

Particulate matter emissions other than fugitive dust would not be significant, and given that this landfill expansion would be intended primarily for inorganic, non-hazardous demolition material, it would not contain putrescible waste, so no significant organic air emissions would be expected.

Overall, the maximum theoretical emissions of any one pollutant would not be significant enough to make the proposed landfill expansion subject to permitting requirements under the Air Program.

There is a potential for asbestos emissions from both asbestos removal and disposal. Asbestos removal is regulated by ch. NR 447, Wis. Adm. Code and is required to be done in a manner that minimizes emissions. The disposal of asbestos-containing material in the existing landfill (License #3646) is regulated by conditions contained in the August 3, 2004 Plan of Operation Approval issued by the Department. The majority of asbestos-containing material is expected to be non-friable transite siding, which is not expected to release any asbestos unless broken. The current approval requires that any non-friable asbestos materials be covered with at least one foot of soil prior to compaction to minimize the release of any asbestos. Friable material is required to be covered as soon as it is placed in the landfill and covered with at least three feet of soil prior to compaction. These same procedures would likely be proposed by SpecPro in the Plan of Operation for the landfill expansion or would be included as conditions by the Department.

## **8. *Other Changes***

none

## **9. *Identify the maps and figures attached***

Map 1: Topographic Map of BAAAP Area

Map 2: Map of Future Parcel Ownership and 2010 Land Transfers

Map 3: C&D Landfill Complex and Proposed Expansion

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## AFFECTED ENVIRONMENT

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### 10. Information Based On (check all that apply):

Literature/correspondence (specify major sources)

- Army electronic correspondence titled “*Feasibility Report – Addendum 2*”, and dated and received December 16, 2010.
- Army correspondence titled “*Groundwater Standards Exemption Request Feasibility Report – Addendum Number 1 Contiguous Addition to Landfill 3646 Badger Army Ammunition Plant*”, and dated November 24, 2010 (received on November 26, 2010).
- Army Report titled “*Feasibility Report Contiguous Addition to Landfill 3646 Badger Army Ammunition Plant*”, and dated October 21, 2010 (received October 22, 2010).
- Department correspondence titled “*Initial Site Report Completeness Determination and Opinion: Proposed Contiguous Expansion of Landfill Capacity, Badger Army Ammunition Plant, Town of Merrimac, Sauk County, Wisconsin (License #3646)*” and dated August 31, 2010.
- Army report titled “*Initial Site Report Proposed Contiguous Addition to Landfill 3646 Badger Army Ammunition Plant*” and dated August 3, 2010.
- Department correspondence titled “*Initial Site Inspection Results: Proposed Expansion of Landfill License #3646, Town of Merrimac, Sauk County, WI*” and dated June 17, 2010.
- Department’s Natural Heritage Inventory (NHI) intranet data portal.
- Department’s Intranet Surface Water Data Viewer WT Webviewer.
- Departments Initial Site Inspection, conducted May 13, 2010 (DNR Response letter, dated June 17, 2010).
- Army correspondence titled “*Request for Initial Site Inspection Proposed Contiguous Addition to Landfill 3646 Badger Army Ammunition Plant*” and dated April 27, 2010.
- Department correspondence titled “*Alternative Geotechnical Investigation Program Approval: Badger Army Ammunition Plant Landfill #03646 Proposed Expansion, Sauk County*” and dated March 24, 2010.
- Army correspondence titled “*Alternative Geotechnical Investigation Plan Proposed Contiguous Addition of Landfill 3646 Badger Army Ammunition Plant*” and dated March 3, 2010.
- Department approval titled “*Plan of Operation Approval for the Proposed Badger Army Ammunition Plant Construction and Demolition Landfill (Site No. 3646)*” and dated August 3, 2004.

- Army report titled “*Plan of Operation Report Expansion of Landfill Capacity Project Badger Army Ammunition Plant*” and dated May 13, 2004.
- Department Form 1600-8 “*Environmental Analysis And Decision On The Need For An Environmental Impact Statement*” Applicant: U.S. Army Ammunition Plant and dated 2004.
- Department approval titled “*Plan of Operation Approval Modification for the Disposal of Asbestos Containing Material at the Badger Army Ammunition Plant Landfill (Lic. No. 3118)*” and dated July 31, 2003.
- Army report titled “*Expansion of Landfill Capacity Project Feasibility Report, APPENDIX D-Endangered Resources Management Plan*” and dated July 2003.

*Personal Contacts (list in item 26)*

*Field Analysis By:*  *Author*  *Other (list in item 26)*

*Past Experience With Site By:*  *Other (list in item 26)*

## ***11. Physical Environment (topography, soils, water, air)***

### **Geology**

The BAAAP property straddles a region where glacial ice stagnated and receded at the end of the last glacial advance in Wisconsin. The glacier advanced over thick, fairly uniform outwash sand that had built up in front of the advancing ice in a deep bedrock depression, so that when the glacier retreated, BAAAP was left with two distinct regions of thick sediment separated by glacial end-moraine. The eastern two thirds of the property contains the undulating “kettle and knob” terrain where the stagnating ice left inter-bedded, irregular layers of sandy, silty glacial till mixed with more uniform layers of sand and gravel.

The western third of the property contains more level terrain where the uniform outwash sand layers escaped reworking by glacial ice. After the ice retreated, wind deposited 2-10 feet of silt and clay (loess) over the entire property. Post-glacial streams reworked the loess and concentrated the clay in quiet backwater areas, for example at the north edge of the property near bluffs of the Baraboo Range.

The site of the proposed landfill expansion is located within undulating topography on the east side of BAAAP. Borings taken at and near the site reveal the discontinuous, inter-bedded layers of gravel, sand, silt and glacial till, typical of the morainal areas at BAAAP, with more uniform sand and gravel outwash below. Viewed from the land surface downward, soils at the proposed landfill expansion site typically consist of approximately 5-10 feet of silt and clay derived from loess, followed by approximately 50-70 feet of inter-bedded silt, silty sand and clean sand originating as glacial moraine, and beneath that, 80 feet (or more) of stratified sand and gravel, deposited as glacial outwash.

The approved Coal Yard clay borrow area, located in the northwest corner of the property, occurs where postglacial streams deposited clay in quiet backwater areas near the base of the Baraboo bluffs. The clay varies from approximately 2-14 feet in thickness.

Based upon information from the drilling of deep, high capacity water supply wells at BAAAP, the uppermost bedrock in the subsurface is mainly glauconitic sandstone of the Cambrian Eau Claire formation. The sandstone is likely to be located more than 200 feet below the ground surface at the site of the proposed landfill expansion. The irregular bedrock surface becomes more shallow towards the north edge of the BAAAP property, where the sandstone thins out and quartzite of the south flank of the Baraboo Hills rises above the land surface.

### **Surface water and wetlands**

The Department has conducted map searches and field verification of surrounding waterways and wetlands, and determined that there are no surface water bodies or wetlands near the proposed landfill expansion or the approved borrow areas. There are numerous depressions in the knob and kettle topography of the eastern two-thirds of the BAAAP property. A small, un-named pond located in one of these depressions is located approximately 1,500 feet north of the proposed landfill expansion and is the water body closest to the proposed expansion site. Weigand's Bay, Lake Wisconsin and the 100-year floodplain of the Wisconsin River are more than 3,700 feet away from the proposed landfill expansion at its closest point.

See Appendix C for a description of wetlands and water bodies at the property.

### **Groundwater**

#### **BAAAP Property:**

Groundwater at BAAAP generally flows from northwest to southeast across the property at all depths, from the topographic high of the Baraboo Hills to the Wisconsin River depression. However, the dominant southeast flow is shifted to the south and southwest over the southern third of the property by inflowing groundwater from the Wisconsin River. This inflow is the result of an approximate 50-foot head of water that exists at the Prairie du Sac dam at the base of Lake Wisconsin. Except for localized areas, groundwater flows more or less horizontally across the BAAAP property, without a significant upward or downward flow component. The numerous wetlands and ponds that exist on the east side of BAAAP result mostly from perched groundwater in glacial kettle depressions.

There is one high capacity water supply well and one low capacity water supply well providing potable water on the BAAAP property. The high capacity well (Well #1) supplies water to the BAAAP administration buildings and, when needed, to the Bluffview Mobile Home Park. A small low capacity well serves the Sportsman Club.

See Appendix D for more information on the water supply systems at BAAAP.

#### **At Landfill Site:**

At the site of the proposed landfill expansion, groundwater is found between 87 and 122 feet below the land surface in glacial outwash sediment (sand and gravel). Groundwater flows primarily in a horizontal manner beneath the landfill site, as it generally does across the entire property.

There are no water supply wells located within 1,200 feet of the proposed landfill expansion, therefore no well variances would be necessary to site the landfill. The closest private residential water supply well is located approximately 2,800 feet east of the proposed expansion. Approximately 32 additional private water supply wells are located within a one-mile radius of the proposed expansion, all of them located off BAAAP property. Based on groundwater flow directions, these residential wells in the vicinity of Weigand's Bay are generally side-gradient from the proposed landfill expansion. Residences at the Summer Oaks subdivision, located approximately 4000 feet southeast of the landfill site, would be down gradient.

### **Groundwater Contamination:**

Contaminant releases resulting from past dumping or spills are known to have caused groundwater contamination at various locations on the BAAAP property. Areas of known groundwater contamination have included the Deterrent Burning Ground (DBG), the Propellant Burning Ground (PBG), the fuel oil release at Powerhouse #1, the ditches within the Rocket Paste area, the Nitroglycerin and Rocket Pond areas, and the Settling Ponds/Spoils Disposal area. Groundwater monitoring wells are sampled regularly to track groundwater contaminant plumes and private residential water supplies are also monitored regularly to ensure no water supplies are impacted by unsafe levels of contaminants. A description of each of these groundwater contaminant source areas and the remedial actions conducted in each area to date is included below.

#### **1. Deterrent Burning Ground (DBG)**

The DBG and an adjacent coal ash disposal site are located in the northeast section of the BAAAP property. Liquid waste deterrent was dumped at this location during the Vietnam active period. Deterrent is an organic mixture of benzene, di-nitro toluene (DNT) and chlorinated compounds.

In 2003, the DBG and the coal ash disposal site were capped with a composite soil and geomembrane cover system. Prior to capping, all readily available shallow soil contamination was removed. A bioremediation system including nutrient infiltration galleries was placed beneath the landfill cover to facilitate the biodegradation of di-nitrotoluene in subsurface soils (biodegradation is the process of using naturally occurring bacteria to degrade organic contaminants in soil). The bioremediation system began operation in early 2004. The Army continues to inject water into the infiltration galleries of the bioremediation system.

In recent years, several DNT isomers have been detected in groundwater southeast of the DBG at BAAAPs southern property boundary and beyond, towards Weigand's Bay. The Army has installed additional temporary and permanent groundwater monitoring wells in the area to better define the extent and degree of the contaminant plume southeast of the DBG. Groundwater monitoring is ongoing and will continue in this area.

#### **2. Propellant Burning Ground (PBG)**

The PBG is located in the west-central part of the Badger plant. Propellant was dumped into open pits during the Korean and Vietnam active periods. This dumping has created a groundwater contaminant plume that stretches for several miles from the PBG, almost to the Wisconsin River below the Prairie du Sac dam. The groundwater contaminants include DNT, carbon tetrachloride, trichloroethylene (TCE) and chloroform.

The Army has conducted numerous remedial actions to address contaminated soil and groundwater occurring at the PBG. A groundwater extraction system was installed along the southern boundary of BAAAP and to the north, toward the PBG, to capture and treat the contaminated groundwater plume and keep it from migrating beyond BAAAPs southern property boundary. The groundwater treatment system uses air stripping (volatilization) and activated carbon filters to remove organic contaminants prior to the treated water being discharged to Lake Wisconsin. “Spent” activated carbon (that which cannot be regenerated) is disposed of in the active landfill (#3646).

To address soil contamination that was a continuing source of groundwater contamination at the PBG, the Army has conducted several remedial actions, including the excavation of highly contaminated soil for disposal in the active landfill, the installation and operation of a soil vapor extraction (SVE) system, and the installation and operation of a bioremediation system. The SVE system was installed to extract contaminated soil vapor from soils above the water table via applied vacuum. The bioremediation system was installed to inject nutrient-rich water into contaminated soils using infiltration galleries to facilitate the biodegradation of di-nitrotoluene. Data collected from the PBG bioremediation system indicated that the system was very effective at removing and degrading DNT contamination. The PBG bioremediation system was shut down in 2006 when it was determined the system was no longer degrading and removing DNT.

### 3. Fuel oil release at Powerhouse #1

Powerhouse #1 (#400-1) is located in the western part of the Badger plant, just east and a little north of the main gate. Located adjacent to this power plant is a large above-ground fuel oil tank. In the mid-1990s it was discovered that a transfer line between the tank and the power plant had leaked, releasing fuel oil to the soil and groundwater. Data from monitoring wells indicated that free-product fuel oil was present on the water table, but that the volume of free-product fuel oil was relatively small. This case was closed by the Department September 5, 2006.

### Other Contaminant Findings

An investigation in the 1970s identified contaminated sediments in Grubers Grove Bay of Lake Wisconsin which had likely originated from wastewater discharges from the BAAAP property. In the summer of 2001, approximately 90,000 cubic yards of sediment contaminated with metals including mercury, lead, copper and zinc were removed from the bay. In February 2003, sediment sampling in Grubers Grove Bay indicated that elevated levels of metals remained in the bay. In 2006, an additional 60,250 cubic yards of contaminated sediment was dredged from Grubers Grove Bay. The spoils from the two dredging events were placed in geotubes in an engineered disposal cell on BAAAP property. The Army and the Department are currently in discussions regarding possible additional remedial actions to address the remaining sediment contamination in Grubers Grove Bay.

Groundwater sampling conducted in December 2003 detected DNT in two homes south of BAAAP, and in monitoring wells located in the southeast part of the property. Following confirmation of the DNT detections and some additional monitoring, the Army replaced five privately owned water supply wells south of the BAAAP property, due to the presence contaminant exceedences above drinking standards in those wells. The Army continues to monitor groundwater in this area and currently conducting an investigation into the source of these contaminants.

The Army has also conducted investigations of shallow soil contamination in the areas of the Settling Ponds, the Spoils Disposal areas, and Final Creek. Some of the contaminated soils from these areas have been excavated and disposed of in the active landfill (#3646).

The Army has completed additional investigations of production areas within BAAAP. Appendix E offers a comprehensive list of the remedial actions underway across the property and all environmental restoration areas to date.

## ***12. Biological Environment (dominant aquatic and terrestrial plant and animal species and habitats including endangered resources; wetland amounts, types and hydraulic value)***

### **BAAAP Property**

Prior to European Settlement, BAAAP was part of a large prairie and oak savanna known as Sauk Prairie. Since that time, most of the property has been significantly altered and very little of the original prairie-savanna vegetation remains. Today the vegetation at BAAAP is composed mainly of old field, cropland, pasture, conifer plantations, and scattered woodlots. A small portion of the property at the north end extends into the Baraboo Bluffs.

See Appendix C for a complete summary of the natural resources of the entire BAAAP property, including wildlife, forestry and fishery resources.

### **Landfill and Borrow Sites**

The pre-settlement vegetation at the landfill and sand borrow areas would most likely have been oak savanna. The soil borrow areas at the north end of the property were historically at the savanna-woodland edge, and may have been sedge meadow or wet-mesic prairie. None of the original oak savanna and prairie that once existed at these proposed locations remains.

The proposed landfill expansion would be located in an area on the northeast side of the East Rocket Production area containing roadways, foundations and other infrastructure. Currently, the site is highly disturbed, consisting of planted and non-native vegetation including old-field Eurasian grasses and weeds, conifer plantings and old-field native deciduous trees and shrubs as shown below:



*Proposed Landfill Expansion Site Looking South (5/13/2010)*

The former coal yard is a highly disturbed area previously used for the storage of coal stockpiles. The Coal Yard Clay Borrow Area is bordered by agricultural land to the east and north that is leased to grow row crops. Vegetation in the Coal Yard Clay Borrow Area consists predominantly of weeds with possible minor occurrences of old-field Eurasian grasses, as shown below:



*Coal Yard Clay Borrow Site Looking Northwest (6/19/2007)*

## **Endangered Resources**

In May 2010, field staff reviewed the Department's Natural Heritage Inventory portal for information regarding the presence of sensitive species within a 1-mile radius of the proposed landfill expansion site. The following endangered (E), threatened (THR) or Special Concern (SC) species were identified:

### **Mammals**

Prairie vole (SC)

### **Birds**

Henslow's Sparrow (THR)

Upland Sandpiper (SC)

Yellow-breasted Chat (SC)

Western Meadowlark (SC)

Bell's vireo (THR)

Osprey (SC)

### **Reptiles**

Gray Ratsnake (SC)

Eastern Massasaugua Rattlesnake (E)

Western Ribbonsnake (E)

Blandings Turtle (THR)

### **Plants**

Yellow Gentian (THR)

Prairie False Dandelion (SC)

Christmas Fern (SC)

Small forget-me-not (SC)

Since the project is unlikely to have any impact to surface water bodies, sensitive species of fish, mussels, and aquatic insects were not included on this list.

In addition, the Reservoir Pond was found to support a highly unusual population of neotenic tiger salamanders (meaning they breed in the larval stage and do not completely metamorphose into adults). The Reservoir Pond is a significant distance from the proposed landfill expansion and would not be expected to be affected by the expansion. The neotenic tiger salamanders are further discussed in Appendix F.

Given the highly disturbed condition of the proposed expansion site, as well as the active or future proposed soil borrow sites, it is unlikely that they would support the rare plant species described above. Recommendations were provided on how to avoid potential impacts to rare animal species (see Section 17, below).

## **Critical habitat**

Critical habitat is defined in s. NR 500.03(55) Wis. Adm. Code, as any habitat determined by the Department to be critical to the continued existence of any endangered or threatened species. The locations of the proposed landfill expansion and borrow areas do not contain critical habitat, and therefore would meet the location requirements for siting a landfill expansion and associated borrow

areas.

### **Forest Resources**

No known forest resources would be affected by the proposed expansion.

### **Wildlife and Fishery Resources**

The near-vertical sand banks located at the sand borrow area support nesting rough-winged and bank swallows, as well as kingfishers.

The proposed landfill expansion and borrow sites are used by white-tailed deer, wild turkey, rabbit, coyote, fox, striped skunk and pheasants.

## ***13. Cultural Environment***

### ***a. Land use (dominant features and uses including zoning if applicable)***

Current land use across the property is industrial and agricultural. Access is restricted, with a chain link fence enclosing 95-percent of the installation. Surrounding land use consists of agricultural, commercial, industrial, recreational and residential uses. See the Final EIS on disposal of the property for a discussion of county and town zoning policies and provisions on and around the BAAAP property.

Once the property is transferred, land use will be recreational and agricultural with some historical preservation. Specific uses for state-owned land would be determined during the master planning process, which will follow the Reuse Plan as closely as possible. The Department uses master plans to establish authorized management and development on its properties, and has committed to leading a joint master planning effort with the USDA and Ho-Chunk. This planning effort will also be done in conjunction with the Badger Oversight and Management Board.

### ***b. Social/Economic (including ethnic and cultural groups)***

A number of public and private activities are conducted at BAAAP. These include scheduled times for public hunting of deer and turkey, and farming and grazing on leased parcels of land (see Section 14 below). There is a sportsman's club on the post. SpecPro and Orbitec, private sector corporations, maintain offices and laboratory spaces at BAAAP. The Madison Police Department and the Madison Area Technical College conduct training sessions at BAAAP, and the Army Corps of Engineers and staff from other Army installations use BAAAP facilities for meetings and training purposes. The Badger History Group also rents office space in the Administration Building. See Section 14, below, for a description of use by the U.S. Dairy Forage Research Center.

### *c. Archaeological/Historical*

#### **BAAAP Property**

Archaeological investigations dating back to the mid-1800s have reported a number of cultural resources on the BAAAP property, including Native American effigy mounds. While modern agricultural and industrial land uses have destroyed much surface evidence, there are historical mound sites on the property with potential for subsurface human remains. Formal archaeological studies began in 1983 and continued through 2001. A total of 32 Native American and Euroamerican archaeological sites have been recorded within the property. None of these sites has been determined eligible for listing in the National Register of Historic Places, however three Native American and three Euroamerican cemeteries are protected by state law (s. 157.70, Wis. Stats.). In addition, the Ho-Chunk Nation has strong interest in the preservation of mound cemeteries, Traditional Cultural Properties, and traditional village locations. The entire Badger plant is considered historically significant because of its role in U.S. industrial mobilization during World War II. Collectively, the buildings represent a distinct historic environment and retain their 1940s character.

The Badger Reuse Plan recognizes the cultural history of the property and includes recommendations to memorialize this history and preserve significant sites and structures (see Appendix B).

#### **Landfill and Borrow Sites**

The locations of the proposed landfill expansion and the previously approved soil borrow area were screened using Wisconsin Historical Society Inventories to ensure compliance with s. 44.40, Wis. Adm. Code. The screenings indicated that there are no structures of archeological or historical significance located at the proposed landfill expansion site, or at the previously approved soil borrow site. Mark Dudzik, archaeologist with the Department's Facilities Management Section, concurred with these findings.

### ***14. Other Special Resources (e.g., State Natural Areas, prime agricultural lands)***

#### **Natural Areas**

The forested hills adjoining the north boundary of BAAAP have a number of designations, reflecting the area's very high ecological and biological significance. The Baraboo Range is the largest contiguous block of upland forest in southern Wisconsin and is designated by the National Park Service as a National Natural Landmark and by The Nature Conservancy as one of its "Last Great Places" for conservation priority. The Baraboo Hills region and the adjoining Wisconsin River corridor also are designated by The Nature Conservancy as "Ecologically Significant Areas" of the Prairie-Forest Border Ecoregion (see Appendix C).

This area of the Baraboo Range bordering BAAAP to the north is within Devil's Lake State Park, and is also designated a State Natural Area (SNA) known as "South Bluff and Devil's Nose." This SNA encompasses a large forested expanse of the southern flank of the Baraboo Hills, which is mostly southern mesic and dry-mesic forest, and includes Pine Glen in the southwestern portion. Pine Glen is a deep gorge cut into the quartzite bluff, from which the headwaters of Pine Glen Creek emerge just to the north. This pine relic features white pine and other northern plant species able to persist in its cool micro-climate. The South Bluff and Pine Glen support a large population of forest interior songbirds, including several that are Threatened or Endangered.

The Department's SNA Program protects the highest quality examples of native biological communities and significant geological features. A number of other SNAs occur in the larger area around BAAAP, including Devil's Lake Oak Forest, East Bluff State Natural Area, Parfrey's Glen, and Baxter's Hollow.

### **Agricultural Lands**

A 2100-acre dairy research farm of the U.S. Dairy Forage Research Center occupies the southeast portion of BAAAP. The Center is a cooperative effort between the U.S. Department of Agriculture, the University of Wisconsin-Madison, and other land-grant universities. Its livestock facilities house milking cows and replacement stock with a total herd numbering approximately 660 heads. The majority of leases held at BAAAP are agricultural leases, used for row crops, forage crops and pasture.

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## ALTERNATIVES

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***15. Briefly describe the impacts of no action and of alternatives that would decrease or eliminate adverse environmental effects. (Refer to any appropriate alternatives from the applicant or anyone else.)***

The applicant provided several alternatives in the Feasibility Report:

**1. No action** – All contaminated buildings at the BAAAP property must be removed before the property can be transferred to new owners, to limit the Army’s liability. In addition, waste generated during deconstruction of the remaining buildings will require disposal. If the landfill expansion is not built the contaminated waste would have to be transported off-site. The no action alternative could also affect the disposal of any remaining “clean” infrastructure at BAAAP by limiting the volume of landfill space available for disposal needs. Recycling and reuse of material is being investigated by numerous parties and would be done to the greatest extent possible. However, significant quantities of material from the buildings, such as transite siding, and asbestos shingles, cannot be recycled and it is likely that the BAAAP facility has greater than 750,000 cubic yards of additional demolition waste remaining.

**2. Off-site Disposal** – The Army has indicated that for liability reasons, the non-hazardous waste that is generated at the BAAAP property must remain on site. However, there are numerous other reasons that limit the practicality of this option. The most likely acceptable off-site location for the construction and demolition waste would be the Waste Management Wisconsin-Madison Prairie Landfill (the nearest landfill designed to safely contain construction and demolition waste, including asbestos). However, this option would require a significant amount of truck traffic to haul the waste and would increase costs due to trucking costs and the tipping fees at the Madison Prairie landfill. The truck traffic would generate air pollution from burning diesel fuel, increase the risk of a spill if there were an accident, and contribute to highway road wear.

**3. On-Site Disposal** – This is the course of action determined by the Army to be the most feasible and economical, as presented in the Feasibility Report. It is believed that this option would minimize the overall environmental impacts of landfilling at BAAAP by utilizing existing roads and infrastructure and by concentrating disposal of similar waste materials in one designated area.

The Army proposes a contiguous addition to existing landfill #3646. Keeping similar waste types in one area of the BAAAP property would help to minimize transportation costs and the amount of land disturbed for landfilling purposes. It would also eliminate the engineering complexities of designing and siting a new stand-alone landfill. By maintaining as small a footprint as possible for the overall landfill complex, it would be easier to maintain the complex as a single unit once closed, and would improve the overall aesthetics of the area.

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## ENVIRONMENTAL CONSEQUENCES

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### *16. Physical (include visual if applicable)*

The proposed landfill expansion design exceeds the requirements for a large-sized construction and demolition waste landfill except for a requested reduction in the number of required leachate headwells as discussed below. The design would incorporate a four-foot liner of compacted clay overlain by a 60-mil geomembrane and a leachate collection system designed to minimize the hydraulic head of liquid on the liner. The leachate collection system would consist of a one foot sand drainage blanket and an associated network of pipes and pumps. Because this type of waste would generate little or no landfill gas, a passive, rather than active, gas collection system is proposed as part of the final cover system when the site is closed. The final cover system would consist of, from bottom to top, one foot of gas venting sand, two feet of compacted clay, a 40-mil geomembrane, one foot of drainage blanket sand, a geotextile, 18 inches of rooting zone soil, and six inches of topsoil. Gas vents would be connected to the gas venting layer to allow passive venting to the atmosphere. Any gas that is generated would move through the permeable sand and exit the site without building to dangerous concentrations. The exit pipes would be located near the high points of the site, since landfill gas is lighter than air and would tend to migrate upwards. However, as stated above, gas generation is expected to be minimal. If gas generation is determined to be a problem based on the monitoring of the passive vents, additional gas probes could easily be added.

One deviation from the Wisconsin Administrative Code design requirements is a proposal to install one leachate head-monitoring well in each phase instead of the required two. The leachate head wells would be used to evaluate the build-up of leachate on the landfill liner. Because the leachate collection system would be designed to gravity drain to one side of the landfill (the north side) and leachate volumes would be monitored monthly, the Department would likely allow the use of one leachate head well per phase.

The leachate from existing landfills #3118 and #3646 is sampled and analyzed annually to determine its chemical constituents. The leachate has generally been found to contain varying amounts of volatile organic compounds (primarily petroleum-related VOCs such as benzene) and polycyclic aromatic hydrocarbons (such as naphthalene), significant amounts of arsenic, manganese, and iron, significant amounts of pentachlorophenol, and lesser amounts of barium and lead. The leachate is also tested annually for seven polychlorinated biphenols (PCBs), with only a single detection of PCB-1260 in March 2007, and for mercury which has not been detected. Overall, the constituents found in the BAAAP landfill leachate and their concentrations are typical of leachate produced from construction and demolition debris. Analytical results for the landfill leachate at BAAAP indicate that it would likely pose no problems for the wastewater treatment plant (WWTP). Additionally, the Department's Wastewater Program has indicated that the estimated increased volume of leachate that would result from the proposed landfill expansion would likely pose no problems for the WWTP. Sludge produced by the WWTP is stored, dried, tested for heavy metals and pathogens to make sure it is below permit limits, and is then applied to approved fields for beneficial reuse on the BAAAP property. The ultimate fate of the remaining wastewater effluent is seepage into a drainage ditch and seepage pond. The groundwater extraction wells along the southwest boundary of the property then draw up groundwater for additional treatment in a system known as the Modified Interim Remedial Measures (MIRM) system. This system is designed to minimize the possibility of contaminated groundwater leaving the BAAAP property. Ultimate discharge of remediated MIRM effluent is to Lake Wisconsin. See Appendix G for a more complete discussion of the wastewater treatment facilities at BAAAP.

Surface water that runs off the proposed landfill expansion, as at the active landfill, would be channelized and gravity-drained via ditches to a proposed sedimentation/infiltration basin located just north of the proposed landfill expansion.

The final use of the landfill would be coordinated with conservation plans for the entire BAAAP property.

### **Groundwater Monitoring at the Landfill**

The proposed landfill expansion would be located adjacent to the western boundary of existing BAAAP Landfill # 3646, with an upgraded composite liner design and a leachate collection system. The existing landfills have 20 groundwater monitoring wells that have undergone routine groundwater monitoring since their installation. The Army submits environmental monitoring data electronically to the Department semi-annually, and in hard copy annually. This data includes the results of laboratory analyses of groundwater, leachate and lysimeter samples collected at the landfill. While groundwater impacts do exist in the vicinity of the landfills, we believe those impacts likely emanate from other sources. Analytical data showing exceedances of groundwater standards for methylene chloride and bis 2-ethylhexyl phthalate are sampling and/or laboratory artifacts. Exceedances of nitrate and nitrite appear to be associated with background groundwater conditions, independent of the landfill. Nitrate and nitrite groundwater impacts are ubiquitous throughout Wisconsin due to long-term agricultural activities. Metals groundwater exceedances were documented primarily during the mid-1990's, and are thought to be either related to the filter pack sand that was used to install the monitoring wells, or the natural geologic formation that the wells are installed within. Trace amounts of what are likely petroleum-related volatile organic compounds (PVOCs: toluene, xylene, naphthalene) have been detected in some monitoring wells and may be the result of cross-contamination during the well drilling and installation process or they may be migrating from other contaminated areas of the BAAAP property. Occasional low-level detections of VOCs in landfill wells may be the result of contaminant migration from an off-site source. Another possible source of trace PVOC and VOC detections could be the access road between landfill #3118 and landfill #3646, portions of which were built using non-hazardous, low-level contaminated soils from other parts of the BAAAP. Regardless, the low-level contamination that is being documented beneath the landfills has not been detected on a consistent basis and there are no indications of increasing contaminant trends, which likely indicates sources other than the landfill.

PCB congeners are not part of the current BAAAP landfill groundwater monitoring protocol, primarily because they have not been detected at any frequency or in any significant amounts in the landfill leachate. However, it is likely that the department would require annual PCB groundwater monitoring at BAAAP as a precautionary measure if the proposed landfill expansion is approved and built.

The groundwater monitoring wells that currently monitor the active and closed landfills, combined with those that are planned for the proposed landfill expansion, would provide sufficient spatial coverage to enable detection of leakage away from both landfills. Groundwater monitoring wells located between the new and old landfills would help investigators to distinguish which landfill is the source, if any groundwater contamination were to be found in the future. Groundwater monitoring wells that have been installed up gradient of the existing landfills and the proposed expansion would allow comparisons between background groundwater quality and the quality of groundwater after it had passed beneath the landfill.

## **Groundwater Remediation**

As discussed in Section 11, above, groundwater is contaminated at the Deterrent Burning Ground (DBG), the Propellant Burning Ground (PBG) and at Powerhouse #1. In addition, DNT has been detected recently at two private wells south of the property and two monitoring wells within the southern part of the property. The site of the proposed landfill expansion is approximately 4500 feet down gradient of the Deterrent Burning Ground (DBG) and two closed landfills near the DBG (landfill #3 and landfill #5). Groundwater contamination associated with the DBG and the two closed landfills appears to be fairly stable, and to extend less than 500 feet from the DBG. Because of their positions with respect to groundwater flow directions and/or their distance from the landfill site, it is unlikely that any of the potential significant contamination sources at BAAAP could influence groundwater quality at the proposed landfill.

The Army has completed additional investigations of production areas within BAAAP. Appendix E offers a comprehensive list of the remedial actions underway across the property and all environmental restoration areas to date.

### **Information Sources**

Full information regarding the various areas at Badger undergoing remedial action and groundwater treatment can be found in the information repositories that the Army maintains at the Prairie du Sac library, the Sauk City library and at the Badger plant itself. The repositories at the libraries can be viewed during normal library hours. The repository at the Badger plant may be viewed by appointment by calling 608/643-3361

## **Air Contaminants**

The primary air contaminant expected is particulate matter in the form of fugitive dust, generated from truck traffic and soil handling. Maximum theoretical emissions of fugitive dust are estimated to be less than 6.0 tons per year.

Because of the type of waste that would be contained in the proposed landfill, landfill gas generation is expected to be negligible.

There is a potential for asbestos emissions from both asbestos removal and the landfilling of asbestos. Asbestos removal is regulated by ch. NR 447, Wis. Adm. Code and is required to be done in a manner that minimizes emissions. The disposal of asbestos-containing materials in the existing landfill is regulated by conditions contained in the August 3, 2004 Plan of Operation Approval issued by the Department for landfill #3646. The majority of asbestos material is expected to be transite siding which is not expected to release any asbestos unless broken. The current approval requires that this material be covered with at least one foot of soil prior to compaction to minimize the release of any asbestos. Friable material is required to be covered as soon as it is placed in the landfill and covered with at least 3 feet of soil prior to compaction. These same procedures would likely be proposed by SpecPro in the Plan of Operation for the proposed landfill expansion, or would be included as conditions by the Department.

Malodorous emissions are regulated by ch. NR 429, Wis. Adm. Code. Due to the type of waste, minimal odors are expected from the operation of the landfill. In addition, the requirements for daily cover would reduce any odors that may be present.

### **Wetlands**

Department staff conducted an Initial Site Inspection on May 13, 2010 and also reviewed the Department's Intranet Surface Water Data Viewer (WT Webviewer) to verify the presence or absence of wetlands and other surface water bodies in the vicinity of the proposed landfill expansion. The Department's review has determined that no wetlands or other surface water bodies would be adversely impacted by the proposed expansion. Similar inspections and reviews were also conducted previously for all approved soil borrow sources and would be required of any additionally proposed soil borrow sites. Because no construction will occur in wetlands or waters of the United States, a U.S. Army Corps Section 404 permit is not required for the project.

At the end of their utilization, all clay borrow areas will be reclaimed as storm water retention basins, ponds, or wetlands. Restoration of the clay borrow areas has potential to further increase the overall bio-diversity of the property.

### **Visual Impacts**

The final height for the existing landfill and proposed expansion would be approximately 926 feet above mean sea level (MSL). The area surrounding the landfill and proposed expansion has an average elevation of approximately 880-900 feet above MSL. The landfill would likely be visible from various locations on the BAAAP property that are in the vicinity of the landfill facility. Most of the facility would be screened from private residences east of STH 78 by the local terrain and vegetation. When the landfill is near final grade, filling and construction activities also may be visible from a few locations along STH 78. Appropriate restoration and potential public use of the area would be determined by subsequent owners of the landfill in conformance with the master plan for the property.

## ***17. Biological (including impacts to threatened/endangered resources)***

### **Endangered Resources**

In May 2010, field staff reviewed the Department's Natural Heritage Inventory portal for information regarding the presence of sensitive species within a 1-mile radius of the proposed landfill expansion site. The following endangered (E), threatened (THR) or Special Concern (SC) species were identified:

#### **Mammals**

Prairie vole (SC)

#### **Birds**

Henslow's Sparrow (THR)

Upland Sandpiper (SC)

Yellow-breasted Chat (SC)

Western Meadowlark (SC)

Bell's vireo (T)

Osprey (SC)

**Reptiles**

Gray Ratsnake (SC)  
 Eastern Massasaugua Rattlesnake (E)  
 Western Ribbonsnake (E)  
 Blandings Turtle (THR)

**Plants**

Yellow Gentian (THR)  
 Prairie False Dandelion (SC)  
 Christmas Fern (SC)  
 Small forget-me-not (SC)

Since the project is unlikely to have any impact to surface water bodies, sensitive species of fish, mussels, and aquatic insects were not included on this list.

In addition, the Reservoir Pond was found to support a highly unusual population of neotenic tiger salamanders (meaning they breed in the larval stage and do not completely metamorphose into adults). The Reservoir Pond is a significant distance from the proposed landfill expansion and is not expected to be affected by the expansion.

Given the highly disturbed condition of the proposed expansion site, as well as the active or future proposed soil borrow sites, it is unlikely that they would support the rare plant species described above.

The Olin Corporation on behalf of BAAAP had previously developed an Endangered Resources Management Plan (ERMP) for the then proposed landfill (Lic. #3646) and borrow sites in July 1993 in conjunction with the DNR's Bureau of Endangered Resources (BER). The ERMP addresses the potential to impact animal species at BAAAP and how to avoid or minimize such impacts. All subsequent DNR approvals of the Army's landfill operations that had the potential to impact animal species at BAAAP have required the Army to follow the best management practices contained in the July 2003 ERMP, including the following:

**Birds:** To address the concern that nesting grassland birds may be affected by site disturbance or excavation activities, all such work should be done between September 1 and May 1, which is outside of the nesting season. If funding, weather or other unforeseen factors should preclude vegetation and topsoil stripping, then plowing may be used as a quicker method to disturb the area prior to the nesting period and render it unsuitable for breeding birds.

**Other rare animals:** Excavation of soil borrow areas should occur before the end of May to avoid potential impacts to the timber rattlesnake and other reptiles.

**Native Vegetation:** Any documented remnants of native plant communities occurring in areas that may be impacted by surrounding demolition activity and equipment will be clearly mapped and delineated in the field prior to demolition of the buildings, so that they are protected from heavy equipment and construction damage.

**Contingencies**

The Army has stated that if endangered resources are identified during preparation or work activities, it will be documented and the Department's Bureau of Endangered Resources will be contacted immediately. This is an unlikely scenario, however, based upon all the reasons given above.

For all the proposed sites targeted for landfill development and soil excavation, any restoration of vegetation and/or screening activities, including seed mixes, trees planted, etc. would be required to be consistent with the Department's master plan for BAAAP, and with previous Department-approved work plans for restoration of soil borrow areas.

## **18. Cultural**

### ***a. Land Use (including indirect and secondary impacts)***

On the BAAAP property itself: During the periods of landfill construction and filling operations, ecological restoration efforts would be deferred until project completion. No impacts to agricultural lands or dairy forage research operations would occur.

Since the waste that would be placed in the landfill is exclusively from the clean up and closure of the BAAAP property, it is not expected that the landfill would change any regional conditions.

In the long-run, the expansion of the landfill would allow demolition and cleanup activities to continue so that plans for future ecosystem restoration and conservation across the property may be carried out.

All of the land use scenarios expected for the property in the future will result in very limited exposure by humans, wildlife, and the physical environment to areas of contamination. Access to the plant is restricted, which will continue into the near future. Current and future agricultural activity does not and will not occur on lands where uptake of contaminants in the soils is a risk.

### ***b. Social/Economic (including ethnic and cultural groups, and zoning if applicable)***

No adverse changes to the regional social or economic conditions are expected as a result of the construction, operation, and long-term presence of the landfill expansion. Indirectly, the landfill expansion would facilitate the demolition and disposal of additional abandoned buildings and the remediation of additional areas impacted by contamination at BAAAP. The ultimate cleanup of the property likely would have beneficial social and economic impacts in the area.

Because the waste would not need to be shipped off site, there would be no adverse impacts to the community from increased truck traffic, road dust, or road degradation. Property values in the area of BAAAP are unlikely to be negatively affected if the landfill expansion is constructed at the location proposed.

Although a number of public and private activities are underway at BAAAP, none would be significantly affected by the landfill expansion or by excavation activities at the approved borrow areas.

### ***c. Archaeological/Historical***

The locations of the proposed landfill expansion and the previously approved soil borrow area were screened using Wisconsin Historical Society Inventories to ensure compliance with s. 44.40, Wis. Adm. Code. The screenings indicated that there are no structures of archeological or historical significance located at the proposed landfill expansion site, or at the previously

approved soil borrow site. Mark Dudzik, archaeologist with the Department's Facilities Management Section, concurred with these findings

***19. Other Special Resources (e.g., State Natural Areas, prime agricultural lands)***

No direct impacts to the nearby State Natural Areas, State Park, or Baraboo Hills National Natural Landmark would be expected. No impacts to agricultural resources would occur. The only possible indirect impact would be visual. The final landfill may be visible from certain areas along the north boundary of the BAAAP property.

***20. Summary of Adverse Impacts That Cannot Be Avoided (more fully discussed in 15 through 18)***

The proposed landfill expansion and soil borrow area would be unavailable for future development projects or excavations. Some grassland bird habitat (e.g., for Sedge Wren) may be destroyed through clay borrow excavation, however if restored properly, the area could provide better habitat in the long term. The landfill at final grade could be visible from viewing points both on and off the property. Tree plantings at strategic locations on the property could help to visually screen the landfill as seen from certain locations.

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## DNR EVALUATION OF PROJECT SIGNIFICANCE

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### *21. Environmental Effects and Their Significance*

- a. Discuss which of the primary and secondary environmental effects listed in the environmental consequences section are long-term or short-term.*

The environmental impacts from the construction and operation of the landfill expansion would be minimized by the Department's regulations on locational criteria, performance standards and design requirements in ch. NR 504, Wis. Adm. Code. The short- and long-term environmental impacts of the proposed facility would be expected to be minimal and confined to the area in the immediate vicinity of the landfill and the separate soil borrow area.

Because of the regulatory requirements regarding landfill design, construction, operations, and monitoring, the proposed landfill expansion would not be expected to cause any appreciable impact to either the quality or quantity of groundwater available for use. The performance of the existing landfill provides additional evidence that the proposed landfill expansion would not harm either human health or the environment due to release of contaminants to groundwater.

The closed landfill facility would be permanently unavailable to future development projects or excavations. However, the landfill and its immediate surroundings, and the proposed borrow area have the potential to be restored to wildlife habitat compatible with the Badger Reuse Plan.

- b. Discuss which of the primary and secondary environmental effects listed in the environmental consequences section are effects on geographically scarce resources (e.g. historic or cultural resources, scenic and recreational resources, prime agricultural lands, threatened or endangered resources or ecologically sensitive areas).*

Overall, the remaining native animal and bird populations at BAAAP are likely to benefit significantly from the increased habitat provided by the demolition and disposal of the BAAAP buildings and infrastructure.

For the proposed sites targeted for landfill development and soil excavation, any vegetation restoration, including seed mixes, trees planted, etc. would be required to be consistent with the Department's master plan for BAAAP, the Reuse Plan, and Department-approved work plans for restoration of the borrow area. The Department also intends to establish a work group comprised of appropriate biologists and other experts to develop guidance for the ultimate reclamation of these sites, so that they offer the greatest potential to support breeding birds and other desirable native plants and animals

- c. Discuss the extent to which the primary and secondary environmental effects listed in the environmental consequences section are reversible.*

Regulatory controls over landfill design and construction in chs. NR 500 to 538, Wis. Adm. Code and groundwater quality regulations in ch. NR 140, Wis. Adm. Code would prevent significant impacts to the groundwater from the operation of the proposed landfill. Both sets of regulations

are enforceable, and if violated, would necessitate action to seek restoration of groundwater quality to within acceptable limits. If a significant asbestos release occurs, the owner or operator would be responsible for clean up.

Any disturbance to landfill operations areas would be temporary and most of the disturbed areas could be restored to meet future ecosystem design considerations for the property.

## 22. Significance of Cumulative Effects

***Discuss the significance of reasonably anticipated cumulative effects on the environment (and energy usage, if applicable). Consider cumulative effects from repeated projects of the same type. Would the cumulative effects be more severe or substantially change the quality of the environment? Include other activities planned or proposed in the area that would compound effects on the environment.***

### Leachate

The proposed expansion would be located adjacent to the western side of the existing landfill (Lic. #3646). The expansion would be constructed while the existing landfill is still being operated, temporarily increasing truck and equipment traffic, and noise and dust in the area. If the proposed landfill expansion is approved for waste placement, the department would require that the Army begin the process of closing the initial phases of the existing landfill that have reached capacity (Phases 1 through 5). This would help the amount of traffic, noise and dust to eventually revert to approximately the same as at present.

Currently, leachate from the existing landfill (Lic. #3646) and the closed landfill (Lic. #3118) is pumped to a force main where it flows to the existing wastewater treatment plant on the BAAAP property. The amount of leachate generated by the proposed expansion and existing landfills will change depending on weather, the type of cover in place and the amount of open area that has not been permanently capped. The total amount of leachate generated is expected to increase beyond current volumes with the use of the proposed expansion.

SpecPro has calculated the estimated daily volumes of leachate generated at the closed landfill (Lic. #3118), the active landfill (Lic. #3646) and the proposed contiguous expansion using the default leachate generation rates found in s. NR 512.12(3), Wis. Adm. Code. The estimated average daily volume of leachate generated at the closed landfill (Lic. #3118) is 1,200 gallons/day (~438,000 gallons/year). The estimated average daily volume of leachate generated at the active landfill (Lic. #3646), assuming all 14 acres are open is 4,200 gallons/day (~1,533,000 gallons/year). The estimated average daily volume of leachate generated at the proposed contiguous expansion, assuming all 14 acres are open would be 6,200 gallons/day (~2,263,000 gallons/year). These values yield a total estimated average volume of leachate generation at the BAAAP facility of approximately 11,600 gallons/day or 4,234,000 gallons/year.

The estimated 11,600 gallons/day or 4,234,000 gallons/year of leachate generation at the facility is considered conservative, and is likely biased high, because it assumes that all 28 acres (10 phases) of the active landfill (Lic. #3646) and the proposed contiguous addition are open and have not been capped. However, once the Army begins filling the first phase of the proposed expansion if approved, the Department would require that they start closing the initial phases of the existing landfill that have reached waste capacity, so it is improbable that all 10 phases of landfill #3646 would be open at the same time. Once a phase is closed, leachate volumes generated by that phase tend to decrease

substantially over time. Again, this scenario assumes that the Army would not be developing Phase 6 of the existing landfill (#3646) if the proposed expansion is approved.

The current wastewater treatment plant (WWTP) has more than enough capacity to treat the estimated total volume of leachate generated at the site. The estimated future leachate generation rate of 4,234,000 gallons/year (11,600 gallons/day) is only 2.3% of the WWTP design flow which is 182,500,000 gallons/year (500,000 gallons/day) and approximately 21% of the current WTP flow (56,000 gallons/day) and can easily be treated at the WWTP. Dave Carper of the Department's Wastewater Program has concurred that the estimated increased volume of leachate to be treated by the Bluffview WWTP would not likely be a problem for the facility.

### **Groundwater Contaminants**

The most significant known source of groundwater contamination at BAAAP is the propellant burning ground, located in the east-central portion of the property. The plume of groundwater contamination from this site once migrated several miles south of the property, and well sampling has detected DNT contamination in two private wells south of the plant, which the Army is currently investigating. At this time, the source of the DNT in these private wells is undetermined. The proposed landfill would not contribute to this plume or to groundwater contamination arising from any of the other known BAAAP contamination sources.

The Army has completed additional investigations of production areas within BAAAP. Appendix E offers a comprehensive list of the remedial actions underway across the property and all environmental restoration areas to date.

## **23. Significance of Risk**

- a. Explain the significance of any unknowns that create substantial uncertainty in predicting effects on the quality of the environment. What additional studies or analysis would eliminate or reduce these unknowns?***

The environmental risks of solid waste disposal facilities have been well documented by the Department and in the scientific literature. The majority of the work has been done on municipal solid waste landfills because they are a larger potential risk than construction and demolition landfills. The potential environmental effects from the proposed construction and demolition landfill expansion include groundwater contamination, asbestos releases and fugitive dust emissions.

SpecPro indicates that the general waste stream to be disposed of in the proposed contiguous addition will similar to the waste stream currently approved for disposal in the active landfill (Lic. #3646). The waste destined for disposal in the proposed landfill expansion would contain the following by volume: ~41% impacted soils (contaminated soils from BAAAP remediation projects that have been determined to be non-hazardous); ~36% demolition wastes (materials from razed buildings and structures, including treated and painted wood, unpainted and painted concrete, and shingles); ~18% cover material (unsalvageable wood that is processed into mulch, bricks and mortar, impacted soils, and other earthen, soil-like demolition debris); ~4% friable and non-friable asbestos waste; and, ~1% non-putrescible office wastes. Other acceptable wastes include spent activated carbon and sludge drying bed soils, which are also tested prior to disposal to ensure that they are non-hazardous.

Some of the paint on the painted materials at BAAAP is known to contain varying concentrations of PCBs and lead. Materials that contain PCBs over specified threshold concentrations are also regulated under the Federal Toxic Substances Control Act (TSCA). The Army is currently in discussions with the U.S. Environmental Protection Agency (EPA) regarding how to appropriately sample, analyze and characterize this debris, and to what extent. Generally, the Army will need to determine if PCB-containing wastes are defined as “PCB bulk product waste” or “PCB remediation waste”, per 40 CFR (Code of Federal Regulations), Section 761.3. How the material is defined and the concentration of PCBs that have been detected in the material will help the Army determine their disposal options for that material. “PCB bulk product wastes” are specifically allowed to be disposed of in a licensed municipal or non-municipal non-hazardous landfill per 40 CFR, Section 761.62(b)(i). It is likely that there would be a significant increase in painted concrete wastes entering the landfill expansion as compared to prior disposal in either the closed (#3118) or active (#3646) landfills.

The other contaminants associated with these waste streams would include nitrocellulose, nitroglycerine and dinitrotoluene from propellant residues; pentachlorophenol, creosote, chromium, copper and arsenic from treated wood, and arsenic, barium, cadmium, and chromium from paint. The use of a composite landfill liner and leachate collection system, as proposed for the landfill expansion, would help minimize the potential for any of these contaminants associated with the incoming waste stream to significantly impact the environment.

Contaminated soil may contain traces of any of the above substances and several additional volatile organic compounds (VOCs), such as carbon tetrachloride. In addition to the above substances, leachate from demolition waste is likely to contain sulfate, nitrate, chloride, and manganese, and has the potential to increase the hardness, alkalinity, pH and specific conductance of groundwater.

Leachate monitoring provides specific information on the types of chemicals that occur in the landfill’s leachate. If the engineered structures of the leachate collection and composite liner system were to fail, most of the above substances, including the metals, PCBs, asbestos, and creosote would have a limited potential to migrate a significant distance from the landfill, due to their larger molecular structure and general inability of significant amounts to dissolve in water. VOCs, such as carbon tetrachloride, are more readily dissolved in water and thus would be the most likely to migrate a significant distance from the waste. However, the presence of a composite liner and the fact that the overall volume of VOCs present in the waste stream would likely be small, would help to minimize the potential for any groundwater impacts beneath the landfill. Regular monitoring of the groundwater wells surrounding the landfill would help to quickly identify and evaluate possible problems with either the leachate collection or landfill liner systems. The quick identification of potential problems would allow the landfill expansion owner to locate and correct the problem, and/or to conduct immediate remedial activities to minimize environmental impacts. To date, no modern landfills in Wisconsin constructed with a clay or composite liner have failed to protect groundwater.

Unexpected areas of contamination could be found as buildings are deconstructed. The proposed landfill expansion would be used to dispose of non-hazardous waste material generated by the remediation activities. The current active landfill (Lic. #3646) is used for this purpose and no adverse environmental impacts have been detected.

The siting, design and construction requirements of chs. NR 500 to 538, Wis. Adm. Code, have been developed to minimize the potential environmental impacts at solid waste disposal facilities. In addition, Department staff would conduct routine landfill inspections and environmental monitoring data reviews to ensure that requirements are being met. If the required standards are

met, the proposed landfill expansion would not be expected to have an adverse effect on the environment.

- b. Explain the environmental significance of reasonably anticipated operating problems such as malfunctions, spills, fires or other hazards (particularly those relating to health or safety). Consider reasonable detection and emergency response, and discuss the potential for these hazards.***

Potential failures that could occur would be likely due to poor construction or operating practices or material failures. Areas of potential failure would include the leachate collection lines that exit the site. However, once outside the waste area, these pipes would be required to be double walled to contain leaks and monitoring would indicate a spill relatively quickly. Any spill could be cleaned up with little environmental damage.

The Department has granted BAAAP a conditional approval for the disposal of asbestos-containing material in the active landfill. The same requirements for asbestos now in place for the active landfill would be included in any Plan of Operation approval issued for the proposed landfill expansion. If asbestos-containing materials were not handled in accordance with the approval, it is possible that asbestos could become airborne. The risk would decrease with distance from the release. Depending on the amount of asbestos released, the owner or operator could be responsible for the clean up.

If a significant release of contaminants to groundwater were to occur the Department would require a regulatory response as specified in ch. NR 140, Wis. Adm. Code. The nature of the response required would depend, among other factors, upon the concentrations of the contaminants present in groundwater and the distance the contamination has migrated. A significant release of leachate to groundwater, due to liner or leachate line failure, could likely be corrected by standard groundwater remediation procedures before drinking water supplies or the Wisconsin River were at risk.

#### ***24. Significance of Precedent***

***Would a decision on this proposal influence future decisions or foreclose options that may additionally affect the quality of the environment? Describe any conflicts the proposal has with plans or policy of local, state or federal agencies. Explain the significance of each.***

There are no new designs or other features of the proposed landfill that would set a precedent for future decisions.

#### ***25. Significance of Controversy Over Environmental Effects***

***Discuss the effects on the quality of the environment, including socio-economic effects, that are (or are likely to be) highly controversial, and summarize the controversy.***

The Department is aware of some interested parties who might prefer that the landfill expansion be sited off the BAAAP property. However, the costs associated with doing so would be very high as the nearest suitable C&D waste site is in Madison. The Army has dictated that the non-hazardous waste

generated on site must remain on site for liability reasons. Questions may be raised about the choice of locations within the property as a whole. Reasons for the choice of location are described in the Feasibility Report, and are summarized above in Section 15 on Alternatives.

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## SUMMARY OF ISSUE IDENTIFICATION ACTIVITIES

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*26. List agencies, citizen groups and individuals contacted regarding the project (include DNR personnel and title) and summarize public contacts, completed or proposed).*

<u>Date</u>	<u>Contact</u>	<u>Contact Summary</u>
Various	Mike Sitton, the Army	Feasibility Report
Various	Brian Jacobs, SpecPro	Feasibility Report
Various	Russ Anderson, WDNR Envir. An. & Rev.	Environmental Assessment
Various	Eileen Pierce, WDNR Regional AW Leader	Property Transfers at BAAAP
Various	Dennis Mack, WDNR Reg.Waste Prog.Sup.	Waste Program Issues at BAAAP
Various	Tom Bennwitz, WDNR Waste Management	Reuse and Recycling at BAAAP
Various	Brad Wolbert, WDNR Bur. of Waste Man.	Feasibility Report
Various	Joe Lourigan, WDNR Waste Management	Feasibility Report
Various	Hank Kuehling, WDNR R&R	Remediation Projects at BAAAP
Various	Cathy Bleser, WDNR Endangered Res.	Endangered Resources at BAAAP
Sept. 30, 2010	Mike Mossman,WDNR Bur. Integ. Sci. Ser.	Neotenic Tiger Salamanders
Oct. 7, 2010	Steve Ales, WDNR Drinking Water	Water Systems at BAAAP
Nov. 1, 2010	Dave Carper, WDNR Wastewater	Wastewater Systems at BAAAP

**DECISION (This decision is not final until certified by the appropriate authority)**

In accordance with s. 1.11, Stats., and Ch. NR 150, Adm. Code, the Department is authorized and required to determine whether it has complied with s.1.11, Stats., and Ch. NR 150, Wis. Adm. Code.

Complete either A or B below:

A. EIS Process Not Required

The attached analysis of the expected impacts of this proposal is of sufficient scope and detail to conclude that this is not a major action which would significantly affect the quality of the human environment. In my opinion, therefore, an environmental impact statement is not required prior to final action by the Department.

B. Major Action Requiring the Full EIS Process

The proposal is of such magnitude and complexity with such considerable and important impacts on the quality of the human environment that it constitutes a major action significantly affecting the quality of the human environment.

Signature of Evaluator	Date Signed

Signature for U.S. Department of Army	Date Signed

Joan Kenney, Installation Director  
Badger Army Ammunition Plant, Sauk County

Number of responses to news release or other notice:

Certified to be in compliance with WEPA	
Environmental Analysis and Liaison Program Staff	Date Signed

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## **NOTICE OF APPEAL RIGHTS**

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If you believe that you have a right to challenge this decision, you should know that the Wisconsin statutes and administrative rules establish time periods within which requests to review Department decisions must be filed. For judicial review of a decision pursuant to sections 227.52 and 227.53, Wis. Stats., you have 30 days after the decision is mailed, or otherwise served by the Department, to file your petition with the appropriate circuit court and serve the petition on the Department. Such a petition for judicial review shall name the Department of Natural Resources as the respondent.

To request a contested case hearing pursuant to section 227.42, Wis. Stats., you have 30 days after the decision is mailed, or otherwise served by the Department, to serve a petition for hearing on the Secretary of the Department of Natural Resources. All requests for contested case hearings must be made in accordance with section NR 2.05(5), Wis. Adm. Code, and served on the Secretary in accordance with section NR 2.03, Wis. Adm. Code. The filing of a request for a contested case hearing does not extend the 30 day period for filing a petition for judicial review.

Note: Not all Department decisions respecting environmental impact, such as those involving solid waste or hazardous waste facilities under subch. III of ch. 289, are subject to the contested case hearing provisions of section 227.42, Stats.