



June 28, 2012

Ms. Joan Kenney - Commander's Representative  
Badger Army Ammunition Plant  
2 Badger Road  
BARaboo WI 53913-5000

Subject: Final Determination of Feasibility for an Alternative Groundwater Remedial Strategy at and near the Badger Army Ammunition Plant

Dear Ms. Kenney:

The Department of Natural Resources (the Department) has made a determination of the final remedy for the groundwater contamination located on and emanating from the Badger Army Ammunition Plant (BAAP). The Department has determined that the selected remedy is Alternative 3; it includes the installation of a public water supply system, the phased shut-down of the Interim Remedial Measures/Modified Interim Remedial Measures (IRM/MIRM) groundwater pump-and-treat systems, and monitored natural attenuation of groundwater contamination. The Army's proposal of the final remedy is presented in the "Revised Alternative Feasibility Study, Groundwater Remedial Strategy, Badger Army Ammunition Plant", dated December 2011 and received by the Department on December 16, 2011. The Army must submit details of the approved proposal to the Department for approval in response to conditions set forth in the attached determination. These future submittals will be made available to the public by the Army and by the Department.

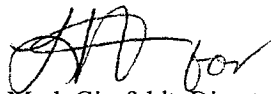
This approval modifies the final remedies for groundwater for the Propellant Burning Ground, the Deterrent Burning Ground, and the "Southern Off-Post Area" that had previously been selected in the June 1, 1995 Plan Approval Modification of the September 14, 1987 In-Field Conditions Report approval document. The approval contained herein is conditional; i.e., specific requirements (conditions) included in the attached approval document must be met and are the responsibility of the Army. The more significant conditions include requirements to: continue the operation and maintenance of the IRM/MIRM systems and submit a report on the effectiveness of these systems; propose an investigation of the groundwater/surface water interaction where contaminant plumes discharge to the Wisconsin River; continue implementing the current groundwater monitoring program and submit proposed revisions for review and approval; propose an investigation of contaminants retained in source area soil associated with the three identified contaminant groundwater plumes; and obtain review and approval of the proposed public drinking water supply system.

It is important to emphasize that citizens within the proposed municipal sanitary district will have the opportunity on the local-government level to participate in the discussions and decisions regarding the proposed public drinking water supply system. These local discussions will include whether or not private well owners will be allowed to keep their private wells and how irrigation wells will fit into the municipal system proposal, and whether the system is granted local approval. Local municipalities involved in the sanitary district formation process include the Towns of Merrimac, Sumpter, Prairie du Sac, and the Village of Prairie du Sac. Meetings and other opportunities to provide comments and questions will be publicized by these municipalities as the process progresses.

Note that the Department has the authority to require the Army to take additional actions to address contamination at the site if the chosen remedy is not effective.

If you have questions about this approval, please contact Linda Hanefeld at [linda.hanefeld@wisconsin.gov](mailto:linda.hanefeld@wisconsin.gov) or (608) 275-3310.

Sincerely,



Mark Giesfeldt, Director  
Bureau for Remediation and Redevelopment

Attachment

- c: Matt Moroney - Deputy Secretary (e-copy)
- Pat Stevens - Air and Waste Division Administrator (e-copy)
- Mark Aquino - South Central Region Director (e-copy)
- Eileen Pierce - WDNr SCD Air and Waste Program Manager
- Linda Hanefeld - WDNr SCR Remediation & Redevelopment Program Supervisor
- Jeff Ackerman - WDNr SCR R&R Program Hydrogeologist
- Craig Karr - WDNr
- Hank Kuehling - WDNr SCR R&R Program LTE Hydrogeologist
- Michelle Mullins - USEPA, Region 5
- Mike Sitton - US Army
- Laura Olah - Director, CSWAB
- Rick Walgenbach - USDA Dairy Forage Research Center
- Randy Poelma - Ho Chunk Nation Office of Environmental Health

BEFORE THE STATE OF WISCONSIN  
DEPARTMENT OF NATURAL RESOURCES

APPROVAL OF ALTERNATIVE FEASIBILITY STUDY,  
GROUNDWATER REMEDIAL STRATEGY  
FOR THE BADGER ARMY AMMUNITION PLANT  
SAUK COUNTY, WISCONSIN

**FINDINGS OF FACT**

**General Information:**

Facility: Badger Army Ammunition Plant  
(located along USH 12 between Prairie du Sac and Baraboo)

Owner: U.S. Department of the Army  
2 Badger Road  
Baraboo, WI 53513-5000

Operator: BTS/SpecPro Environmental Services, Inc.  
1 Badger Road  
Baraboo, WI 53913-5000

Contact: Joan Kenney  
Installation Director/Commander's Representative  
Badger Army Ammunition Plant  
2 Badger Road  
Baraboo, WI 53913-5000

Consultant: BTS/SpecPro Environmental Services, Inc.  
1 Badger Road  
Baraboo, WI 53913-5000

MSA Professional Services  
1230 South Boulevard  
Baraboo, WI 53913

**The Department finds that:**

1. The U.S. Army (Army) continues to investigate and remediate soil and groundwater contamination at the Badger Army Ammunition Plant (BAAP).
2. The Department of Natural Resources (Department) issued a "Conditional Plan Approval for Waste Disposal Sites at the Badger Army Ammunition Plant, Sauk County", dated September 14, 1987. This approval required, in addition to other items, definition of the degree and extent of groundwater contamination at four areas including the propellant burning grounds and the area south of and outside the southern BAAP boundary, and also the review of and continuation of the groundwater monitoring program.

3. The Department issued a “Modification of Conditional Plan Approval of In-Field Conditions Report for Waste Disposal Sites at the Badger Army Ammunition Plant, Sauk County”, dated February 21, 1990. This document is an approval of the proposed Interim Remedial Measures (IRM) system, remedial investigations, and monitoring programs.
4. The Department issued a “Modification of Conditional Plan Approval of In-Field Conditions Report Dated September 14, 1987 for Approval of Corrective Measures Selected in the Feasibility Study/Corrective Measures Study Report for the Badger Army Ammunition Plant, Sauk County, Wisconsin”, dated June 1, 1995. This approval includes conditions that establish remediation goals for contaminants of concern and preferred remedial alternatives at five locations.
5. The Department issued a “Modification of Conditional Plan Approval of In-Field Conditions Report Dated September 14, 1987 for the Purpose of Groundwater Monitoring at On Site and Off Site Groundwater Monitoring Wells and Off Site Private Wells”, dated August 3, 1998. This approval contains conditions that revise the BAAP groundwater monitoring program.
6. The Department issued a “Modification of Conditional Plan Approval of In-Field Conditions Report Dated September 14, 1987 for the Purpose of Groundwater Monitoring at On Site and Off Site Groundwater Monitoring Wells and Off Site Private Wells”, dated December 28, 2000. This approval contains conditions that revise the BAAP groundwater monitoring program.
7. The Department issued a “Modification of Conditional Plan Approval of In-Field Conditions Report Dated September 14, 1987 for the Purpose of Groundwater Monitoring at On Site and Off Site Groundwater Monitoring Wells and Off Site Private Wells”, dated August 15, 2005. This approval contains conditions that revise the BAAP groundwater monitoring program.
8. The Department received on April 28, 2011 the “Alternative Feasibility Study – Groundwater Remedial Strategy – Badger Army Ammunition Plant”, dated April 2011; this study was prepared by SpecPro, Inc. on behalf of the Army. This document contains background and groundwater information, as well as an analysis of three groundwater remedial alternatives and the Army’s preferred choice.
9. The Department responded to the April 2011 Alternative Feasibility Study with a May 24, 2011 letter that contained requests for additional information.
10. The Department received, on December 6, 2011, the “Revised Draft Alternative Feasibility Study – Groundwater Remedial Strategy – Badger Army Ammunition Plant”, dated December 2011 and prepared by SpecPro, Inc. on behalf of the Army.
11. The Department received, on December 16, 2011, the “Revised Alternative Feasibility Study – Groundwater Remedial Strategy – Badger Army Ammunition Plant”, dated December 2011 and prepared by BTS/SpecPro, Inc. on behalf of the Army.
12. On February 2, 2012, SpecPro submitted corrections to the December 16, 2011, “Revised Alternative Feasibility Study – Groundwater Remedial Strategy – Badger Army Ammunition Plant” on behalf of the Army.

13. On February 13, 2012, the Department issued to the Army a preliminary determination of feasibility for an alternative groundwater remedial strategy at and near BAAP.
14. The Department accepted comments during a 57 day public comment period announced in the preliminary determination.
15. The Army shall obtain from the Department approval of the plans for, and operations of, a municipal water supply system. To date, the Department has not received a request for approval of plans for a municipal water supply system from the Army.
16. Based on the above, the Department is issuing this approval.

#### **CONCLUSIONS OF LAW**

1. The Department has the authority under ch. 281, Wisconsin Statutes and chs. 811, 810 and 809, Wisconsin Administrative Code, to approve the plans and operations of a municipal water supply system.
2. The Department has the authority under chs. 289 and 292, Wisconsin Statutes and the Wisconsin Administrative Codes listed below to issue the following approval of the modification of the September 14, 1987 In-Field Conditions Report Approval, the June 1, 1995 Plan Modification Approval, and the Modifications of Conditional Plan Approval of In-Field Conditions Report Dated September 14, 1987 for the Purpose of Groundwater Monitoring at On Site and Off Site Groundwater Monitoring Wells and Off Site Private Wells dated August 3, 1998; December 28, 2000 and August 15, 2005.
3. The Department has promulgated chapters NR 700 through NR 754, Wis. Administrative Code, establishing the minimum requirements for investigating and remediating releases of a hazardous substance to the lands and waters of the State.
4. The Department has authority under ch. NR 722, Wis. Adm. Code, to require an acceptable process for the consideration and selection of actions to be implemented to remediate contaminated sites.
5. The Department has authority under ch. NR 724, Wis. Adm. Code, to require compliance with those portions of this chapter that apply to remedial action implementation, operation, maintenance, and monitoring.
6. The Department has authority under ch. NR 726, Wis. Adm. Code, to consider natural attenuation as a remedial option.
7. The Department has authority to require a response under s. NR 140.26, Wis. Adm. Code, if an enforcement standard for a substance of health or welfare concern has been attained or exceeded at a point of standards application.

### CONDITIONS OF APPROVAL

1. The Army shall continue operation of the Interim Remedial Measures (IRM) and Modified Interim Remedial Measures (MIRM) systems, as currently required, to collect and treat contaminated groundwater until modifications are approved by the Department in writing.
2. Prior to requesting modification or termination of the operation of the IRM or MIRM systems, the Army shall propose to the Department a process by which the effects of the requested changes can be predicted and evaluated. This proposal will be reviewed by the Department. Written Department approval will be required before any modifications are implemented.
3. As part of the workplan for the phased shutdown of the IRM/MIRM, the Army shall prepare a comprehensive written report evaluating the effectiveness of the MIRM and IRM systems in preventing offsite groundwater contaminant migration. The evaluation shall include, but not be limited to, delineation of hydraulic capture zones, contaminant trends in select on- and off- site monitoring wells, calculations of contaminant travel times, and a concise statement concerning the effectiveness of the remedial systems in preventing offsite contaminant movement. Also included in this report shall be a description of the maintenance activities taken to keep the MIRM and IRM systems operational such as well chlorination and pump replacements.
4. The IRM and MIRM systems and all associated appurtenances shall be maintained in operational condition until such time that the Army obtains written Department approval to abandon or dismantle either or both systems.
5. The Army shall propose an investigation and monitoring program to define the degree and extent to which contaminated groundwater is entering the Wisconsin River, Lake Wisconsin and/or other surface waters. This shall include, but not be limited to, installation of additional groundwater monitoring wells in addition to those already being used to monitor the plume(s) and may include the sampling of surface water.
6. The BAAP groundwater monitoring program currently implemented by the Army shall continue until modifications are approved by the Department.
7. By July 1, 2013, the Army shall propose modifications to the groundwater monitoring program with the goal of providing data on the long-term effectiveness of natural attenuation as a remedial alternative. The requested changes in the monitoring program to evaluate natural attenuation shall encompass all three known groundwater contaminant plumes (propellant burning ground (PBG), deterrent burning ground (DBG) and central plumes). The proposal shall include (but not be limited to) a map or maps showing the names and locations of all monitoring wells associated with the property investigation and those that will be included in the groundwater monitored natural attenuation (MNA) network. The Army shall identify any locations where new wells will be installed to address any gaps in data collection to support monitored natural attenuation. The modification proposal shall include cross-sections, a table or tables providing information about the wells (by name or number identifier and/or associated license number) in the network, which plume(s) the wells are associated with, the parameters for which groundwater will be monitored, test methods used, and the frequency of sampling. The Army shall obtain written Department approval prior to implementing the modifications to the groundwater monitoring network.

8. A groundwater narrative summary report similar in format to those submitted in the past several years shall be submitted to the Department annually for each calendar year by May 1 of the following year. Contents of the report shall focus on the results of work performed to evaluate monitored natural attenuation.
9. The Army shall conduct adequate saturated and unsaturated soil sampling, for all appropriate parameters, within the PBG, the DBG and central plumes to determine the nature and extent of site contaminants adsorbed onto the soil. Because back-diffusion of adsorbed waste constituents appears to be a major contributor to the groundwater plumes' stability, fully characterizing the adsorbed waste mass is necessary to evaluate natural attenuation as a possible remedial alternative.
10. In conducting the required descriptions of plume configuration and behavior as well as the impact of past or future remedial efforts (as required in conditions 3, 5, 7 and 9, above) the Army shall consider that the plumes at Badger are three dimensional entities. All investigations and analyses described in this section shall be implemented to fully characterize in three dimensions the characteristics of all flow systems.
11. Within 30 days of the date of this approval, the Army shall provide a proposed schedule of events regarding the efforts to obtain local approval of the municipal water supply system. Inform the Department's Remediation and Redevelopment and Drinking Water and Groundwater programs, in writing, of any unforeseen delays in obtaining local approvals. Updates shall be submitted at least every 60 days.
12. The source control actions taken at the PBG and DBG shall be maintained as required in past approvals from the Department. Specifically these approvals are Condition 6 of the October 14, 2002 approval for the PBG and Condition 5 of the March 17, 2008 approval for the DBG.
13. If approved by the local units of government, the Army shall obtain the Department's approval of plans for the municipal water supply system prior to commencing construction. Please be aware that you will also need approvals from the Public Service Commission of Wisconsin. Please contact them directly.
14. If the chosen remedy is not effective, the Department has the authority to require the Army to take additional actions to address contamination at the site.

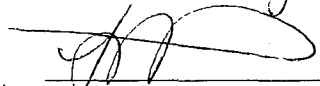
#### **NOTIFICATION OF APPEAL RIGHTS**

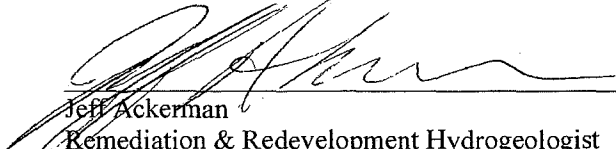
If you believe that you have a right to challenge this decision, you should know that the Wisconsin statutes, administrative rules, and case law establish time periods within which requests to review Department decisions must be filed. To request a contested case hearing pursuant to section 227.42, Wis. 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 is not a prerequisite for judicial review and does not extend the time period for filing a petition for judicial review.

For judicial review of a decision pursuant to sections 227.52 and 227.53, Wis. Stats., you must file your petition with the appropriate circuit court and serve the petition on the Department within the prescribed time period. A petition for judicial review must name the Department of Natural Resources as the respondent.

This notice is provided pursuant to section 227.48(2), Stats.

Dated: 28 June 12

  
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for Mark Giesfeldt, Director  
Bureau for Remediation & Redevelopment

  
\_\_\_\_\_  
Jeff Ackerman  
Remediation & Redevelopment Hydrogeologist  
South Central Region