

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

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May 31, 2007

Ms. Joan Kenney - Installation Director
Badger Army Ammunition Plant
2 Badger Road
Baraboo, WI 53913-5000

Subject: Preliminary Determination of Final Remedy for Propellant Burning Ground Waste Pits
Subsurface Soil

Dear Ms. Kenney:

On April 10, 2006 the Army submitted a request to modify the final remedy for the Propellant Burning Ground. The Department is now writing to notify you that we have made a preliminary determination that the final remedy for the Propellant Burning Ground waste pits subsurface soil (PBG) is Alternative 2, partial excavation and incineration, full-scale bioremediation, and a cap/cover. If approved, this remedy would modify portions of the Department's Plan Modification Approval issued on June 1, 1995.

Components of this remedy include:

- Soil vapor extraction system (completed in 1999)
- Partial excavation, followed by incineration and disposal off-site of contaminated soil (completed in 1999)
- Full-scale bioremediation to promote contaminant degradation (completed in 2006)
- Removal of existing structures and abandonment of selected monitoring wells
- A cap/cover that includes both soil material and a plastic membrane
- Continued groundwater pumping and treatment
- Institutional controls including listing on the WDNR GIS Registry of sites with soil and groundwater contamination
- Fencing and warning sign installation
- Long term maintenance of the cap/cover
- Continued groundwater monitoring
- A review of the remedy 5 years after construction and in 5 year increments after that.

A soil vapor extraction (SVE) system was installed in late 1997 to remove volatile organic compounds (VOCs) from each of the three waste pits. This system was operated beginning in 1997 and was shut down in 1999 when satisfactory removal of VOCs was achieved.

The partial excavation of contaminated soils has already occurred at the PBG. The uppermost 20.5-23.5 feet of contaminated soil were removed from Waste Pit 1 (WP-1), as were the upper 14.5 feet of contaminated soil from WP-2 and the upper 13.5 feet from WP-3. The excavated soil was taken off-site for treatment at an incinerator, followed by disposal off-site. However, contaminated soil does remain in

the subsurface at the former waste pits. The cap/cover will act to restrict access to the remaining soil, and will limit the amount of precipitation that passes through the remaining contaminated soil.

A bioremediation system was installed and operated at the site from November 1999 through July 2000 and from December 2000 through June 1, 2006. This system includes the components of water infiltration, air injection, nutrient infiltration, a nitrate removal system (if needed), and two source control wells located down-gradient of the pits. The goal of this system was to promote the degradation of dinitrotoluene (DNT) compounds and to reduce the potential for further groundwater contamination.

Existing structures associated with the remediation systems at the site will be removed to allow for the construction of the site cap/cover. System and monitoring wells that will be unnecessary after covering the site will be properly abandoned.

Approximately 5 acres of the PBG site will be capped. The bottom layer of the cover will consist of backfill soil to bring the site to design grades for proper drainage. A geosynthetic clay layer (GCL) will then be installed, which is equivalent to a minimum of 2 feet of compacted clay. The GCL will be overlain with a 60-mil high-density polyethylene flexible membrane liner. This liner will be covered with a 1-foot layer of granular drainage material. After placement of a layer of geo-textile fabric, a 30-inch soil cover will be installed, which will be covered by 6 inches of topsoil. The topsoil will be seeded with native grass.

Groundwater pumping and treatment will continue using source control wells SCW-1 and SCW-2. The intent of this pumping is to capture the contaminants released from the PBG until the source control effects of the cap/cover have been realized. The termination of groundwater pumping and treatment is subject to Department approval.

Institutional controls to be implemented include listing on the Department's GIS Registry for Soil and Groundwater Contamination. For the Soil Registry, the Army must determine the boundaries of the cap/cover using Global Positioning System (GPS) coordinates. For the Groundwater Registry, all properties under separate ownership with groundwater quality exceeding one or more ch. NR 140, Wis. Adm. Code, enforcement standards as a result of contaminants originating at the PBG will be included in the GIS Registry of Closed Remediation Sites. When issued, the Department's closure letter for the PBG site will include: a maintenance agreement from the Army that includes maintenance activities and frequencies of completion; and a prohibition of excavation into the cap without prior approval of the Department.

A four-strand barbed wire fence and warning signs will be installed around the perimeter of the site. Maintenance of the cover will include annual inspections and inspections after large storm events, mowing, and repairs, if necessary.

A Department-approved groundwater monitoring plan will continue to be implemented for this site until modification or termination is approved by the Department. Results of the monitoring are to be submitted to the Department on a regular timetable after the samples have been collected and analyzed.

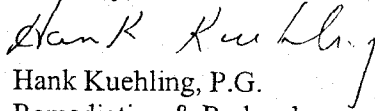
Five years after implementation of the remedy, and in five year increments after that, the Army is to submit a report summarizing the remedy. Items to be discussed in the report include, but aren't limited to, maintenance actions taken on the cap/cover, a summary of detected groundwater contaminant concentrations and changes in groundwater quality, and a summary of all other work completed and actions taken at the site during the reporting period.

The requirements noted above will be the responsibility of the Army until this responsibility is transferred to another party by mutual agreement.

This is the Department's preliminary determination regarding the final remedy for the propellant burning ground waste pits subsurface soil. The Department will accept comments on the proposed final remedy during a public comment period between June 19, 2007 and August 2, 2007. A public informational meeting will be held in conjunction with the Restoration Advisory Board meeting scheduled for June 18, 2007. This public informational meeting will be held at the Badger Army Ammunition Plant at 5:30 p.m. The Department will accept only written comments, by letter or e-mail, during the comment period. After the public comment period has ended, the Department will respond to comments received and make its final determination.

Please contact me if you have any questions regarding this letter, either at the address listed above or as indicated below.

Sincerely,



Hank Kuehling, P.G.

Remediation & Redevelopment Program Hydrogeologist

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