

DEMIL DISPATCH

BGAD Project

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BGAD Project Team Assembled

By: Shannon Powers

The Kentucky Environmental and Public Protection Cabinet has assembled its team to head up the Blue Grass Army Depot (BGAD) Project. The purpose of this team is to review, amend, and approve the permit applications and oversee construction and operations of the depot's demilitarization facility to ensure compliance and be protective of human health and the environment. The team, which officially came together mid-August 2004, consists of three engineers, a

geologist, an inspector, and a program coordinator.

The project manager is John Jump, a licensed professional engineer. Jump comes to the Division of Waste Management (DWM) from the Division for Air Quality (DAQ) where he was the Chemical Section supervisor in the Permit Review Branch for 1 1/2 years. Beginning in 1998, he reviewed applications and wrote permits in the Chemical Section. Jump was a teaching assistant at the University of Kentucky where he researched flaw detection in composite plates. Jump is a graduate of the University of Kentucky where he earned his B.S. in Materials Engineering.

The second engineer is Eric Ringo. He graduated from the University of Kentucky in 1983 with a B.S. in Mechanical Engineering. After graduation, Ringo went to work for Kentucky Utilities at the E.W. Brown Electric Generating Station. Ringo spent 17 years at the Jim Beam Brands' Distilling Company where he was plant engineer and a member of the team responsible for environmental permitting and compliance. He joined DWM

in August 2003 where he has been working in the Permit Review Section of the Hazardous Waste Branch.

Brian Ballard is the third engineer. Ballard is responsible for writing the BGAD Project Clean Air Act Amendment (CAAA), Title V permits. He has worked in the Permit Review Branch of DAQ since June 2003. He is a graduate of the University of Louisville (U of L) where he earned a Master of

Engineering in Chemical Engineering in May 2003. His graduate level curriculum at the university included courses in waste management and plant design. Through the U of L Co-op Engineering Program, Ballard worked at General Electric Plastics in Mount Vernon, Ind., from 2000 to 2001. Previous to that, Ballard worked as a wastewater laboratory technician at Zoeller Pump Company in Louisville.
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The BGAD Project Team is pictured outside the Chemical Limited Area (CLA) on the depot. The team consists of Tim Barrett, Bill Buchanan, John Jump, Eric Ringo, and Shannon Powers. Bill Schneider is also pictured. Brian Ballard is not pictured.

BGAD Project Team Assembled

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Geologist Tim Barrett comes to the BGAD Project and DWM from the Petroleum Storage Tank Environmental Assurance Fund where he was the director of the fund's Technical Operations Division. Before that, Barrett worked 10 years as an environmental consultant and project manager at Commonwealth Technology, Inc. and Spade Corp. Barrett is a major in the Kentucky Army National Guard. His specialty areas are chemical warfare and artillery. Working on environmental affairs, he is presently assigned to the Kentucky Joint Forces Command. He is a graduate of Edinboro University of Pennsylvania where he earned a degree in Geology. Barrett has been a registered professional geologist since 1993.

Inspector Bill Buchanan, a registered industrial

hygienist, comes to the project and DWM from Mountain Environmental Services Inc. where he served as the corporate health and safety specialist for the past two years. Prior to this, he served as a technical oversight and environmental scientist for the Department of Energy (DOE) Savannah River Site (SRS) in Aiken, S.C. Buchanan has experience in many different areas of inspection, sampling, risk assessment, and project oversight. He holds a B.S. in Environmental Health Science from Eastern Kentucky University (EKU) and is in the process of pursuing a M.S. in public health from EKU.

Shannon Powers, the project coordinator, comes to the project and DWM from Kentucky Division of Emergency Management (KyEM) where she was the Chemical Stockpile

Emergency Preparedness Program (CSEPP) public information officer for three years. Before that, Powers was a teaching assistant at Western Kentucky University, the assistant editor for *The Ohio County Times-News*, and a production

assistant/researcher for Peridot Pictures. She is a graduate of Western Kentucky University where she earned her Bachelor of Arts in Mass Communication and English in 1994 and her Master of Arts in English in 1998.

Team Members Enter VX Igloo

By: Tim Barrett

On Oct. 14, 2004, Tim Barrett and Bill Buchanan, two of the Division of Waste Management's Blue Grass Army Depot (BGAD) Project team members, entered a VX nerve agent storage igloo. Joining the team members on the entry were John Eggum, Madison County Chemical Stockpile Emergency Preparedness Program (CSEPP) medical coordinator and Richmond Mayor Connie Lawson. The group's escort was LTC George Shuplinkov, the Blue Grass Chemical Activity (BGCA) commander.

Prior to entering the igloo, Barrett and Buchanan were fit-tested by BGAD personnel for a military M-40A1 protective mask. Fit-testing is required to ensure the protective mask seals around the individual's face. The team members were sized and outfitted with coveralls, protective rubber gloves, and boots.

BGCA personnel explained to the team members that the only hazard within the VX igloo was a contact hazard. BGCA took precautions prior

to the entering of the igloo by sampling the it's internal, ambient atmosphere. A mobile laboratory called a Real Time Analytical Platform (RTAP) conducted the sampling. The RTAP pulls a vacuum on the air within the igloo and analyzes the recovered air for the presence of agent vapors.

Since no agent vapors were detected, team members entered the igloo with their protective masks strapped to their hips and readily available.

Inside the igloo, there was a center aisle with munitions stacked from the floor to the ceiling. Every munition stack appeared to be stored in an orderly fashion with munitions resting on wooden pallets and secured by metal straps. Barrett and Buchanan were amazed that the pallets, metal straps, and munitions showed no signs of aging.

Additionally, the interior of this particular concrete igloo appeared to be in good



Inspector Bill Buchanan and Geologist Tim Barrett stand in front of the doorway to one of the BGCA's VX igloos.

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One Ton Container Plug Change Becomes Container Change

By: Bill Buchanan

The Blue Grass Army Depot (BGAD) has approximately 523 tons of chemical agents stored at its facility in Richmond. Most of these agents are contained in rockets and projectiles housed in earth-covered igloos, but almost 100 gallons are stored in a one ton container (OTC), which is most commonly used by industry to store chlorine gas.

The OTC is 81.5 inches long and 30.5 inches in diameter. The sidewalls are constructed of 13/32 of an inch hot-rolled steel with the bulkheads a little thicker at 3/4 of an inch. There are five plugs in one end of the container and three in the other. Two of the plugs had been valves. These eight plugs allowed the container to be maintained and serviced. The original plugs were brass and were changed to carbon steel plugs about ten years ago when testing proved the brass ones were deteriorating. Recently, BGAD concluded that the 10-year-old carbon steel plugs needed to be replaced, and submitted a work plan to the Kentucky Division of Waste Management.

On Nov. 16, 2004, the carbon steel plugs were to be replaced with stainless steel ones, and a sample of the container's content was to be collected and tested to determine the best method of demilitarizing it. A specialized team from Utah's Deseret Chemical Depot was brought in to do the replacement.

During the operation, the Utah team noticed that one of the plug holes in the container was severely deteriorated, and the new plug could not be fitted. A temporary, expandable rubber plug was installed while corrective action options were considered. Only five of the eight plugs were replaced during this operation.

After thorough consideration, BGAD opted to transfer the contents into two new OTCs in case a neutralizing or decontaminating agent needed adding once the sample analysis was obtained. These containers were shipped to BGAD, and the Technical Escort Unit, a specialized Army unit from Pine Bluff, Ark., was selected to perform the transfer. The transfer took place outside the igloo but inside two glove boxes (one container in each) under negative pressure provided by a 1,000 cubic feet per minute filter that would absorb any material if there was a leak. The glove boxes were housed inside a negatively-pressured vapor control shelter, which acted as a secondary containment should the glove boxes have leaked. Monitoring instruments were used that could detect chemical agents at levels below parts per billion.

Approximately 80 percent of the contents of the original OTC was placed in the first recipient container, and the remaining 20 percent was

placed in the second recipient. Some of the original liquid chemical agent had solidified into sludge on the bottom of the OTC and was not able to be distributed. Because safety is the top priority when an operation of this magnitude is undertaken on the depot, the

transfer into the new containers took four days from start to finish. All three containers were put safely back into the igloo and are being monitored on a routine basis to ensure that they remain in good condition until demilitarization.



Members of the Technical Escort Unit, a specialized Army unit from Pine Bluff, Ark., prepare the BGAD one ton container (OTC) for the transfer of its contents into two new OTCs. The original is getting ready to be placed into the vapor control shelter.

Team Members Enter VX Igloo

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condition with no visual signs of moisture infiltration. While in the structure, Barrett and Buchanan asked the chemical activity's entry team many questions related to the storage and handling of the munitions in such a confined area. Barrett and Buchanan, as well as Eggum and Lawson, stayed in the igloo for approximately 10 minutes.

Once outside the igloo, the team toured the RTAP. The chemical activity's field laboratory technician explained how the RTAP unit received and analyzed the agent sample. The technician said all agent munition structures are sampled weekly to determine if the structure contains a possible leaking munition.

DWM Permitting Strategies for BGAD and BGCAPP

By: Eric Ringo

Resource Conservation and Recovery Act (RCRA) Hazardous Waste permits are considered by some regulators to be the most difficult of all environmental permits to compose. The statutes and regulations are complex. Each facility is unique. There are many RCRA guidance documents to be interpreted. That being said, Blue Grass Army Depot (BGAD) itself is a complex facility.

The proposed Blue Grass Chemical Agent-Destruction Pilot Plant (BGCAPP) is combining a diverse array of technologies to destroy the on-site chemical munitions stockpile. The proposed technologies were chosen as an alternative to incineration. States have approved RCRA permits to incinerate the chemical munitions, which became models for other states to use when writing

incineration permits. BGCAPP will use neutralization technology. Because of the project's uniqueness, there is not a clear model for the Kentucky permit writers to emulate.

The BGCAPP is scheduled to take five years to construct and systemize. RCRA hazardous waste treatment permits are very detailed. They require the kind of detail that will not be available in the early stages of the construction. Some of the types of details required are: waste analysis procedure including instrument types; location and calibration; personnel training including job descriptions and procedures; and contingency planning including lists of emergency response equipment.

The permitting strategy is to issue a Research Development and Demonstration (RD&D) permit that will require a compliance schedule. RD&D permitting is ideal because it will allow the BGCAPP to demonstrate that the proposed

technology, chemical neutralization followed by super critical water oxidation (SCWO), can be integrated and proven in a full-scale facility as required by the state's statutes. The RD&D permit will allow enough flexibility to safely adjust the process during the extended ramp-up time.

The compliance schedule will be a key component of the permit. It will be a schedule of information submitted by BGAD, requiring approval by the Kentucky Department for Environmental Protection (KDEP). All submittals will be scheduled for various stages of design and construction and before processing any chemical munitions.

Before the chemical munitions are processed at BGCAPP, KDEP will have an abundance of detailed information that will be reviewed and made public. There will be stopping points built into the permit to be used if necessary. KDEP will ensure that the process is uncomplicated, and that public participation remains high.



Engineers John Jump and Eric Ringo look over the second version of the Research, Development, and Demonstration (RD&D) Permit Application provided by BGAD and Bechtel Parsons Blue Grass.

SCWO Testing and Meeting in California

By: John Jump

John Jump represented the Kentucky Department for Environmental Protection, Division of Waste Management (KDEP, DWM), at a meeting of the National Research Council Committee to Assess Designs for Pueblo and Blue Grass Chemical

Agent Destruction Pilot Plants (ACWA Design Committee) on Nov. 18, 2004 at the General Atomics research facility in San Diego, Calif. This meeting focused on specific tests conducted under the Technical Risk Reduction Program used for establishing operating

parameters on equipment that will be used for demilitarizing munitions that contain chemical agent. The two components observed during tours at the meeting were the Energetics Batch Hydrolyzer (EBH) and Supercritical Water Oxidation (SCWO) systems

proposed for the Blue Grass Chemical Agent-Destruction Pilot Plant (BGCAPP).

At the BGCAPP, nerve (GB and VX) and blister (H) agents, and other munition-related

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DAQ Permitting Strategies for BGAD and BGCAPP

By: Brian Ballard

On Sept. 20, 2004, the Blue Grass Army Depot (BGAD) submitted two Clean Air Act (CAA) permit applications for the permitting of new and existing facilities located in Richmond, Ky., to Kentucky's Division for Air Quality (DAQ).

The submittals include an application for an operating permit for BGAD. This application is for existing emission sources and the construction of some new sources. The second application is for future sources of the proposed Blue Grass Chemical Agent-Destruction Pilot Plant (BGCAPP).

DAQ considers the existing operations at BGAD and proposed BGCAPP one stationary source as defined under 40 Code of Federal Regulations (CFR) Part 70 (Title V) of the Clean Air Act (CAA). The potential emissions of carbon monoxide, single and combined hazardous air pollutants (HAPs), nitrogen oxides, and volatile organic compounds (VOCs) from this one stationary source exceeds major source thresholds as defined in Title V of the CAA.

The BGCAPP CAA application explains in the cover letter that the facilities will be constructed at BGAD. Bechtel Parsons Blue Grass (BPBG) will operate the BGCAPP as a separate entity within the depot. The depot requested in the pilot plant's CAA application a separate and

stand-alone construction and Title V operating permit for BGCAPP. The basis for issuance of a separate Title V permit is provided in the U.S. Environmental Protection Agency Title V guidance memorandum, "Major Source Determinations for Military Installations under the Air Toxics, New Source Review, and Title V Operating Permit Programs of the Clean Air Act (CAA)," dated Aug. 2, 1996.

DAQ agreed to issue separate Title V operating permits while recognizing that any regulations will be based on total emissions from the existing depot operations and the proposed BGCAPP.

DAQ's permitting strategy is to issue two separate Title V permits. One Title V operating permit will cover the existing operations, the construction of some new surface coating operations and installation of a mobile generator, all of which are part of the depot and not associated with the pilot plant. BGAD will be the permittee and operator for emission units in this permit. A second Title V permit will be issued for the proposed BGCAPP, in which case, the permittee is the depot and the operator is Bechtel Parsons Blue Grass.

Both permits will have combined source-wide limits of 90.0 tons per year for VOC, 22.5 tons per year for combined HAPs, and 9.0 tons per year for a single HAP. By taking these limits, BGAD will preclude the applicability of 40

CFR Part 63, National Emission Standards for Hazardous Air Pollutants, Subpart M (Surface Coating of Miscellaneous Metal Parts and Products), 40 CFR Part 63, National Emission Standards for Hazardous Air Pollutants,

Subpart DDDDD (Industrial, Commercial, and Institutional Boilers and Process Heaters), and 401 Kentucky Administrative Regulations (KAR) 59:225 (New Miscellaneous Metal Parts and Products Surface Coating).

Blue Grass Team Tours Newport Demil Facility

By: Shannon Powers

The Blue Grass Army Depot (BGAD) Project Team visited the Newport Chemical Depot in Indiana on Sept. 20, 2004. The purpose of the visit was to gain knowledge of a constructed demilitarization facility, which will utilize neutralization as its agent destruction method. Kentucky has chosen neutralization followed by super-critical water oxidation (SCWO) as its method of destroying the rockets and projectiles containing nerve and blister agents housed at BGAD in Richmond.

Thomas Linson, Indiana Department of Environmental Management (IDEM), arranged the visit for the Kentucky group. The visit included a presentation on Indiana's Chemical Stockpile Emergency Preparedness Program (CSEPP) by Doug Stroud, CSEPP/Treaty Coordinator; a presentation on the demilitarization process by Bob Danner, PMATA Environmental Engineer; and a tour of the facility led by Mike

McKee, Parsons Environmental Engineer.

Team members John Jump, Eric Ringo, Tim Barrett, Bill Buchanan, and Shannon Powers, along with Sam Lofton, supervisor of the division's Frankfort Regional Office, agreed that the visit was very beneficial.

"The level of engineering sophistication was what I expected, but seeing it was still impressive," commented Ringo, one of the team's engineers.

Buchanan added, "The tour allowed me to see a constructed version along the lines of what I will be inspecting during the building and operating of the demilitarization facility at Blue Grass."

The Newport environmental protection team wants to view the Kentucky facility once construction has begun. An exchange program was arranged between both sites.



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SCWO Testing and Meeting in California

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hazardous wastes such as explosives and rocket propellant energetics, will be neutralized by a hydrolysis chemical reaction in a strong caustic solution. The hydrolysis reaction decomposes organic compounds by breaking hydrogen bonds in the presence of hydroxide ions. After neutralization, breakdown products of the chemical agent are still present in the hydrolysate. According to the Chemical Weapons Convention Treaty of 1997, these products must also be destroyed. For this reason, the resulting

hydrolysate must be further destroyed using the SCWO process. SCWO has been shown to be a very promising technology for the treatment of other organic waste such as that found in wastewater treatment plants.

The most interesting part of the tour was observing a prototype EBH unit. The EBH is a large rotating drum, much like a concrete mixer. Rockets that are drained of agent will be sheared into small pieces and placed in the EBH along with a caustic solution. The drum will rotate to promote mixing and the

energetics will be dissolved. After several hours, the contents will be removed where liquid and various solid parts (rubber gaskets, metal parts, etc.) will be separated. The energetics from the sheared rockets will be further hydrolyzed in the Energetics Neutralization Reactors (ENRs) to ensure complete energetics destruction and that there is no residual chemical agent.

The system contractor responsible for constructing, operating, and closing the BGCAPP is continuing to place much effort into

improving the EBH and SCWO as well as other technologies and methods at General Atomics. The tour of the EBH Test Facility and SCWO Pilot Plant allowed KDEP to better understand the equipment and how it will be used in the BGCAPP. Attendance at the meeting and tour of the EBH and SCWO facilities provided KDEP, DWM, valuable insight into the BGCAPP design and how the different technologies will play a role in ensuring its compliance with Kentucky's environmental regulations and statutes.