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EMAIL TRANSMITTING U S NAVY COMMENTS INCORPORATED INTO REQUEST FOR NO  
FURTHER ACTION ADDENDUM FOR SITE 7 ABL ROCKET CENTER WV  
3/25/1999  
OHM REMEDIATION SERVICES CORP.

**Hayes, Dawn M.**

**From:** Fulton, David E. 609.588.6397 [FULTON@Ohm.Com]  
**Sent:** Thursday, March 25, 1999 5:12 PM  
**To:** Dawn Hayes  
**Subject:** ABL - Site 7

**Sensitivity:** Confidential

  
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SITE7-1\15986S...

Dawn:

I have incorporated your comments into the Addendum. Attached is the "revised" Section 4.0 from the Draft Final Report we did this past January. This revised setion more clearly shows the post-excavation sample results versus the Region III RBCs for industrial sites. How would you like to handle the resubmittal...

- 1) Send Addendum only
- 2) Send Addendum with "revised" Section 4.0 only as an insert
- 3) Send Addendum with a new Final Report with "revised" Sec 4.0
- 4) Other

Let me know  
Dave

## 1.0 INTRODUCTION

The following site information is provided:

Site Name: Site 7, Beryllium Landfill  
Location: Allegany Ballistics Laboratory (ABL)  
Mineral County, West Virginia  
EPA facility identification number: WV0170023691

## 2.0 STATEMENT OF BASIS AND PURPOSE

This ~~decision~~ document presents the results and rationale for ~~requesting a "No Further Action"~~  
~~status-closure of for~~ the Site 7, Beryllium Landfill, at the ABL facility, located in Rocket Center,  
West Virginia.

The selected remedial action was chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The remedial action ~~is~~ was based on the administrative ~~record~~ Record of Decision (ROD) for this site ~~and signed by the Navy, The State of West Virginia concurs with the selected remedy and the United States Environmental Protection Agency.~~ Subsequently, a non-time-critical removal ~~action,~~ action as defined in 40 CFR Section 300.415(b)(4),) was deemed appropriate for Site 7 to prevent and minimize the threat of a release and to assess the threat of hazardous substances released. Completion of the remedial action has met the ~~goals and~~ Remedial Action ~~Objectives~~ established for the site, thus providing the justification for the ~~No Further Action status~~ closure.

In addition, the removal action attained, to the extent practicable, Applicable or Relevant and Appropriate Requirements (ARARs) under federal and state environmental laws, as described in 40 CFR 300.415(i).

~~Submittal of this decision document fulfills the requirements defined by CERCLA, SARA, and the NCP for "No Further Action" status and has been prepared in accordance with USEPA's guidance document entitled "Record of Decision Checklist for No Action".~~

### **3.0 SITE HISTORY AND ENFORCEMENT ACTIVITIES**

ABL is a government-owned, contractor-operated research, development, and production facility located in Mineral County, West Virginia. Since 1943, the facility has been used primarily for research, development, and testing of solid propellants and motors for ammunition, rockets, and armaments. The facility lies between the North Branch Potomac River on the north and west and Knobly Mountain on the south and east. Site 7 is located directly south of the main administration building, Building 300, and adjacent to State Route 956.

In the early 1960's, ABL requested and obtained a permit from the State of West Virginia (permit 3324) to establish a landfill for waste disposal, specifically beryllium. ABL was conducting research on propellants containing beryllium and needed to dispose of both beryllium-containing propellants and beryllium. A small (10-feet by 15-feet by 6-feet deep) earthen pit was created, and was used intermittently in the 1960s to dispose of beryllium-contaminated waste. The work with beryllium at ABL ceased in the late 1960's.

Records documenting the material disposed of at Site 7 were not kept and identification of material disposed of in the landfill was based on conversations with personnel who were

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involved at the time the site was active. The following information was gathered from the personnel:

1. No beryllium-containing propellant was landfilled.
2. Beryllium-containing wastes included wiping tissues, gloves, emptied containers, and respirator cartridges which might be contaminated with metallic beryllium or beryllium oxide.
3. The total quantity of waste disposed of in the landfill was "small". The landfill was approximately 150 square feet in area and 6 feet deep. Waste was placed in the pit and covered with a few shovels of dirt.
4. A small quantity of laboratory chemicals was also placed in the landfill, however no one was able to provide information as to specific chemicals or chemical types.

The site was inspected in January 1979 and officially closed on June 28, 1979. In June 1980, the landfill was again inspected by the State of West Virginia and the facility was directed to remove the landfilled waste. The activities that followed this request are detailed below.

**Initial Assessment Study**

Prior to initiation of the Installation Restoration Program (IRP) at ABL, environmental investigations were conducted under the Navy Assessment and Control of Installation Pollutants (NACIP) program. The NACIP program called for two primary phases, the Initial Assessment Study (IAS), and the Confirmation Study. The Navy completed an IAS (NEESA, 1983) in 1983 to identify areas where hazardous substances, pollutants, or contaminants may exist as a result of the facilities past hazardous material storage, handling, and waste disposal operations. The IAS identified the beryllium landfill as an area where hazardous substances may exist, and reported that a maximum of 2 pounds of beryllium, which was used experimentally in the production of

propellant, was buried in the pit. In addition, the IAS reported that less than 100 pounds of miscellaneous unidentified overage laboratory chemicals were disposed of in the pit in an isolated event. Soil from a nearby area was used as cover material for the pit, and 3 to 4 feet of soil cover the buried waste (NEESA, 1983).

The IAS concluded that the extent of potential groundwater contamination resulting from leaching and downward migration of beryllium and other potentially hazardous compounds is likely to be minor because of the small amounts of waste, which were disposed of in the landfill. (NEESA, 1983)

Coordination efforts with the State of West Virginia Department of Natural Resources (DNR) regarding final disposition of the material in the landfill were on going during the IAS. The IAS recommended no further action in the Confirmation Study, which was the next step in the NACIP Program.

### **Interim Remedial Investigation**

In 1984 the Navy decided that additional information was required to assess the environmental risks posed by Site 7. The Navy conducted a Confirmation Study under the NACIP program. In 1986, the NACIP program was changed to the Navy's Installation Restoration Program (IRP) to comply with the requirements of CERCLA as amended by SARA. SARA required Federal Agencies to institute a ~~program which~~ program that followed the requirements of CERCLA along with standard Superfund policies and procedures. As a result, the Confirmation Study was re-titled to be consistent with CERCLA terminology as an Interim Remedial Investigation (Interim RI).

During the Interim RI, three ~~test~~ test pits were excavated at Site 7. Composite samples were collected from each test pit at 0-3 feet, and from one test pit at 3-6 feet. All of the samples were

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analyzed for volatile organic compounds; semi-volatile organic compounds, pesticides, PCBs, metals, cyanide, phenols and EP toxicity. (Figure 2-1) The Interim RI concluded that beryllium was not a concern at the concentrations detected at Site 7. Mercury and silver were the only inorganics detected at concentrations above background levels, but the EP Toxicity test results for mercury and silver were below regulatory levels.

**Remedial Investigation**

In July 1992 a groundwater monitoring well was installed 15 feet downgradient of Site 7. Well 7GW1 is screened from about 10 feet to 80 feet below ground surface. Well 7GW1 was sampled on October 29, 1992 and the sample was analyzed for volatile organics, explosives, and total metals. No volatile organics or explosives were detected in the groundwater sample.

**Construction Investigation**

The Navy initiated an investigation to excavate and characterize the waste from Site 7 for disposal under a Removal Action. In June 1994, the material from Site 7 was excavated and placed into steel storage containers. The results from the Interim RI were used to initially characterize the material as non-hazardous.

The excavation of the Site 7 landfill was completed June 30, 1994. Excavation began at the southern end of Site 7. The soil first excavated from the site was visibly clean and contained no debris. This soil was placed into the first 20 cubic yard (yd<sup>3</sup>) container. As the excavation proceeded north, it was visually apparent where material had been placed into the ground. The material excavated from the remainder of the site that was visibly mixed with debris was placed into two remaining ~~20-yd<sup>3</sup>~~ 20-yd<sup>3</sup> containers. Small vials (2 to 3 oz.) which were partially filled with a gray-white solid substance and a dark gray solid substance were observed within the debris. Various sized laboratory bottles were also mixed within the debris. During excavation,

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the material was visually screened to remove a representative number of containers for further characterization of the material.

The excavation continued until the remaining soil was visibly free of containers and debris. When the excavation was complete, soil samples were collected from each of the sidewalls and the bottom of the excavation. The samples were analyzed for Contract Laboratory Program (CLP) Full Target Compound List (TCL) organics and Target Analyte List (TAL) inorganics. The analytical results of these samples are presented in Section 2.3. Analytical results from the samples were compared to USEPA Region III Risk Based Concentration (RBC) Table. This table provides chemical concentrations within a media that correspond to a fixed risk level of  $10^{-6}$  or a hazard level of 1.0. The values in the table were used as a guideline to determine whether the excavation was complete.

Following excavation, the material in the vials was characterized as beryllium (Be) and beryllium oxide based on conversations with plant personnel. The solid gray-white material in the vials was identified as a beryllium-oxide and the solid dark gray material was identified as beryllium-powder (the marking "Be-Metal" was observed on one of the vials that was approximately 3 oz. and 1/2 full). From the two roll-off containers that contained the visibly contaminated soil, the Navy collected sufficient material to fill four (4) each one-quart containers and one (1) each 16-ounce container. This material was then shipped via overnight courier to Brush Wellman in Elmore, OH, a RCRA treatment facility for Be, to evaluate treatment options. The facility rejected the sample because it contained both a small vial containing metallic mercury (Hg) and an unidentifiable cylindrical polymer object.

The unidentifiable object was returned to ABL where it was subjected to a series of tests. Initial analytical results concluded that the object was composed of approximately 50% nitroglycerin. The remaining 50% of the material was unknown but suspected of being a type of polymer

coating. A hazard analysis was completed by ABL to determine the potential hazards associated with this material. Sensitivity testing indicated that the object ~~is~~was reactive. Positive reactions were obtained in both the ABL friction and impact tests at relatively low testing levels. However, no reactions occurred when a 25 LB weight was dropped on the sample from a height of six feet, and the sample burned only moderately when exposed to a kerosene soaked sawdust fire. Based on the results of the tests, ignition of similar items is considered unlikely with prudent handling of the soil, and if ignited in an unconfined state, the most likely response is a moderate burning reaction.

Two composite samples of the excavated material were collected from the steel intermodal containers (one from the container with visibly clean soils and one from the two remaining containers) and analyzed for Toxicity Characteristic Leaching Procedure (TCLP). The results were negative, indicating that the waste was not a characteristic waste. ~~The container which contained the visibly clean soils~~container that contained the visibly clean soils was determined to be non-hazardous and disposed of in the Arden Landfill in Washington, Pennsylvania.

#### **4.0 SUMMARY OF SITE CHARACTERIZATION**

This section summarizes available data on the physical and demographic characteristics of the site. The site characterization includes a description of the site, and the geology, hydrogeology, topography, hydrology, climate, and surrounding land use of the site. A summary of previous investigations is also included.

##### **Geology**

ABL is located in the Valley and Ridge Physiographic Province, near its western boundary with the Allegheny Plateau Province. The Valley and Ridge Physiographic Province is underlain by sedimentary rock folded and faulted during the late Paleozoic Era. More-resistant sandstones

underlie ridges, and less-resistant shales and soluble limestones underlie the lowlands. Shale, limestones, and sandstones of Silurian and Devonian age underlie ABL.

Test pits excavated during the Interim Remedial Investigation indicate that Site 7 is underlain by several feet of clay. The surficial material encountered during installation of monitoring well 7GW1 (located 15 feet downgradient of Site 7), is a clayey gravel. Beneath the clay is relatively dense limestone, as indicated in drilling logs for 7GW1. Bedrock was encountered within approximately 1.5 feet of the surface during drilling.

### **Hydrogeology**

The drilling logs from 7GW1, a 64 foot-deep groundwater monitoring well installed approximately 15 feet north of Site 7 in the Fall of 1992, indicate that limestone was encountered throughout the entire well. Bedrock was encountered within approximately 1.5 feet of the surface. During drilling, no apparent water-bearing fractures were encountered. After a number of weeks, it was discovered that water had accumulated in the borehole to a depth of approximately 30 feet from the ground surface. The groundwater flow within the limestone is confined to fractures and solution channels. The direction and rates of groundwater flow in fractured bedrock are controlled by the size, frequency, and orientation of fractures and by the hydraulic gradient. Solution-widened fractures in limestone can facilitate rapid migration of groundwater. The most likely groundwater flow direction at Site 7 is towards the North Branch Potomac River.

### **Topography**

The most significant physiographic feature in the vicinity of ABL is Knobly Mountain. Site 7 is located on the side of Knobly Mountain at an approximate elevation of 920 feet mean sea level (msl) (USGS 7.5-minute, 5-minute Cresaptown, WV-MD quadrangle map). Site 7 is relatively level, and

the topography surrounding the site is gently sloped to the north at approximately an 8% grade. The area immediately north of the site has a slightly greater topographic relief.

### **Hydrology**

The predominant hydrologic feature in the vicinity of ABL is the North Branch Potomac River, which borders the western and northern sides of the facility. The elevation of the river ranges from about 655 feet msl, in the vicinity of Site 5, to about 645 feet msl at the eastern end of the facility.

Surface water from Site 7 flows northward down Knobly Mountain towards the North Branch Potomac River, which is approximately 2,000 feet downgradient of the site.

### **Climate**

Northeastern West Virginia has a semi-humid continental climate characterized by warm summers and cold winters and an even distribution of precipitation. At Cumberland, Maryland, the closest official recording station to ABL, the average annual temperature is 53.0 degrees Fahrenheit, with an average annual precipitation of 35 inches. However, annual precipitation averages about 50 inches along the divide in western Mineral County where ABL is located. Annual evaporation averages approximately 33 inches in the vicinity of ABL. Temperature, total precipitation, and snowfall are all somewhat variable within the region due to the mountainous topography.

### **Surrounding Land Use**

The land surrounding ABL consists of undeveloped woodland, cropland, and a limestone quarry. The property approximately 3/4 of a mile west of Site 7, on the Maryland side of the North Branch Potomac River, is primarily bottomland and is used for growing crops. A limestone quarry is approximately 3/4 of a mile south of Site 7 adjacent to State Route 956. The land east

of Site 7, off of Plant 1, is divided by a mountain ridge and is undeveloped woodlands and croplands.

There are currently about 550 employees at ABL. The majority of the employees work at Plant 4 which1, which is one-half mile from Site 7. There are no known residents within one-half mile radius of Site 7, and it is estimated that less than 50 residents live within a one mile radius. Residents on the other side of the North Branch Potomac River use groundwater as their water supply. The North Branch Potomac River is not used as a water supply in the vicinity of ABL, but may be used for recreational activities such as boating, fishing, and swimming.

#### **Terrestrial Flora and Fauna**

Terrestrial flora at ABL is predominantly woodland species. The predominant tree stand is oak-hickory-pine forest. This area was probably originally dominated by oak-chestnut forest, but cutting of large oaks and elimination of chestnut by blight havehas allowed hickory and pine to become established. Site 7 and the area immediately adjacent is a small open area surrounded by oak-hickory-pine forest.

The undeveloped areas within the facility support a variety of indigenous wildlife species such as white-tailed deer, woodchuck, gray fox, opossum, squirrel, raccoon, and rabbit, as well as game birds such as wild turkey and quail. The area also has a rich herpetofauna (reptiles), which include both northern and southern species at the limits of their range.

#### **5.0 DESCRIPTION OF THE SELECTED REMEDY AND RATIONALE FOR NO FURTHER ACTION** **CLOSEOUT**

Alternative 1 was selected from the Engineering Evaluation and Cost Analysis (EE/CA), dated May 1996, and involved the screening, segregating, and sampling of approximately 36 cubic

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yards of material excavated in June 1994 and contained within three steel intermodal containers. The material consisted of soil and debris mixed with beryllium, mercury, and PEP (propellant, explosives, ~~pyrotechnics~~ and pyrotechnics).

The goal of the non-time critical removal action was to prevent hazardous contaminants, pollutants and/or constituents from being released to or from the shallow subsurface soil media and prevent the release of hazardous contaminants, pollutants and/or constituents from the bulk storage containers. This goal corresponds to 40 CFR Section 300.415(b)(2)(iii). The specific objectives developed for this site included:

- (1) Excavation of the material
- (2) Restricting access to the material
- (3) Characterization of the material
- (4) Removal, treatment, and disposal of the material from the site.

Excavation of the material (Objective #1) was performed in June 1994. Site 7 is characterized as a small pit measuring 10 feet by 15 feet by 6 feet deep. Post excavation samples were collected from the four walls and floor and analyzed for full Toxic Compound List (TCL), Toxic Analyte List (TAL), and Toxic Characteristic Leaching Procedure (TCLP) analytes. The results (presented in Table 4.1 of the Final Report, dated June 27, 1997) indicates the concentration levels were below the industrial limits established by the EPA Region III Risk-based Criteria, dated April 15, 1998.

Objectives #2 through #4 were achieved via the implementation of a ~~soil~~soil segregation, analysis, and disposal activities described in the Final Report, dated June 27, 1997. On October 14, 1994, one roll-off containing overburden soils was disposed of at a municipal landfill. Materials in the two remaining roll-offs contained small vials of beryllium dust (Hazardous waste

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In summary, the threat to human health and the environment from the Site 7 landfill has been reduced as a result of the remedial action.