



Arnold Engineering Development Center Installation Restoration Update

*A publication for
Coffee and Franklin county residents*

*Environmental Public Affairs
Arnold AFB, Tennessee*

April 2002



A self-propelled barge "sails" the waters of the Retention Reservoir as a work platform for a drilling rig to detect whether solvents are present in sediments at the bottom of the reservoir.

CAB meets April 23

The next meeting of the Arnold AFB Community Advisory Board is set for April 23 at the Oak Restaurant on Interstate Road in Manchester. Members of the public are welcome and encouraged to attend.



Sampling at Retention Reservoir Ending

Fieldwork on a \$1.1 million environmental restoration project at the Retention Reservoir and former Chemical Treatment Pond was completed on February 22. The project began in October 2001 at the reservoir, a storage area for water exiting the AEDC industrial facilities and plant area. The water flows into the reservoir through Rowland Ditch and is held in the reservoir before it is allowed to drain back through Rowland Creek into Woods Reservoir.

According to CH2M HILL Project Manager, Kurt Sichelstiel, project objectives are focused on mapping and assessing the bottom of the Retention Reservoir, Chemical Treatment Pond, and Rowland Ditch/Creek to see if contaminants are present in the sediments.

He also said they are examining the effects of contaminants, if found, on groundwater in the shallow and intermediate aquifers beneath the Base. A unique approach was developed to meet these objectives, including use of a specialized barge transported to AEDC from its home port in a Louisiana harbor town and high-tech gadgetry to "sniff out," or detect, key contaminants.

The barge—really a self-propelled, shallow-draft, jack-up "boat"—served as the work platform for a special type of drilling rig, known as a direct-push technology (DPT) rig. The DPT rig was used to push a special device capable of detecting solvents that may exist as dense, nonaqueous-phase liquids (often called DNAPLs) and/or high

continued on page 2

Sampling... *continued from page 1*

concentrations of dissolved volatile organic compounds (VOCs) within the sediments and underlying native soils. This special device, called a membrane interface probe (MIP), was coupled with a gas chromatograph instrument and field computer that allowed the project team to quickly and effectively evaluate whether a particular area contained high concentrations of solvents. CH2M HILL subcontractor, Columbia Technologies, provided navigation and instrument operation.

Sichelstiel said that early indications from these screening activities suggested that DNAPLs or high levels of VOC contamination do not appear to be present within the sediments. Additional confirmation samples were collected from the sediment and native soils and sent to separate analytical laboratories to verify these “screening” results. Analysis of the confirmation samples is under way. He stressed that although the preliminary results are promising, complete results will not be available until later this spring.

Previous sampling programs in years past at the Retention Reservoir identified sediments that contain PCBs and beryllium. These chemicals are known to bioaccumulate in fish and are the reason the reservoir is closed to fishing. Sediments in the Chemical Treatment Pond contain low concentrations of PCBs and arsenic and pose no significant health risks.

“The collection of data from this current sampling program allows us to determine if levels of contamination are present which call for corrective action,” said Charles King, chief of the environmental management division. “If necessary, we then can select the proper technology to address that contamination.”

Sichelstiel said most of the sampling on the reservoir utilizing the barge was completed in late December, and that shoreline sampling was completed in February. He said that 17 monitoring wells have been installed and groundwater sampling from these and an additional 25 existing wells—all of which surround the

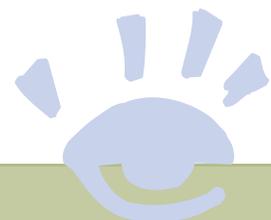


A technician operates a field computer aboard the barge in the Retention Reservoir to check a particular area for solvent concentrations.

surface water bodies—was also completed in early 2002. “Final evaluation of the data and interpretation of the results will be presented at an environmental Installation Action Plan meeting this fall (2002),” he said. “At that time, results will be summarized and conclusions and recommendations will be presented to the Tennessee Department of Environment and Conservation.” ■



AEDC bioenvironmental engineer Master Sgt. Whitney Wildfeuer checks drinking water in the military family housing for chlorine residuals. Watching the procedure is Alexis Lyons, daughter of Tech. Sgt. Chris and Karen Lyons. The reading was excellent with no chance for microorganisms to grow.



Our New Look

Envision has undergone restoration. Reporting our successes toward a cleaner environment, has led us to this clean retrofit. We hope you will continue to enjoy Envision, which now will be published semi-annually.

Groundwater Treatment Units Operate at AEDC

Operating around-the-clock, five groundwater treatment facilities maintained by AEDC's Environmental Management Division treat more than 500,000 gallons of water per year.

These facilities were constructed during a 3-year period (from 1994 to 1996) at a cost of between \$250,000 and \$400,000 each. By treating underground water that may contain traces of contamination, the five facilities satisfy regulatory and compliance requirements for discharge to surface water.

The sites are located (1) behind the J-4 Test Cell, (2) at a landfill located behind the Sewage Treatment Plant, (3) at the location of the old Camp Forrest Water Treatment Plant, (4) at the Coffee County Landfill, and (5) behind the Model Shop.

"The basic principal for the operation of all facilities is the same," said Ray Henshaw, AEDC environmental specialist. "However, each facility is laid out a bit different(ly) with the proper design and equipment to treat water at each specific site."

The largest of the five groundwater treatment facilities (and the last online) became operational in December 1996 to process untreated groundwater from AEDC's massive J-4 Test Cell. The Site 22 facility is necessary because the J-4 Test Cell continuously dewateres the cell of groundwater. It treats the water at up to 400 gallons a minute for traces of trichloroethene (TCE) and tetrachloroethene (PCE).

"This \$400,000 facility uses air strippers to aerate the groundwater before it passes through a sieve-tray air stripping unit and a carbon absorption unit," Henshaw said. "The treated water is then discharged to the Retention Reservoir and eventually back to Woods Reservoir."

Site 1, located to the rear of the Sewage Treatment Plant, was used from the 1950s into the 1970s for the disposal of hazardous and solid waste. Three groundwater extraction wells pump the



groundwater from the ground into a tank at the rate of more than 40 gallons per minute. The water moves through an air stripper system, which separates any TCE and PCE contaminants from the water. A carbon adsorption unit absorbs the remaining contamination in the final stage of the decontamination process.

In January 1996, the \$256,000 water treatment facility located at the old Camp Forrest Water Treatment Plant became operational by pumping up to 90 gallons of water per minute.

"The groundwater is treated by air stripping and liquid phase carbon adsorption to remove any volatile organic compounds at the site," Henshaw said. "The main contaminant at the site is trichlorofluoromethane, better known as Freon."

Site 3, more commonly known as the Coffee County Landfill, has had a groundwater treatment facility for several years and treats up to 17,000 gallons of water per day. Water is pumped into a holding tank and treated with forced air thus releasing volatile organic compounds into the atmosphere.

The remaining water treatment plant is Site 8, located to the rear of the Model Shop. The facility, opened in 1997, treats

Dennis Flatt, Restoration Program Manager, shows AEDC Community Advisory Board members and Base officials, the inside of the groundwater treatment facility at the J-4 Test Cell.

water with elevated levels of PCE at the rate of 2 gallons per minute.

"These five water groundwater treatment facilities are an integral part of our installation restoration program," said Charles King, chief of the environmental management division. "They reduce volatile organic compound levels at the sites to acceptable limits and satisfy regulatory and compliance requirements established by the Tennessee Department of Environment and Conservation and the Environmental Protection Agency." ■

AEDC Paint Shop Cuts Hazardous Waste

Up to 80 percent of hazardous materials generated from paint stripping is being eliminated at the AEDC paint shop with the use of a new portable blasting machine. The newly purchased unit gives the shop an alternative means of removing paint from well joints and other painted surfaces that require welding.

“The process is a substitute for the use of methylene chloride that we used in paint stripping before the introduction of the sand blaster,” said Robert Powell, senior team leader of the carpenter and paint shop. “This cuts the disposal of hazardous material by at least 80 percent.”

“We researched the Internet and came up with this hand-held sand blaster that recycles its blasting grit,” Powell said. “In addition, it vacuums and bags the dust and paint chips created during the job into a small container, which is all that needs to be disposed of as hazardous waste.”

The process is five times faster than the previous method of stripping paint. It previously took two men an entire day



Lead painter Mark Boaz demonstrates the flexibility of the new portable blasting machine in the AEDC paint shop. Observing the paint stripping action is Robert Powell, senior team leader of the carpenter and paint shop.

to set up a breathing chamber and get ready to strip paint. Each of them had to be suited in protective clothing and provided fresh air. In addition, all tools, paintbrushes, and other material had to be treated and disposed of as hazardous waste.

“Besides being easier and faster, the new process saves money as we no longer use steel-tooth brushes and paint brushes on

the job,” said Mark Boaz, lead painter. “Some of these jobs took up to 100 steel brushes and two or three boxes of paint brushes.”

The new lightweight machine is called an edust-o-matic portable blasting cleaner and is manufactured by Clemco, a company in Washington, Missouri.

“We are now testing other products to see if we can eliminate the use of methylene chloride completely,” Powell said. “Of the 10 product samples we are experimenting with, one of them will hopefully meet our shop requirements.” ■

CAB Members Tour Environmental Sites

Members of the AEDC Community Advisory Board received a look at Base restoration program sites during a tour on August 25, 2001. Hosting the Saturday tour were personnel from the Base Environmental Management Division.

CAB members Anna Johnson of Tullahoma, William Prince of Winchester, Bill Roberson of Manchester, and Charles King, AEDC co-chair, received briefings on the environmental restoration sites including the Coffee County Landfill, several groundwater treatment facilities, a site in Camp Forrest, and several sites near the Retention Reservoir.

Base environmental personnel who briefed the CAB members and answered questions regarding the current status and future plans at the sites were Pam King,

AEDC Installation Restoration Program Manager; Dennis Flatt, ACS Restoration Program Manager; and King, Chief of the AEDC Environmental Management Division. Also present were Roger Donovan of the Tennessee Department of Environment and Conservation and Mike Singer of CH2M HILL.

Other Base officials participating in the tour were Navy Capt. Larry Judge, AEDC Vice Commander; Col. Pat Eagan, AEDC Support Director; Maj. M. S. Teskey, AEDC Staff Judge Advocate; Capt. Tim White, AEDC Public Affairs Officer; and Marty Martin, Environmental Public Affairs Officer. ■



Dennis Flatt, Restoration Program Manager, briefs Community Advisory Board members and Base officials during a stop at the groundwater treatment facility at the J-4 Test Cell. The location was one of several restoration sites visited by the tour on August 25, 2001. Listening to Flatt are Colonel Pat Eagan, AEDC Support Director; CAB members Anna Johnson, William Prince, and Bill Roberson; Pam King, AEDC Restoration Program Manager; and Capt. Tim White, AEDC Public Affairs Officer.

What's Bugging People at AEDC

What's bugging people at AEDC? It could be bugs such as ticks and mosquitoes. Keeping these arthropods under control falls under the jurisdiction of Tech. Sgt. Rusty Fohner, Noncommissioned Officer-in-Charge of AEDC Public Health and Health Promotions.

Sergeant Fohner is an Air Force entomologist responsible for the protection of Base personnel against discomfort and diseases caused by insects. He is assigned to the Medical Aid Station but is located in Building 1100 as a member of the Environmental, Safety, Health, and Quality (ESHQ) team.

"Our two major concerns, especially in the housing area, are ticks and mosquitoes," Fohner said. "Mainly because both of these insects can carry diseases that could be harmful to humans. We also have



Technical Sgt. Rusty Fohner and Bill Seay monitor a mosquito light trap in the military family housing area.

mites, chiggers, and other insects, but they rarely carry disease."

According to the sergeant, there are two types of ticks on-Base: the American dog tick and the lone star tick. Both are capable of carrying Rocky Mountain Spotted Fever, a virus called ehrlichiosis that causes muscle aches, headaches, fevers, and chills. These symptoms can be very mild to severe, requiring hospitalization.

Sergeant Fohner said some cases of Rocky Mountain Spotted Fever occurred last year near Huntsville and in the Nashville area.

The other major disease caused by tick bites is Lyme disease, but no cases of this disease have been found in this area. However, if you visit an area from Wisconsin to New England, you should be aware of this disease, which according to the National Centers for Disease Control, if left untreated can advance from early flu-like symptoms to painful and permanent damage to the joints.

Ticks are controlled in the housing area by spraying, usually in April. This spraying takes place after Sergeant Fohner and Bill Seay, a contractor assigned to the Environmental Management Division, have conducted tick drags in the area and determined the extent of the tick population.

"Our sector surveillance includes the tick drag, which is a white towel that is dragged through the underbrush," said Sergeant Fohner. "The ticks are easy to count on the white background."

The other major insect problem in Base housing is the mosquito. According to Sergeant Fohner, local mosquitoes do not carry diseases

like Western Nile and encephalitis, which are found in northern areas such as New York.

"We set traps and containers where the mosquitoes lay their eggs to determine if we have a problem on-Base," he said. "So far in the past 10 years, we haven't found it necessary to spray for mosquitoes. We do not want to spray as a certain amount of the chemical would find its way back into Woods Reservoir."

He stressed that people can help control the mosquito population by not allowing water to stand, by keeping their gutters clean, and by protecting themselves in the woods with a good repellent and clothing that provides cover. "We place a bacteria donut in backwaters, such as drainage ditches and ponds, that kills the mosquito larva."

"It is important not to let water stand around in old containers," Sergeant Fohner said. "For example, an old tire filled with stagnant water can hatch up to six million mosquitoes a day." ■

Camp Forrest Contains 16 Environmental Sites

Sixteen sites in the former Camp Forrest area have been identified by the AEDC Environmental Management Division as possible sources of contamination from World War II activities. The locations are undergoing a Resource Conservation and Recovery Act (RCRA) Facility Investigation to determine if cleanup measures are required.

Camp Forrest, which was a WWII training base that housed on average 50,000 U.S. Army troops during the war, is located on the western portion of Arnold AFB bordering Tullahoma. The post was one of the largest in the Army at that time and, for example, had hundreds of barracks, two service clubs, 38 post exchanges, 12 chapels, and four theaters.

The Army dismantled the buildings during the late 1940s and early 1950s. Today,



A World War II photo of a Camp Forrest incinerator building. Ash from the incinerator was disposed of in adjacent landfills. Only the bottom portion of the building remains today.

remains include roads and structures such as concrete foundations and chimneys. Since the dismantling, trees and brush have covered the area, which is used for forestry, recreation, wildlife management, and National Guard activities.

“The areas of the camp that concern us the most and are under investigation are 10 gas stations sites, two landfills, two motor pools, and an incinerator and vehicle maintenance area,” said Linda Blackwelder, CH2M HILL project officer. All of the gas station sites have



Marker at the Tullahoma end of Wattendorf Memorial Highway marks the entrance to Camp Forrest, the U. S. Army post from 1940-1946.

foundations from an office building, pump islands, and locations where underground gasoline storage tanks were situated. All of the tanks were removed in the late 1940s, but the sites could have petroleum-related chemicals in the soil and groundwater.

The incinerator concrete structure is intact. Ash from the incinerator was disposed of in adjacent landfills, located in the northwest area of Camp Forrest. Another landfill in the southeast corner of the post was used for disposal of burned refuse and sanitary landfill material.

The World War II motor pools at Camp Forrest have the remains of service bays and maintenance pits while the one large vehicle maintenance area had two large concrete ramps that were removed in 1992 during logging operations. These sites may have traces of petroleum-related chemicals in the surrounding soil and groundwater.

During an expanded preliminary assessment of the Camp Forrest area in the early 1990s, 85 possible sites were identified. The contaminants of concern were metals, volatile organic compounds (VOCs), pesticides, fuels, and asbestos. Confirmatory sampling at the sites was completed in 1994.

According to Blackwelder, results were reevaluated in 2001 for comparison of confirmatory sampling to current regulatory criteria, and confirmatory sampling summaries were prepared for each site. At that time, 16 sites were recommended for additional sampling in a RCRA Facility Investigation. Additional confirmatory sampling is required at eight sites. The remaining sites require no additional sampling because no evidence of environmental contamination was found. She said confirmatory sampling summary reports were submitted in March 2001 to the U.S. Environmental Protection Agency and the Tennessee Department of Environment and Conservation.

Current activities at the 16 sites include sampling surface and sub-surface soils, groundwater and surface water sampling, sediment sampling, and air sampling. “Fieldwork at the Camp Forrest sites, including the installation of 30 monitoring wells, is approximately 70 percent completed and should be finished by spring,” Blackwelder said.

According to Pam King, AEDC Restoration Program Manager, following completion of the RCRA Facility Investigation later this year, we will look at the collection of data from this program and determine if levels of contamination call for corrective action. If necessary, the cleanup activities would take place over the next few years. ■



Only the service pit remains from a World War II Camp Forrest motor pool service bay.

Status Report on IRP Sites

Of the 24 Installation Restoration Program sites, 10 sites have been closed and no further action is planned. The status of all 24 sites, as of **January 31, 2002**, is shown below.

Site 1, Landfill 2 and Leach Pit 2: Construction of a \$1.56 million modified clay cap with a geosynthetic clay liner was completed in November 1997. Groundwater treatment facility treats approximately 1,700,000 gallons of water per month. Private water wells were sampled west of airfield as a precautionary measure. Site investigation plan being prepared.

Site 2, Retention Reservoir and J-4 Drainage Area and Site 11, Chemical Treatment Pond: Sediment sampling at Retention Reservoir and former Chemical Treatment Pond completed in January 2002. Shoreline soil sampling currently under way.

Site 3, Landfill 4: Construction of a \$2.1 million cap completed in November 1998. Groundwater treatment facility treats about 17,000 gallons of water per day. Permanent gas ventilation system installed in January 2000. Private wells in area sampled. Construction of 11 trenches completed in February 2001. Site investigation plan being prepared.

Site 4, Surface Drainage, Bradley Creek: Site investigation plan being reviewed.

Site 5, Surface Drainage, Rowland Creek: No further action based on the RCRA Facility Assessment.

Site 6, Camp Forrest Water Treatment Plant: Corrective measure study under way included sampling of private water wells in Spring Creek area. Interim Corrective Measure in the form of a groundwater treatment facility that treats about 400,000 gallons of water per month. A waterline from Estill Springs was completed in April 2001 for residents in this area. Corrective measures study being prepared.

Site 7, Main Test Area: Corrective Measures Study under way. Interim corrective measure in the form of a groundwater treatment facility in operation.

Site 8, Leach Pit No. 1: Corrective Measures Study under way. Groundwater treatment facility operational. Interim corrective measure in the form of a groundwater treatment facility in operation. Supplemental site investigation plan being prepared. Private water wells east and southeast of the industrial area sampled as a precautionary measure.

Site 9, Surface Drainage, Brumalow Creek: Site investigation plan being reviewed.

Site 10, Fire Protection Training Area 2, Landfill 1, Burn Area 2: Site investigation plan being reviewed.

Site 12, Retention Leach/Burn Area: An interim corrective measure to biologically treat soils and RCRA Facility Investigation is complete. Site investigation plan being reviewed.

Site 13, Fire Protection Training Area: Proposed for no further action.

Site 14, Surface Drainage, Crumpton Creek: Proposed for additional sampling and long-term monitoring. Site investigation plan being reviewed.

Site 15, High-Energy Fuel Burn/Burial Area: No further action based upon completed confirmatory sampling results.

Site 16, Beryllium Leaching Area: No further action based upon completed confirmatory sampling.

Site 17, Burn Area No. 2: No further action based upon completed confirmatory sampling results.

Site 18, Building 1421 Area: This site is proposed for no further action based upon confirmatory sampling results.

Site 19, Camp Forrest Area: Thirty-six monitoring wells installed at nine former Camp Forrest gasoline stations/motor pools. A site investigation work plan for Camp Forrest is being developed.

Site 20, Steam Plant Ash Pits: Site investigation plan being reviewed.

Site 21, Three hazardous waste storage buildings and one non-hazardous waste storage building: No further action on all four buildings. These were previously permitted storage units that underwent RCRA closure.

Site 22, Main Test Area: Some areas required more study and some areas are no further action. Corrective Measures Study Work Plan being prepared. Final site investigation plan being reviewed.

Site 23, Salvage yard: No further action.

Site 24, Camp Forrest Asbestos Area: No further action.



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