

5654

**FACTSHEET ADVANCED WASTEWATER TREATMENT SYSTEM**

06/14/94

DOE-FN      PUBLIC  
2  
FACTSHEET

5654

## FACT SHEET: ADVANCED WASTEWATER TREATMENT SYSTEM

### Background

The Advanced Wastewater Treatment (AWWT) system was initiated as an Environmental, Health and Safety Improvements Project at Fernald. Danis Industries Inc. of Dayton, Ohio, through competitive bidding was awarded the prime construction contract for \$12,060,000. Construction began in November 1992, and is scheduled for completion in late 1994. Startup of the system is expected in January 1995.

The AWWT system will treat existing uranium-contaminated wastewater streams at the Fernald site in order to achieve a reduction in the annual amount of uranium that is discharged to the Great Miami River. Uranium content in wastewater treated at the facility will be reduced to less than 20 parts of uranium per billion parts of water, the U.S. EPA's proposed maximum limit for uranium in drinking water.

The AWWT, at total capacity, will be capable of processing 1,100 gallons of water per minute, dedicated to wastewater and contaminated stormwater runoff. When excess capacity is available, the AWWT system will also treat uranium-contaminated groundwater being extracted from the South Groundwater Contamination Plume to further reduce uranium discharges to the river. The AWWT has been designed to allow for expansion to address future site needs.

### The treatment process

Following is a description of the basic processes used in the AWWT: Water will first be chemically pre-treated to remove suspended solid materials and some radionuclides. The water will then be routed through carbon filters to remove volatile organic compounds and then flow through an ion exchange system which will exchange sulfate ions with uranium complex ions. Uranium ions will collect on the resin. When spent, the resin will be regenerated for further use by stripping it of the uranium with sulfuric acid and replacing the sulfate ions. The resulting concentrated uranium-bearing stream will then undergo chemical precipitation which is capable of removing high concentrations of uranium in wastewater.

### Water treatment systems interface

Following is a description of the various processes that support groundwater treatment at Fernald, and how they fit into the long-term program:

- \* The AWWT system will remain in service throughout the remediation of the Fernald site. The AWWT system will be one of the final site facilities to be decommissioned and dismantled.

--continued--

- \* A planned AWWT Dewatering Facility is currently in the preliminary engineering phase. Construction is scheduled for completion in October 1995. The purpose of the AWWT Dewatering Facility is the processing (dewatering) of waste slurries and sludges from the AWWT facilities, including those generated from planned future groundwater remediation treatment systems. The dewatering of miscellaneous waste sludges from the Fernald site may also be performed at the AWWT Dewatering Facility, which will remain in service throughout the Fernald site remediation.
- \* The Interim Advanced Wastewater Treatment unit at the Stormwater Retention Basin will remain in service after the AWWT becomes operational. As part of the 1993 agreement between DOE and U.S. EPA that resolved an Operable Unit 2 dispute, this interim treatment unit will be used to treat a portion of the South Plume extracted groundwater when stormwater is re-routed to the AWWT. Under the terms of the agreement, this unit will remain in service as a supplemental environmental project until permanent groundwater treatment facilities are provided (scheduled for 1998).
- \* The South Plume Interim Treatment system began operating in March 1994. This system will remain in service at least until permanent groundwater treatment facilities are provided.
- \* Existing stormwater collection systems that send runoff to the Bionitrification Surge Lagoon and to the Stormwater Retention Basin will remain in service as necessary to support site remediation. These systems can be phased out and decommissioned as site areas are remediated.
- \* The Stormwater Retention Basin will remain in service to collect site stormwater runoff for flow equalization prior to treatment at the AWWT. The retention basin likely will remain in service throughout the duration of site remediation. It can be phased out of service when successful completion of site remediation eliminates the need to collect site stormwater runoff.
- \* The Stormwater Retention Basin Valve House contains valving to allow diversion of wastewater flows from the Stormwater Retention Basin and the South Groundwater Contamination Plume to the various interim and permanent treatment facilities. The valve house will remain in service throughout the life of site wastewater treatment and groundwater remediation operations.
- \* The Effluent Aeration Facility was provided to elevate the dissolved oxygen level of non-treated groundwater from the South Plume prior to its discharge to the Great Miami River. The facility will remain in operation throughout the life of site remediation to treat groundwater from the South Plume and other sources prior to discharge.

#####