



Paducah Gaseous Diffusion Plant  
Citizens Advisory Board

**Chair**

Judy Clayton

**Chair-Elect**

Ralph Young

**Board Members**

John Anderson

Allen Burnett

Robert Coleman

David M. Franklin

Jonathan Hines

Shirley Lanier

Margaret Morgan

Dianne O'Brien

Elton Priddy

Alex Roman

Mark Sullivan

Don Swearingen

May Louise Zumwalt

**Board Liaisons**

Reinhard Knerr

DOE DDFO

Buz Smith

DOE Federal Coordinator

Ed Winner

Division of Waste

Management

Turpin Ballard

Environmental Protection

Agency

Mike Hardin

Fish and Wildlife Resources

Stephanie Brock

Radiation Health Branch

**Support Services**

EHI Consultants, Inc.

111 Memorial Drive

Paducah, KY 42001

Phone 270.554.3004

Fax 270.554.3248

[www.pgdpcab.org](http://www.pgdpcab.org)

[info@pgdpcab.org](mailto:info@pgdpcab.org)

## Consensus Recommendation: 10-01

Approved March 18, 2010 by the Paducah Gaseous Diffusion Plant Citizens Advisory Board

### Title: Optimization of the Northwest Plume Pump and Treat System

#### BACKGROUND

The cleanup strategy under the *Federal Facility Agreement for the Paducah Gaseous Diffusion Plant* (FFA) establishes six operable units (OUs): the Groundwater OU (GWOU), the Surface Water OU (SWOU), the Soils OU (SOU), the Decontamination and Decommissioning OU (D&D OU), the Burial Grounds OU (BGOU), and the Comprehensive Sitewide OU (CSOU). Each OU is scoped to remediate areas and media associated with operation of the Paducah Gaseous Diffusion Plant (PGDP). The specific scopes and further discussions for each OU are addressed in the Site Management Plan (DOE 2008a).

Investigations under the GWOU discovered offsite contamination within two plumes of the Regional Groundwater Aquifer (RGA). After discovery of off-site contamination, DOE conducted a site investigation to identify the nature and extent of the contamination. The investigation determined that the groundwater contamination is spreading generally northward toward the Ohio River in multiple plumes. The most prominent of the plumes, containing both trichloroethylene (TCE) and technetium-99 (<sup>99</sup>Tc), is the Northwest Plume. The extent of the off-site plumes is well noted.

As an interim remediation approach, a pump and treat system was developed where extraction wells were placed in the high-concentration core of the Northeast and Northwest plumes. Both pump and treat operations have been largely successful in reducing the concentrations of TCE and <sup>99</sup>Tc, and have attained completion levels specified with the Record of Decision (ROD). As part of PGDP's regulatory framework, every remediation project undergoes a Five-Year Review that determines the continued effectiveness of the applied treatment. The Northwest Plume pump and treat system has undergone review through the formal regulatory process in 1998, 2003 and 2008.

The 1998 Five-Year Review determined that no additional action need be taken. The 2003 Five-Year Review showed that the pump and treat action was still being effective, however contaminant levels indicated that the high-concentration core of the plume was migrating. The most recent Five-Year review recommended that DOE take action to best reduce offsite groundwater contamination. Although the pump and treat system for the Northwest Plume continues to remove TCE, the action could be optimized by ascertaining whether the high-concentration *core* of TCE of the Northwest Plume at the North Extraction Well Field has migrated eastward of the capture zone of the well field.

DOE, along with its contractors, U.S. Environmental Protection Agency (EPA), and the Commonwealth of Kentucky have begun discussion and preparation of documents for an

Explanation of Significant Difference (ESD), which is a regulatory amendment to a ROD. The ESD for the Northwest Plume pump and treat will allow for the relocation of extraction wells to a centroid location within the plume. The relocation of extraction wells will allow for the optimization of the pump and treat system and should result in the removal of large quantities of TCE and <sup>99</sup>Tc from the groundwater plumes.

#### **RECOMMENDATION**

**The PGDP CAB fully supports the Northwest Plume Interim Remedial Action Optimization project and recommends that DOE continue with the process of expediting time frames and enhanced communication efforts between the Department of Energy, U.S. EPA, and Kentucky Division of Waste Management.**

**Expediting projects such as this is in the best interest of the public, as it will result in increased removal rates for TCE and <sup>99</sup>Tc from the area of the Northwest Plume containing the highest concentrations of these compounds. The CAB acknowledges the uniqueness of this project because the Record of Decision is already in place. Further, the CAB is aware that the actual pump and treat process is not changing; only the location of the extraction wells. That being said, the CAB believes this process of expediting time frames through enhanced communication between the Department of Energy and the regulators is a good idea, and should continue in the future.**

**In addition, the PGDP CAB recommends the lessons learned from this project be applied to future projects.**