

# PROJECT facts

U.S. DEPARTMENT OF ENERGY  
OFFICE OF FOSSIL ENERGY  
NATIONAL ENERGY TECHNOLOGY LABORATORY



## MERCURY RISK ASSESSMENT II

### CONTACTS

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### Background

The Clean Air Mercury Rule (CAMR), issued by the U.S. Environmental Protection Agency in 2005, will require significant reductions in mercury emissions from coal-fired power plants. In formulating the regulations, a central point of debate concerned whether power plant mercury emissions result in mercury “hot spots,” areas where excess local deposition could occur. Although EPA ultimately decided to issue CAMR with a nationwide limit on mercury emissions, many states are considering or have passed legislation requiring controls on a plant-specific basis.

### Primary Project Goal

The primary goal of this project is to characterize the extent of mercury deposition near coal-fired power plants. Coal plants in three states, burning three types of coals, will be evaluated.

### Objectives

- To obtain direct evidence of local deposition patterns through collection and analysis of soil and vegetation samples near three U.S. coal-fired power plants – one in North Dakota, one in Illinois, and one in Texas.
- To determine if a correlation exists between model mercury deposition patterns and measured soil and vegetation concentrations.
- To examine deposition in heavily forested regions around a coal-fired power plant and determine if deposition exceeds that in similar regions not near a coal plant. It is known that mercury deposition on tree leaves is higher per unit area of land than in open agricultural regions.

### Accomplishments

Soil and vegetation samples have been collected from all three coal-fired power plants. Soil samples from around the Coal Creek Power Plant in North Dakota and the Kincaid Power Plant in Illinois showed no evidence of local hot spots within 10 km of the plant. Vegetation samples also did not show evidence of hot spots around these two plants. Preliminary results from soil and vegetation samples from a 16-km radius around the Monticello Power Plant in Texas have also found no strong evidence of hot spots.



## PARTNER

Brookhaven National Laboratory

## PERIOD OF PERFORMANCE

2/15/2002 to 9/30/2006

## COST

**Total Project Value**  
\$706,500

**DOE/Non-DOE Share**  
\$706,500 / \$0

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It was estimated that less than 2% of the total mercury emissions from the three plants considered was deposited within 15 km of these plants. These small percentages of deposition are consistent with the literature review findings of only minor perturbations in environmental levels, as opposed to hot spots, near the plants.

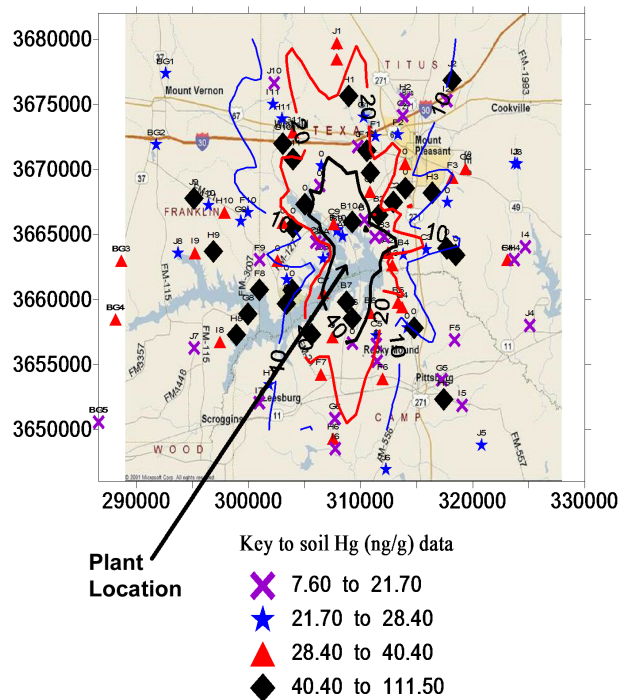
Two journal articles have been published on the research results: (1) "Methylmercury, Fish Consumption, and the Precautionary Principle" in the *Journal of the Air and Waste Management Association*, 2005; and (2) "Urban Impacts of Mercury Emissions from Coal Fired Power Plants," in the *Journal of Urban Technology*, August 2006.

## Benefits

Data collected through activities under this project will be used to evaluate the potential for hot spots of local mercury deposition from coal-fired power plants.

## Planned Activities

- Analyze and interpret soil and vegetation samples collected around the Monticello plant
- Compare modeled deposition patterns with measured data
- Evaluate mercury deposition around a coal-fired power plant in a heavily forested area.



Soil Hg levels posted on a map of a study area. Black, red, and blue lines represent predicted annual deposition contours ( $\mu\text{g}/\text{m}^2/\text{yr}$ ) above background. Total background deposition is around  $20 \mu\text{g}/\text{m}^2/\text{yr}$ .