

**LMFS-96-23**  
**A SURVEY OF HEALTH EFFECTS: MERCURY EMISSIONS FROM NORTH DAKOTA LIGNITE-FIRED POWER PLANTS**

**CONTRACTOR:** Roth Associates, Inc.

**PRINCIPAL INVESTIGATOR:** H. Neil Roth, Ph.D.  
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**CONTRACT AMOUNT:** \$90,231

**Project Schedule – 4 Months**

Contract Date – 4/30/96  
Start Date – 4/30/96  
Completion Date – 8/15/96

**Project Deliverables**

Status Report – 6/1/96 ✓  
Status Report – 7/15/96 ✓  
Final Report – 8/15/96 ✓

**Project Schedule – 3 Months**

Addendum to Contract – 11/22/96  
Start Date – 11/22/96  
Completion Date – 1/97

**Project Deliverables**

Letter Report – 11/96 ✓  
Letter Report – 12/96 ✓  
Draft Final Report – 1/97 ✓  
Final Report – 1/97 ✓

**OBJECTIVE / STATEMENT OF WORK**

The objective of this project is to conduct a comprehensive search of available scientific information about mercury health effects.

**Project Description**

The contractor will identify and collect data, provide a review and analysis of the data, prepare conclusions and recommendations, and present the findings in a final report.

**STATUS**

The contractor identified 175 pertinent studies and reviewed 94 studies. Of these 94 studies 19 had sufficient scientific credibility to warrant further review. The best quality data are the Iraq, Seychelles Islands, Faroe Islands and New Zealand studies. The contractor found that many of the studies are questionable and contain one or more serious flaws.

In summary the contractor found:

- Of the 20 quality studies subjected to an in-depth review;
  - three studies showed an adverse effect due to mercury;
  - six studies showed no effect due to mercury; and
  - eleven studies had mixed results.
  
- **There is no clear pattern of mercury posing a health threat even at the elevated levels in the 20 quality studies.**
  - However, it would be premature to conclude from these findings that mercury poses no threat in the U.S. without knowing more about levels of the substance in the U.S. and in the 20 studies.
  
  - Finally, it should be recognized that even the results in the 20 quality studies are highly questionable because most of the studies had one or more serious flaws. For example:
    - 18 studies had fair to poor exposure data;
    - 14 studies did not have reasonable adjustments for confounders;
    - 16 studies were based on faulty statistical analyses; and
    - two studies had inadequate sample sizes.

The contractor recommended that:

- new studies which appear in the scientific literature should be reviewed;
- the new Faroe Island and Seychelles Island studies should be reviewed; and
- the revised EPA mercury and HAPS studies should be reviewed.