

Los Alamos Environmental Restoration Facility

LOS ALAMOS NATIONAL LABORATORY

ENVIRONMENTAL RESTORATION  
Records Processing Facility  
ER Records Index Form

ER Record I.D.# 0055612

ERID NO: 55612 DATE RECEIVED: 04/23/97 PROCESSOR: YCA PG COUNT: 2

PRIVILEGED (Y/N): N RECORD CATEGORY: P RECORD PACKAGE NO.: N/A

FILE FOLDER: N/A

CORRECTION (Y/N): N CORRECTED NO.: N/A CORRECTED BY: N/A

AR (Y/N): Y AR DESCRIPTION (D/G): N/A

MISCELLANEOUS: REFERENCE SITED

THIS FORM IS SUBJECT TO CHANGE. CONTACT RPF FOR LATEST VERSION. (JAN. 1996)



2988

SENT BY: FASTER-BETTER-CHEAPER ; 4-16-97 : 11:28AM ;

LANL E

50566547475056675224:# 2/ 6

*Gilbert*

Department of Statistics  
103 Pond Laboratory  
University Park, PA 16802 USA

314865-3443:Comen APR 16 '97... 11:27AM  
314865-1248 (Cont)

Professor of  
Mathematical Statistics  
Member of  
Graduate Ecology Program

*Gilbert  
and  
Symon*

2

(2 pages)

0972

556/2

**CENTER FOR STATISTICAL ECOLOGY  
AND ENVIRONMENTAL STATISTICS**



**Proceedings of**

**The Workshop on Superfund Hazardous Waste:  
Statistical Issues in Characterizing a Site:  
Protocols, Tools, and Research Needs**

**February 21-22, 1990  
Crystal City  
Arlington, VA.**

**Editors:**

**Herbert Lacey**  
Statistical Policy Branch (PM-223)  
U.S. Environmental Protection Agency  
401 M Street, S.W.  
Washington, DC 20460

**Royal J. Nadeau**  
Environmental Response Branch/OSWER  
U.S. Environmental Protection Agency  
Woodbridge Avenue  
Raritan Depot - Building 10  
Edison, NJ 08837

**Ganapati P. Patil**  
Center for Statistical Ecology and Environmental Statistics  
Department of Statistics  
Penn State University  
University Park, PA 16802

**Larry Zaragoza**  
Site Assessment Branch (OS-230)  
U.S. Environmental Protection Agency  
401 M Street  
Washington, DC 20460

APR 23 1997

*esm*

November 1990

Printed on Recycled Paper

STATISTICAL SAMPLING AND ANALYSIS ISSUES AND NEEDS FOR TESTING ATTAINMENT  
OF BACKGROUND-BASED CLEANUP STANDARDS AT SUPERFUND SITES

Richard O. Gilbert  
Jeanne C. Simpson  
Pacific Northwest Laboratory(a)  
P. O. Box 999  
Richland, WA 99352

ABSTRACT

The primary purpose of the Workshop on Superfund Hazardous Waste is to identify statistical issues and research needs that can form the basis for a long-term statistical research and training plan for Superfund hazardous waste site characterization and remediation. This paper discusses issues and needs that arise when statistical procedures are used to test whether remediated Superfund sites have attained site-specific background standards. Several nonparametric tests are discussed (Wilcoxon rank sum, slippage, quantile) as regards their power to detect non-attainment of background standards. Some of the important issues that appear to need attention are (1) how to select site-specific background areas, (2) determine the types of post-remedial-action concentration distributions that are likely to occur in practice for various types of remedial actions (to better select the most powerful tests to use), (3) develop and evaluate the power of multiple-comparison slippage, quantile, and other robust tests, (4) conduct additional (to those reported here) power studies of the Wilcoxon, slippage, and quantile tests, for various patterns of "hot spot" contamination, (5) develop and communicate a unified approach for deciding when to use geostatistical methods, classical testing methods as discussed here, or both simultaneously, and (6) determine and evaluate statistical procedures that are appropriate for testing compliance with non-constant risk-based standards.

- 
- (a) Work supported by the U.S. Environmental Protection Agency under a Related Services Agreement with the U.S. Department of Energy, Contract DE-AC06-76RLO 1830. Pacific Northwest Laboratory is operated for the U.S. Department of Energy by Battelle Memorial Institute.