
Preface

The *Environmental Report 1999* is prepared for the U.S. Department of Energy (DOE), as required by DOE Order 5400.1 and DOE Order 231.1, by the Environmental Protection Department at Lawrence Livermore National Laboratory (LLNL). The results of LLNL's environmental monitoring and compliance efforts and an assessment of the impact of LLNL operations on the public and the environment are presented in this publication.

One important change has been made to the 1999 report. A new Appendix C, Errata, has been added to notify holders of previous environmental reports that corrections to the bound, hard copies were necessary, what the corrections were, and that the corrections were made on the Internet versions. With the errata, the hard copy and Internet versions are equivalent documents. Environmental reports covering calendar years 1994 through 1999 can be accessed on the Internet at the address of the LLNL SAER homepage: <http://www.llnl.gov/saer>. Both the main volume and data supplement volume of each individual report can be viewed in its fully corrected, most up-to-date form.

To produce a more readable and useful document for our diverse readership, which includes regulators, scientists and engineers, educators, the media, public interest groups, and interested citizens, this report is divided into two volumes: main volume and Data Supplement. The main volume describes LLNL's environmental impact and compliance activities and features descriptive and explanatory text, summary data tables, and plots showing data trends. The summary data include measures of the central tendency of the data (i.e. mean and medium), their spread or variability, and their extreme values. The main volume contains the Executive Summary and the Compliance Summary; it features individual chapters on monitoring of air, sewage, surface water, ground water, soil and sediment, vegetation and foodstuff, and environmental radiation; and it contains chapters on site overview, environmental program information, ground water investigation and remediation, radiological dose assessment, and quality assurance. Information on both the Livermore site and Site 300 is presented in each chapter. The main volume contains the information of interest to most of our readers and will be distributed. The distribution list for the 1999 report can be accessed from the LLNL SAER homepage on the Internet at the address provided above. Requests for additions to or deletions from the list can be entered on the distribution list webpage.

The Data Supplement provides individual data points, where applicable, some summary data, and more detailed accounts of sample collection and analytical methods. The Data Supplement will be sent only upon request; a card for this purpose is included on the last page of this volume. Both the main volume and the Data Supplement are available on the Internet at the address provided above.

As in our previous annual reports, data are presented in Système International (SI) units. In particular, the primary units we use for radiological results are becquerels and sieverts for activity and dose, respectively, with curies and rem used secondarily ($1 \text{ Bq} = 2.7 \times 10^{-11} \text{ Ci}$; $1 \text{ Sv} = 100 \text{ rem}$). If the data are available, radioactivities are reported as the measured concentration with an uncertainty $\pm 2\sigma$ counting error); if not, they are reported as being less than a detection limit. If the concentration is less than the uncertainty, the result is considered to be indistinguishable from a zero concentration. Units are discussed in Supplement 13-1 of Chapter 13, Radiological Dose Assessment, and in Chapter 14, Quality Assurance, in the main volume.

This document is the responsibility of LLNL's Operations and Regulatory Affairs Division of the Environmental Protection Department. Monitoring data were obtained through the combined efforts of the Operations and Regulatory Affairs Division, Environmental Restoration Division, the Chemistry and Materials Science Environmental Services Laboratories, and the Hazards Control Department. Special recognition is deserved for the dedication and professionalism of the technicians who carried out environmental monitoring—Gary A. Bear, David J. Castro, Paul C. Dickinson, Keith Toon, David Macedo, Charles Hunt, Renee Needens, Terrance W. Poole, Donald G. Ramsey, Terri Crippen, and Robert Williams—and to the data management personnel—Jennifer Clark, Kimberly A. Stanford, Louise Morris, Beth Schad, Suzanne Chamberlain, Connie Wells, Della Burruss, and Susan Lambaren. Betty Cuevas provided secretarial support and collated and distributed drafts.

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