

SANDIA REPORT

SAND2000-8210

Unlimited Release

Printed December 1999

Environmental Protection Implementation Plan

RECEIVED

JAN 31 2000

OSTI

R. C. Holland

Prepared by

Sandia National Laboratories

Albuquerque, New Mexico 87185 and Livermore, California 94550

Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the United States Department of Energy under Contract DE-AC04-94AL85000.

Approved for public release; further dissemination unlimited.



Sandia National Laboratories

Issued by Sandia National Laboratories, operated for the United States Department of Energy by Sandia Corporation.

NOTICE: This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government, nor any agency thereof, nor any of their employees, nor any of their contractors, subcontractors, or their employees, make any warranty, express or implied, or assume any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represent that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government, any agency thereof, or any of their contractors or subcontractors. The views and opinions expressed herein do not necessarily state or reflect those of the United States Government, any agency thereof, or any of their contractors.

Printed in the United States of America. This report has been reproduced directly from the best available copy.

Available to DOE and DOE contractors from
Office of Scientific and Technical Information
P.O. Box 62
Oak Ridge, TN 37831

Prices available from (615) 576-8401, FTS 626-8401

Available to the public from
National Technical Information Service
U.S. Department of Commerce
5285 Port Royal Rd
Springfield, VA 22161

NTIS price codes
Printed copy: A03
Microfiche copy: A01



DISCLAIMER

Portions of this document may be illegible in electronic image products. Images are produced from the best available original document.

SAND2000-8210
Unlimited Release
Printed December 1999

Supersedes SAND98-8253, dated November 1998

ENVIRONMENTAL PROTECTION IMPLEMENTATION PLAN

Robert C. Holland
Environmental Operations Department
Sandia National Laboratories/California

ABSTRACT

This *Environmental Protection Implementation Plan* is intended to ensure that the environmental program objectives of Department of Energy Order 5400.1 are achieved at SNL/California. This document states SNL/California's commitment to conduct its operations in an environmentally safe and responsible manner. The *Environmental Protection Implementation Plan* helps management and staff comply with applicable environmental responsibilities.

SANDIA NATIONAL LABORATORIES/CALIFORNIA
ENVIRONMENTAL PROTECTION IMPLEMENTATION PLAN

For the Period:
November 9, 1999 to November 9, 2000
Prepared: October 1999

Prepared by: Environmental Operations Department, 8516
Sandia National Laboratories/California
P. O. Box 969, MS 9221
Livermore, CA 94551-0969

Approved by:

 11/10/99

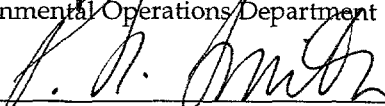
Date

R. C. Holland, 8516
Environmental Operations Department

 11/11/99

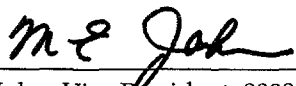
Date

J. J. Bartel, Department Manager, 8516
Environmental Operations Department

 11/16/99

Date

P. N. Smith, Director, 8500
Site Operations Center

 11/18/99

Date

M. E. John, Vice President, 8000
Sandia National Laboratories, California

CONTENTS

Page

1.0 INTRODUCTION	7
1.1 Site Description.....	7
1.2 Environmental Protection Policies.....	9
1.3 Environmental ALARA.....	10
1.4 Environment, Safety, and Health Organization	10
1.5 Environmental Protection Responsibilities	14
1.6 Implementation Plan	15
1.7 Schedule for DOE Order 5400.1.....	17
2.0 NOTIFICATION OF ENVIRONMENTAL OCCURRENCES	18
2.1 Notification Procedures	18
2.2 Notification Requirements.....	19
2.3 Documentation of Environmental Occurrences	21
3.0 GENERAL PLANNING AND REPORTING	22
3.1 Long-range Environmental Protection Plan.....	22
3.2 Annual Site Environmental Report.....	22
4.0 SPECIAL PROGRAMS AND PLANS.....	24
4.1 Groundwater Protection Management Program	24
4.2 Waste Minimization and Pollution Prevention Awareness Program	24
5.0 ENVIRONMENTAL MONITORING PROGRAM	26
5.1 Effluent Monitoring	26
5.2 Environmental Monitoring Plan.....	26
5.3 Environmental Monitoring Activities	28
6.0 QUALITY ASSURANCE AND DATA VERIFICATION.....	29
6.1 Quality Assurance Program.....	29
6.2 Laboratory Certification.....	29
7.0 REFERENCES	30
ACRONYMS AND ABBREVIATIONS	31

ILLUSTRATIONS AND TABLE

	Page
Figure 1. SNL/California site map	8
Figure 2. SNL/California in a regional setting.....	9
Figure 3. SNL/California Environment, Safety, and Health organizational chart	11
Figure 4. SNL/California Environmental Operations Department, organizational chart	12
Table 1. SNL/California's DOE Order 5400.1 Compliance Schedule	17

1.0 INTRODUCTION

Sandia National Laboratories (SNL) is a prime contractor to the Department of Energy (DOE). Sandia Corporation, a wholly owned subsidiary of Lockheed Martin Corporation, manages and operates SNL, which maintains principal facilities in Albuquerque, NM; Livermore, CA; Tonopah, NV; and Kauai, HI.

As one of the United States' multipurpose national laboratories, SNL develops solutions to a wide range of problems facing the country. SNL's mission includes advanced military technology, energy and environmental research, arms control/nonproliferation, and advanced manufacturing technology. In addition, SNL is actively pursuing the transfer of commercially viable technology to the private sector to strengthen our nation's economic competitiveness in world markets. Operations at SNL's California facility in Livermore comprise three broad programmatic areas:

National Security: This program involves national security work, both nuclear and nonnuclear. Defense activities encompass maintenance and safeguarding of the nuclear weapons stockpile, control of the proliferation of nuclear weapons, and aerospace research.

Integrated Manufacturing Technologies: This program uses the systems and technology at the site to enhance the nation's economic competitiveness. Our aim is to be an agile manufacturing test bed for low-cost prototypes and development, as needed by U.S. industries. This program serves as a focus for partnerships with U.S. companies to develop joint manufacturing solutions.

Environmentally Driven Initiatives: This multifunctional program addresses a broad range of initiatives centered on combustion science and technology. Areas of emphasis include combustion processes, sensor technology, modeling, incinerator processes, and global climate change.

SNL/California incorporates the highest regard for environment, safety, and health (ES&H) into every experiment and all site operations. The site operates under the scope of Federal, State, and local regulatory authorities and has obtained all applicable operating permits. SNL is committed to operating in full compliance with the letter and spirit of applicable environmental laws, regulations, and standards. Furthermore, SNL/California strives to go beyond compliance with legal requirements by making every effort practical to reduce impacts to the environment to levels as low as reasonably achievable.

1.1 Site Description

The SNL/California site (Figure 1) covers 1.7 km² (413 acres) of land located on the southeastern boundary of the City of Livermore, in eastern Alameda County, 65 km (40 miles) east of San Francisco (Figure 2). The site lies at the western base of the Altamont Hills, which form the eastern boundary of the Livermore Valley.

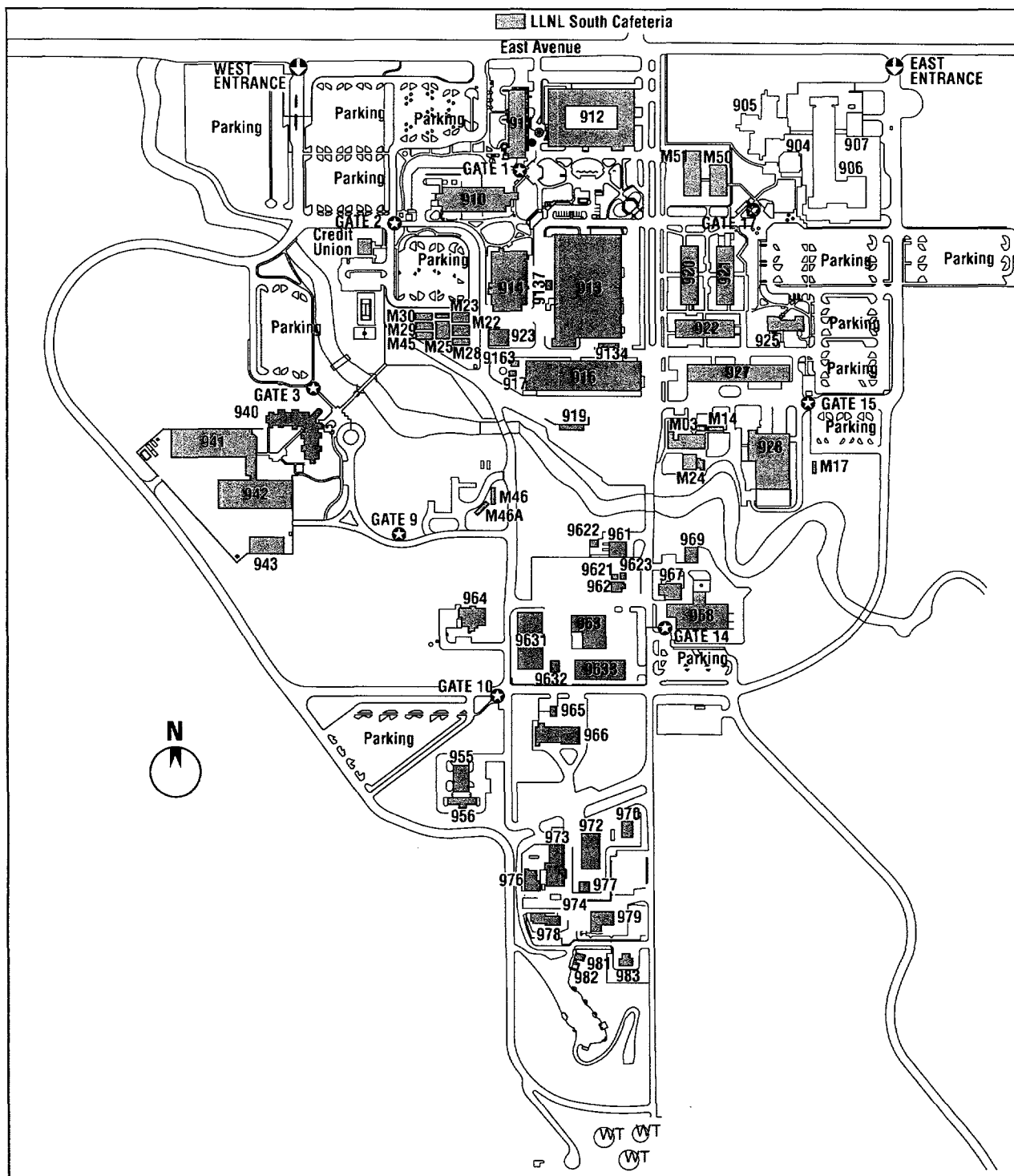


Figure 1. SNL/California site map.

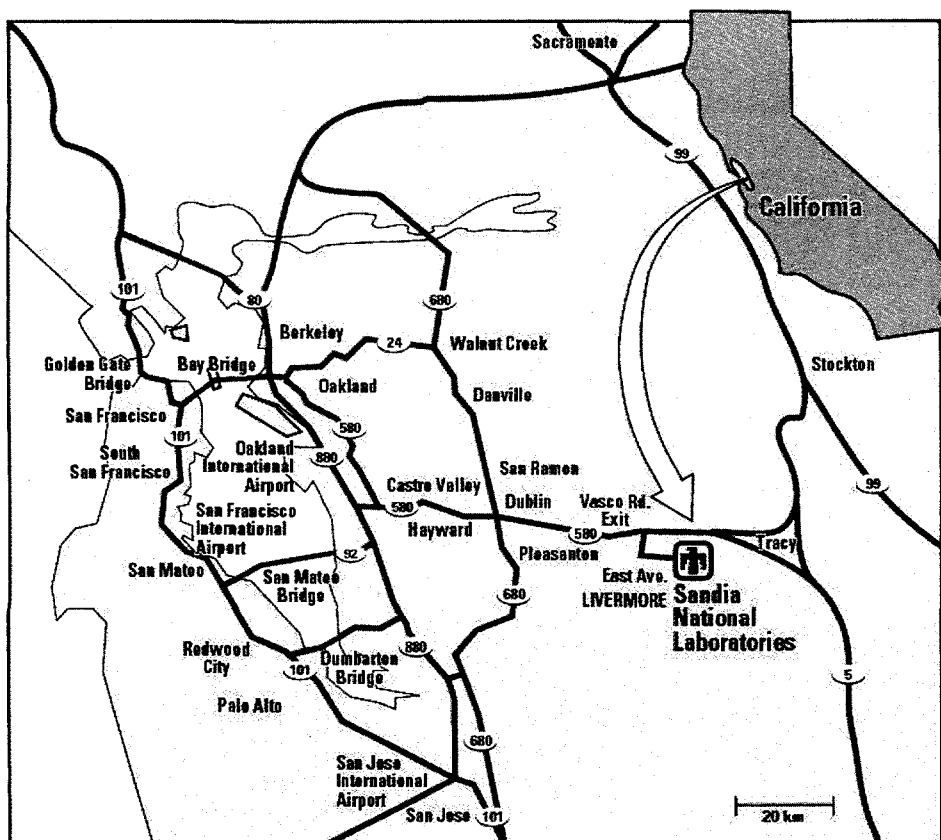


Figure 2. SNL/California in a regional setting.

The Livermore Valley is an irregularly shaped lowland in the Diablo Range of the California Coastal Mountain Range. The valley is approximately 26-km (16 miles) long (east to west) and averages about 11-km (7 miles) wide. The valley floor slopes downward generally to the west at about 10 m/km (50 ft./mile). The elevation is approximately 200 m (660 ft.) at the eastern boundary of the valley and 90 m (295 ft.) at the southwest corner.

The Valley's major drainage is intermittent streams (arroyos). These arroyos generally carry water to the southwest end of the Valley and into the Alameda Creek near Sunol. Alameda Creek then continues on to the San Francisco Bay.

1.2 Environmental Protection Policies

SNL, as part of the DOE Complex, is committed to full compliance with all applicable environmental laws and regulations. This *Environmental Protection Implementation Plan* (EPIP) is intended to ensure that the environmental program objectives of DOE Order 5400.1 are achieved at SNL/California.¹ The EPIP serves as an aid to management and staff to fulfill these responsibilities. SNL has adopted the following corporate ES&H policy:²

Sandia National Laboratories considers the protection and preservation of the environment and the safety and health of its personnel, contractors, visitors, and the public to be critical to its success. SNL shall make deliberate efforts to reduce hazardous exposures and releases to as low as reasonably achievable considering technical, economic, and social factors.

Concerns and conduct in matters pertaining to the environment, safety, and health are the responsibility of all Sandia employees, contractors, and visitors. NO JOB IS MORE IMPORTANT THAN YOUR HEALTH, YOUR SAFETY AND THE PROTECTION OF OUR ENVIRONMENT.

Long-standing DOE policy states that sites will comply with all applicable environmental statutes and regulations. The primary responsibility for assuring compliance with ES&H principles and procedures rests with line managers and those in charge of specific programs and experiments. To support line managers in fulfilling this responsibility, SNL maintains a staff of ES&H professionals.

1.3 Environmental ALARA

DOE Orders require that risks to the public and the environment be kept as low as reasonably achievable (ALARA). This aim is an essential part of corporate citizenship and an element by which the quality of the Laboratories is judged.

Due to the very low level of activities at Sandia/California utilizing radioactive materials, an ALARA committee is no longer required. New or modified projects utilizing radioactive materials are reviewed by Health Physics personnel during the IDT process (see Section 1.6). In addition, large projects determined to require a more in depth ALARA review will be coordinated with the Sandia/New Mexico Radiation Protection Safety Committee.

1.4 Environment, Safety, and Health Organization

At SNL, ES&H is every employee's responsibility. ES&H management combines technical experts (who are educated and/or experienced in specific ES&H fields) with line personnel to implement ES&H requirements throughout the Laboratories. An SNL Quality Leadership Council meets regularly to establish ES&H policy related to issues affecting all of Sandia Corporation.

To fulfill its ES&H commitments, SNL has established a corporate-level ES&H organization. This resides in the Laboratory Services Division at SNL/New Mexico. The ES&H requirements are implemented using written ES&H programs and procedures.

SNL/California has an ES&H organization to carry out the corporate ES&H vision. Its organizational structure is shown in Figure 3. This organization develops and implements ES&H programs and ensures compliance with regulations specific to the California site.

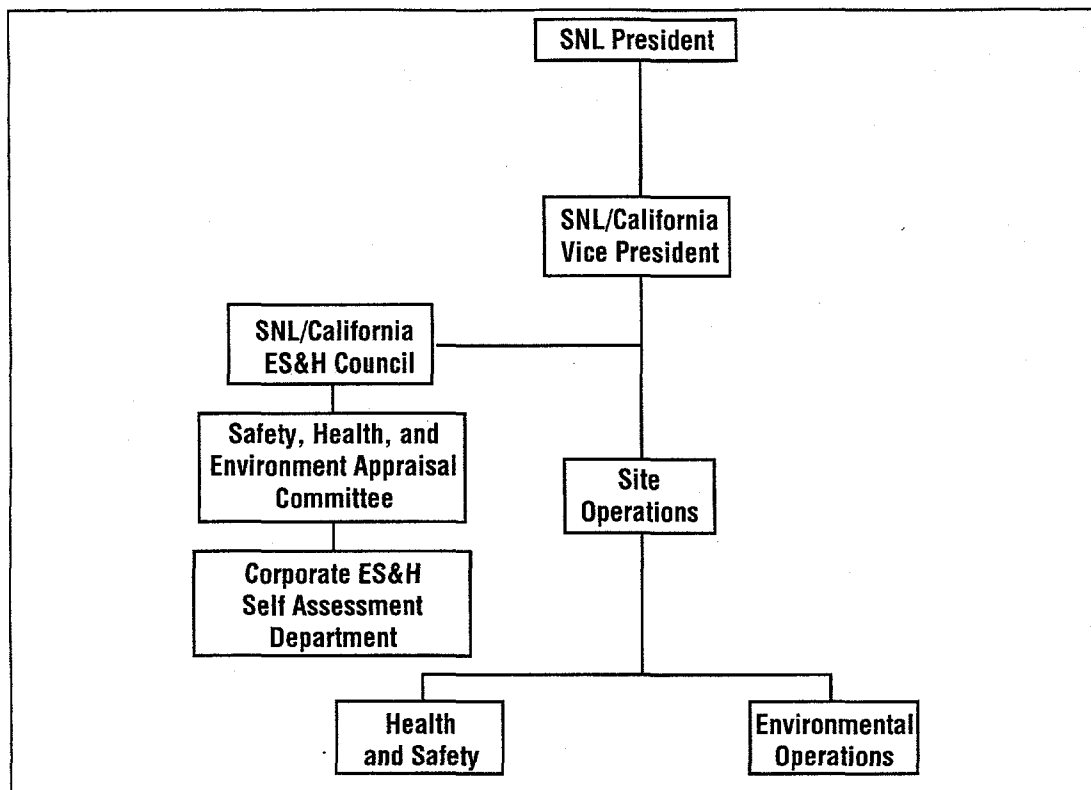


Figure 3. SNL/California Environment, Safety, and Health organizational chart.

1.4.1 Site Operations Center

The Site Operations Center is responsible for ES&H at the SNL/California site. An important part of the center's mission is to ensure the health and safety of SNL/California employees and the general public, and to protect the environment. The primary objective of the ES&H departments is to provide guidance and assistance to the line organizations in order that they might meet the requirements of ES&H laws and regulations in the most efficient manner possible. The Site Operations Center has two departments involved in ensuring workplace safety and protection of the environment: Health and Safety, and Environmental Operations.

The environmental programs at SNL/California are consolidated in the Environmental Operations Department, which is responsible for this plan. Therefore, the functions of this department are described below.

The ES&H departments receive funding from both direct (programs specifically funded by DOE) and indirect (programs funded from site overhead) sources. Directly funded programs include Environmental Restoration, Waste Management, and Pollution Prevention.

1.4.2 Environmental Operations Department

The Environmental Operations Department is responsible for ensuring that SNL/California operations have minimal impact on the environment. The department provides guidance to line organizations to help them comply with applicable environmental regulations and DOE orders. A staff of professionals provides consultation, safety reviews, and evaluations for the California site. To fulfill its mission, the department has groups responsible for waste management, environmental restoration, pollution prevention, environmental surveillance, air quality, environmental planning, and wastewater and storm water management (see Figure 4). The following sections briefly describe these groups and the programs for which they are responsible.

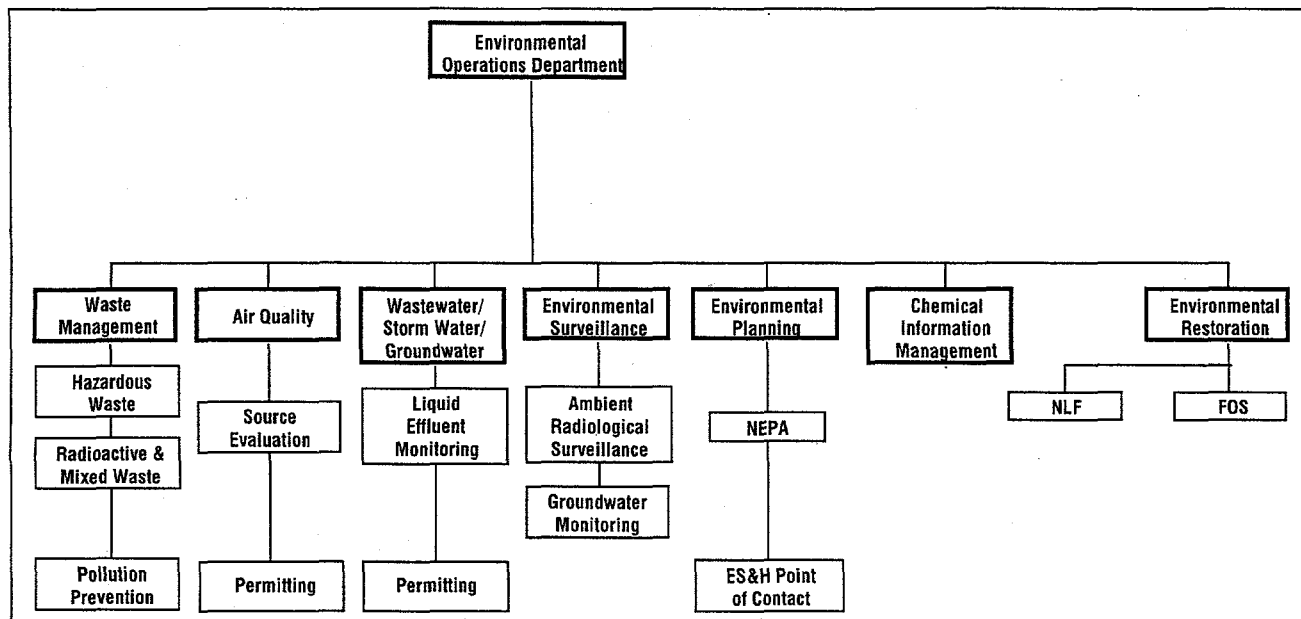


Figure 4. SNL/California, Environmental Operations Department organizational chart.

Waste Management

The Waste Management Program manages hazardous, radioactive, energetic, medical, and mixed wastes. Responsibilities include picking up, transporting, storing, and disposing of wastes in accordance with DOE, EPA, and State regulations. The Waste Management Program also is responsible for employee training in hazardous waste generation, disposal, and spill control and remediation. The only waste treatment processes done on-site are compaction (to reduce waste volume), consolidation, and commingling. No transuranic or high-level waste is generated at this site. No hazardous, radioactive, or mixed waste has ever been disposed of on site by SNL/California.

Environmental Restoration

The Environmental Restoration Program is responsible for assessing the extent of historical contamination at the SNL/California site and managing any necessary restoration efforts. This program also is responsible for characterizing groundwater flow, for monitoring groundwater, and for managing the underground storage tank program. The group fulfills SNL/California's responsibilities under the *Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)*.

Pollution Prevention

The Pollution Prevention Program is responsible for promoting pollution prevention and source reduction of all wastes, for all site activities. This program performs pollution prevention opportunity assessments (PPOAs) for the site. Other program activities include gathering process information, recycling, and sanitary waste treatment. SNL/California has a waste minimization coordinator to manage this effort.

Environmental Surveillance

The Environmental Surveillance Program at SNL/California assesses potential impacts to the public and the environment from site operations. The program assesses the general environment of SNL/California and nearby vicinity to verify that emission controls are effective in preserving the local environs. The program conducts these activities to ensure that SNL/California complies with Federal, State, and local regulations and DOE orders governing protection of the environment (specifically the *National Emission Standards for Hazardous Air Pollutants* (NESHAPs) Rule for Radionuclides, under the Federal Clean Air Act).⁴ The group prepares numerous reports and other documents to demonstrate compliance.

Air Quality

The Air Quality Program is responsible for the regulatory compliance of all air emission sources at the SNL/California site. This program does the following:

- Updates the site air emissions inventory.
- Evaluates SNL/California operations that are potential sources of air pollutants.
- Determines and documents compliance requirements.
- Maintains compliance records.
- Prepares reports and permit applications required by air quality regulations.
- Manages a voluntary Trip Reduction Program, which surveys employee/contractor transportation methods and educates employees and contractors about transportation alternatives.

The Air Quality Program also works with managers to formulate strategies to achieve compliance with applicable air emissions regulations.

Environmental Planning

The Environmental Planning Program is responsible for implementing NEPA at the SNL/California site by evaluating proposed projects, activities, and programs for potential environmental and human impacts. Key environmental concerns include potential air emissions (through vents or stacks on buildings), water effluents (storm water or sanitary sewer outfall), human exposure to hazardous substances, and waste generation and minimization.

In addition, the Environmental Planning Program acts as the point of contact for the ES&H Interdisciplinary Team (IDT). The IDT comprises representatives from the ES&H, facilities management, and security programs. The IDT is responsible for providing guidance to the line organizations as they plan and implement projects on or off site. By reviewing proposed projects early in the planning stages, the IDT helps make sure that projects begin on time and that consideration is given to the various programmatic requirements at SNL/California.

Wastewater/Storm Water/Groundwater Management

The Wastewater/Storm Water Management Program is responsible for ensuring that SNL/California complies with all Federal, State, and local regulations and DOE orders regarding the quality of wastewater and storm water discharges. The Program is also responsible for compliance groundwater monitoring. The Program monitors these discharges both visually and through analytical effluent sampling. The Program ensures that SNL/California site activities do not negatively impact the quality of surface waters in the vicinity and in the San Francisco Bay. The Program verifies that wastewater and storm water discharges are in compliance with established standards and requirements, respectively. The Program prepares numerous reports, permit applications, and other documents to demonstrate compliance.

1.4.3 Self-Assessment Program

Integration of corporate ES&H self-assessment information is the function of the ES&H Assessment Department (12870). Integration and evaluation focuses on the processes used to control ES&H performance and progress in meeting both corporate-level performance objectives and the performance objectives that self-assessing organizations set. The integrated information from self-assessments, information from the corporate performance objective and performance indicator analyses, information from external assessments, results of Lockheed Martin Corporation self-assessments, and any other pertinent information are combined and reported to the SNL Self-Governance Committee. These reports are provided on a quarterly basis. The ES&H Assessment Department (12870) also:

- Develops and manages the internal ES&H assessment program and processes within SNL.
- Provides tools and guidance to SNL management and staff for use in conducting ES&H assessments.
- Coordinates, conducts and follows up on internal, independent ES&H assessments in partnership with the corporate Internal Audit Department (12830).
- Coordinates and prepares ES&H information for reporting SNL ES&H performance for the DOE/SNL laboratory appraisal agreement.

1.5 Environmental Protection Responsibilities

This section describes the organizations and individuals responsible for ensuring compliance with DOE Order 5400.1.¹ Compliance includes incorporating the 13 responsibilities required of the Head of the Field Organization, as identified in the Order [pages 12_14, paragraphs f. (1)_f. (13)]. The responsibilities are listed below in the context of how SNL/California fulfills them:

1. The SNL Leadership Council issues environmental policy statements and goals.
2. Line organizations, with the help of the Environmental Operations Department, ensure that all SNL/California operations comply with applicable environmental laws and regulations.

3. The ES&H coordinators and the Environmental Operations Department personnel facilitate implementation of the ES&H programs.
4. The Environmental Operations Department coordinates the receipt and renewal of all required environmental permits for SNL/California operations.
5. The Self-Assessment Program (with line participation) conducts internal environmental assessments of SNL/California programs, projects, and facilities in accordance with DOE Order 450.4 and other ES&H requirements.⁵
6. The Environmental Operations Department maintains liaison with appropriate Federal, regional, State, and local environmental officials to facilitate effective environmental management. This liaison with regulatory agencies is conducted in accordance with the protocols established by the DOE Albuquerque Operations Office (DOE/AL), Kirtland Area Office (DOE/KAO).
7. The Site Operations Center works with the Procurement Services Department to:
 - a. develop and implement programs that direct contractors to execute environmental protection compliance programs; and
 - b. oversee, confirm, and independently verify these contractor programs.
8. The Environmental Operations Department prepares long-range environmental protection plans.
9. The Site Operations Center ensures that budget requests provide for required environmental protection upgrades.
10. The Environmental Operations Department oversees the preparation of the semiannual pollution abatement plans.
11. The Environmental Operations Department gives DOE Headquarters (DOE/HQ) all environmental information and documentation requested by the DOE.
12. Any SNL employee has the authority and the responsibility to curtail or suspend any operation that poses a clear and present danger to members of the public or the environment.
13. The Site Operations Center and the Public Information Office provide public information and educational materials about SNL/California's environmental protection programs.

1.6 Implementation Plan

ES&H concerns are built into projects from planning to completion. Projects are reviewed by the appropriate authorities, including the Environmental Planning Program, the Health Physics Program, and the Pollution Prevention Program. The aim is to reduce risks to employees, the public, and the environment to the lowest reasonable levels. The procedures used to implement ES&H requirements are identified below.

1.6.1 Early Planning

SNL/California's Interdisciplinary Team (IDT) is the point of contact for incorporating ES&H requirements in a project before it begins. It brings together line organizations and key support organizations to address the various programmatic requirements at SNL/California in relation to the ES&H requirements. The IDT comprehensively reviews proposed projects.

The IDT also incorporates NEPA review, guidance and consultation in a project's early planning stages. The NEPA process assures that all risks of a proposed action are considered, controls or mitigation of hazards are planned, and pollution prevention and waste minimization are considered before operations begin.

1.6.2 Department Manager Responsibilities

Managers have the following responsibilities for implementing ES&H requirements:

- 2 Implement the SNL ES&H policy and programs, establish appropriate procedures within their departments, and communicate SNL's ES&H policy and expectations to all employees.
- 3 Identify and assign department staff to implement the ES&H programs and procedures within the organization.
- 4 Approve Preliminary Hazard Surveys, Qualitative Risk Assessments, ES&H Safe Operating Procedures (SOPs), and corrective action reports.
- 5 Set ES&H goals for the department and establish metrics to measure progress toward those goals.
- 6 Establish a manager-led self-appraisal activity, to include participating in management and functional appraisals of facilities and project activities.
- 7 Survey all facilities or project activities within the department for ES&H compliance, at least semiannually.
- 8 Hold a department meeting semiannually to discuss ES&H performance with respect to metrics and to draw out employees' ES&H concerns.
- 9 Maintain ES&H documentation, including training records, meeting records, and reviews of relevant Web-based information.

1.6.3 Employee Training

Department managers are responsible for making sure that all employees and contractors are trained appropriately in ES&H. The Corporate Training & Development Department designs, develops, and presents all Laboratory-wide ES&H training for employees, contractors, and visitors. As needed, the ES&H Training Group may request assistance from line organizations or contractors with acknowledged expertise. This assistance may include developing qualification guidelines for instructors. The ES&H Training Group also maintains the database of ES&H training records.

1.7 Schedule for DOE Order 5400.1

Table 1 contains SNL/California's schedule for complying with the reporting requirements of DOE Order 5400.1.¹

Table 1. SNL/California's DOE Order 5400.1 Compliance Schedule.

Report/Plan	Original Due Date	Review/Update
Implementation Plan	11/9/89	none/annual
Site Environmental Report	annual (6/1)	none/annual
Groundwater Protection Management Program Plan	5/9/90	annual/every 3 years
Waste Minimization Pollution Prevention Awareness Program Plan	11/1/91	annual/every 3 years
Environmental Monitoring Plan	11/9/91	annual/every 3 years

2.0 NOTIFICATION OF ENVIRONMENTAL OCCURRENCES

Pursuant to DOE Orders 5400.1 and 232.1A, SNL/California, as a DOE-operating contractor, is responsible for appropriately reporting environmentally significant events.^{1,6} SNL/California will comply with the notification criteria contained in the DOE emergency preparedness orders (DOE Order 5500 series). Various Federal, State, and local laws and regulations also require SNL/California to report environmentally significant occurrences.

2.1 Notification Procedures

SNL/California has established procedures for notifying the DOE and appropriate regulatory agencies of environmental occurrences. The notification procedures are described below.

2.1.1 Line Organizations

Every employee in every line organization has been instructed to report environmental incidents of any type to the ES&H Hotline, ext. 4-ES&H (4-3724), at SNL/California. The Occurrence Reporting Group, in the Security Operations Department, provides training in occurrence reporting procedures and responsibilities to all SNL/California employees and contractors.

2.1.2 Site Operations Center

The Occurrence Management Group in the Site Operations Center evaluates incidents and determines the appropriate level of notification. The Security Operations Department maintains the SNL/California *Emergency Preparedness Plan*. This plan includes "Emergency Plan Implementation Procedures," which address notification responsibilities. As appropriate, Site Operations Center notifies DOE/KAO, SNL/New Mexico organizations, and other agencies of any incidents.

2.1.3 DOE Kirtland Area Office

DOE/KAO is responsible for reporting events to the DOE/AL Emergency Operations Center (EOC). DOE/KAO acts as a liaison between SNL/California and Federal, State, and local agencies.

2.1.4 DOE Albuquerque Operations Emergency Operations Center

If necessary, the DOE/AL EOC notifies the DOE/HQ EOC, which in turn notifies the appropriate DOE/HQ Program Office and the Assistant Secretary for ES&H.

2.1.5 Reporting Occurrences or Complaints After Working Hours

If an event or condition requires immediate attention or emergency response, the employee involved is to call the Sandia emergency phone number, ext. 911. This extension connects to the Central Alarm System (CAS), which dispatches the appropriate emergency response personnel. The CAS then notifies the appropriate Sandia Occurrence Management Representative (OM Rep.). (An OM Rep. is available 24 hours a day.)

If an event or condition does not require emergency response, employees are to call the ES&H Hotline, which is answered by the CAS after hours. The CAS notifies an OM Rep. the OM Rep. determines if the event or condition is reportable under DOE Order 232.1A.⁶ If it is, the OM Rep. notifies the appropriate facility manager, and the occurrence is reported to DOE/KAO, DOE/AL EOC, DOE/HQ (Assistant Secretary for Defense Programs-DP-1), and SNL/New Mexico, as necessary. If it is not reportable under DOE 232.1A, or if the call is a complaint rather than a report of an occurrence, the OM Rep. follows up to see that appropriate action is taken to resolve the problem.

2.2 Notification Requirements

DOE Orders clearly state that DOE operations are to be conducted in full compliance with all applicable environmental laws and regulations. SNL/California is committed to this policy. Proper communication is a vital component of this commitment. SNL/California has policies and procedures to ensure proper and timely notification of the appropriate organization or regulatory agency in case of environmental occurrences.

Operations at SNL/California are regulated under a wide range of environmental statutes. The type and magnitude of an environmental occurrence dictate which agencies are to be notified. Some of the agencies that may need notification include:

- Lead DOE Agency
- National Response Center
- Office of Emergency Services
- EPA
- California EPA (Cal-EPA)
- Coast Guard
- Department of Transportation (highway spills)
- San Francisco Bay Area Regional Water Quality Control Board (RWQCB)
- Bay Area Air Quality Management District (BAAQMD)
- Alameda County
- City of Livermore
- California Department of Health Services

2.2.1 Department of Energy

General Requirements for Notification

SNL/California notifies the DOE of significant environmental occurrences and significant "near misses" in accordance with the requirements of DOE Order 232.1A.⁶ The Site Operations Center at SNL/California is responsible for appropriately notifying DOE/KAO, which notifies DOE/HQ. SNL/California also notifies DOE/KAO any time that an environmental occurrence is reported to an outside agency.

Occurrence Reports

Occurrence reports (ORs) are required for any off-normal or unplanned event having programmatic significance, such that it adversely affects or potentially affects performance, reliability, or safety of a facility. An example is a "near miss", which is a situation that could have resulted in an accident (but did not). The Occurrence Reporting Program is responsible for complying with the OR requirements described in DOE Order 232.1A.⁶

SNL/California reports events or conditions significant enough to require an OR to the DOE, in accordance with the time requirements specified in DOE Order 232.1A.⁶ All reportable incidents require the facility manager to submit a written report to the DOE within 24 hours. Depending on the severity of the occurrence, oral notification to DOE/HQ and DOE/KAO may be required within 15 minutes to 2 hours of an incident.

2.2.2 Environmental Protection Agency

The EPA has established emergency notification requirements, which are published in Title 40, Code of Federal Regulations (CFR), Parts 112, 117 and 302 (CERCLA).⁷ Under CERCLA, SNL/California (through the DOE) reports any hazardous pollutant release exceeding the reportable quantity to the National Response Center within 24 hours.

The EPA has established reportable quantities for specific chemicals and radionuclides. The SNL/California Environmental Operations Department is responsible for maintaining the list of reportable quantities. Line organizations are responsible for reporting all releases of one pint/one pound or more of any chemical or radionuclide on the list to Environmental Operations Department personnel, who will evaluate all releases and determine the appropriate level of notification. An unplanned release that exceeds a reportable quantity must be reported to the National Response Center and to the DOE under the requirements of DOE Order 232.1A. Environmental Operations personnel are responsible for immediately notifying the appropriate center director, department managers, and the OM Rep., who ensures that the DOE is notified per DOE Order 232.1A requirements.

2.2.3 State of California Bay Area Air Quality Management District

SNL/California is required to notify the BAAQMD of any excess air emission or system failure, defined as:

- A failure of pollution abatement equipment resulting in an unplanned release to the atmosphere.
- An unplanned release to the atmosphere of a NESHAPs regulated material that exceeds the reportable quantity.³
- A violation of the requirements stated in any air discharge permit held by SNL/California.

An unplanned air release that requires reporting to the BAAQMD is reportable to the DOE under DOE Order 232.1A requirements. The Air Quality Program will notify the Environmental Operations Department manager and the OM Rep., who will ensure that the DOE is informed.

2.2.4 City of Livermore Water Reclamation Plant

The *Clean Water Act* (CWA) establishes standards for industrial discharges to waterways and Publicly owned Treatment Works (POTWs). SNL/California holds a discharge permit issued by the City of Livermore Water Reclamation Plant (LWRP). This permit requires SNL/California to notify the LWRP of any discharge that exceeds permit limits, including any release that may harm treatment plant operations.

SNL/California may notify the LWRP two ways:

1. If a release to the sanitary sewer system exceeds permit limits, the knowledgeable Environmental Operations Department engineer will immediately notify the responsible DOE/KAO staff member, who will notify the LWRP. If a DOE/KAO representative cannot be contacted, the SNL/California engineer will notify the LWRP directly.

2. Within 30 days, the SNL/California Environmental Operations Department will submit a written investigation report of the incident to DOE/KAO, which will forward the report to the City of Livermore.

2.3 Documentation of Environmental Occurrences

2.3.1 DOE Requirements

Following an environmental occurrence, SNL/California will prepare a written report in accordance with the requirements of DOE Order 232.1A.⁶ The appropriate facility manager is responsible for ensuring that the reports are transmitted electronically to the Occurrence Report and Processing System database. The Environmental Operations Department is responsible for maintaining evidence files and copies of all reports. These reports are made available to auditors and regulatory agencies.

2.3.2 Annual Summary and Public Disclosure

Environmental occurrences are summarized each year in the *Site Environmental Report*.⁸ This report is available to the DOE, regulatory agencies, and the general public.

3.0 GENERAL PLANNING AND REPORTING

3.1 Long-range Environmental Protection Plan

Chapter III of DOE Order 5400.1 requires that each DOE field organization develop a long-range environmental protection plan.¹ This plan should define specific environmental objectives and outline strategies for attaining those objectives, to include budgetary and staff resources, as well as milestones.

The Environmental Operations Department satisfies this requirement for SNL/California by providing information for the DOE's *Environmental Restoration and Waste Management Five-Year Plan*.⁹

3.2 Annual Site Environmental Report

3.2.1 Purpose

DOE Order 5400.1 requires each DOE site to prepare an annual summary environmental report.¹ SNL/California's *Site Environmental Report* documents all significant environmental activities throughout the year.⁸ It presents effluent and environmental monitoring data and discusses the Environmental Restoration Program and other environmental protection activities. The report also evaluates SNL/California's compliance records according to applicable environmental standards and includes a compliance summary section, which discusses any areas of noncompliance. The report's major emphasis is environmental management performance, which is evaluated by how well SNL/California's environmental protection activities comply with environmental laws and regulations. A quality section expresses Sandia's efforts to continually improve its corporate citizenship. In addition, SNL/California works to make the document easy for the general public to understand.

3.2.2 Site Environmental Report Preparation

The *Site Environmental Report* is prepared by the Environmental Operations Department and is approved by DOE/AL. Its preparation is an ongoing process.

3.2.3 Site Environmental Report Format

DOE Order 5400.1, Attachment II-1, "Suggested Content and Format for Annual Environmental Reports," establishes the scope and format for the site environmental report.¹ SNL/California's *Site Environmental Report* conforms to this format.

3.2.4 Organizations Involved in Report Production

Preparation of the *Site Environmental Report* is a cooperative effort among several organizations. The Environmental Operations Department holds overall responsibility for documenting all relevant environmental protection activities in the calendar year and using that information to produce the report. The final draft of the report is delivered to DOE/KAO according to a negotiated production schedule.

Off-site monitoring for external radiation exposure in the vicinity of SNL/California is conducted by LLNL's Environmental Monitoring Section (EMS). The EMS transmits monitoring data to the SNL/California Environmental Operations Department for review and inclusion in the *Site Environmental Report*. The arrangement for environmental monitoring between SNL/California and LLNL is discussed further in Section 5.0.

After the Environmental Operations Department has completed the report, it is reviewed by SNL/California management. It is forwarded to DOE/KAO for further review and approval and then to DOE/HQ for final review and approval.

4.0 SPECIAL PROGRAMS AND PLANS

4.1 Groundwater Protection Management Program

Under DOE Order 5400.1, SNL/California is required to establish a program for groundwater protection management.¹ The Environmental Operations Department maintains a *Groundwater Protection Management Program Plan* (GPMPP),¹¹ which is reviewed annually and updated at a minimum of once every three years.

The Environmental Restoration Group is responsible for implementing the GPMPP. The DOE Office of Environmental Restoration and Waste Management provides funding for the Groundwater Protection Program, which is projected into a five-year, DOE-approved baseline budget. When programmatic requirements increase or deviate from the baseline, SNL/California submits requests for funding changes to the DOE for approval.

To avoid duplication of effort, SNL/California may use existing plans, permits, and other technical compliance documents, in whole or in part, to satisfy GPMPP requirements. These may include documents prepared to ensure compliance with environmental protection acts, to include the Safe Drinking Water Act (SDWA), the Resource Conservation and Recovery Act (RCRA), CERCLA, CWA, and local regulatory acts, such as the Porter-Cologne Water Quality Control Act and Safe Drinking Water and Toxic Enforcement Act (Prop. 65).

DOE Order 5400.1 requires completion of a groundwater monitoring plan to be included as part of the GPMPP. SNL/California's groundwater monitoring plan incorporates elements of the ongoing groundwater monitoring program developed to meet the requirements of the Environmental Restoration Program. This program is ongoing at SNL/California, in compliance with RWQCB Compliance Order 89-184.¹²

4.2 Waste Minimization and Pollution Prevention Awareness Program

SNL/California's Waste Minimization and Pollution Prevention Awareness Program is an organized, comprehensive, and continual effort to reduce waste generation and to eliminate or minimize pollutant releases to all environmental media from all aspects of site operations. These efforts offer increased protection of public health and the environment. They also yield the following benefits:

1. Reduce waste management and compliance costs.
2. Reduce resource usage.
3. Improve product yields.
4. Reduce or eliminate inventories and the potential for release of hazardous chemicals reportable under the *Emergency Planning and Community Right-to-Know Act*.
5. Reduce or eliminate the potential for civil and criminal liabilities under environmental laws.

SNL/California has a full-time waste minimization coordinator, who is responsible for site-wide waste minimization activities.

SNL/California's *Waste Minimization and Pollution Prevention Awareness Program Plan* contains the guidance and the regulatory requirements for waste minimization and pollution prevention for the site.¹³ DOE, EPA, and Cal-EPA guidance was used in developing this plan.

The program reflects SNL/California's goals and policies for waste minimization and represents an ongoing effort to make pollution prevention part of Sandia's operating philosophy. In accordance with DOE policy, SNL/California applies a hierarchical approach to waste reduction of all types of waste.

The first principle of waste minimization is eliminating or minimizing waste generation through source reduction. If possible, waste materials that cannot be eliminated or minimized are reused and/or recycled (i.e., reclaimed). To the greatest extent possible, all waste is treated to reduce volume, toxicity, or mobility before storage or disposal.

5.0 ENVIRONMENTAL MONITORING PROGRAM

The Environmental Operations Department is responsible for the Environmental Monitoring Program. This program ensures that site operations comply with all Federal, State, and local regulations and DOE orders regarding emissions to the environment. The Environmental Surveillance Program is responsible for assessing the impacts of SNL/CA operations on the environment.

Environmental monitoring at SNL/California consists of three major parts:

- Liquid effluent monitoring.
- Modeling off-site doses.
- Direct radiation monitoring.

Because the two DOE sites in Livermore (LLNL and SNL/California) are adjacent to each other, distinguishing between their environmental impacts is frequently impossible. Therefore, SNL/California and LLNL have established a cooperative arrangement for environmental monitoring. (Note: LLNL is also a prime contractor, but is operated by the University of California and reports to the DOE Oakland Operations Office.) The two facilities have prepared and signed a "Joint Statement of Responsibilities for Environmental Monitoring at Livermore."¹⁴ This statement documents each facility's roles and responsibilities for environmental monitoring. Each site monitors its own effluents and performs on-site surveillance. Since SNL/California in recent years has conducted very few operations with radioactive materials, radiological monitoring data from LLNL is no longer sent to SNL/California (with the exception of penetrating radiation measurements made by TLDs).

5.1 Effluent Monitoring

SNL/California monitors liquid effluents to ensure compliance with established limits for release of pollutants into bodies of water. Environmental Operations personnel monitor effluents by collecting and analyzing samples or directly measuring liquid effluents so that they can characterize and quantify any contaminants released to the environment.

The only liquid effluents are discharges to the sanitary sewer system and surface runoff to the storm sewer system. The sanitary sewer effluent from SNL/California is monitored for pollutants that could be released from site activities. It then merges with the LLNL sewer effluent at the LLNL sewer outfall before they both are discharged to the city sewer system. Besides ensuring that release limits are not exceeded, SNL/California uses these data as a warning system to ensure that pollutants are not released in concentrations sufficient to affect operations at the LWRP. In case of such discharges, SNL/California notifies both LLNL and the LWRP. SNL/California does not discharge wastewater directly to the ground, arroyo, or any surface water body. Stormwater runoff is monitored twice per year for constituents required by the State's General Industrial Stormwater Permit.

5.2 Environmental Monitoring Plan

DOE Order 5400.1 requires each DOE site using hazardous materials to prepare a site-specific environmental monitoring plan.¹ This plan is to document all aspects of effluent monitoring and surveillance. It must include a thorough description of the monitoring program, rationale, design criteria, and quality assurance.

The Environmental Operations Department has prepared SNL/California's *Environmental Monitoring Plan*.¹⁷ This plan details all elements of the SNL/California Environmental Monitoring Program, as described above. It also summarizes the regulatory requirements (DOE, Federal, State, and local) for monitoring, as well as SNL/California's compliance with these requirements.

The *Environmental Monitoring Plan* addresses four essential elements:

1. *Radiological Monitoring.* The plan addresses the requirements for radiological effluent monitoring and environmental surveillance contained in DOE Orders 5400.5 and DOE/EH-0173T.^{16,17} The plan also ensures compliance with the requirements of Title 40 CFR, Part 61 (NESHAPs),⁴ including an assessment of radiological impact to the public, using EPA-approved methods.
2. *Nonradiological Monitoring.* The plan addresses environmental and effluent monitoring of nonradiological hazardous materials to ensure compliance with Federal, State, and local regulations.
3. *Meteorological Monitoring.* Accurate meteorological data serve many purposes, such as directing environmental monitoring activities, radiological assessment, and emergency response. The meteorological system is part of the Atmospheric Release Advisory Capability (ARAC), a DOE-run network of meteorological stations designed to provide information to emergency response personnel in case of a release of radioactive or toxic materials. Meteorological instruments and supporting equipment conform to ARAC specifications. The *Environmental Monitoring Plan* describes the existing program for meteorological data acquisition.
4. *Groundwater Monitoring Program.* SNL/California has a Groundwater Monitoring Program, as described in Section 4.1, which is documented in the *Environmental Monitoring Plan*.

5.2.1 Environmental Data Management

SNL/California has a database for tracking and archiving environmental data. This system manages field and analytical information generated by environmental monitoring, environmental restoration, and groundwater protection activities. The database is backed up weekly. In addition, the responsible program maintains hard copies of the data for about one year. The data are then transmitted to the ES&H Records Center for retention.

The Environmental Operations Department is responsible for managing environmental data. Each year, these data are summarized in the *Site Environmental Report* (see Section 3.2).⁸ This report also summarizes SNL/California compliance with environmental laws and regulations.

SNL/California has a *Quality Assurance Management Plan* for the Site Operations Center (see Section 6.0),¹⁸ as well as a *Quality Assurance Project Plan*¹⁹ and operating procedures for data verification and management for the Environmental Surveillance Program.

5.2.2 Environmental Monitoring Plan Schedule

In accordance with DOE Order 5400.1, SNL/California implemented all environmental monitoring requirements within three years of the issuance of the order. The Environmental Operations Department submitted the plan to the DOE, and DOE approved it on April 7, 1992. Environmental Operations personnel review it annually and update it at least every three years. (DOE must approve the report every three years.) If needed to complete the report, additional budget and resources will be requested through the regular budgetary process.

5.3 Environmental Monitoring Activities

5.3.1 Implementation

SNL/California's Environmental Surveillance and Wastewater/Stormwater Programs examine the significant pathways by which contaminants can enter the environment. These pathways, from which samples are taken, include ambient air, surface water, soil, sewage, groundwater, storm-water runoff, vegetation, and local foodstuffs. An extensive network of environmental dosimeters also measures external radiation levels. SNL/California also monitors all potentially contaminated liquid effluents by:

1. Sampling storm-water runoff from the site.
2. Sampling sanitary sewer effluents.
3. Monitoring external radiation at the site perimeter.

5.3.2 Reporting

Environmental monitoring data and compliance activities are published in the *Site Environmental Report* (see Section 3.2).⁸ It is sent to the DOE and appropriate regulatory agencies. It is also available to the general public in local public reading rooms.

The Environmental Operations Department is responsible for managing the effluent monitoring and environmental surveillance data and preparing the summary reports.

6.0 QUALITY ASSURANCE AND DATA VERIFICATION

6.1 Quality Assurance Program

DOE Orders 5400.1¹ and 5400.5¹⁶ require a quality assurance program for environmental monitoring that is consistent with DOE Order 5700.6C, which has been replaced by 10 CFR 830.120.²⁰ SNL/California implements these requirements through the Site Operations Center's *Quality Assurance Management Plan*.¹⁸ ES&H personnel used ANSI/ASME NQA-1 1989 as the primary guidance for preparing this plan.²¹ The requirements of the *Quality Assurance Management Plan* are augmented by program plans and operating procedures, which provide task-specific instructions.

The SNL/California Environmental Surveillance Program's *Quality Assurance Project Plan* documents quality assurance elements of the program.¹⁹ This plan provides implementation guidelines for the requirements of the Center's *Quality Assurance Management Plan*.¹⁸ ES&H personnel used DOE Order 5700.6C and ANSI/ASQC-E4-1994 as the primary guidance for preparing the plan.^{20,22} It also covers the quality assurance guidelines in DOE/EH-0173T.¹⁹ The *Quality Assurance Project Plan* establishes program responsibilities to ensure that data are accurate, complete, precise, and representative.¹⁹

Contract laboratories doing analyses for SNL/California's environmental monitoring program are accredited by the Cal-EPA. To receive accreditation, the laboratory must have an implemented quality assurance plan. Periodically, the Cal-EPA inspects accredited laboratories to make sure they are operating within quality assurance requirements.

6.2 Laboratory Certification

All environmental samples collected for regulatory compliance purposes are collected using guidance issued by the EPA. They are analyzed by off-site contract laboratories certified by the Cal-EPA. SNL/California permanently retains the analytical data and associated quality assurance documentation.

7.0 REFERENCES

1. U. S. DOE, Order 5400.1, *General Environmental Protection Program* (November 1988).
2. U. S. DOE, Sandia National Laboratories, *Environment, Safety, and Health Manual*, MN471001 (Rev. 32), Issue AE (July 31, 1995).
3. W. TenBrook, *Administrative Procedure for ALARA Program Implementation*, Sandia National Laboratories/California, Implementing Procedure OP471447 (September 20, 1995).
4. U. S. EPA, Title 40 CFR, Part 61, *National Emission Standards for Hazardous Air Pollutants* (NESHAPs), Subpart H, "Standards for Radionuclides" (1994).
5. U. S. DOE, Order 450.4., *Safety Management System Policy* (August 1997).
6. U. S. DOE, Order 232.1A, *Occurrence Reporting and Processing of Operations Information* (August 1997).
7. U. S. EPA, Title 40 CFR, Parts 112, 117 and 302 (1994).
8. R. C. Holland, *Site Environmental Report for 1996*, Sandia National Laboratories/California, SAND97-8018 (October 1997).
9. U. S. DOE, *Environmental Restoration and Waste Management Five-Year Plan* (July 1990).
10. Executive Order 12088 (October 13, 1976).
11. U. S. DOE, Sandia National Laboratories/California, *Groundwater Protection Management Program Plan* (1993).
12. State of California, San Francisco Bay Region, Regional Water Quality Control Board, Order 89-184 (December 13, 1989).
13. U. S. DOE, Sandia National Laboratories/California, *Pollution Prevention Plan* (May 1994).
14. U. S. DOE, "Joint Statement of Responsibilities for Environmental Monitoring at Livermore," SNL/California and LLNL (August 1, 1993).
15. R. C. Holland, *Environmental Monitoring Plan*, Sandia National Laboratories/California, SAND93-8011B (February 1997).
16. U. S. DOE, Order 5400.5, *Radiation Protection of the Public and the Environment* (February 1990).
17. U. S. DOE, *Environmental Regulatory Guide for Radiological Effluent Monitoring and Environmental Surveillance*, DOE/EH-0173T (1991).
18. U. S. DOE, Sandia National Laboratories/California, *Quality Assurance Management Plan* (November 1994).
19. R. C. Holland, *Quality Assurance Project Plan*, Environmental Monitoring Program, Sandia National Laboratories/California, SAND93-8003 (June 1998).
20. U. S. DOE, Order 5700.6C, *Quality Assurance* (August 1992). Replaced by 10 CFR 830.120, "Quality Assurance Requirements" (October 1997).
21. American Society of Mechanical Engineers, *Quality Assurance Program Requirements for Nuclear Facilities*, ANSI/ASME NQA-1 (1986).
22. American Society of Quality Control, *Quality Assurance Program Requirements for Environmental Programs*, ANSI/ASQC E4-1994

ACRONYMS AND ABBREVIATIONS

ALARA	As low as reasonably achievable
ANSI	American National Standards Institute
ARAC	Atmospheric Release Advisory Capability
ASME	American Society of Mechanical Engineers
BAAQMD	Bay Area Air Quality Management District
Cal-EPA	California Environmental Protection Agency
CAS	Central Alarm System
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CWA	Clean Water Act
DOE	Department of Energy
DOE/AL	DOE Albuquerque Operations Office
DOE/HQ	DOE Headquarters (EH-1)
DOE/KAO	DOE Albuquerque Operations Office, Kirtland Area Office
DOE/OAK	DOE Oakland Operations Office
EMS	Environmental Monitoring Section (LLNL)
EOC	Emergency Operations Center
EPA	Environmental Protection Agency
ES&H	Environment, Safety and Health
GPMP	Groundwater Protection Management Program Plan
IDT	Interdisciplinary Team
LLNL	Lawrence Livermore National Laboratory
LWRP	Livermore Water Reclamation Plant
NEPA	National Environmental Policy Act
NESHAPs	National Emission Standards for Hazardous Air Pollutants
OM Rep.	Occurrence Management Representative
OR	Occurrence Report
POTWs	Publicly-owned Treatment Works
PPOA	Pollution Prevention Opportunity Assessment
RCRA	Resource Conservation and Recovery Act
RWQCB	Regional Water Quality Control Board
SCEC	SNL/California ES&H Council
SDWA	Safe Drinking Water Act
SNL	Sandia National Laboratories
SOPs	Safe Operating Procedures
TRL	Tritium Research Laboratory

DISTRIBUTION:

4 U.S. Department of Energy
Albuquerque Operations Office
Attn.: S. Lacy
J. Johnsen
G. Laskar
B. Oms
V. Zimpel
J. Gould
P.O. Box 5400
Albuquerque, NM 87115

1 MS 0141 B. Krauss, 11300
1 MS 0361 L. Jones, 7000
1 MS 0511 J. Baremore, 1900
1 MS 1309 Environmental Operations Programs Library, 7512
1 MS 1311 S. Hwang, 7575
1 MS 1315 T. Blejwas, 7500
1 MS 1315 R. Rohde, 7501
1 MS 9001 M. E. John, 8000
Attn.: R. C. Wayne, 2200
J. Vitko, 8100
W. J. McLean, 8300
D. Hensen, 8400
T. M. Dyer, 8700
K. Washington, 8900

1 MS 9002 P. N. Smith, 8500
1 MS 9221 J. J. Bartel, 8516
40 MS 9221 R. C. Holland, 8516

3 MS 9018 Central Technical Files, 8940-2
1 MS 0899 Technical Library, 4916
1 MS 9021 Technical Communications Dept. 8528/Technical Library, 4916
1 MS 9021 Technical Communications Dept. 8528, for DOE/OSTI