

**WASTE MINIMIZATION
AND
POLLUTION PREVENTION
AWARENESS
PLAN**

**Lawrence Berkeley Laboratory
Berkeley, California**

Prepared by:

**Environmental Management (EM)
and
Energy Research (ER)**

**Funded Programs
of**

Environment, Health and Safety Division

April, 1994

PUB-3106

DISCLAIMER

This document was prepared as an account of work sponsored by the United States Government. While this document is believed to contain correct information, neither the United States Government nor any agency thereof, nor the Regents of the University of California, nor any of their employees, makes any warranty, express or implied, or assumes any legal responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by its trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof, or the Regents of the University of California. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof or the Regents of the University of California.



Lawrence Berkeley Laboratory

University of California Berkeley, California 94720

(510) 486-4000 • FTS (510) 486-4000

June 1, 1994

DIR:94:253

Karin King
Waste Minimization Coordinator
Department of Energy
Oakland Operations Office
7000 East Avenue
P.O. Box 808, L-574
Livermore, CA 94550

SUBJECT: Revised Waste Minimization and Pollution Prevention Awareness Plan

Dear Ms. King:

Enclosed for review and approval is the recently revised Waste Minimization and Pollution Prevention Awareness Plan for Lawrence Berkeley Laboratory (LBL). This plan has been updated in accordance with the guidance distributed by Deputy Secretary of Energy Bill White in his memorandum dated March 28, 1994.

The plan details efforts which LBL is currently undertaking and will undertake in the future to fulfill the needs of the Laboratory and the Department in meeting important requirements for pollution prevention and waste minimization. LBL is committed to a program which we hope will become a model for all DOE facilities.

Any questions related to this plan should be directed to Brian Smith of my staff. He can be contacted at (510) 486-6508.

Sincerely,

David C. McGraw

Director

Environment, Health and Safety Division

DCM:GM:gm

- c. Tanya Goldman / DOE-BSO
- Mary Gross / DOE-BSO
- Ron Pauer
- Brian Smith
- Kam Tung
- Tim Wan
- Shelley Worsham

**WASTE MINIMIZATION
AND
POLLUTION PREVENTION
AWARENESS
PLAN**

**Lawrence Berkeley Laboratory
Berkeley, California**

**Prepared by:
Environmental Management (EM)
and
Energy Research (ER)
Funded Programs
of
Environment, Health and Safety Division**

April, 1994

PUB-3106

This plan is a key document affecting all activities at Lawrence Berkeley Laboratory (LBL) which potentially generate solid, hazardous, radioactive, and mixed wastes. It is intended to address and comply with Federal and State environmental regulations and describes the administrative controls/strategy approach at LBL. The plan will act as a living document with periodic revisions that will reflect the Program activities as they evolve, change or are implemented.

Director's Policy Statement on Waste Minimization

It is important that Lawrence Berkeley Laboratory (LBL) make a strong commitment to waste minimization—to reduce substantially waste generation and to increase recycling. Our goal is to achieve an overall reduction in the generation of hazardous, radioactive, and mixed waste streams through reduced generation at the source, process changes, employee awareness, administrative controls, and increased recycling.

This policy will be implemented by the establishment of the Waste Minimization and Pollution Prevention Awareness Program. The goal of the program will be to systematically eliminate or reduce the generation of waste from site operations to prevent or minimize the release of pollution in any environmental medium. The program will seek to make source reduction and environmentally sound recycling integral parts of the philosophy and operations of LBL. It will also seek to develop in all employees an awareness of environmental problems and encourage their participation in minimizing the generation of waste materials.

The Waste Minimization and Pollution Prevention Awareness Plan will describe those activities and techniques that will be employed to reduce the quantity and toxicity of wastes generated at the site. This plan will be used to satisfy DOE Order 5400.1 and other environmental requirements that apply to minimization of waste. The Waste Minimization and Pollution Prevention Awareness Plan will be reviewed annually and revised as necessary.

This policy applies to all site operations, associated support operations, and site contractors that generate any type of waste, including hazardous, radioactive, and mixed waste. Each division should establish waste minimization goals and assign responsibilities for achieving these goals. The success of waste minimization will depend on active participation and contribution from every employee of LBL.



Charles V. Shank
Director

TABLE OF CONTENTS

Section	Page
Preface.....	ii
Director's Policy Statement on Waste Minimization	iii
I. INTRODUCTION	1
A. Purpose of Plan	1
B. Scope of Program.....	1
C. Legal and Policy Background.....	3
D. Mission and Site Description	7
II. POLICY	10
A. Statement of Management Support/Commitment.....	10
B. Policy Statement	11
C. Program Plans and Implementing Procedures	11
D. Contractor Waste Minimization and Pollution Prevention Awareness Programs.....	11
E. Vision of the Future	12
III. ORGANIZATION	12
IV. GOALS	14
V. WMin/PP ACTIVITIES AND RESOURCE REQUIREMENTS	15
A. Site-wide Program Elements (EM).....	17
1. WMin/PP Organization and Infrastructure	17
a. Site-wide Minimization Committee	17
b. Site-wide Waste Minimization Specialist	19
2. Program Development	20
3. Employee Involvement	25
a. Pollution Prevention Awareness	25
b. Training Goals.....	26
c. Employee Orientation Program	26
d. Specialized Training Program.....	26
e. Qualification of Personnel Performing Waste Minimization Steps in Work Plans and Procedures.....	27
f. Performance Evaluation.....	27

	g.	Incentive Awards and Recognition	27
4.		Tracking	28
	a.	Materials Tracking	28
	b.	Procurement Control System	28
	c.	Program Tracking	28
	d.	Cost/Benefit Analysis	29
5.		Reporting.....	29
	a.	Waste Generation Baseline	29
	b.	Federal and State Reporting Requirements.....	29
	c.	Environmental Restoration	29
6.		Establish Site-Wide Source Reduction Programs for Hazardous, Radioactive, and Mixed Waste Streams	30
7.		Establish Site-Wide Recycling Programs for Hazardous, Radioactive, and Mixed Waste Streams	30
8.		Establish Site-Wide Source Reduction and Recycling Programs for Sanitary Waste Streams	31
9.		Technical Assistance.....	32
10.		Information and Technology Exchange	32
	a.	Meetings, Workshops, and Seminars	32
	b.	Information Exchange and Outreach	33
	c.	Technology Transfer	34
11.		Program Evaluation.....	34
B.		WMin/PP Generator Implementation Program Elements (ER).....	35
	1.	Generator-Specific WMin/PP Organization and Infrastructure.....	35
	2.	Generator-Specific WMin/PP Program Development	38
	3.	Site-Wide Program Participation	40
	a.	Employee Involvement	40
	b.	Tracking and Reporting Systems	41
	c.	Information Exchange and Technical Assistance	41
	4.	Site/Facility Training	42
	a.	Generator-Specific Training Program.....	42
	b.	Employee Orientation Program	43
	5.	Opportunity Assessments.....	43
	6.	Implement Source Reduction Opportunities for Hazardous, Radioactive, and Mixed Waste Streams	45
	a.	Scope.....	45
	b.	Input Material Changes.....	46

c.	Operational Improvements.....	46
d.	R&D Experiment and Production Process Changes.....	47
e.	Administrative Steps.....	47
f.	Integration of Total Quality Management and Waste Minimization.....	48
7.	Implement Recycling Opportunities for Hazardous, Radioactive, and Mixed Waste Streams.....	48
8.	Implement Source Reduction and Recycling Opportunities for Sanitary Waste Streams.....	49
9.	Design Considerations.....	50
10.	Generator Program Evaluation.....	50
VI.	SITE-WIDE ANALYSIS.....	52
VII.	PROGRAM STATUS.....	53
VIII.	REFERENCES.....	54

APPENDICES

APPENDIX A:	DOE Definition of Waste Minimization and Pollution Prevention	A
APPENDIX B:	SB14 Hazardous Waste Source Reduction and Management Review Act of 1989	B
APPENDIX C:	DOE Waste Reduction Policy Statement.....	C
APPENDIX D:	WMin/PP Goals	D
	1) WMin/PP Goals Table.....	D-1
	2) Appendix F Waste Streams	D-2
APPENDIX E:	Committee Members.....	E
	1) Site-wide WMin/PP Committee Members	E-1
	2) Generator WMin/PP Committee Members	E-2
	3) Affirmative Procurement Committee Members	E-3
APPENDIX F:	Environmental Management (EM) ADS	F
APPENDIX G:	Energy Research (ER) ADS.....	G
APPENDIX H:	Development of Responsive LBL Site-wide WMin/PP Plans and Generator Specific Programs for Successful Crosscut Planning	H
APPENDIX I:	WMin/PP Techniques Applicable to Site Wastes.....	I
APPENDIX J:	WMin/PP Technology Projects.....	J

APPENDIX K: Record of Revisions to this Plan K

FIGURES

Figure I-1: Waste Management Hierarchy 2
Figure I-2: LBL Site Map 8
Figure III-1: Waste Minimization and Pollution Prevention Awareness Program
Organization Chart 13
Figure V-1: Waste Minimization Committee Organization Chart 19
Figure V-2: Dissemination of Information at LBL 21
Figure V-3: Structure of Generator WMin/PP Program 37

Waste Minimization and Pollution Prevention Awareness Plan

Lawrence Berkeley Laboratory Berkeley, California

I. INTRODUCTION

A. Purpose of Plan

The purpose of this plan is to maintain and re-evaluate the Lawrence Berkeley Laboratory (LBL) Waste Minimization and Pollution Prevention Awareness Program. This plan specifies those activities and techniques to be employed which reduce the quantity and toxicity of wastes generated at the site. It is intended to satisfy Department of Energy (DOE) and other legal requirements, including State of California laws and regulations, as discussed in Section I.C. - Legal and Policy Background. The Pollution Prevention Awareness Program is included with the Waste Minimization Program in accordance with DOE Order 5400.1.

B. Scope of Program

A waste minimization program is an organized, comprehensive, and continuing effort to systematically reduce solid, hazardous, radioactive, and mixed waste generation. The LBL Waste Minimization and Pollution Prevention Awareness Program is designed to eliminate or minimize pollutant releases to all environmental media from all aspects of the site's operations. These efforts offer increased protection of public health and the environment and will yield the following additional benefits:

- Reduced waste management and compliance costs;
- Reduced resource usage;
- Reduced or eliminated inventories and releases of hazardous chemicals;
- Reduced or eliminated civil and criminal liabilities under environmental laws.

The program reflects the goals and policies of waste minimization/pollution prevention for LBL and represents an ongoing effort to make waste minimization/pollution prevention an important part of the site's operating philosophy. In accordance with Environmental Protection Agency (EPA) guidelines and DOE policy, a hierarchical approach to waste reduction has been adopted and is applied to all types of waste. Figure I-1 illustrates the waste management hierarchy.

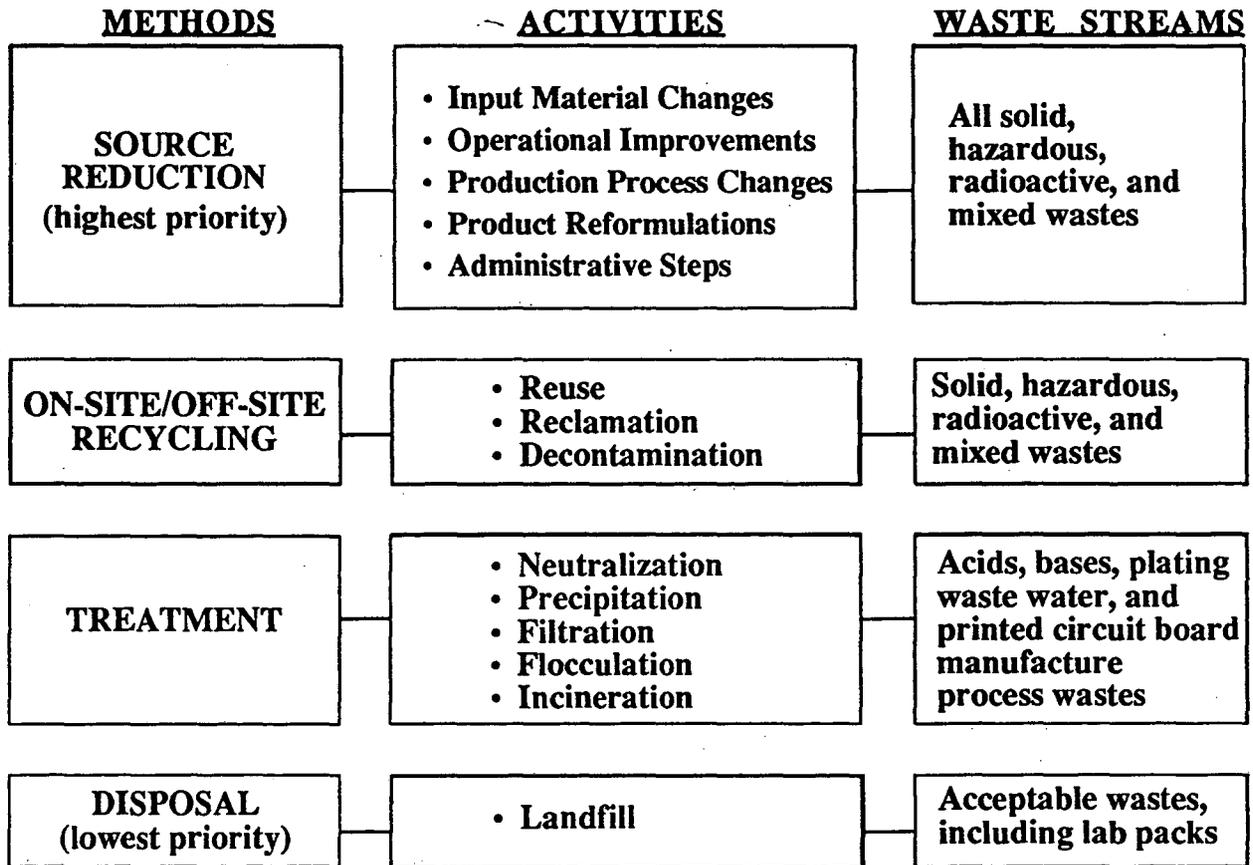


Figure I-1. Waste Management Hierarchy

Waste minimization/pollution prevention will be accomplished by eliminating or minimizing the generation of waste through application of source reduction techniques where appropriate. Those potential waste materials that cannot be eliminated or minimized will be recycled (i.e., reused, reclaimed, or decontaminated) if practicable. Moreover, selected waste streams will be treated to reduce volume, toxicity, or mobility prior to storage or disposal.

The scope of this plan is confined to source reduction, material substitution, and environmentally sound recycling.

This plan is a reference tool and guidance document for managers, operations personnel, and support staff. It contains the policy, objectives, strategy, and support activities of the Waste Minimization and Pollution Prevention Awareness Program. Waste minimization and pollution prevention goals, the development of detailed waste generation information through waste minimization assessments and surveys, and a process for continual evaluation of the program are primary elements of this plan. Various waste minimization/pollution prevention techniques will be implemented with the support of employee training and awareness programs to reduce waste while meeting operational requirements for quality, productivity, safety, and environmental compliance.

Costs continue to be a factor as LBL treats, stores, and disposes of production, laboratory, and legacy wastes, and performs environmental remediation activities. The Laboratory will generate additional wastes as facilities are decontaminated and decommissioned and as new types of production operations are brought on-line. Through early investments in source reduction and environmentally safe recycling, the Laboratory could significantly reduce future waste management costs and, simultaneously, minimize health risks to its workers and the public. As LBL reduces waste generation associated with an activity, it avoids spending a proportional amount in waste management cost. The Laboratory can save waste management costs by applying WMin/PP to operational practices.

The Environmental Protection Agency (EPA) definition of waste minimization is the action taken on wastes that are generated, stored, or disposed of leading to a decrease in volume or quantity, and/or reduction of toxicity or other hazardous characteristics. Waste minimization is divided into three categories: 1) source reduction, 2) recycling, and 3) waste treatment. The U.S. Department of Energy defines WMin/PP as activities that involve source reduction and recycling of all wastes and pollutants. WMin/PP includes practices that reduce the use of materials, energy, water, or other resources and practices that protect natural resources through conservation or more efficient use. A more detailed definition for waste minimization and pollution prevention is provided in Appendix A.

C. Legal and Policy Background

The current trend in environmental regulation is pollution prevention over pollution control. The use of less toxic materials has been promoted by the President, the EPA, the public sector, U.S. private industry, and the general public. Regulations are being promulgated by EPA that encourage source reduction through decreased use of toxic chemicals, energy, and other raw materials.

The Resource Conservation and Recovery Act (RCRA) requires hazardous waste generators to establish a program to reduce the volume or toxicity of waste to the degree determined by the generator to be "economically practicable." Hazardous waste generators must certify in their waste manifests that this requirement has been fulfilled. Generators must also identify in their biennial reports to the EPA, and in many cases to their respective state and local environmental regulatory agencies, the efforts undertaken during the year to reduce the volume and toxicity of generated wastes.

An annual waste minimization certification is required under LBL's Part B Permit. The primary components consist of:

1. The facility has a program in place to reduce the volume and toxicity of all hazardous and mixed wastes which are generated by the facility operations to the degree, determined by the owner and/or operator, to be economically practicable.
2. The method of storage, treatment, or disposal is the only pragmatic method or combination of methods currently available to the facility which minimizes the present and future threat to human health and the environment. A copy of the waste minimization certification shall be included in the operating record.

LBL makes this certification, in accordance with CCR, Title 22, Section 66270.11, by March 1. LBL submits the certification to the Department's Region 2 Facility Permitting Branch Chief and shall record and maintains on-site such certification in the facility Operating Record.

DOE Orders 5400.1 and 5820.2A mandate that the management of hazardous, radioactive, and mixed wastes shall be accomplished in a manner that minimizes the generation of such wastes.

DOE Order 5400.1 further establishes environmental protection program requirements and responsibilities for assuring compliance with environmental protection laws. The Order requires the establishment of a Waste Minimization Program "that will contain goals for minimizing the volume and toxicity of all wastes that are generated" and a Pollution Prevention Awareness Program. The Waste Minimization and Pollution Prevention Awareness Programs are to be established through implementing plans. The implementing guidance to DOE Order 5400.1 permits the consolidation of the two programs and implementing plans.

DOE Order 5820.2A establishes policies, guidelines, and minimum requirements by which DOE manages its radioactive and mixed waste, and contaminated facilities. It states that the

"generation, treatment, storage, transportation, and/or disposal of radioactive wastes, and the other pollutants or hazardous substances they contain, shall be accomplished in a manner that minimizes the generation of such wastes across program office functions and complies with all applicable Federal, state, and local environmental, safety, and health laws and regulations and DOE requirements."

The Order requires the preparation of a waste management plan for each facility that generates, treats, stores, or disposes of DOE wastes. The elements of the waste management plan are incorporated into the site-specific plan, which "will indicate actions to minimize hazardous waste generation", as specified in the Order.

DOE Order 5820.2A contains specific waste minimization requirements for management of high-level, transuranic, and low-level waste. These requirements include the use of source reduction techniques such as process modification, process optimization, and materials substitution.

DOE's Waste Reduction Policy Statement requires all DOE program offices and field operations to "institute a waste reduction policy to reduce the total amount of waste that is generated and disposed of by DOE operating facilities through waste minimization (source reduction and recycling) and waste treatment." This policy consolidates the requirements of DOE Orders 5400.1 and 5820.2A for either a waste minimization or a waste reduction plan and provides guidance for satisfying the reporting requirements of those orders. The statement adopts the hierarchical approach to waste reduction and applies the policy to all types of waste. The policy requires waste reduction to be a "prime consideration" in research activities, process design, and in facility design and operations.

LBL is impacted by various California environmental laws and regulations regarding waste minimization activities. One law in particular, the Hazardous Waste Source Reduction and Management Review Act of 1989 (commonly known as Senate Bill 14 or SB14), describes requirements for hazardous waste generators. The goal of SB14 is to reduce the generation of hazardous waste at its source, reduce releases into the environment of chemicals that have adverse and serious health or environmental effects, document hazardous waste management information, and make that information available for public review.

SB14 requires that generators of hazardous waste in excess of specified annual amounts prepare documentation of their activities by September 1, 1991. Every four years thereafter, a review of annual waste generation masses is required, and if necessary, supplemental reports. The documents include:

- **Source Reduction Evaluation Review Plan and Plan Summary** -prospective documents, which include an estimate of the quantity of hazardous waste generated, an evaluation of potential source reduction approaches, and a timetable for implementing selected source reduction measures;
- **Hazardous Waste Management Performance Report and Report Summary** - retrospective documents, which must assess the effect of each waste management approach implemented since the baseline year, including source reduction, recycling, or treatment measures;
- **Goals** - four-year numerical source reduction goals must be established to reflect waste stream reductions due only to source reduction, excluding effects due to production variation or economic influences.

Senate Bill (SB) 1726, Landban Extension & Waste Minimization Reporting, amended the Hazardous Waste Source Reduction and Management Review Act of 1989 (the Act). Instead of every four years, a Progress Report must be prepared by March 1 of each even-numbered year. The Progress Report is submitted as part of the generator's Biennial Report to the Department using the GM form. SB1726 established a state-wide source reduction goal of 5% per year.

The implementing regulations allow generators to use knowledge of their own processes and procedures to reduce hazardous waste and prevent release of pollutants into the environment. The requirements in the regulations specify the format to be used for documenting the performance of a serious review and evaluation. LBL's SB14 documentation can be found in Appendix B. The Plan is also available to the public upon request, in the Building 50 library.

Several Executive Orders (EO) also play an important role in source reduction. EO 12856, issued August 6, 1993, requires that each Federal agency commit to pollution prevention through source reduction where practicable as the primary means of achieving and maintaining environmental compliance. This Order also states that Federal agencies must develop voluntary goals to reduce releases and off-site transfers of toxic chemicals covered under the Emergency Planning and Community Right-to-Know Act (EPCRA).

The manufacture and use of ozone-depleting substances is being phased out through international agreements and Executive Order direction (EO 12843 issued April 21, 1993). Federal Acquisition,

Recycling, and Waste Prevention (EO 12873 signed October 20, 1993) promotes reductions in waste generation through recycling and the use of recycled and energy efficient materials.

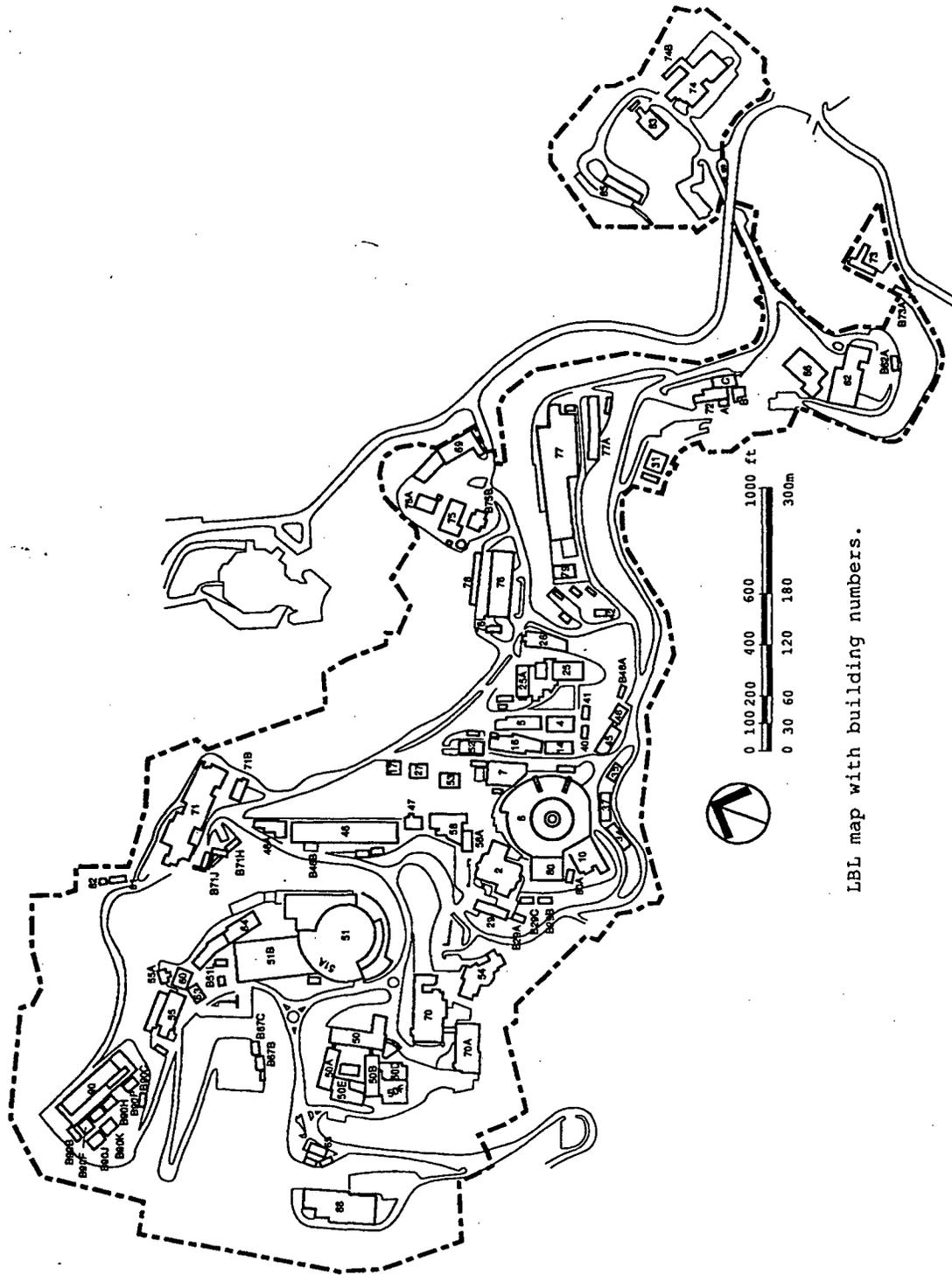
D. Mission and Site Description

Lawrence Berkeley Laboratory (LBL), located in Berkeley, California, is a multiprogram National Laboratory managed by the University of California for the U. S. Department of Energy. The oldest of DOE's nine national laboratories, LBL has pursued internationally recognized scientific research. The research develops fundamental understanding and applications in many fields, including energy, environment, materials, physics, transportation, computing and communication, and biology and medicine. LBL does not conduct weapons or defense-related research. The major role of LBL is to conduct energy research programs such as high-energy physics, nuclear physics, heavy-ion fusion, magnetic fusion energy, X-ray optics, biology, and medicine. The Program Secretarial Officers (PSOs) which are currently involved in activities at this site are ER, CE, EM, FE, and RW. ER is the lead PSO for LBL.

LBL was founded on the Berkeley campus by the late Nobel laureate Ernest Orlando Lawrence in 1931. It moved to its present location in 1940 when the 184-Inch Cyclotron was constructed. Lawrence was the first to advance the idea that scientific research is best done through a collaboration between scientists, engineers, technicians, and students with different fields of expertise. Team work is the foundation of the LBL approach to science, an approach that has yielded rich dividends in basic knowledge and applied technology, along with many awards, including nine Nobel Prizes for research in physics and chemistry.

The Laboratory's activities are located both on-site and off-site. There are 81 buildings on the LBL hillside site, plus additional facilities located on the University campus and surrounding cities. The 130-acre main site is situated on the west-facing slope of the Berkeley Hills, above the main campus of the University of California (UC) at Berkeley. The LBL site map is included in this report as Figure I-2.

LBL is operated by UC for DOE, and is located on land owned by UC Regents. DOE-owned buildings are constructed on land leased to DOE under a long-term agreement. Additional UC space for DOE programs is supplied under the terms of the DOE-UC prime contract, without additional lease costs. The DOE-Oakland Operations Office (DOE-OAK) is responsible for LBL operations oversight.



LBL map with building numbers.

Figure I-2. LBL Site Map

Key to LBL Buildings Shown in Figure I-2

88-Inch Cyclotron, Nuclear Science Accelerator & Fusion Research Division	88	IBM PC & Macintosh Training Laboratories	50B
Accelerator Electronics	50	Indoor Air Pollution Studies	44
Administration	46	Information & Computing Sciences	50B
Advanced Accelerator Studies	50A	Inventory Management	7
Advanced Light Source (ALS)	47	Laboratory Counsel	7
Advanced Materials Laboratory (AML)	6, 80	Library	50A
Archives & Records	2	Life Sciences Division	50
Atmospheric Aerosol Research	69	Liquid Gas Storage	Donner
Atomic Resolution Microscope (ARM)	73	Magnet Development	81
Auditorium	72B	Magnetic Fusion Energy (MEVVA)	53
Badge Office/Parking Permits	50	Magnetic Fusion Energy (MFE)	4
Benefits Office	65	Magnetic Fusion Energy Laboratory	16, 52
Bevalac/Bevatron	90	Magnetic Measurements Laboratory	7
Business Services	51	Mail Room	69
Cafeteria	69	Materials Sciences Division	66
Cashier	54	Mathematics Department	50B
Cell and Molecular Biology	90	Mechanical Engineering	B46C,D
Center for Advanced Materials	Donner	Mechanical Processes	77
Center for X-ray Optics	66	Mechanical Technology Shops	25
Central Stores	2	Media Relations	50C
Chemical Biodynamics	7	Metal Stores	79
Chemical Sciences Division	Calvin	National Center for Electron Microscopy (NCEM)	72
Communications & Networking Resources	66	National Tritium Labeling Facility (NTLF)	75
Communications Engineering & Electronics	50B	New Hazardous Waste Handling Facility	85
Community Relations	41	Nuclear Magnetic Resonance (NMR)	55A
Computer Evaluation Library	50A	Nuclear Science Division	70A
Computer Resources	50B	Operations	50A
Computing Services	50B	Parking Permits/Badge Office	65
Copy Centers	50F	Patents	50A
Craft Shops	50, 90	Personnel Office	90
Craft Stores	76	Photography, Photo-Lab	10
Cryogenic Facility	78	Physics Division	50A
Data Processing Services	56	Planning & Development	50A
Director's Office	65	Property Management	69
DOE On-site Field Office	50A	Public Information, Flea Market/Currents	50C
Earth Sciences Division	50B	Purchasing	69
Electronic Instrumentation	50E	Radioisotope Service	75
Electronics Development Laboratory	29	Reception Center	65
Electronics Engineering	40	Research Medicine and Radiation Biophysics	55
Electronics Installation & Fabrication	80	Shipping	69
Electronics Shops	80A	Surface Science Catalysis Laboratory (SSCL)	66
Emergency Services	7, 25A	Systems Engineering	46A
Employment Office	48	Technical Information Department	50F
Energy & Environment Division	90	Telephone Services	50B
Engineering Division	90	Tour Director	50A
Environment, Health & Safety Division	90	Transportation	69
External Particle Beam (EPB) Hall	90, 75B	Ultra High Vacuum Assembly Facility (UHV)	77A
Facilities	51B	Utilities Service	37
Fire Station	76	VAX User Facility	B51L
Geophysical Measurements Test Facility	48	Wells Fargo (ATM) Express Service	B54A
Health Services	31	Workstation Group	50B
Heavy Ion Fusion (HIF)	26		
Heavy Ion Linear Accelerator (HILAC)	58		
Help Desk (computers)	71		
High Bay Laboratory	50B		
High Voltage Electron Microscope (HVEM)	60		
High Voltage Test Facility & Cable Shop	72A		
	27		

II. POLICY

A. Statement of Management Support/Commitment

LBL is committed to minimizing the generation of waste in an environmentally sound manner by giving preference to source reduction and recycling over treatment and disposal of such wastes. Waste minimization/pollution prevention contributes to the protection of human health and the environment by reducing risks of exposure to hazardous materials and releases of pollutants. An aggressive waste minimization program helps to enhance LBL's credibility and demonstrates the site's commitment to environmental protection.

There are also regulatory programs which highlight the need to minimize the amount of waste generated at LBL. Most prominent is EPA's program to restrict land disposal of untreated hazardous wastes. Under the Land Disposal Restrictions (LDR) program, many untreated hazardous wastes that were previously sent for disposal will now be incinerated or otherwise treated at costs substantially higher than those for land disposal alone. In addition, it is expected that permitted treatment and disposal capacity will not meet demand for some hazardous wastes. Waste minimization/pollution prevention offers a long-term solution to these problems.

Another impetus is the regulation of mixed wastes by EPA and DOE. Under the proposed regulatory structure, EPA will regulate mixed wastes, while DOE will regulate radioactive wastes. To avoid unnecessary costs and radiological exposure to waste handlers, it is important that hazardous waste be segregated from radioactive portions to minimize or eliminate the generation of mixed waste.

Beyond protection of the environment and regulatory impetus, there are financial and liability issues. Waste minimization reduces storage, treatment, and disposal costs, as well as providing more efficient use of resources, thereby reducing operating costs. In some cases, recovery of valuable materials in a waste stream can lead to procurement savings. Waste minimization also serves to reduce a facility's financial liability for future cleanup, remediation, or litigation costs.

A successful lab-wide WMin/PP program requires proactive leadership. A hands-on approach by top LBL management will promote appropriate action to provide adequate personnel, budget, training, and materials on a continuing basis to ensure that the objectives of this plan are met.

B. Policy Statement

LBL's Director has issued a written policy that establishes the Waste Minimization and Pollution Prevention Awareness Program and states a waste minimization policy for LBL. The Director's statement appears at the beginning of this plan (see page iii). DOE has also issued its policy statement on Waste Reduction, which appears in this plan as Appendix C. Policy statements from various site operating contractors that exceed the EPA criteria for small-quantity generators are specifically written into purchasing contracts.

All written policy statements are utilized to implement the following:

- An effective Waste Minimization/Pollution Prevention program at the site;
- The current Waste Minimization/Pollution Prevention Crosscut Plan; and
- Pertinent Waste Minimization/Pollution Prevention Executive Orders.

C. Program Plans and Implementing Procedures

The Environment, Health, and Safety (EH&S) Division adheres to several existing waste management and certification plans and their implementing procedures. All of these plans incorporate waste minimization techniques and approaches and provide additional waste management guidance. Specific source reduction, reuse, and recycling opportunities are identified in LBL's Guidelines for Generators of Hazardous Waste, LBL PUB-3092. Due to the importance of minimizing waste, this information is provided in the introduction of the generator's guide. Additionally, research and development (R&D) programs at LBL include waste minimization elements in their program plans. Also, during the LBL Project Review Process, a waste minimization check is included. Prior to sign-off on NEPA reports, various waste minimization and source reduction applications must be considered.

D. Contractor Waste Minimization and Pollution Prevention Awareness Programs

All contractors to LBL that exceed the EPA criteria for small-quantity generators must establish a Waste Minimization and Pollution Prevention Awareness Program. The LBL Waste Minimization Specialists work with purchasing to develop programs that are consistent with the LBL Program. Contractors shall have in place and be able to demonstrate implementation plans to ensure

compliance with Federal, state, and local environmental laws and regulations. Contractors will also be responsible for administering guidance, instructions, and procedures applicable to the operations of their subcontractors temporarily working on-site.

E. Vision of the Future

In the year 2000, through the guidance of DOE and following the regulatory guidelines of all levels of government, LBL will show a sustained, integrated commitment to WMin/PP for all aspects. Acknowledged by the surrounding communities and Federal government as a responsible role model because of the Laboratory's WMin/PP practices, LBL will be recognized as a leader in:

- Conserving resources and minimizing wastes and pollutants;
- Incorporating WMin/PP into planning, operations, processes, and design activities;
- Reducing costs of environmental compliance and program operations through WMin/PP practices;
- Developing and using innovative technologies to prevent pollutants and minimize wastes from all DOE activities;
- Encouraging WMin/PP through policies, procedures, and incentives;
- Participating in, and influencing the formulation of, sound and effective environmental laws and regulations;
- Engaging in partnerships with other government agencies, academic institutions, and U.S. industry to exchange WMin/PP technologies and practices; and
- Proactively involving stakeholders and the public in the planning and implementation of WMin/PP activities.

III. Organization

Organizational structures, functional responsibilities, levels of authority, and lines of communication for activities affecting implementation of this plan have been developed. The Waste Minimization and Pollution Prevention Awareness Program Organizational Chart is included as Figure III-1. More detailed discussion of the organization and infrastructure will be presented in Section V.A.1.

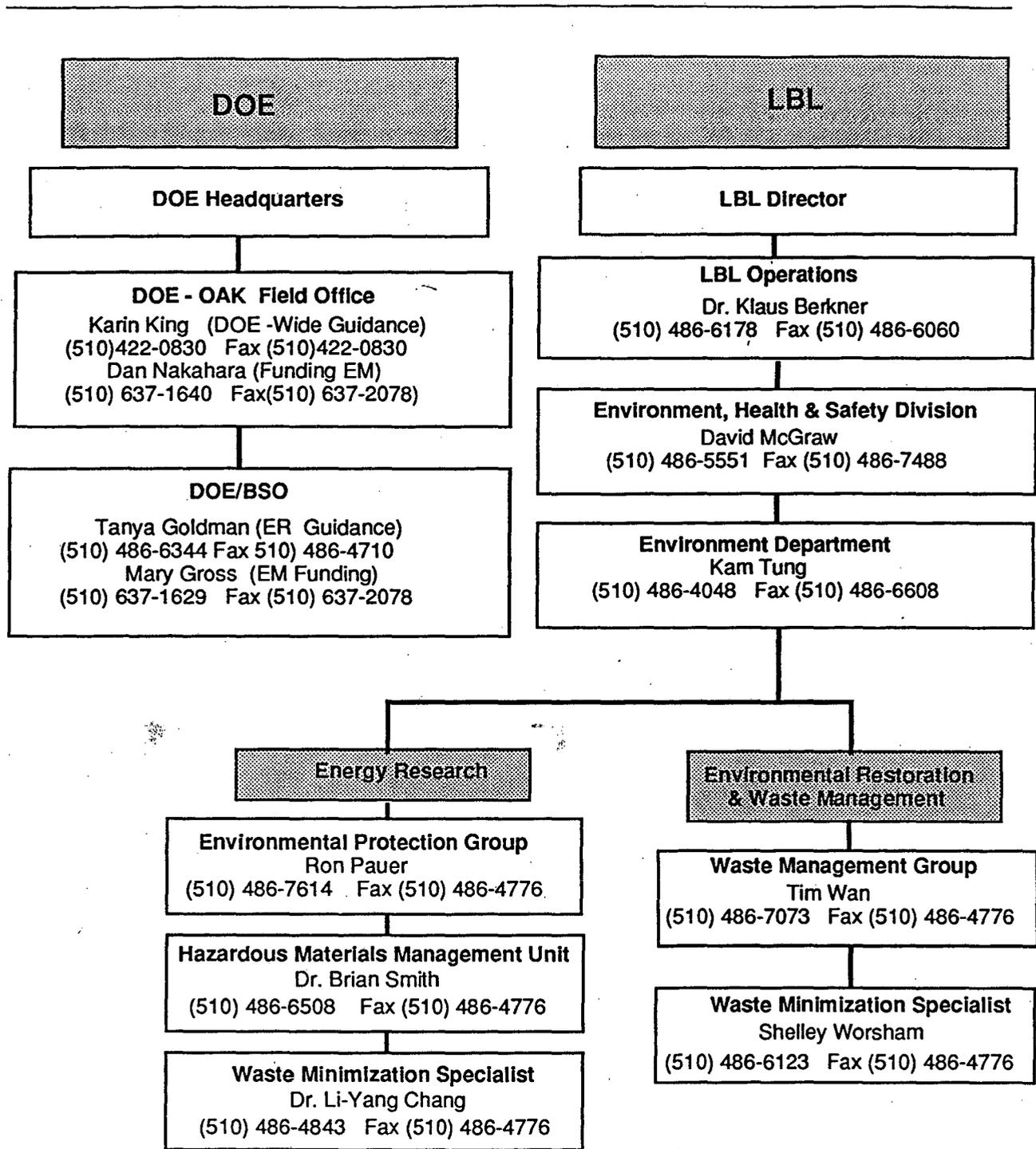


Figure III-I. Waste Minimization and Pollution Prevention Awareness Program Organizational Chart

IV. GOALS

Goal-setting provides: 1) targets for reducing waste generation; 2) standards for evaluating WMin/PP progress; 3) a framework for decision making. Quantitative goals will be set for wastes from ongoing, routine DOE production and research and development operations. LBL will establish qualitative goals for those cleanup activities such as decontamination and decommissioning of the Bevatron, environmental restoration, and legacy wastes that are not readily applicable to quantitative goal-setting. For example, by not commingling retrieved wastes with newly generated wastes, LBL could set a percentile goal that no more than "X"% newly generated waste will be added to the cleanup activity. This will be done for both the Bevatron, which was shut down in February of 1993, and all site restoration projects upon completion of the assessment phases. Until that time, LBL will continue to conduct operations in such a way as to reduce any possible waste generation and minimize the impact to the environment. In the future, the review of mechanisms to quantify waste minimization progress for the reduction of newly generated secondary wastes from treatment, storage and disposal activities, environmental restoration, D&D, etc., will be addressed. All quantitative goals established during the current year will be based upon the previous year's waste generation rates. Final numerical goals will be provided as a percentage reduction from the 1993 baseline quantity while having an achievement goal set for December 31, 1999. Interim numerical goals will be established on an annual basis. Table D-1 Waste Minimization and Pollution Prevention Goals, is included in Appendix D for reference.

Quantitative goals are reported annually for each of the ten (10) waste types that are defined in the DOE Annual Report. The waste types include:

- Radioactive, including LLW, TRU, HLW;
- Hazardous, including RCRA-, state-, and TSCA-regulated;
- Mixed, including LLW-M, TRU-M, and TSCA-M (as applicable);
- Sanitary.

Beginning in 1994, the Annual Report breaks out "Process Waste Water" as a separate waste type, with sub-types of radioactive, hazardous, mixed, and industrial. Goals will be established by 1995 to address these various waste streams under "Process Waste Water".

Presently, LBL radioactive and mixed waste goals regarding source reduction and recycling activities will be aggregated. Pending completion of the radioactive aspect of the LBL Shoebox

waste tracking system (FY95), specific goals will be identified for the radioactive and mixed wastes. By the beginning of FY96, separate goals will be established when the development of the radioactive waste database is complete and thoroughly utilized.

DOE requires that separate goals be established for both hazardous and sanitary wastes with regards to source reduction and recycling activities. At this time recycling goals have been established for sanitary waste and a combined goal for hazardous waste streams. Quite often the base year established by DOE varies from governmental regulatory agencies. Under AB939 (base year 1990), LBL is mandated to meet landfill diversion goals of 25% by 1995 and 50% by the year 2000. Also, isolated hazardous waste stream goals have been set up to comply with SB-14 and the DOE/UC Contract 98 Appendix F Performance Measures (base year 1993). In FY95 goals will be separated into source reduction and recycling activities for hazardous and sanitary wastes.

The Pollution Prevention Act of 1990 established source reduction as the national strategy of first choice to reduce the generation of pollution. On August 3, 1993, President Clinton signed Executive Order 12856, "Federal Compliance With Right-to-Know Laws and Pollution Prevention Requirements," which mandates pollution prevention leadership within the Federal government. The Executive Order requires that all Federal agencies develop voluntary goals to reduce their total release of toxic chemicals to the environment by 50 percent by December 31, 1999.

Numerical estimates are provided for the number of pollution prevention opportunity assessments for which funding is requested each year beginning with 1994. Two opportunity assessments were completed by the end of calendar year 1993: Waste Oil (Non-Automotive) and B25 Printed Circuit Board Manufacturing Waste Water Treatment Alternatives Evaluation Phase I and Phase II. For calendar year 1994, four primary PWAs have been scheduled. Note that the total number of PWAs appears small, but each will cover a variety of waste streams.

V. WMin/PP ACTIVITIES AND RESOURCE REQUIREMENTS

This section contains a summary of activities and resource requirements contained in the EH&S Management Plan WMin/PP functional area Activity Data Sheets (ADS) for LBL. Table V.1. summarizes resources by key programmatic activities/elements, CSO, and FY94, 95 and 96. For more in-depth budgetary details, reference should be made to the WMin/PP Site-wide ADS's prepared by EM in Appendix F and the WMin/PP Generator ADS's prepared by ER in Appendix G. Each key programmatic activity/element is discussed in the appropriate narrative and ADS.

CSO	PROGRAMMATIC ACTIVITY/ELEMENT	FY94	FY95	FY96
EM	Planning	200K	350K	424K
ER	Core	77K	104K	106K
	Implementation	0K	192K	198K
	Abrasives Reductions			123K
	Wastewater Upgrade			156K
	Deionization Resin Reagent			188K
	Coolant Reduction			92K
	Ozone Depleting Substances Reduction			380K
	Spill Prevention Control and Counter Measures Upgrades	380K		222K

Table V.1. Key Programmatic Elements

The WMin/PP activities indirectly affect safety and health. If waste quantity or toxicity is reduced, the potential for inadvertent release to the workplace or environment is correspondingly reduced. However, there are no direct costs under the ADS's that are clearly separated into the S&H functional areas.

A WMin/PP implementation program is not likely to reduce the risk of environmental damage due to LBL operations, but would be useful in incrementally reducing the amount of waste generated by LBL and the risk of eventual damage to the environment from that waste. In the event that ER support for a WMin/PP implementation program is not forthcoming, LBL will be out of compliance with a variety of DOE Orders and Executive Orders regarding the need for WMin/PP implementation Programs. Non-compliance could result in forced shutdown of programs that generate waste at LBL. Lack of support for a WMin/PP program would also make it very difficult for LBL to comply with Appendix F Performance Measures found in the contract negotiated between the DOE and the University of California, requiring 5% per year reductions in three of LBL's five major waste streams over the next five years. Because currently funded WMin/PP activities at LBL focus on the development of goals and of projects to meet these goals, funding for project implementation is sorely needed. Therefore, if implementation monies are not provided goals cannot be met and the implementation elements of the WMin/PP Crosscut Plan will not be accomplished. Non-compliance with the Appendix F Performance Measures will negatively influence performance ratings of the Laboratory, and of its uppermost managers.

**A. Site-wide WMin/PPA Program Elements
Supported by the DOE Office of Environmental Management (EM)**

1. *WMin/PP Organization and Infrastructure*

The LBL Environment, Health, and Safety (EH & S) Division is composed of a group of specialists from several disciplines, including the following: Industrial Hygiene, Radiation Assessment, Hazardous Waste Management, Environmental Protection, Safety, Training, Research, Emergency Prevention and Preparedness, Health Sciences, and Protective Services (Fire and Police Security). Presently there are two Waste Minimization Specialists at LBL. The site-wide Waste Minimization Specialist (EM) oversees and coordinates the employee awareness campaigns, all types of WMin/PP training, waste volume amounts, and the development of various recycling contracts. The generator specific Waste Minimization Specialist (ER) within the Environment Department coordinates the waste minimization assessments, assists in establishing new waste minimization projects, reviews materials handling practices, applies waste minimization principles, and assists with development and implementation of personnel training. Both Waste Minimization Specialists are members of the LBL Site-wide Waste Minimization Committee.

a. Site-wide Waste Minimization Committee

The responsibilities of the Site-wide Waste Minimization Committee include:

- Communicating program objectives to the site;
- Obtaining waste generator support and input for the program;
- Facilitating integration and coordinating interaction between waste generators and waste managers on waste minimization matters;
- Establishing waste minimization goals (in accordance with DOE Order 5400.1) and objectives;
- Sponsoring ongoing employee awareness and training;
- Prioritizing waste streams or facility areas for assessment;
- Establishing task forces comprised of generators and other personnel with special interest or knowledge to conduct process waste assessments;
- Evaluating the technical and economic feasibility of options to reduce generation;
- Recommending and ranking options for management implementation;

-
- Monitoring and evaluating performance of waste minimization options that have been implemented;
 - Monitoring and reporting progress of the waste minimization program, utilizing audits and annual reviews;
 - Recommending personnel for achievement and incentive awards;
 - Facilitating technology transfer and pollution prevention awareness.

The Site-wide Waste Minimization Committee is composed of designated divisions/departments and large quantity generators. The program structure is designed to maximize the collection and dissemination of waste minimization information and provide LBL with the responsibility for the development, design, construction, and implementation of waste minimization projects. In that respect, the large quantity generators are the key participants. All other technical members act as support staff.

The Site-wide Waste Minimization Committee reports to the LBL EH&S Division Director. The Chairperson of the Site-wide Waste Minimization Committee is a member of the EH&S Division, and the committee consists of operators and research staff representing a variety of divisions. Members include staff from EH&S Division Training Department, Office of Technology Transfer, and other divisions in addition to the Waste Minimization Specialists. See Figure V-1. Waste Minimization and Pollution Prevention Awareness Program Organizational Chart. The current list of Waste Minimization Committee Members can be referenced in Appendix E.

The Site-wide Waste Minimization Committee meets at least bi-monthly, or as needed. All committee members serve a three year term. At the end of each term, members wishing to remain on the panel may be allowed re-appointment. Occasionally, new members must be appointed due to retirement programs or changes in job duties.

This program structure is designed to maximize the collection and dissemination of waste minimization information and to provide LBL with the responsibility for the development, design, construction, and implementation of waste minimization projects. The primary functions of the Waste Minimization Committee are to provide awareness of the Waste Minimization and Pollution Prevention Awareness Program at LBL and to identify tasks to be implemented. It will also provide a mechanism for communication within LBL, among DOE facilities, private industry, and other external entities.

b. Site-wide Waste Minimization Specialist

The responsibilities of the Waste Minimization Specialist include:

- Ensuring that waste minimization approaches are in compliance with Federal, state, and local laws and regulations, DOE Policy and Orders, and LBL Policy;
- Updating the Waste Minimization Program's "Schedule of Program Activities" annually;
- Performing other updates/changes to the Waste Minimization/Pollution Prevention Awareness Plan;
- Preparing and filing reports required by regulatory agencies regarding waste minimization;
- Evaluating the specialized training program described in Section V.A.Employee Involvement.

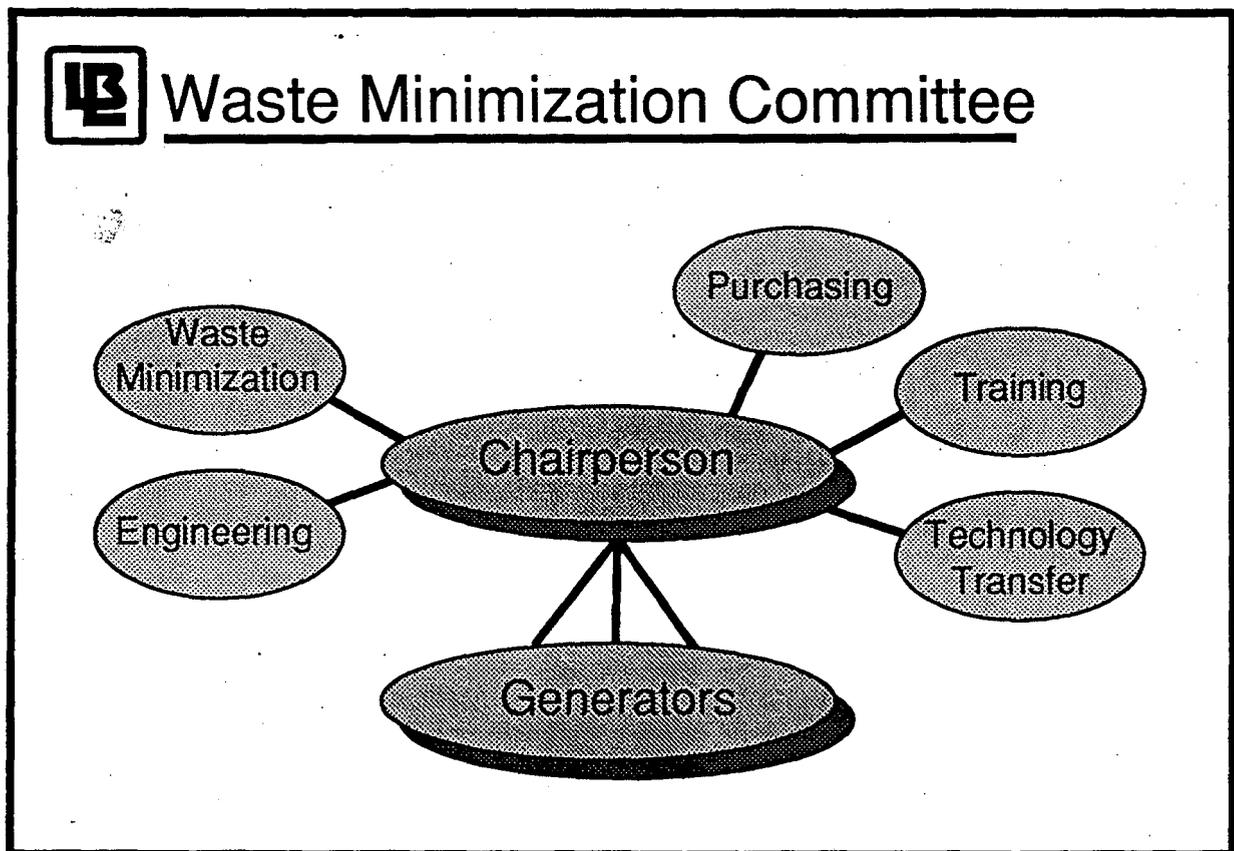


Figure V-1. Waste Minimization Committee Organization Chart

EM is responsible for monitoring the site's waste generation volume. This is directly related to the various reports that require specific waste generation break downs and totals. Key reports for FY94 include the DOE Annual Waste Reduction Report, EPA Biennial Report, and the DOE/UC Appendix F Waste Minimization Performance Measures. Currently the only links with site restoration programs are the tabulation of wastes generated and the establishment of several recycling contracts with outside vendors.

Continuing contact occurs between the LBL Waste Minimization Specialists and both the DOE/OAK Operations Office and Headquarters. DOE/OAK Waste Minimization meetings are held bi-monthly to coordinate efforts of all laboratories associated with the field office. Both Headquarters and the DOE/OAK field office use E-Mail, telephone, and fax capabilities to ensure efficient and effective communication. A diagram of the various avenues of communication is presented in Figure V-2 showing the flow and disbursement of information.

2. *Program Development*

The LBL Waste Minimization and Pollution Prevention Awareness Plan has been developed to obtain accurate and current information on waste stream generation and waste management costs. This information provides the basis for implementing specific waste minimization techniques and technologies. The Plan is reviewed annually and revised as necessary. At a minimum it is updated every three years. Distribution is made to all employees through division heads, and the policy, goals, objectives, and strategy of the plan are explained to employees. The Site-wide Waste Minimization Specialist is responsible for developing and implementing the site WMin/PP Awareness program, integrating WMin/PP practices into site operating procedures, and incorporating DOE quality assurance objectives and methods (DOE Order 5700.6C) into WMin/PP activities.

The essential elements of the strategy are to:

- Maintain an organization that is comprised of line and staff representatives who will champion, develop and administer the waste minimization program;
- Define target waste streams for reduction; and
- Develop a method for tracking the performance and progress of the program.

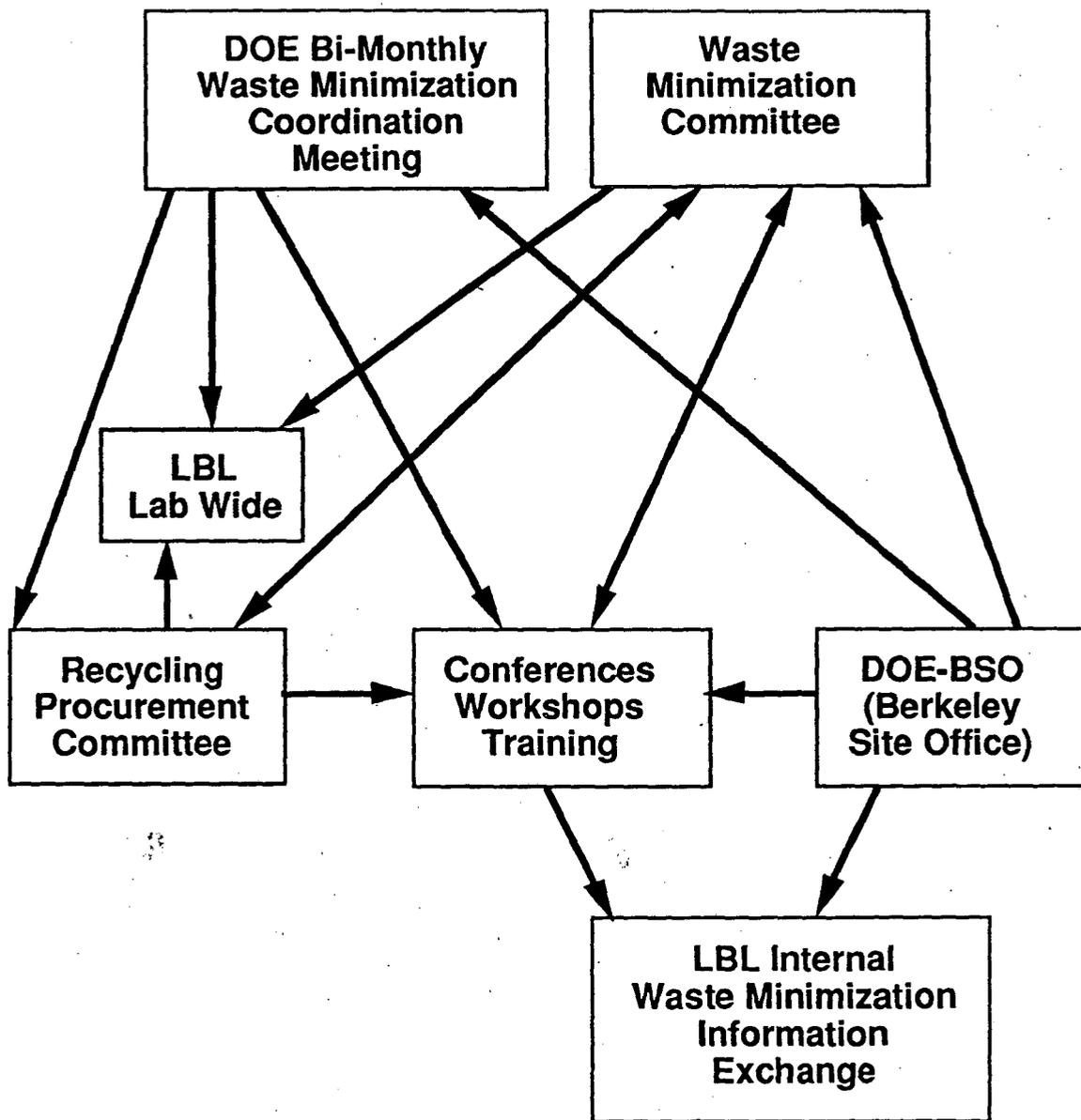


Figure V-2: Dissemination of Information at LBL

The LBL Waste Minimization and Pollution Prevention Awareness Program objectives are:

- Foster a philosophy to conserve resources and create a minimum of waste and pollution in achieving site-strategic objectives;
- Promote the use of non-hazardous materials in plant operations and research and development (R&D) activities to minimize the potential risks to human health and the environment;
- Reduce or eliminate the generation of waste materials through input material changes, operational improvements, experiment process changes, and administrative steps;
- Enhance communication of waste minimization objectives, goals, and ideas laterally and vertically within LBL;
- Promote integration and coordination of waste generators and waste managers on waste minimization matters;
- Evaluate the characteristics of waste streams, including mass balances, and prepare percentage reduction goals;
- Identify and implement methods and technologies for waste minimization;
- Target policies, procedures, or practices that may be barriers to waste minimization;
- Create incentives for pollution prevention;
- Develop and implement employee pollution prevention awareness and training programs;
- Collect and exchange waste minimization information through technology transfer, outreach, and educational networks;
- Develop mechanisms for fully disseminating current technical information to site users;
- Enhance employee awareness of pollution prevention goals, objectives, and methods;
- Develop specific quantitative goals, objectives, and schedules for waste minimization activities;
- Comply with Federal, state, and local regulations and DOE requirements for waste minimization.

Program objectives with established quantitative and qualitative goals will be revised based upon the fluctuation of annual waste generation streams. Budget formulation is also an annual activity. Within the ADS structure are activity schedules for specific waste minimization and pollution prevention tasks and projects. These schedules includes milestone dates for DOE and other

regulatory agency submittals, training, and preparation of procedures. The schedules, updated annually, include and supplement the ongoing waste minimization efforts at LBL. These ongoing efforts are summarized as shown in Table V-3.

Waste Minimization Techniques Applied to LBL Site Wastes (On-going)	
Inventory Control	<ul style="list-style-type: none"> • Limit purchases of chemicals to smallest possible quantities • Develop a hazardous material inventory system • Utilizing limited number of paint colors
Material or Process Substitution	<ul style="list-style-type: none"> • Replace chromic acid cleaning solutions in laboratories when applicable • Promote use of less toxic additives in cooling tower water • Promote use of copper plating recovery for printed circuit etching operation • Convert to trivalent chrome plating from hexavalent • Promote use of powder coatings instead of solvent-based coatings • Replace radioactive marking with fluorescent marking • Ozone Depleting Substances replacement program • Replace solvent based liquid scintillation products with aqueous base liquids • Elimination or replacement of asbestos containing products • Elimination or replacement of products containing polychlorinated biphenyls (PCBs)
Waste Segregation	<ul style="list-style-type: none"> • Separation of halogenated solvents, flammable organics and oils
Toxicity Reduction	<ul style="list-style-type: none"> • Acid neutralization of laboratory waste streams • Oil/water separator for shop cleaning activities • Plating waste water treatment units

Table V-3. Waste Minimization Techniques

Other scheduled activities include those defined for the LBL Affirmative Procurement Committee which meets on a bi-monthly basis. The members consist of a variety of individuals from LBL Procurement/Purchasing. The meetings consist of updates on current projects, identification of new issues/projects, and meeting regulatory compliance review as pertaining to their activities. The Waste Minimization Specialist provides recommendations and guidance to the Affirmative Procurement Committee. A current list of the LBL Affirmative Procurement Committee Members can be referenced in Appendix E.

The LBL Operating and Assurance Program Plan establishes requirements designed to:

- Maintain the level of performance necessary to achieve LBL's programmatic and administrative objectives effectively and safely through application of Quality Assurance (DOE Order 5700.6C), Conduct of Operations (DOE Order 5480.19) and Maintenance Management (DOE Order 4330.4A) Principles;
- Implement an LBL management philosophy that supports and encourages continual improvement in performance and quality at the Laboratory;
- Provide a management system that permits an integrated approach to compliance with applicable and related regulatory requirements and DOE Orders.

As applied to waste minimization, quality assurance includes the concepts of achievement of management defined goals and documentation related to acquisition and verification of data related to these performance measures.

Documentation related to the establishment of defined goals include Performance Objectives and Criteria identified in the Self Assessment Program (PUB 3105). The Self Assessment Program includes a requirement for each LBL organizational entity to perform a self-assessment related to achievement of Waste Minimization goals. The Waste Minimization LBL-wide performance criteria are:

- LBL Divisions encourage the use of non-hazardous work materials;
- LBL Divisions encourage the use of recycled materials and encourage recycling of work materials;
- LBL Divisions minimize the quantities of induced radioactive waste by avoiding introduction of unnecessary items into radiation fields;
- LBL Divisions encourage the use of minimum amounts of material necessary to help the Laboratory meet it's solid waste minimization goals;
- LBL Divisions store hazardous waste separately from radioactive waste.

Additionally, Contract 98 between the US DOE and the University of California, Appendix F Waste Minimization Criteria includes performance measures specifically related to a reduction in the production of certain types of waste by an average of 5% per year and a reduction in aggregate waste production by 10% for FY94. The data gathered in support of achievement of these performance measures is subjected to self assessment, independent verification and external validation. Reference Appendix D for detailed information.

3. *Employee Involvement*

a. Pollution Prevention Awareness

The purpose of the Pollution Prevention Awareness Program required by DOE Order 5400.1 is to foster the philosophy that prevention is superior to remediation. The goal of the program is to incorporate pollution prevention into the decision-making process at every level throughout the organization.

The Pollution Prevention Awareness Program has the following objectives:

- Make employees aware of general environmental activities and hazards at the site;
- Make employees aware of the WMin/PPA program requirements, goals, and accomplishments;
- Inform employees of specific environmental issues;
- Train employees on their responsibilities in pollution prevention;
- Recognize employees for efforts to improve environmental conditions through pollution prevention;
- Encourage employees to participate in pollution prevention;
- Publicize success stories.

The program consists of four elements: pollution prevention awareness campaign, awards and recognition, information exchange, and training. All elements are further explained in this section of *Employee Involvement*.

A Pollution Prevention Awareness Campaign is conducted at least once each year. It is developed and coordinated by the Site-wide Waste Minimization Committee. The campaign makes use of site newsletters, seminars, bulletin boards, signs, and slogans to enhance employee awareness of, and

participation in, pollution prevention at the site. The campaign may choose a specific chemical reduction goal in keeping with the Waste Minimization Program element goals.

b. Training Goals

One of the most important elements of the Waste Minimization and Pollution Prevention Awareness Program is training. The training is extended to all levels of personnel within the site. The training goals are to make each employee aware of waste generation, its impact on the site and the environment, and techniques used to reduce waste and prevent pollution. A member of the EH&S Training Department sits on the Site-wide Waste Minimization Committee.

c. Employee Orientation Program

The Waste Minimization and Pollution Prevention Awareness Program is integrated into the general orientation program for all employees. The waste minimization/pollution prevention aspect of the general employee orientation program is reviewed annually and revised as necessary. This program includes the following elements:

- The need for, and benefits to be derived from, waste minimization and pollution prevention;
- Management commitment to waste minimization and site waste minimization policy;
- Overview of policy and regulations;
- Improved operation practices for reducing waste generation;
- Solicitation of waste minimization and pollution prevention ideas and the discussion of solutions to identified problems.

d. Specialized Training Program

Specialized training sessions on pollution prevention policy, procedures, and waste minimization techniques are tailored for LBL management and staff. These sessions are incorporated into the regularly scheduled training program. The adequacy of training procedures and of any special equipment needed to perform waste minimization functions is evaluated annually by the Waste Minimization Committee.

e. Qualification of Personnel Performing Waste Minimization Steps in Work Plans and Procedures

As part of quality assurance (QA), certain employees are required to be trained on their knowledge of site policies and procedures prior to performing work. Waste minimization is incorporated into operating, administrative, and waste handling procedures requiring documentation using data sheets or forms. Training on waste minimization is conducted as part of the process used to qualify personnel to perform waste minimization/pollution prevention activities. Quality assurance is discussed in greater detail in Site-wide Program Development.

f. Performance Evaluations

Waste minimization goals, objectives, and accomplishments are incorporated into annual evaluations of job performance for those persons who have waste minimization responsibilities. Sample language is provided that would be appropriate to include in the individual job descriptions for employees, managers, and supervisors. This language does not have to be used verbatim. However, all the points contained in it must be addressed in individual job descriptions.

To achieve LBL's waste minimization and pollution prevention goals, every person performing work at LBL or at one of LBL's off-site locations is required to meet the following performance expectation: "Minimize the volume and toxicity of all LBL-generated wastes and maintain chemical inventories as low as is reasonable."

g. Incentive Awards and Recognition

Award programs are used to recognize individual and team waste minimization and pollution prevention achievements. Potential awards for successful projects are selected upon completion of the assessments. Presently, the EH&S Division offers a quarterly award recognition program for all LBL employees. This program provides special recognition for those individuals who have contributed significantly to environmental protection, safety, and health.

Incentives are necessary to stimulate and maintain interest in changing processes and activities. Providing budgetary incentives among waste generators is difficult because waste management is funded by the EM organization as a service to all other waste generating organizations. Consequently, waste generators are not directly charged for waste management costs, nor do they financially benefit from reducing waste generation and environmental release rates. Without incentives, beneficial changes in generator facilities might not be made because there are no

immediate avoided costs to the generation of waste. A future objective will be the development of a recognition and award program for those LBL employees who identify or contribute significantly to specific waste minimization and pollution prevention ventures.

Waste minimization and pollution prevention success stories are publicized in a variety of avenues, including newsletters, seminars, division safety committee meetings, bulletin boards, and signs.

4. *Tracking*

a. Materials Tracking

Currently LBL maintains a database for wastes manifested and shipped off-site. A computer system tracking materials from the point of site entry to final disposition is being developed for implementation. Materials tracking will be conducted in two phases. The first phase to be implemented tracks waste (a system named Shoebox) from the point of generation within LBL to the point of final disposition. The second phase will track materials from the point of site entry to the point of waste generation. Material inventory tracking will be included. An implementation schedule for the waste tracking system appears in the EM ADS. Completion of this major project will allow for more accurate estimation of waste generation, wastes to be removed under the environmental restoration program, and waste management costs/benefits of WMin/PP.

b. Procurement Control System

Procedures governing the purchase and control of materials will be reviewed and revised to meet the objectives of this plan. The focus of the reviews will be the completion and approval of purchase requisitions to minimize the quantity and toxicity of material and excess raw materials procured. Materials to be procured will be evaluated for hazardous constituents and alternative non-hazardous substitute materials by program, Engineering, or EH&S personnel.

c. Program Tracking

The Waste Minimization and Pollution Prevention Awareness Program at LBL is in its formative stages of development. A computerized system tracking the progress of the program will be developed by EH&S in conjunction with Quality Assurance. Aspects of the program to be monitored include: 1) status of employee orientation, training, and qualification; 2) milestones of the Pollution Prevention and Awareness Campaign; 3) awards and recognition; and 4) the results of implementation of waste minimization techniques.

d. Cost/Benefit Analysis

The LBL Waste Management Group currently estimates waste generation for LLW and mixed waste streams. With the completion of the waste tracking database (Shoebox), estimates of hazardous, mixed, and low level wastes can be accomplished with greater confidence. Waste Management currently employs a system of accounts to track waste management costs. Future plans include the expansion of LBL's efforts to perform cost/benefit analysis beginning in 1995. LBL will then use the results of these analyses in internal and external proposals, plans, and budgets. To document the importance of such a program, ERWM handling and disposal costs for hazardous, medical, mixed, and low level wastes are estimated at \$3.1 million for FY94. Proper incentive could provide substantial reductions not only in waste generated, but dollars spent.

5. Reporting

a. Waste Generation Baseline

Every year LBL is required to submit the DOE Annual Waste Reduction Report. In order to complete this report, wastes must be characterized and categorized. Upon completion, the current baseline year is compared to the previous baseline year. Much of the waste generation baseline information is derived from the EPA Biennial Report data that also must be prepared annually. Information from the Biennial Report data, the DOE/UC Contract 98 Appendix F Waste Minimization Performance Measures, SB-14, and AB 1475, is reviewed and revised.

b. Federal and State Reporting Requirements

A computerized EH&S Waste Management program currently follows the DOE, Federal, state, and local environmental regulatory requirements and deadlines pertaining to waste minimization. The program lists the required documents (i.e., reports, plans, permits, inventories, etc.), the regulating agency or statute, the deadline for the project or whether the project is ongoing, and any additional comments.

c. Environmental Restoration

Another area of importance is the documentation of wastes generated from the environmental restoration activities. This too must be tracked closely in the DOE Annual Waste Reduction Report in order to report removal of wastes from environmental restoration activities.

6. *Establish Site-wide Source Reduction Programs for Hazardous, Radioactive, and Mixed Waste Streams*

EH&S efforts are coordinated with the Purchasing Department to comply with regulatory compliant material purchases. Specific lists are provided to the buyers to educate and to provide quick reference for possible "red flag" toxic chemicals and other hazardous materials. Prior to purchase, EH&S will try to identify applicable alternatives.

LBL has introduced a site-wide Chemical Exchange Program for those individuals with excess toxic chemicals and hazardous materials. The computerized database is available for identifying surplus chemicals, listing excess chemicals, or requesting desired chemicals. Future opportunities involve linking with the LLNL and SLAC Chemical Surplus Programs.

At LBL, waste assessments are an essential component of waste management and minimization. Because they show where waste reduction techniques can be most effective, waste assessments are used for planning and allocating resources and are useful in measuring progress of waste minimization. Upon completion of the waste assessments, priority will be given to source reduction techniques as opposed to recycling. If the quantity of a waste stream cannot be reduced, then LBL will attempt to reduce its toxicity by input chemical/material substitution, process or experiment change, treatment, or chemical reaction to decompose or detoxify.

Occasionally special Pilot Program projects are identified. These will be supported by EM to ensure validity prior to a full scale implementation. Each project must provide either source reduction or reduced toxicity benefits.

7. *Establish Site-Wide Recycling Programs for Hazardous, Radioactive, and Mixed Waste Streams*

In general terms, recycling is the use of a waste for a purpose other than the material's original purpose, while reuse is the use of a waste for the material's original purpose. Recycling and reuse are applied at LBL through reclamation techniques to eliminate the disposal of waste and reduce input material requirements. The method of choice depends on the physical and chemical characteristics of the waste stream and on the recovery economics. Consistent with the waste management hierarchy, recycling at LBL is acknowledged to be a secondary consideration and investigated after source reduction techniques have been explored. In most cases, the best place to recycle process wastes is within the production facility. Therefore, on-site recycling is preferred to off-site recycling of materials. At LBL, recycling techniques have been applied to lead acid

batteries, mercury, metals, waste oils, empty containers, waste water, and waste solvents. Whenever possible, disposal contracts are set for maximum recycle opportunity.

Reuse involves the return of a waste to the originating process as a substitute for an input material, or to another process as an input material. Reclamation is the recovery of a material from a hazardous waste. Several on-site recovery methods are available and used in a variety of processes. Examples include the use of an electrolyte recovery system to reclaim metals from the drag out from copper and tin-lead plating baths and the use of a distillation unit to recover solvents. Decontamination and decommissioning would utilize sonic cleaners at the HWHF. Conceptual plans for the waste water reuse at B25 have also been developed as a waste minimization opportunity.

8. *Establish Site-Wide Source Reduction and Recycling Programs for Sanitary Waste Streams*

Through the efforts of an active Affirmative Procurement Committee established in FY92, many changes have occurred in the purchasing function. Buyers are highly conscious of researching for products made with or from recycled materials. Major changes that have occurred include the purchase of various paper products with post-consumer content, purchase and buy back of toner cartridges, and several automotive items.

With this change in thinking on a more environmentally conscious level, opportunities are created in working together with other Federal Facilities to consolidate environmentally sound purchase orders. Cooperative buying increases the size of the overall purchase allowing for a lower individual cost per item. Therefore, when Federal Facilities work together (e.g. Tri-Lab Agreement), cost savings are achieved.

Assembly Bill 939 enacts the CA Integrated Waste Management Act of 1989. The Act is intended to address a projected shortage of solid waste disposal sites by encouraging source reduction, recycling and composting and by requiring cities and counties to reduce the waste they send to landfills 25% by 1995 and 50% by the year 2000. The Act encourages industry and public involvement at all levels of implementation. In fact, counties can assess fines to large quantity generators who do not have garbage reduction programs in place. California counties can then assess fines to Federal Facilities under this legislation. The LBL Garbage Refuse Contract is reviewed annually for possible rebidding in order to reduce the bid price and/or increase the percentage of materials being sent for reuse or recycle. In 1993, LBL recycled 41% of its solid trash waste. The recycling goal for 1994 is 45% .

Occasionally special Pilot Program projects are identified. These will be supported by EM to ensure validity prior to a full scale implementation. Each project must provide source reduction benefits.

9. *Technical Assistance*

The Site-wide WMin/PP Specialist will actively collaborate informational efforts with the Generator WMin/PP Specialist in order to disseminate available information to all aspects of LBL. The following efforts are coordinated with the Generator WMin/PP Specialist:

- Assist generators and environmental restoration program managers in setting quantitative and qualitative goals;
- Assist generators in determining waste generation baselines;
- Assist generators in assessing and implementing opportunities;
- Assist generators and environmental restoration programs in establishing model WMin/PP programs.

More elaborate detail will be provided in the ER WMin/PP Generator Implementation Program Elements section V.B.

10. *Information and Technology Exchange*

a. Meetings, Workshops, and Seminars

The bi-monthly waste minimization meetings coordinated by DOE/OAK offer a periodic opportunity to meet with other DOE facilities' WMin/PP staff. The meetings allow for an exchange of ideas and information as well as updates on any relevant legislation.

Both the Waste Minimization Specialists and the Waste Minimization Committee members participate in a variety of seminars, workshops, and meetings pertaining to their involvement in the program. Occasionally, the entire group attends training and refresher courses.

b. Information Exchange and Outreach

A number of agencies offer technical information on waste minimization to the regulated community. Some of these technical-assistance programs are discussed in this section.

The Pollution Prevention Information Clearinghouse (PPIC) is a national and international network consisting of a hotline, an information repository, the Pollution Prevention Information Exchange System (PIES), computer networking activities, and two newsletters. The PIES is available to DOE or contractor staff working in the waste minimization field and includes an interactive message center, several databases, summaries of Federal and state pollution prevention legislation, summaries of waste minimization programs (including DOE's program), a calendar of events, and a national waste exchange to promote reuse of waste materials.

The California Environmental Protection Agency Toxic Substances Control Program has developed a Technology Clearinghouse. The clearinghouse provides reports concerning waste reduction, alternative technologies, planning, land disposal restrictions, and treatment standards. These publications are available at no cost to businesses, individuals, and government agencies located in California. LBL has taken advantage of this service, and EH&S Waste Management Department has many of their publications in the LBL waste minimization reference library.

The California Waste Exchange (CWE), a part of the California EPA Toxic Substances Control Program, is another part of the state's continuing effort to promote the recycling of industrial waste in California. The CWE seeks to encourage the recovery of valuable resources and discourage their disposal to land, air, or water, thereby protecting public health and the environment. CWE publishes a Directory of Industrial Recyclers to make industry aware of presently available commercial recycling opportunities. To facilitate the exchange of industrial materials/waste, CWE acts as a clearinghouse to list wastes wanted and wastes available so that industry can buy, sell, or exchange their wastes. LBL's waste minimization task forces use the above as resource information when performing assessments.

The California Regional Water Quality Control Board (RWQCB) has also established an extensive waste minimization program to promote the reduction of industrial waste water discharged to publicly owned waste water treatment facilities (POTWs), surface water and ground water. The RWQCB has developed a waste minimization network that includes industries, POTWs, and local governments. LBL participates in this network system to access the desired technical information and regulatory policy.

The LBL Waste Minimization Committee fosters participation in business, industry, education, and government forums that are designed to provide technical assistance and to exchange waste minimization information. The chairperson of the Waste Minimization Committee recommends representatives to attend the semiannual DOE Workshop on Pollution Prevention and to participate in other professional organizations discussing waste minimization activities.

c. Technology Transfer

LBL personnel seek and promote waste minimization technology transfer through the continual interaction with the personnel of other DOE facilities. The services of the LBL Technology Transfer Office may be used to facilitate the transfer process. Through that office, those transfers of significance will be coordinated with the DOE Office of Technology Development. A representative of the Office of Technology Transfer sits on the Site-wide Waste Minimization Committee.

In addition, the Technology Transfer Office represents LBL as a member of the Federal Laboratory Consortium for Technology Transfer. Through that body, LBL promotes the transfer of waste minimization technology across Federal agencies. At the present time, the transfer of waste minimization technologies across Federal agencies, as well as within the DOE complex, is in its formative stages of development.

11. *Program Evaluation*

Waste minimization goals, objectives, and accomplishments are incorporated into divisional self-assessments and annual evaluations of job performance for each individual's waste minimization/pollution prevention responsibilities. Each employee will have unique responsibilities. Some may be as basic as to just reduce the solid waste stream volume and others will require much more focus to address the issues at hand.

The Waste Minimization and Pollution Prevention Awareness Program is evaluated annually for effectiveness by the Waste Minimization Committee. Performance program goals will also be reviewed for completion or work toward completion. When performing the evaluation for each waste minimization alternative implemented, waste generation, production efficiency, risk to public health and the environment, worker safety, regulatory compliance, liability exposure, cost benefits, and public relations are considered.

A summary of the evaluation, along with supporting data, performance trends and forecasting will be documented in a written report and submitted to the LBL EH&S Division Director. The report is used by the committee as a basis for establishing waste minimization goals and program objectives and for the revision of the program plan.

B. WMin/PP Generator Implementation Program Elements Supported by the DOE Office of Energy Research (ER)

1. Generator -Specific WMin/PP Organization and Infrastructure

A generator specific waste minimization program is an organized, comprehensive, and continuing effort to systematically reduce volume and/or toxicity of hazardous, radioactive, and mixed waste generation at the source. The program is designed 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 and, therefore, will yield the following additional benefits:

- Reduce the volume or toxicity of wastes;
- Reduce waste management and disposal costs;
- Reduce resource usage;
- Reduce or eliminate inventories and release of hazardous chemicals;
- Increase material recyclability;
- Increase process efficiency and product quality.

The program reflects the goals and policies for waste minimization for generators at LBL and represents an ongoing effort to make waste minimization/pollution prevention an important part of the site's operating philosophy.

While policy direction and infrastructure development provide a solid foundation upon which to implement WMin/PP activities, only the actual implementation of these activities will result in significant waste reduction. Ultimately, the public will measure the Laboratory's progress in managing waste problems by what it accomplishes in reducing its waste generation rates, environmental releases, waste management costs, and overall environmental risks.

By the end of FY94 a Generator Waste Minimization Committee will be established for targeted hazardous wastes, waste generating processes, and facilities. The committee members will be

assigned by the Directors of each Division at LBL, as well as the Facility Department. Each Division will select one representative to participate in the committee activities. The committee members will also be involved in the site-wide program committee (an organization flow chart is presented on the following page).

The responsibilities of the Generator Waste Minimization Committee include:

- Communicating LBL's waste minimization objectives to all generators;
- Organizing a generator specific waste minimization task force;
- Establishing specific waste minimization plans, goals, and objectives for generators;
- Facilitating specific technology transfer and pollution prevention awareness programs;
- Supporting the development of generator specific waste minimization plans and resolving plan implementation difficulties;
- Facilitating interaction between process operators, waste generators, and waste managers on waste minimization matters;
- Establishing task forces comprised of generators and other supporting resources to conduct process waste assessments and alternatives evaluation;
- Assisting on waste audits, source identifications, and waste minimization opportunity assessments;
- Sponsoring ongoing generator training and information exchange;
- Evaluating specific technical and economic option feasibilities to reduce generation;
- Recommending options for management implementation;
- Evaluating generator's performance of waste minimization options that have been implemented;
- Monitoring progress of the waste minimization program, utilizing audits and monthly or quarterly reviews;
- Recommending generators for achievement and incentive awards.

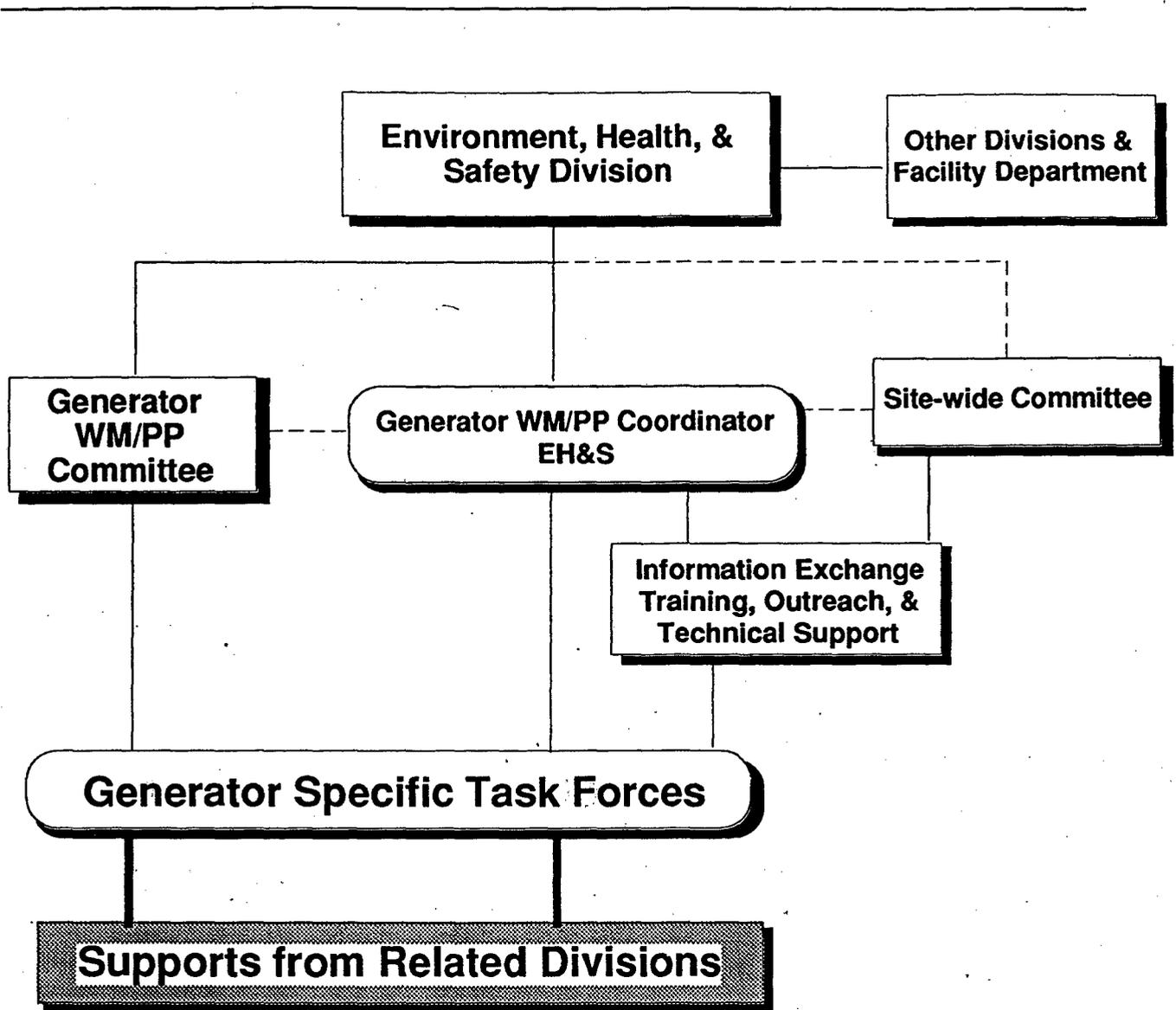


Figure V-3. Structure of Generator WMin/PP Program

A Generator Waste Minimization Program Coordinator from the EH&S Division provides assistance to organize generator's waste minimization task forces and interface with:

- Generator specific committee;
- Site-wide program; and
- DOE headquarters and other networks.

The Generator Program Coordinator also provides technical assistance to:

- Specific waste minimization opportunity assessments;
- Options evaluation, recommendation, and implementation;
- R&D program development;
- Job-specific training; and
- Information exchange, outreach, and technology transfer.

2. *Generator-Specific Wmin/PP Program Development*

There are three generator specific implementation steps that are the foundation of achieving actual reductions in waste generation. They must be fully funded and completed if DOE is to significantly reduce its wastes and pollutants. These steps are to:

- Perform opportunity assessments to identify process changes to achieve goals,
- Implement cost-effective process changes and equipment modifications to reduce waste generation and environmental release rates, and
- Conduct research and development on difficult to manage waste streams affecting multiple generator facilities and sites.

For those waste streams that are difficult to manage, research and development programs will be necessary, along with technology transfer and information exchange with other sites that may have similar problems. When those steps are successfully completed, LBL can then implement program requirements and facility modifications to ensure continued progress.

The objectives of the LBL's Generator Specific Waste Minimization and Pollution Prevention Program are to:

- Foster a philosophy of pollution prevention, resource and water conservation, least-toxic research and operations, source reduction, process optimization, and waste minimization in achieving generator specific objectives and goals;
- Promote the use of non-hazardous materials in plant operations and research and development activities;
- Reduce or eliminate the generation of waste materials through input material changes, product reformulation, operational improvements, experiment process changes, pollution prevention best management practices, and administrative steps;
- Promote the development of the cleaner technology for plant operations and research;
- Promote the use of recoverable materials to increase material recyclability and reduce wastes;
- Promote "Closed-loop" operations and "Least-toxic" research;
- Establish chemical specific mass load balance strategies and prepare percentage reduction goals;
- Develop generator specific waste minimization and pollution prevention plan;
- Develop facility, process, chemical, and experiment specific waste minimization goals;
- Organize generator task forces and implement opportunity assessments;
- Develop tasks implementation schedules and budgets;
- Evaluate the generator specific characteristics of waste streams and identify main waste sources;
- Develop and implement generator specific waste minimization and pollution prevention awareness and training programs;
- Develop generator specific materials and wastes tracking systems and material recovery technologies;
- Collect and exchange waste minimization information through seminars, meetings, conferences, workshops, technology transfer, outreach, and educational networks;
- Identify and target policies, procedures, and practices that may be barriers to waste minimization and pollution prevention;
- Promote integration and coordination of waste generators and waste managers on site-wide waste minimization and pollution prevention matters;

-
- Promote integration of facility upgrading, new facility construction, and plant or process modification projects on waste minimization and pollution prevention matters;
 - Comply with Federal, state, and local regulations and DOE requirements for site-wide waste minimization and pollution prevention program.

3. *Site-Wide Program Participation*

a. Employee Involvement

The purpose of the Generator Specific Waste Minimization and Pollution Prevention Program is to foster the philosophy that prevention and minimization are superior to remediation and treatment. The goal of the program is to incorporate pollution prevention into the decision-making process at the generator level throughout the organization.

The program has the following objectives:

- Make generators aware of waste generation activities and hazards at the points of generation;
- Make generators aware of the waste minimization program requirements, goals, accomplishments, and generator specific waste minimization plan;
- Encourage generators to participate in job-specific waste minimization and pollution prevention activities;
- Train generators in their responsibilities in job-specific pollution prevention;
- Recognize generators for efforts to improve plant operation or research conditions through pollution prevention.

A Waste Minimization and Pollution Prevention Awareness Campaign will be conducted at least once each year. It will be developed and coordinated by the Generator Specific and Site-wide Waste Minimization Committee. The campaign will make use of site newsletters, seminars, bulletin boards, signs, and slogans to enhance employee awareness of and participation in pollution prevention at the site. The campaign may choose a specific chemical reduction goal in keeping with the Waste Minimization Program element goals.

b. Tracking and Reporting Systems

The Generator Waste Minimization and Pollution Prevention Program will participate in the following tracking and reporting activities of site-wide program.

Materials Tracking. Currently LBL maintains a database for wastes manifested and shipped off-site. A computer system tracking materials from the point of site entry to final disposition is being developed for implementation. Materials tracking will be conducted in two phases. The first phase to be implemented will track waste from the point of generation within LBL to the point of final disposition. The second phase will track materials from the point of site entry to the point of generation. Materials inventory tracking will be included.

Procurement Control System. Procedures governing the purchase and control of materials will be reviewed and revised to meet the objectives of this plan. The focus of the reviews will be the completion and approval of purchase requisitions to minimize the quantity of material and excess raw materials procured. Materials to be procured will be evaluated for hazardous constituents and alternative non-hazardous substitute materials by program, engineering, and EH&S personnel, since waste minimization is an evolving learning experience.

Program Tracking. The Generator Waste Minimization and Pollution Prevention Awareness Program is in its formative stages of development. A computerized system tracking the progress of the program will be developed. Aspects of the program to be monitored include status of: a) employee orientation, generator specific training, and qualification; b) milestones of the Pollution Prevention and Awareness Campaign; awards and recognition and; c) the results of implementation of waste minimization techniques.

Federal and State Reporting Requirements. A computerized program is scheduled to be set up to follow the DOE, Federal, state, and local environmental regulatory requirements and deadlines pertaining to waste minimization. The program will list the required documents (i.e., reports, plans, permits, inventories, etc.), the investigating agency or statute, the deadline for the project or whether the project is ongoing, and any additional comments.

c. Information Exchange and Technical Assistance. There are a number of sources of information on waste minimization. A variety of agencies offer technical information on waste minimization to the regulated community. Some of these technical-assistance programs are discussed in the Site-wide Information and Technology Exchange section, V.A.10.

The LBL Generator Specific Waste Minimization Committee will foster participation in business, industry, education, and government forums that are designed to provide technical assistance and to exchange waste minimization information. The Generator Waste Minimization Program Coordinator and the representatives of Generator Specific Committee will attend the semi-annual DOE Workshop on Waste Minimization and participate in other professional organizations discussing waste minimization activities.

The Generator Waste Minimization Program Coordinator and Committee will interact with the site-wide program to install an on-site technical assistance and resources center to provide information to generators. This center will also periodically organize job-specific or chemical-specific waste minimization workshops or seminars for generators. LBL's technical professionals as well as experts from other DOE facilities or institutions will be invited to present their waste minimization results and experience.

4. *Site/Facility Training*

One of the most important elements of the Generator Specific Waste Minimization and Pollution Prevention Program is training. The training will be extended to all levels of personnel within the site. The goals of the training will be to make each employee aware of waste generation, its impact on the site and the environment, and techniques used to reduce waste and prevent pollution.

a. Generator-Specific Training Program. Specialized generator specific training sessions on waste minimization and pollution prevention policy, plans, procedures, opportunity assessments, and waste minimization techniques and best management practices will be tailored for management, staff, and operator positions. These sessions will be incorporated into the regularly scheduled training program. The adequacy of training procedures and of any special equipment needed to perform waste minimization functions will be evaluated annually or as needed by the Generator Waste Minimization Committee.

b. Employee Orientation Program. The Generator Specific Waste Minimization and Pollution Prevention Program will be integrated into the site-wide general orientation program for all employees. This program will include the following elements:

- The need for, and benefits to be derived from, waste minimization and pollution prevention;
- Management commitment to waste minimization and site waste minimization policy;
- Overview of policy and regulations;
- Best management and operation practices for minimizing waste and preventing pollution;
- Solicitation of waste minimization and pollution prevention ideas and the discussion of solutions to identified problems.

5. *Opportunity Assessments*

At LBL, waste assessments are an essential component of the generator specific waste minimization and pollution prevention program. Because they show where the major waste sources are and where waste reduction techniques can be most effective, generator specific waste assessments are used for planning and allocating resources and are useful in measuring the progress of waste minimization.

Waste assessments will be conducted on waste-generating operations and processes to assemble waste generation baseline information. Facility and process data will be surveyed and available resources and information will be reviewed in order to:

- Identify and assess generator specific waste sources and processes;
- Obtain more detail about the characterization of the waste streams;
- Develop process descriptions, material balances, and process flow diagrams;
- Determine if wastes are mixed with other wastes or recyclable materials;
- Identify and evaluate waste minimization and pollution prevention techniques and practices that may be applicable;
- Develop waste minimization and pollution prevention best management practices.

These techniques and practices are categorized as input material changes, operational improvements, experiment process changes, administrative steps, and recycling. Each category will be addressed in detail in the Section of Waste Minimization Techniques and Practices.

All waste-generating operations, processes, facility modifications, and new research programs will be subjected to assessments or environmental impact reviews. The Generator Specific Waste Minimization Task Force will prioritize and schedule performance of the assessments. The task forces will perform the assessment, organize the data and findings, and recommend waste minimization alternatives and techniques.

When making their recommendations, task forces will give priority to:

- (1) source reduction; and
- (2) on-site recovery/recycling techniques.

If the task forces determine that the quantity of a waste stream cannot be reduced, then the generator will attempt to:

- (1) recycle or reclaim materials off-site;
- (2) reduce its toxicity by input chemical/material substitution; and/or
- (3) reduce toxicity by process or experiment change.

The generator specific task force will screen the recommendations and select candidates for a feasibility analysis. The analysis will consist of both technical and economic evaluations. Determining the usefulness of a given alternative is the objective of the technical evaluation. The following elements will be considered when performing the technical evaluation :

- Compatibility with research operations and work flow;
- Applicability of new technology;
- Availability of space and utilities;
- Operation and maintenance needs;
- Waste quantity and material recyclability;
- Risk to worker, public health and the environment;
- Regulatory compliance and liability exposure.

The economic evaluation will be performed using the payback period method by comparing savings in the costs of storage, treatment, disposal, and input material to capital requirements and any increased recurring costs. Exceptions to that method will be made for those alternatives involving significant capital investment.

Based on the results of the feasibility analysis, the task forces will rank the alternatives for implementation of waste minimization. When a waste assessment is completed, the generator specific task force will discuss the findings with the Generator Specific Waste Minimization Committee, Program Coordinator and the Director of EH&S . The Committee and Director will use this information to decide upon the selection of alternatives, and subsequently to locate the needed resources for their implementation.

Opportunities for the research and development (R&D) of waste minimization techniques for generator specific application at LBL will be identified from feasibility and treatability studies of the waste assessments. Recommendations for R&D will be made after being assessed and screened by the Generator Specific Waste Minimization Task Force. For example, development of material recovery technologies for material science and chemical reaction research projects can be beneficial to the waste minimization program and can also be transferred to other Federal Facilities and private industry.

6. *Implement Source Reduction Opportunities for Hazardous, Radioactive, and Mixed Waste Streams*

a. Scope

Waste minimization is accomplished through application of source reduction and recycling techniques. At LBL, source reduction techniques are viewed as the primary waste minimization techniques to avoid the generation of wastes and eliminate the problems associated with waste handling. Source reduction is also recognized by the EPA and DOE as the first element in the waste management hierarchy.

Waste minimization techniques can be separated into several general categories: input material changes, operational improvements, production process changes, product reformulation, administrative steps, and recycling. These categories are consistent with those identified in California Senate Bill 14 discussed in Section I.C and documented in Appendix B.

b. Input Material Changes

Input material change techniques to be applied at LBL include raw material and feedstock changes to reduce, avoid, or eliminate the hazardous materials that enter during the production process, and during the end use of products. Less hazardous or purified materials decrease not only hazardous waste generation but also the quantity of hazardous materials in air emissions and waste water effluents. In the past, LBL has applied these techniques in research laboratories by substituting water-soluble liquids for flammable scintillation fluids. Other examples of source reduction through input material changes include replacing chlorinated solvent degreasers with alkaline degreasers or using water based paints and adhesives for solvent-containing products. R&D chemicals and materials are also evaluated for potential substitution.

c. Operational Improvements

Improvements in the operation and maintenance of process equipment can result in significant waste reduction. At LBL, operational practices are continually evaluated to enhance waste minimization through the efficient use of production-process equipment and waste recovery. Operational improvement techniques to be employed, such as loss prevention (improving operating and handling procedures), waste segregation, production scheduling, maintenance operations, and overall site management are considered during an assessment.

Instituting standard operating procedures (SOPs) optimizes the use of raw materials in the production process and reduces the potential for materials to be lost through leaks or spills. Proper material handling ensures that the raw material reaches the production process. Draining residual material and flushing hoses during loading and unloading processes are two methods of addressing potential raw material loss.

Waste segregation can be an especially effective technique. By segregating wastes at the source of generation and handling wastes separately, the volume and disposal cost of the waste can be reduced. The material recyclability will also be increased. The prevention of unnecessary mixing of hazardous, radioactive, and non-hazardous wastes can be especially important in R&D laboratories.

Segregation is inexpensive to implement and has significant potential for source reduction and savings in treatment and disposal costs. In metal finishing and printed circuit board manufacturing facilities, wastes containing different types of metals and solutions can be treated separately so that the metal and chemical values in the waste can be recovered. Segregation will also minimize the

interference of waste treatability by some chelating compounds in the plating processes. Another common segregation technique useful to research and laboratory facilities is to segregate chlorinated and non-chlorinated solvents to allow recovery.

A strict maintenance program which stresses corrective and preventive maintenance can reduce waste generation caused by equipment failure. Such a program will help personnel spot potential sources of release and correct a problem before any material is lost. To be effective, accurate records on all maintenance activities should be maintained. If necessary, procedures will be developed and implemented to ensure that these activities are documented during 1994.

d. R&D Experiment and Production Process Changes

Process changes, changes in experimental methods or techniques, and equipment modifications are all techniques intended to take advantage of better technology. Changes in process conditions and process automation are two other methods to reduce waste generation through increased efficiency. Developing least-waste laboratory practices are also desirable waste minimization tasks.

Modifying process or experimental equipment requires a thorough understanding of the process or experiment, chemical and physical characteristics, and waste stream generation. Some examples of process modifications for waste reduction include:

- Eliminating the use of filter aids in washing or dewatering processes;
- Installing drag-out recovery tanks for plating operations;
- Using micro-experimental systems for bench-scale research;
- Developing closed-loop recovery and recycling systems; and
- Using airless or electrostatic spray systems for surface coating.

e. Administrative Steps

Administrative steps taken to reduce waste generation include implementing good operating and housekeeping practices that apply to the various aspects of plant operations and research at LBL. Many of these best management practices are used as efficiency improvements, such as procurement and inventory control, waste and material handling, and employee training programs. Other programs such as providing employee incentives are used to encourage employees to strive for waste reduction.

LBL has instituted an inventory control program where, with the exception of some photochemicals and limited quantities of drum stock, chemicals are no longer inventoried by the central storeroom. Chemicals are ordered from a local vendor, delivered to the central storeroom, and distributed to the requisitioner within 24 hours of delivery. This procedure eliminates overstock and storing of chemicals past their shelf life.

f. Integration of Total Quality Management and Waste Minimization

An integration of total quality management and waste minimization practices for waste generators will be developed to assure the qualities of product and environment. Procedures governing the functional activities affecting the quality of the program will be incorporated into standard operating procedures (SOPs), guidelines, and as separate procedures when applicable to implement the plan objectives. Functional activities particularly important to waste minimization are:

- Process operations and optimizations;
- Material and waste handling;
- Equipment maintenance;
- Training;
- Record keeping and document control;
- Material inventory control and tracking;
- Review, approval and distribution of instructions, procedures and schedules;
- Self assessment;
- Total quality management (TQM).

Self assessment will be conducted by persons independent of those performing the functional activities. An integrated TQM and waste minimization self assessment task force will be organized to perform self assessments.

7. *Implement Recycling Opportunities for Hazardous, Radioactive, and Mixed Waste Streams*

In general terms, recovery is to recover valuable materials from waste streams for recycling and reuse, while recycling is the use of a waste for a purpose other than the material's original purpose and reuse is the use of a waste for the material's original purpose.

Recovery, recycling, and reuse are applied at LBL through the following two approaches:

- (1) Use of recoverable materials for research and plant operation.
- (2) Use of reclamation techniques to eliminate the disposal of waste and reduce input material requirements.

The method of choice depends on the physical and chemical characteristics of the waste stream and on the recovery economics. Consistent with the waste management hierarchy, recycling at LBL is acknowledged to be one of main considerations and will be investigated after source reduction techniques have been explored. In most cases, the best place to recycle process wastes is within the production facility or research laboratories. Therefore, on-site recycling is preferred to off-site recovery of materials. At LBL, recycling techniques have been applied to lead acid batteries, mercury, copper, waste oils, waste water, and waste solvents.

Reuse involves the return of a waste to the originating process as a substitute for an input material, or to another process as an input material. Reclamation is the recovery of a material from a hazardous waste. Several on-site recovery methods are available and used in a variety of processes. Some examples include the use of an electrolyte recovery system to reclaim metals from the drag out from copper and tin-lead plating baths and the use of a distillation unit to recover solvents.

8. Implement Source Reduction and Recycling Opportunities for Sanitary Waste Streams

A variety of measures are being implemented with regard to LBL's solid waste source reduction and recycling requirements. The vendor holding the solid waste contract is required to recycle at least 25% of waste. This contract is reviewed annually and put out for rebid as necessary. For LBL to achieve the highest recyclable percentage while maintaining a reasonable cost structure, the DOE/UC Contract 98 Appendix F Performance Measures mandate a 10% aggregate total decrease for LBL.

With the above requirements in mind, LBL suggests alternative information exchange avenues, such as:

- Sending electronic copies whenever possible;
- Approve only purchase requisitions for double-sided copies (unless justification can be made otherwise);
- Mandate that all documents which are 10 pages or more be double-sided copies;
- Print draft copies on clean back side of used paper;
- Make note pads out of waste paper.

Creativity is the greatest challenge to increased effectiveness of LBL's goals.

9. *Design Considerations*

The Generator Waste Minimization and Pollution Prevention Program will also participate in any new facility design and existing facility and process upgrading projects at LBL. In order to reduce wastes and prevent pollution in future, the Generator Specific Program Coordinator and Committee will provide technical support of waste minimization and pollution prevention practices to the facility, process design engineers and managers. Any new waste generation process and technology will be reviewed and approved by the coordinator and committee before implementation.

10. *Generator Program Evaluation*

The Generator Waste Minimization and Pollution Prevention Program will be evaluated annually for effectiveness by the Generator Specific Waste Minimization Committee, the Division of the specific generator, and Waste Minimization Committee.

When performing the evaluation for each waste minimization alternative implemented, waste generation, production efficiency, risk to public health and the environment, worker safety, regulatory compliance, liability exposure, cost benefits, public relations, and implementation difficulties and barriers will be considered.

A summary of the evaluation, along with supporting data, performance trends and forecasting of the specific generator will be documented in a written report and submitted to the Laboratory Director, LBL's EH&S Division, and Directors of corresponding divisions of the specific generator. The report will be used by the Generator Specific Waste Minimization Committee for

re-establishing the generator specific goals, objectives, and plan. The report will also be used by the Site-Wide Waste Minimization Committee as a basis for establishing site-wide waste minimization goals and program objectives and for the revision of the overall plan.

Waste minimization goals, objectives, and accomplishments will be incorporated into annual evaluations of job performance for those persons who have waste minimization responsibilities.

VI. SITE-WIDE ANALYSIS

As evidenced by the LBL WMin/PP Plan, a number of Site-wide and Generator specific activities overlap or have the potential to overlap. The elements of overlap include WMin/PP Organization and Infrastructure, Program Development, and Program Evaluation. In order to create an effective and efficient WMin/PP Program both the site-wide and generator objectives must be identified and understood. A site with a written plan but no implementation process will not affect the waste generation rates. On the other hand, a site with the ability to implement but with no defined plan will not be able to aggressively address key issues effectively. The key issue at LBL is that implementation cannot occur without sufficient dollars. Money can be found in a variety of avenues such as programmatic funds, grants, and partnership awards.

Coordinating budgets and integrating Site-wide WMin/PP programmatic elements with the Generator WMin/PP implementation programmatic elements will assure the accomplishment of assigned goals. Therefore, LBL Site-wide and Generator specific Waste Minimization Specialists work closely together to develop and implement a plan that highlights both concepts of development and implementation. Development and periodic updates of plans, objectives, goals, schedules, budgets, and procedures are a joint effort. The annual evaluation is also a coordinated process. Communication is the primary underlying factor in accomplishing all regulatory compliance. Continual interfacing not only with each other, but with other agencies as well, is extremely important to maintain a level of work related knowledge and compliance. The diagram in Appendix H provides a visual picture of the working process between EM and ER WMin/PP activities.

VII. PROGRAM STATUS

Avoiding waste management costs by reducing waste generation is an obvious and significant benefit to the Department and its stakeholders. However, there are many other notable benefits of a comprehensive WMin/PP program. These benefits are listed below.

- **Environmental** - resource conservation, reduced pollutant releases, increased environmental awareness, and improved stewardship of the environment;
- **Economic** - reduced raw material, energy, waste handling, and disposal costs resulting in an improved global competitive position and reduced costs to the taxpayers;
- **Production** - improved material handling, conservation of energy, increased productivity, safer working conditions, and development of improved processes and technologies;
- **Legal/Regulatory** - improved compliance with environmental regulations, reduced long-term liabilities, reduced record keeping and administrative costs;
- **Social** - reduced health and accident risks, improved employee and union relations, and improved public image.

LBL will strive to exceed established goals and maintain a high standard of commitment. This can only be accomplished with top-management support and the efforts of all employees.

VIII. REFERENCES

- California Department of Health Services (1990). *Alternative Technologies for the Minimization of Hazardous Waste*, July 1990.
- U.S. Department of Energy (1990). *Checklist for Review of DOE Waste Minimization on Plans*, 540-90.
- U.S. Department of Energy (1986). *DOE Order 5700.6Bc Quality Assurance*, September 23, 1986.
- U.S. Department of Energy (1988). *DOE Order 5820.2A, Radioactive Waste Management*, September 26, 1988.
- U.S. Department of Energy (1988). *DOE Order 5400.1, General Environmental Protection Program*, November 9, 1988.
- U.S. Department of Energy (1990). *Implementation Guidance for DOE Order 5400.1, Waste Minimization Plan and Waste Reduction Reporting of DOE Hazardous, Radioactive, and Radioactive Mixed Wastes*, March 1990.
- U.S. Department of Energy (1990). *DOE Waste Minimization Guidance for Process Waste Assessments*, October 17, 1990.
- U.S. Department of Energy (1994). *Guidance for the Preparation of Site Waste Minimization and Pollution Prevention Awareness Plans*, March 28, 1994.
- U.S. Department of Energy (1990). *Model Waste Minimization and Pollution Prevention Awareness Plan*, November 19, 1990.
- U.S. Department of Energy (1994). *1994 Waste Minimization/Pollution Prevention Crosscut Plan*, February 28, 1994.
- U.S. Environmental Protection Agency (1988). *EPA/625/7-88/003, Waste Minimization Opportunity Assessment Manual*, July 1988.
- Freeman, Harry M. (1989). *Standard Handbook of Hazardous Waste Treatment and Disposal*.
- University of California Lawrence Berkeley Laboratory (1986). *Institutional Quality Assurance Program Plan*, February 5, 1986.
- University of California Lawrence Berkeley Laboratory (1987). *UC LBL Institutional Plan, FY 1988-1993*, December 1987.
- University of California Lawrence Berkeley Laboratory (1990). *LBL Interim Waste Minimization Plan*, May 10, 1990.
- University of California Lawrence Berkeley Laboratory (1990). *Quality Assurance Plan for the Hazardous Waste Handling Facility*, August 1990.

REQUEST TO RETURN SUPERSEDED EDITION

TO:

DATE: _____

LOCATION:

According to our records, you have a superseded edition of this title. If not needed, please return book (with this card) to:

Library

Bldg. 50, Room 134

Lawrence Radiation Laboratory

Berkeley

University of California Lawrence Berkeley Laboratory (1990). *Technology Transfer at Lawrence Berkeley Laboratory*, September 1990.

University of California Lawrence Berkeley Laboratory (1991). *FY 1993 Budget Request, Environmental Restoration and Waste Management*, April 1991.

Approved By: David McGraw Date: 5/27/94
David McGraw
Division Director
Environment, Health and Safety Division

Approved By: Klaus Berkner Date: 6-1-94
Klaus Berkner
Associate Laboratory Director
Operations

Approved By: Richard Nolan Date: 6-2-94
Richard Nolan
Acting Director
Berkeley Site Office

APPENDIX A

Department Of Energy

Definition of

Waste Minimization and Pollution Prevention

APPENDIX A Department of Energy Definition of Waste Minimization and Pollution Prevention

Within the Department of Energy, WMin/PP means preventing or reducing the generation of pollutants, contaminants, hazardous substances, or wastes at the source; or reducing the amount for treatment, storage, and disposal through recycling.

WMin/PP can be applied to all pollution-generating activities at DOE, including:

- manufacturing and production operations;
- weapons dismantlement;
- maintenance;
- transportation;
- research, development, and demonstration;
- laboratory research;
- decontamination and decommission activities; and
- legacy waste and contaminated site cleanup.

WMin/PP can be achieved through:

1) Source reduction;

equipment or technology selection or modification, process or procedure modification, reformulation or redesign of products, substitution of raw materials, and improvements in housekeeping, maintenance, training, or inventory control;

increased efficiency in the use of raw materials, energy, water or other resources, including affirmative procurement; and

protection of natural resources by conservation;

2) Recycling: the use, reuse, or reclamation of waste materials.

Environmental restoration activities are directed towards removal and treatment of legacy waste and pollutants already generated from past production and manufacturing operation. In the process of conducting restoration activities, additional waste and pollutants may be generated. Other pollutants and waste will also be generated by decontamination and decommissioning of plant and equipment, and dismantlement of weapons systems. WMin/PP is applicable to the processes and techniques used to perform these activities so as to prevent or reduce the generation of new wastes and pollutants when conducting these activities.

APPENDIX B

CA Senate Bill 14

**Hazardous Waste Source Reduction
and
Management Review Act of 1989**

SB-14

**HAZARDOUS WASTE SOURCE REDUCTION
AND
MANAGEMENT REVIEW**

**California Code of Regulations
Title 26, Chapter 22, Section 67100.1 *et seq.***

**UNIVERSITY OF CALIFORNIA
LAWRENCE BERKELEY LABORATORY**

Berkeley, California

Reporting Year 1990

Baseline Year 1990

PUB-3107

SB-14 COMPLIANCE IS DOCUMENTED BY THREE DOCUMENTS:

1. *SB-14 Report (PART 1-5), Baseline Year 1990*
2. *Waste Minimization and Pollution Prevention Awareness Plan, DOE Report 1991*
3. *Waste Minimization Opportunities Assessment Report for Buildings 25 and 77, March 1991*

PART 1
SOURCE REDUCTION REVIEW AND PLAN

TABLE OF CONTENTS

INTRODUCTION

PART 1.....SOURCE REDUCTION REVIEW AND PLAN

PART 2.....SOURCE REDUCTION PLAN SUMMARY

PART 3.....HAZARDOUS WASTE MANAGEMENT REPORT

PART 4.....HAZARDOUS WASTE MANAGEMENT REPORT SUMMARY

PART 5.....REVIEW AND PLAN CERTIFICATION

ATTACHMENTS

Attachment 1 - Waste Minimization & Pollution Prevention Awareness Plan

**Attachment 2 - Waste Minimization Opportunities Assessment Report for
Buildings 25 & 77, March 1991**

LIST OF TABLES

LIST OF FIGURES

Questions about this Hazardous Waste Source Reduction and Management Review plan should be directed to Dr. Li Yang Chang, Environment, Health & Safety (EH&S) Division, Environmental Protection Group at:

University of California
Lawrence Berkeley Laboratory
Environment, Health and Safety Division
One Cyclotron Road
Mailstop B75-101
Berkeley, CA 94720

PART 1

SOURCE REDUCTION AND REVIEW PLAN

TABLE OF CONTENTS

	Page
Purpose	1-3
Facility Information and Description.....	1-3
Site Operations Generating Hazardous and Extremely Hazardous Waste.....	1-4
Routinely Generated Hazardous and Extremely Hazardous Waste Streams (Major and Minor)	1-6
Description of Processes for Major Waste Streams.....	1-8
Source Reduction Measures Evaluation and Weighing Factors	1-15
Relative Numerical Ranking of Source Reduction Measure.....	1-17
Evaluation Procedures	1-18

FIGURES

Figure (g)1	General Processes that May Generate Hazardous Waste.....	1-5
Figure (i)1	Waste Oil (Non-Automotive).....	1-9
Figure (i)2	Waste Machining & Grinding Coolant/Water.....	1-10
Figure (i)3	Spent Empty Drums \geq 30 Gallons.....	1-11
Figure (i)4	Waste Liquids with $\text{pH} \leq 2$	1-12
Figure (i)5	Waste Mercury	1-13
Figure (i)6	Aqueous Wastewater Treatment Influent.....	1-14
Figure (j,k)1	Waste Oil (Non-Automotive).....	1-19
Figure (j,k)2	Waste Machining and Grinding Coolant/Water.....	1-20
Figure (j,k)3	Spent Empty Drums \geq 30 Gallons.....	1-21
Figure (j,k)4	Waste Liquids with $\text{pH} \leq 2$	1-22
Figure (j,k)5	Waste Mercury	1-23
Figure (j,k)6	Aqueous Wastewater Treatment Influent.....	1-24

TABLES

TABLE (h)1	1990 Routine Hazardous Waste Streams	1-7
TABLE (h)2	1990 Routine Aqueous Hazardous Waste Streams.....	1-7
TABLE (h)3	1990 Routine Extremely Hazardous Waste Streams.....	1-7
TABLE (p) 1	Time Table for Implementing Source Reduction Measures.....	1-29

PART 1

SOURCE REDUCTION AND REVIEW PLAN

California Code of Regulations Section 67100.5

PURPOSE

This Source Reduction Review and Plan has been prepared by the Lawrence Berkeley Laboratory (LBL) at Berkeley, California in accordance with California Code of Regulations (CCR) Section 67100.1 *et seq.* The numbered and lettered sections of this Review and Plan correspond to the numbers and letters contained in CCR Section 67100.5. Certification pursuant to CCR Section 67100.1 is contained in Part 5.

FACILITY INFORMATION AND DESCRIPTION

- (a) University of California
Lawrence Berkeley Laboratory
One Cyclotron Road
Berkeley, California 94720
- (b) *Standard Industry Classification (SIC) code:* 8733
- (c) *Type of business or activity:* Noncommercial Research Organization
- (d) *Length of time LBL has been in business:* Since 1931
Length of time University of California has been in business: Since 1869
- (e) *Major products manufactured or services provided and, if appropriate, their general applications or examples of their applications or end use.*
- LBL is a research institution, not a product manufacturer. It is a multiprogram national laboratory owned by the U.S. Department of Energy, and managed and operated by the University of California. The major role of LBL is to conduct energy research programs such as high-energy physics, nuclear physics, heavy-ion fusion, magnetic fusion energy, X-ray optics, biology, and medicine.
- (f) *Number of employees:* 3,391 (as of September, 1991)
Number of students and visiting guests: 1,608 (as of September, 1991)

 SITE OPERATIONS GENERATING HAZARDOUS AND EXTREMELY HAZARDOUS WASTE

- (g) *General description of site operations with corresponding block diagrams focusing on the type of hazardous wastes, input chemicals and materials produced at the site.*

Figure (g)1 illustrates the general processes that may generate hazardous waste. Hazardous waste generated by laboratories, production and maintenance shops, and treatment units on site at LBL are transferred to the Hazardous Waste Handling Facility, where arrangements are made for shipment and disposal.

Lab chemicals and reagents used for research experiments represent 8-12% of the total hazardous waste generated at LBL in 1990. (Reference Table (g) 1.) Table (g) 2 demonstrates the aqueous wastewater treatment influent generation between research laboratories and production shops. 1990 is both the reporting and baseline year. The majority of this waste is disposed of by lab packing. All other waste streams from production and maintenance shops comprise the remaining 88-92% of general hazardous waste. The chemical/material sources include: oils, solvents, paints, adhesives, ethylene glycol, acids, and cyanides.

TABLE (g) 1

Operation	% Hazardous Waste Generated
Research Laboratories	8-12%
Production and Maintenance Shops	88-92%

TABLE (g) 2

Operation	% Hazardous Waste Generated
Research Laboratories Wastewater Treatment Influent	35%
Production Shop Wastewater Treatment Influent	65%

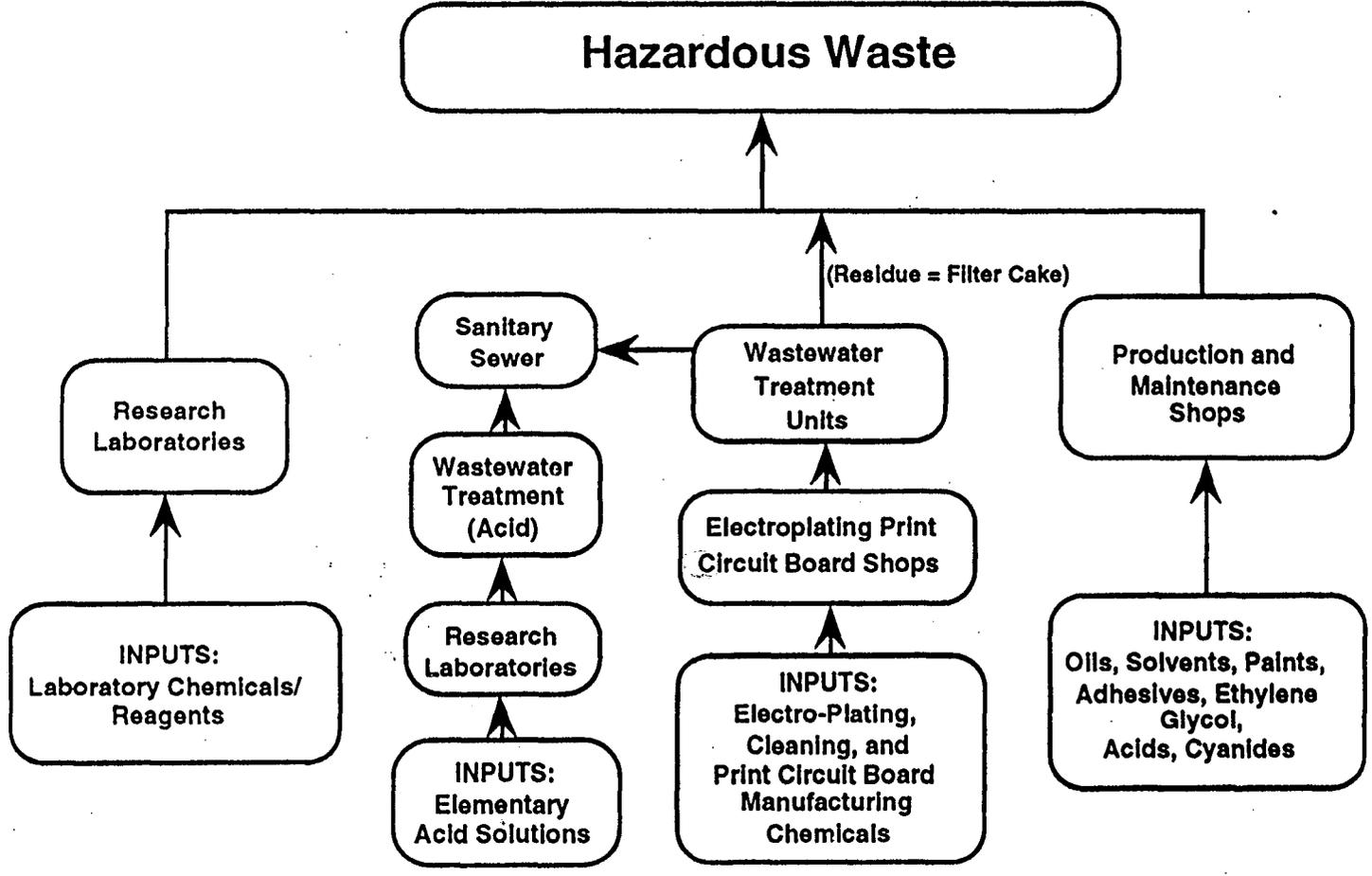


Figure (g) 1

General Processes That May Generate Hazardous Waste

ROUTINELY GENERATED HAZARDOUS AND EXTREMELY HAZARDOUS WASTE STREAMS

- (h) *Routinely generated hazardous waste streams in the current reporting year (1990) which result from ongoing processes or operations that have a yearly volume, or comparable weight, exceeding five percent of the total yearly volume or comparable weight, or for extremely hazardous waste, five percent of the total yearly volume or comparable weight.*

This document does not address the following waste streams which are exempted under CCR Section 67100.2: infectious waste, radioactive waste, asbestos, PCBs, and automotive fluids including waste oil, and other various exempted waste streams which are not applicable.

Total weight (pounds) of routinely generated hazardous waste (includes extremely hazardous waste) in 1990:

53,786 lbs.

Individual waste streams by California Waste Code (CWC) generated in 1990 are shown in Tables (h)1, (h)2, and (h)3.

TABLE (H) 1
LAWRENCE BERKELEY LABORATORY
1990 ROUTINE HAZARDOUS WASTE STREAMS

WASTE STREAM	CWC	QUANTITY (LBS)	% BY CWC	MAJOR (≥ 5%)	MINOR (< 5%)
ELECTROLESS COPPER	132	990	1.90		√
ETHYLENE GLYCOL/WATER	133	990	1.90		√
MACHINING AND GRINDING COOLANT/WATER	134	13,365	25.65	√	
ORGANIC SOLVENT	214	495	0.95		√
WASTE OIL (NON-AUTOMOTIVE)	221	2,970	5.70	√	
OIL/WATER SEPARATOR SLUDGE (NON-AUTOMOTIVE)	222	4	0.01		√
WATER/CHARCOAL/1,1,1-TRICHLOROETHANE	343	1,830	3.51		√
EMPTY DRUMS FROM LATEX PAINT	512	81	7.03	√	
EMPTY DRUMS FROM LACQUER THINNER	512	27			
EMPTY DRUMS FROM MACHINING AND GRINDING COOLANT	512	315			
EMPTY DRUMS FROM OIL	512	2,673			
EMPTY DRUMS FROM TRICHLOROTRIFLUOROETHANE	512	216			
EMPTY DRUMS FROM 1,1,1-TRICHLOROETHANE	512	162			
EMPTY DRUMS FROM FLAMMABLE LIQUID	512	27			
EMPTY DRUMS FROM ACETONE	512	54			
EMPTY DRUMS FROM PETROLEUM NAPHTHA	512	27			
EMPTY DRUMS FROM ISOPROPYL ALCOHOL	512	54			
EMPTY DRUMS FROM TRICHLOROMONOFUOROETHANE	512	27			
1,1,1-TRICHLOROETHANE	741	1,868			
SULFURIC ACID	791	10,993	49.76	√	
AMMONIUM PERSULFATE/SULFURIC ACID	791	2,155			
AMMONIUM PERSULFATE	791	990			
SULFURIC/NITRIC ACID	791	10,558			
NITRIC ACID	791	367			
ACID WASTE	791	367			
CHROMIC ACID	791	495			
TOTAL		52,100			

TABLE (H) 2
LAWRENCE BERKELEY LABORATORY
1990 ROUTINE AQUEOUS HAZARDOUS WASTE STREAMS

WASTE STREAM*	CWC	QUANTITY (LBS)	BUILDING	MAJOR (≥ 5%)	MINOR (< 5%)
WASTEWATER TREATMENT UNIT INFLUENT (METALS)	132	243,000	25		√
WASTEWATER TREATMENT UNIT INFLUENT (ACID)	135	8,640,000	70A	√	
WASTEWATER TREATMENT UNIT INFLUENT (ACID)	135	8,100,000	77	√	
WASTEWATER TREATMENT UNIT INFLUENT (CYANIDE)	131	8,100,000	77	√	
TOTAL		25,083,000			

* THESE WASTE STREAMS ARE ALL CONSIDERED "MAJOR" HAZARDOUS WASTE STREAMS FOR THE PURPOSES OF THIS SB-14 PLAN. HOWEVER, DUE TO THEIR LARGE QUANTITIES, THEY HAVE BEEN SET ASIDE DURING THE DETERMINATION OF OTHER "MAJOR" HAZARDOUS WASTE STREAMS (DETAILED ABOVE IN TABLE (H)1). THEIR INCLUSION WOULD HAVE CAUSED ALL OTHER HAZARDOUS WASTE STREAMS TO BE CLASSIFIED AS "MINOR".

TABLE (H) 3
LAWRENCE BERKELEY LABORATORY
1990 ROUTINE EXTREMELY HAZARDOUS WASTE STREAMS

WASTE STREAM*	CWC	QUANTITY (LBS)	% BY CWC	MAJOR (≥ 5%)	MINOR (< 5%)
WASTE MERCURY	181	1,686	100%	√	
TOTAL		1,686			

 DESCRIPTION OF PROCESSES FOR MAJOR WASTE STREAMS

- (i) *The processes, operations, and activities generating the waste(s) with corresponding block diagrams to illustrate the basis of generation.*

Figures (i)1 through (i)6 are block diagrams illustrating the individual processes that generate hazardous waste. The operations generating the general waste streams are described below for each of the following major waste streams:

CWC WASTE STREAM

- 221 Waste Oil (Non-automotive)
- 134 Waste Machining and Grinding Coolant/Water
- 512 Spent Empty Drums that Last Contained a Hazardous Chemical/Material ≥ 30 Gallons
- 791 Waste Liquids with $\text{pH} \leq 2$
(Sulfuric, Nitric, Chromic Acids and Ammonium Persulfate)
- 181 Waste Mercury

Aqueous Hazardous Waste Streams (Treatment Unit Influent)

- 135 Building 70A Elemental Acid Neutralization
- 135 Building 77 Acid (Chrome) Rinse Water and Metal Flocculation*
- 131 Building 77 Cyanide Destruction Rinse Water and Metal Flocculation*
- 132 Building 25 Metal Flocculation**

Reference: *Block diagrams in Waste Minimization Opportunities Assessment Report for Buildings 25 & 77, March 1991*

BLOCK FLOW DIAGRAM for Waste Oil (Non-Automotive) 1990

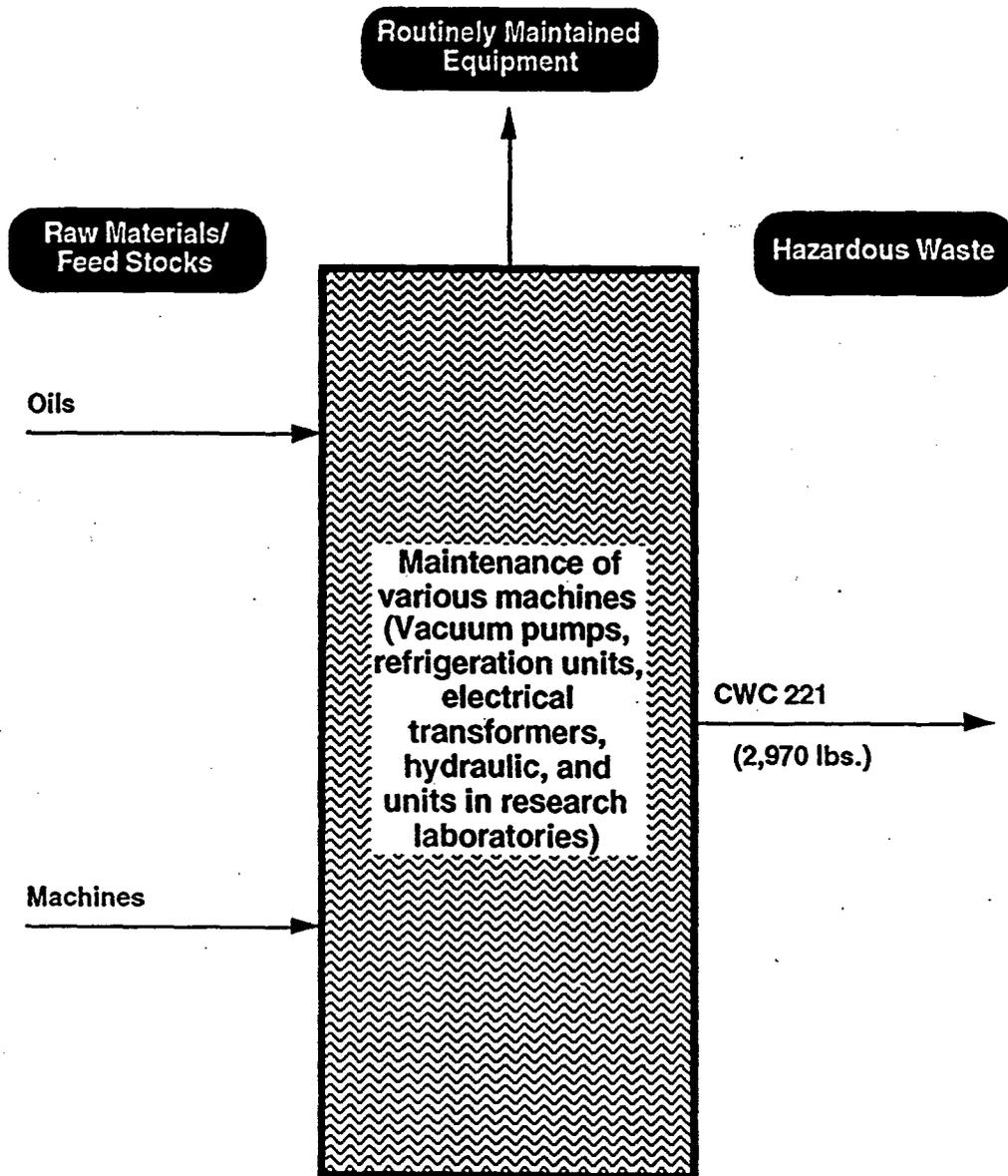


Figure (i) 1

BLOCK FLOW DIAGRAM for Waste Machining and Grinding Coolant/Water 1990

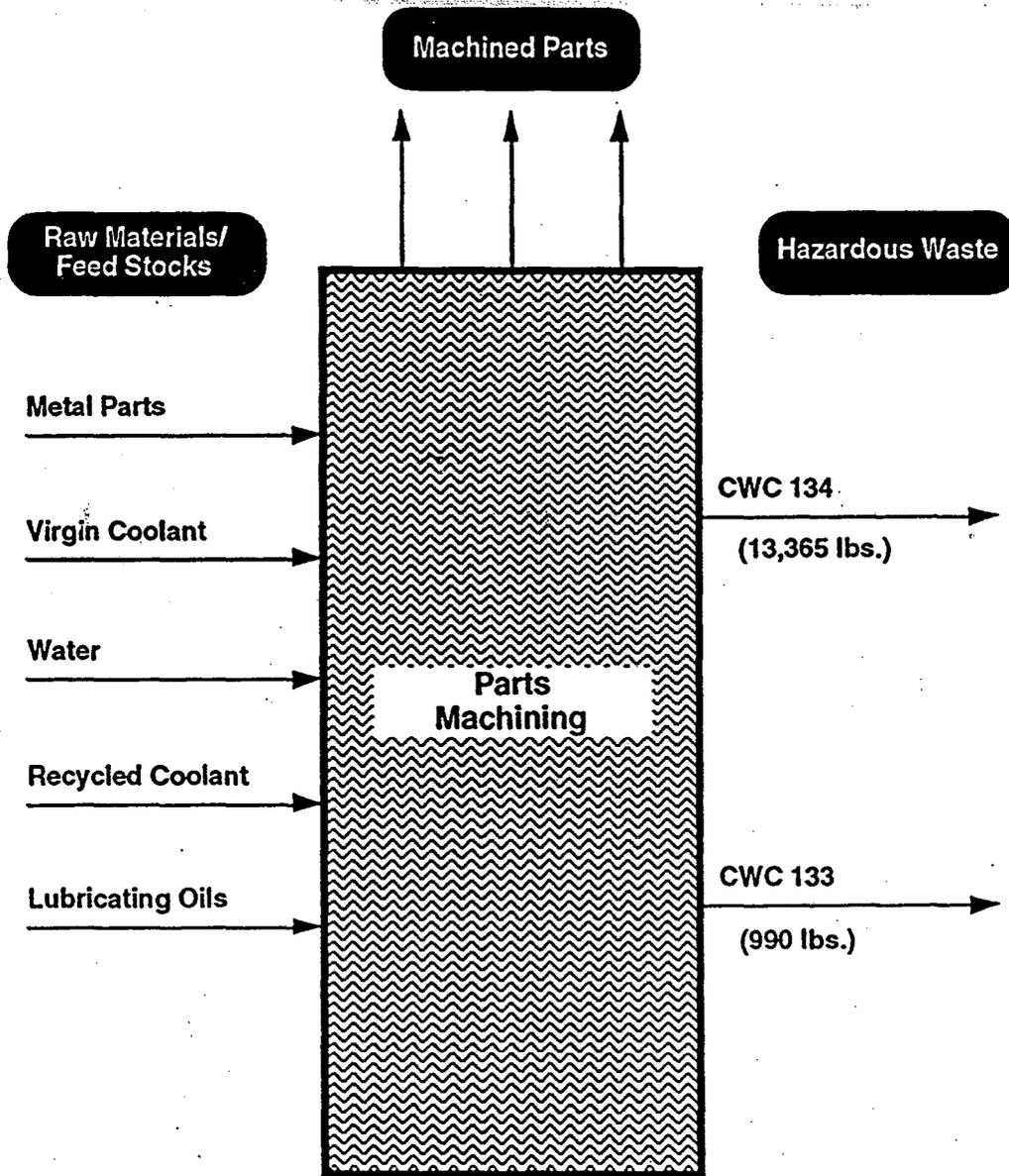


Figure (i) 2

BLOCK FLOW DIAGRAM for Spent Empty Drums ≥ 30 gal 1990

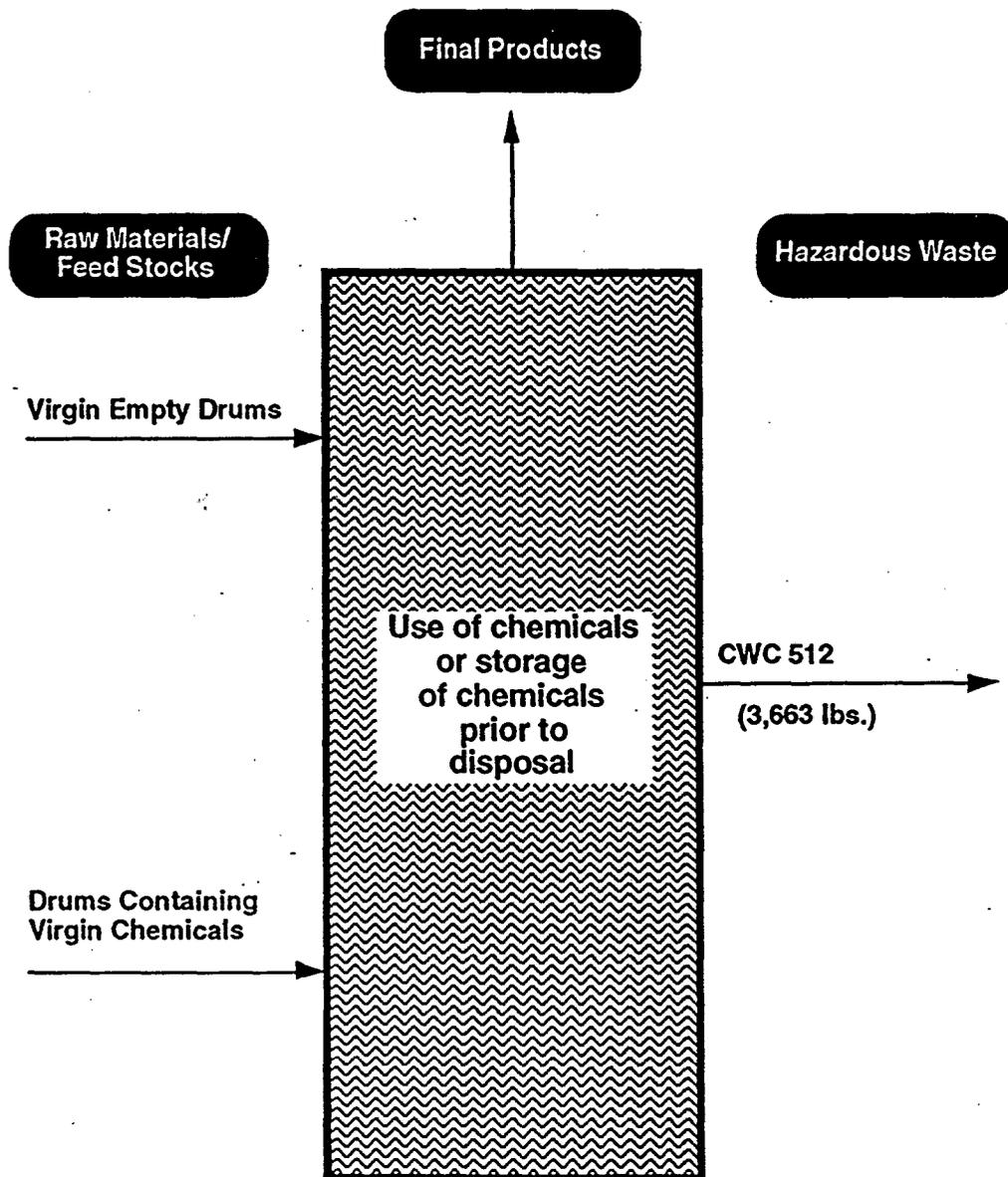


Figure (i) 3

**BLOCK FLOW DIAGRAM
for Waste Liquids with pH \geq 2
(Sulfuric; Nitric, Chromic Acids and Ammonium Persulfate)
1990**

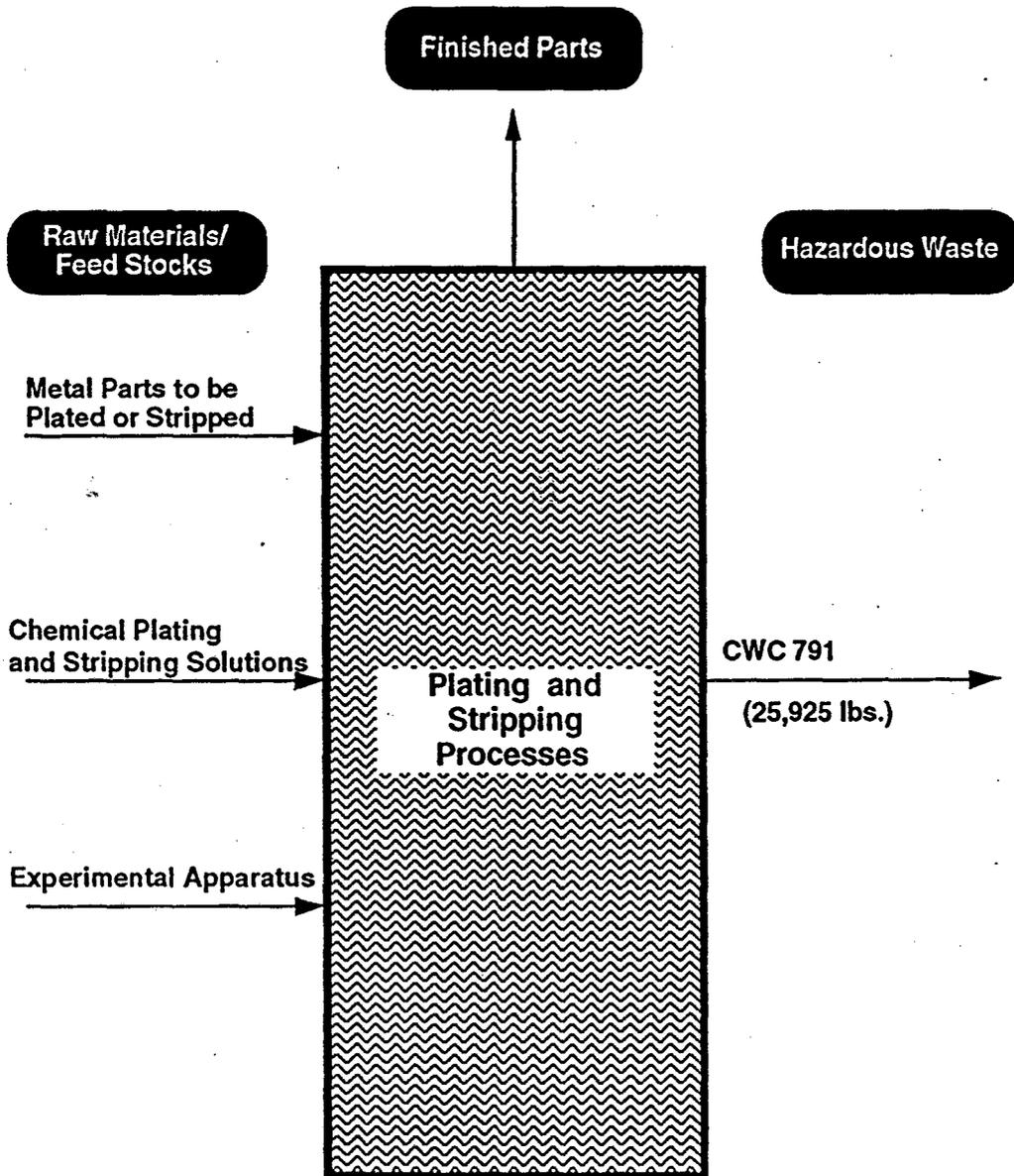


Figure (i) 4

BLOCK FLOW DIAGRAM for Waste Mercury 1990

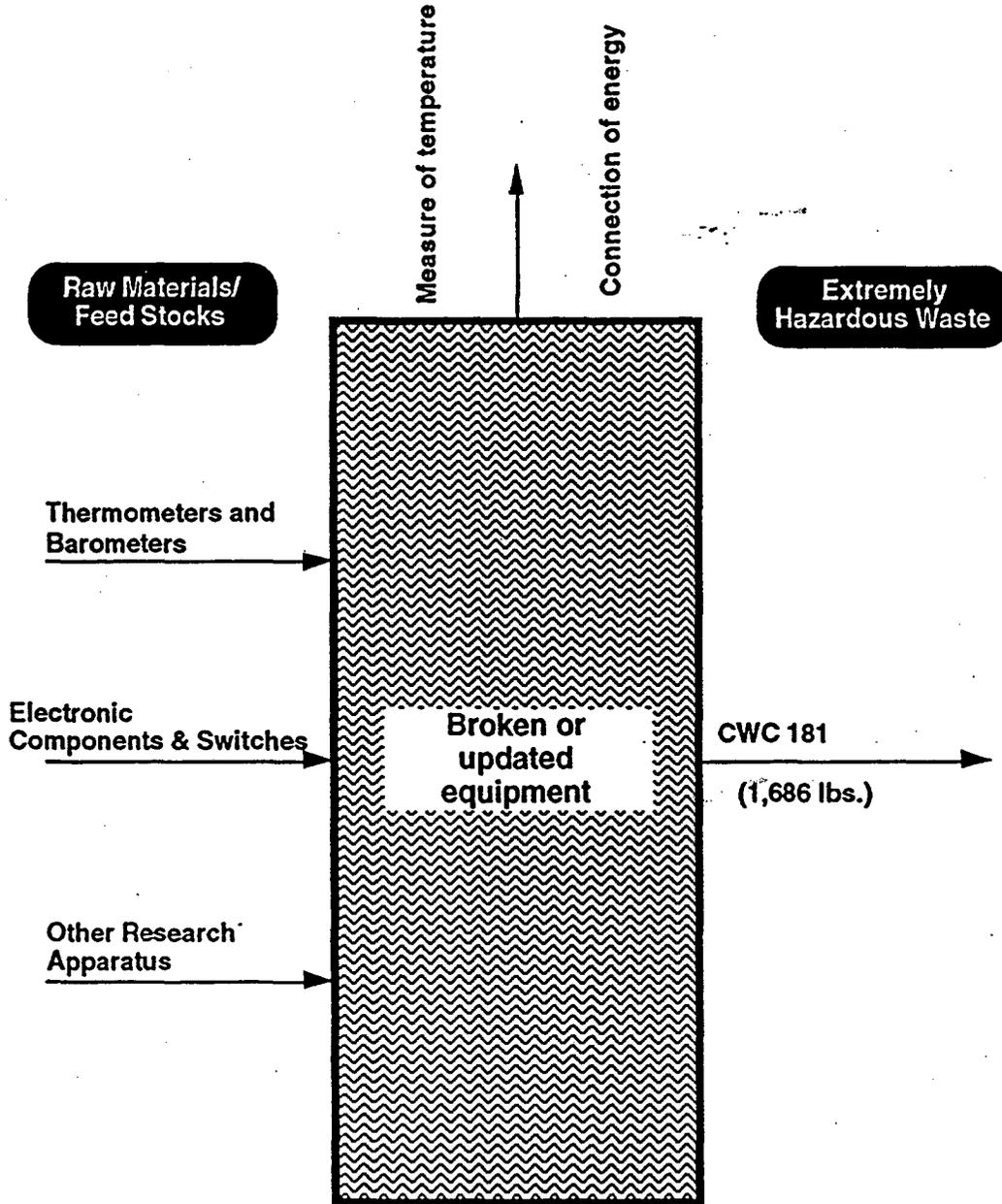


Figure (i) 5

BLOCK FLOW DIAGRAM for Aqueous Wastewater Treatment Unit Influent 1990

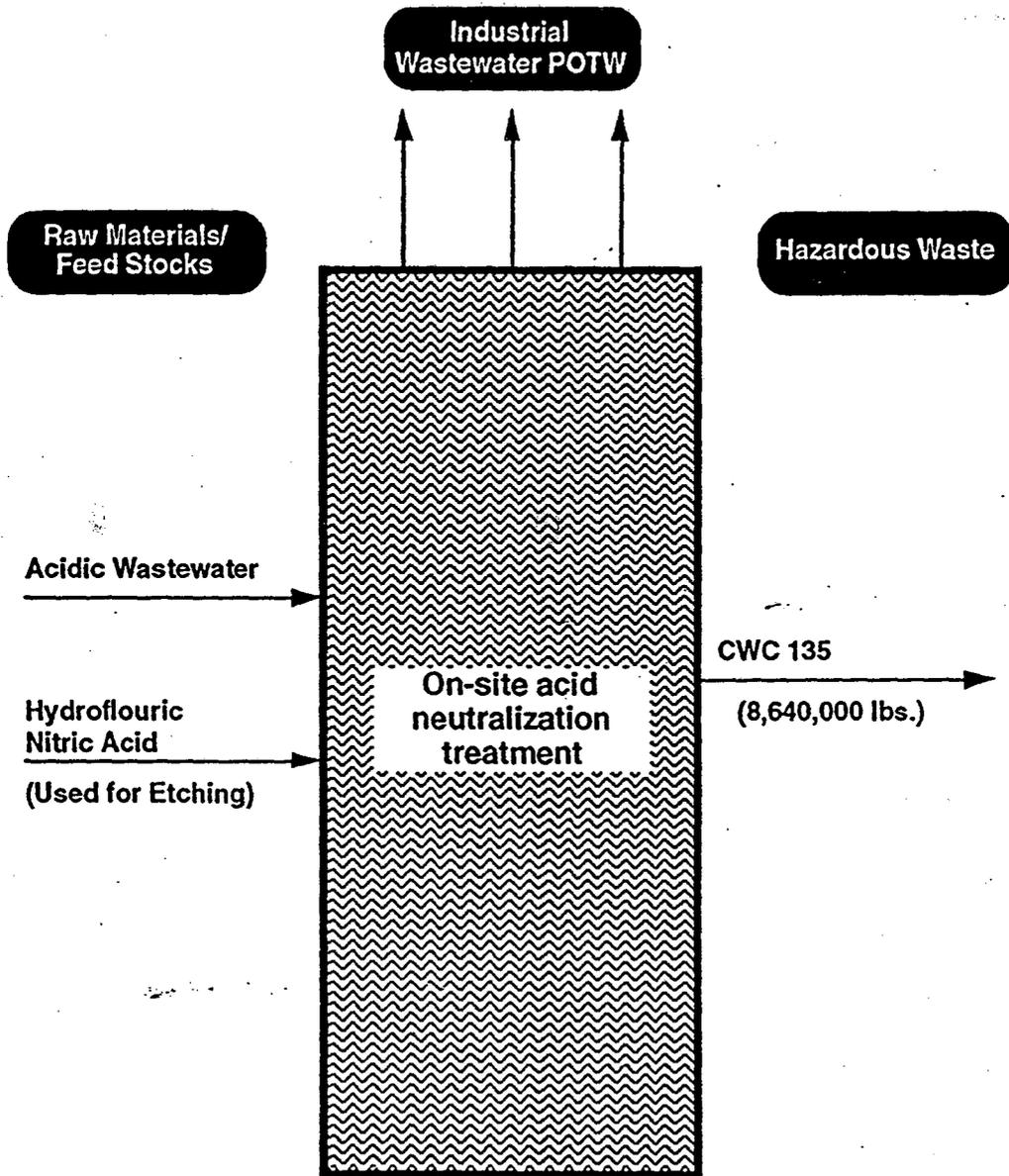


Figure (i) 6

SOURCE REDUCTION MEASURES EVALUATION AND WEIGHING FACTORS

(j, k) *Evaluation of potential viable source reduction measures and consideration of evaluation factors.*

The following source reduction measures were evaluated for the major waste streams.

- 1) Input changes.
- 2) Operational improvements.
- 3) Production process changes.
- 4) Product formulations.

Administrative steps planned at LBL to reduce hazardous waste generation are referenced in the DOE Waste Minimization and Pollution Prevention Awareness Plan (Attachment 1). Included in the administrative steps are inventory control, employee award programs, employee training, in-house policies, management support, and other programs or measures.

Source reduction evaluation matrices are provided in Figures (j, k)1 through (j, k)6. The preliminary evaluations combine the source reduction approaches and measures from CCR Section 67100.5(j) with the evaluation factors from CCR Section 67100.5(k). The approaches and measures are shown vertically on the left of the matrix and the evaluation factors are shown horizontally along the top of the matrix. The letters and numbers shown in parentheses correspond to the section of the regulations in which the item is required.

Each evaluation factor is weighted with respect to its relative importance to implementing a source reduction measure at LBL (see Figures [j, k]1 through [j, k]6). The weighting factors are represented by a percentage with all of them adding up to 100 percent. Weighting factors are assigned such that the factors pertaining to environment, health, and safety add up to 65 percent (i.e., decrease in hazardous waste generated; employee health and safety; and releases to air, water, and land). The factors pertaining to feasibility, institutional implementability, permits, and cost add up to 35 percent. The rationale for assigning the weighting factors is described in the following paragraphs.

Because the goal of SB-14 is to reduce the generation of hazardous waste at its source, the evaluation factor "Decrease in Hazardous Waste Generated" is given a fairly high weight of 15 percent.

"Technical Feasibility" is given a weight of 5 percent because the evaluation assumes that all of the measures listed are technically feasible. (This detailed evaluation includes all of the potentially viable source reduction measures identified; an initial screening was not conducted pursuant to CCR Section 67100.5(o). Technical Feasibility is used more to assess how widely applicable

a particular measure is throughout the campus, given the extremely diverse nature of all the teaching and research activities.

All other criteria being equal, cost should not stop a source reduction measure from being evaluated. With that in mind, a 10 percent weighting factor is assigned to "Economic Evaluation."

"Employee Health and Safety" is given the highest weight of 20 percent because of its importance to LBL. The need for permitting in implementing an option should not have a significant effect on a decision to evaluate the option further. In that respect, "Permits & Variances" has one of the lowest weights of 5 percent. It is important that an option not merely shift contaminants from one media to another; therefore, "Releases and Discharges to Air, Water, and Land" has been given a weight value of 10 percent. "Institutional Implementability" is given a fairly high weight of 15 percent because LBL is made up of many diverse research programs.

As LBL is a research laboratory and there is no defined product manufactured here, the "Effects on Product Quality" was not considered.

WEIGHTING FACTOR	PERCENT
Decrease in Hazardous Waste	15
Technical Feasibility	5
Economic Evaluation	10
Employee Health and Safety	20
Permits & Variances	5
Releases to Air	10
Releases to Water	10
Releases to Land	10
Institutional Implementability	15
Effects on Product Quality	N/A

RELATIVE NUMERICAL RANKING OF SOURCE REDUCTION MEASURES

Each source reduction measure is analyzed against the evaluation factors by using a relative numerical ranking of:

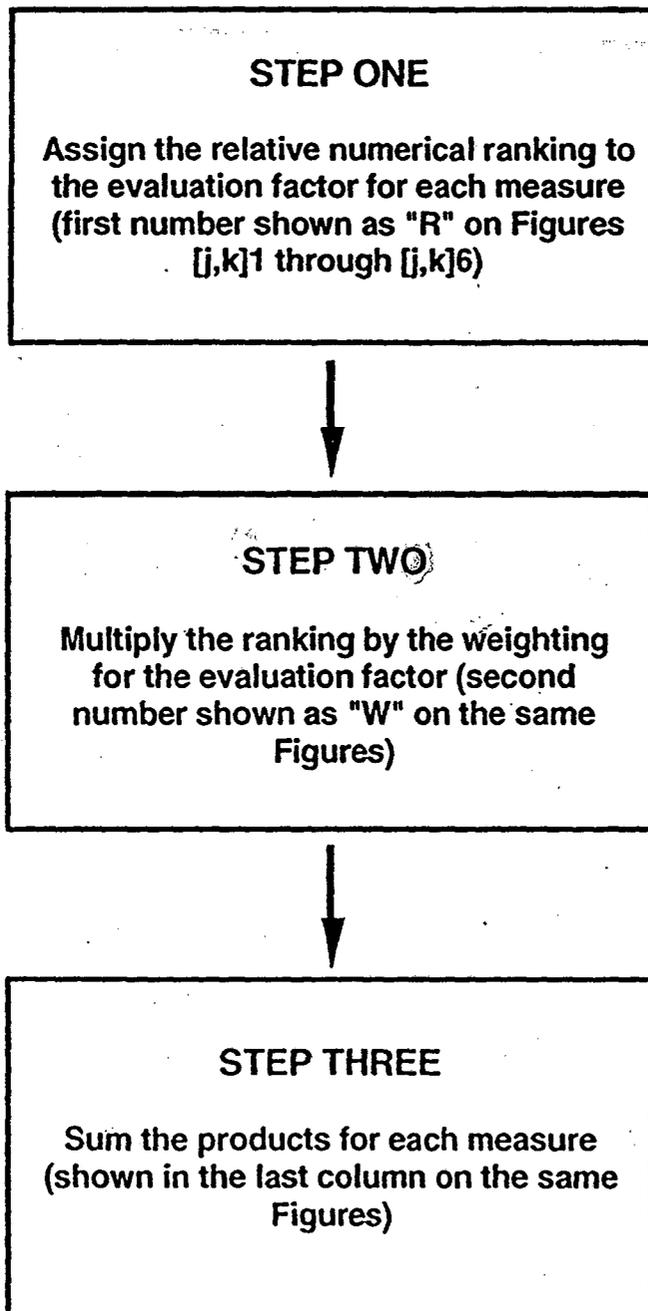
'1' — poor
 '5' — medium
 or, '10' — good.

For each evaluation factor, the relative ranking system is applied as follows:

Evaluation Factor	1	5	10
Decrease in Hazardous Waste Generated	Minimum decrease	Medium decrease, possible decrease, no effect, or different effect (for example, it may depend on the substitute chemical or method used)	Relatively large decrease
Technical Feasibility	Not widely applicable	May be applicable for some operations, or not known to what extent it may be applicable (i.e., the actual applications or the extent to which the measure may be applicable to research is currently unknown)	Widely applicable
Economic Evaluation	High costs	Medium costs	Low costs
Employee Health and Safety	Detrimental	Neutral or no effect	Beneficial
Permits and Variances	Needs permits	Possibly needs permits, etc. (depending on the substitute chemical or method used, for example)	No permits, etc., required
Releases to Air, Water, Land	Increased release	Medium decrease, possible decrease, no effect, or different effect (depending on the substitute chemical or method used, for example)	Large decrease
Institutional Implementability	Very difficult	Somewhat difficult	Not difficult

EVALUATION PROCEDURE

A matrix table that includes all of the previously mentioned criteria is used during the evaluation process to arrive at a numerical ranking/screening of the options. Options are selected to be studied in detail for potential implementation based on the ranking. The following steps are utilized to evaluate potential source-reduction measures:



Waste Oil (Non-Automotive)

FIGURE (j,k) 1
Evaluation of Source Reduction Approaches
[per CCR § 67100.5 (j), (k), and (l)]

Source Reduction Approaches		Source Reduction Measures		Evaluation Criteria																														
				1. Decrease in HW Generated					2. Technical Feasibility					3. Economic Evaluation					4. Employees H&S					5. Permits & Variances					6. Releases & Discharges			7. Institutional Implementability		Total
																													a. Air					
				W* = 15%		W* = 5%		W* = 10%		W* = 20%		W* = 5%		W* = 10%		W* = 10%		W* = 10%		W* = 15%		RxW												
R**	RxW	R**	RxW	R**	RxW	R**	RxW	R**	RxW	R**	RxW	R**	RxW	R**	RxW	R**	RxW	R**	RxW															
Input changes	N/A	1																																
		2																																
		3																																
		4																																
Operational Improvements		1 Maintenance on vacuum pumps	5	.75	10	.5	5	.5	5	1	10	.5	5	.5	5	.5	5	.5	10	1.5	6.25													
		2 Maintenance of hydraulic machinery	5	.75	10	.5	5	.5	5	1	10	.5	5	.5	5	.5	5	.5	10	1.5	6.25													
		3 Maintenance of machines in research labs	5	.75	10	.5	5	.5	5	1	10	.5	5	.5	5	.5	5	.5	10	1.5	6.25													
		4																																
Production process change	N/A	1																																
		2																																
		3																																
		4																																
Product reformulations	N/A	1																																
		2																																
		3																																
		4																																
Other	N/A	1																																
		2																																
		3																																
		4																																

*W-Weighting Factor
**R-Rating
U-Unknown
N/A-Not Applicable

Waste Machining and Grinding Coolant/Water

FIGURE (j,k) 2
Evaluation of Source Reduction Approaches
[per CCR § 67100.5 (j), (k), and (l)]

Source Reduction Approaches		Source Reduction Measures		Evaluation Criteria																
				1. Decrease in HW Generated	2. Technical Feasibility	3. Economic Evaluation	4. Employee H&S	5. Permits & Variances	6. Releases & Discharges						7. Institutional Implementability	Total				
									a. Air		b. Water		c. Land							
				W* = 15%	W* = 5%	W* = 10%	W* = 20%	W* = 5%	W* = 10%	W* = 10%	W* = 10%	W* = 10%	W* = 15%	R**		RxW				
R**	RxW	R**	RxW	R**	RxW	R**	RxW	R**	RxW	R**	RxW	R**	RxW	R**	RxW	R**	RxW			
Input changes	1																			
	2																			
	3																			
	4																			
Operational Improvements	1																			
	2																			
	3																			
	4																			
Production process change	1 Evaporate oil water content	10	1.5	10	.5	5	.5	5	1	.05	5	.5	5	.5	5	.5	10	1.5	6.00	
	2																			
	3																			
	4																			
Product reformulations	1																			
	2																			
	3																			
	4																			
Other	1																			
	2																			
	3																			
	4																			

*W-Weighting Factor
 **R-Rating
 U-Unknown
 N/A-Not Applicable

Spent Empty Drums ≥ 30 Gallons (Drums that last contained a hazardous chemical)

FIGURE (j,k) 3
Evaluation of Source Reduction Approaches
[per CCR § 67100.5 (j), (k), and (l)]

Source Reduction Approaches		Source Reduction Measures		Evaluation Criteria																														
				1. Decrease in HW Generated					2. Technical Feasibility					3. Economic Evaluation					4. Employee H&S					5. Permits & Variances					6. Releases & Discharges			7. Institutional Implementability		Total
																													a. Air					
				W* = 15%		W* = 5%		W* = 10%		W* = 20%		W* = 5%		W* = 10%		W* = 10%		W* = 10%		W* = 15%		RxW												
R**	RxW	R**	RxW	R**	RxW	R**	RxW	R**	RxW	R**	RxW	R**	RxW	R**	RxW	R**	RxW																	
Input changes	1	Use bulk containers		10	1.5	5	.25	5	.5	10	2	10	.25	5	.5	5	.5	1	1	10	1.5	8.00												
	2																																	
	3																																	
	4																																	
Operational Improvements	1	Offsite exchange of containers		10	1.5	5	.25	10	1	5	1	10	.5	5	.5	5	.5	5	.5	10	1.5	7.25												
	2	Reduction to environmental exposure		5	.75	5	.25	1	.1	10	2	10	.5	5	.5	5	.5	5	.5	10	1.5	8.60												
	3	Onsite exchange		10	1.5	10	.5	10	1	5	1	5	.5	5	.5	5	.5	5	.5	10	1.5	7.50												
	4																																	
Production process change	1																																	
	2																																	
	3																																	
	4																																	
Product reformulations	1																																	
	2																																	
	3																																	
	4																																	
Other	1																																	
	2																																	
	3																																	
	4																																	

*W-Weighting Factor
**R-Rating
U-Unknown
N/A-Not Applicable

Waste Liquids with pH ≤ 2
(Sulfuric, nitric, chromic acids, and ammonium persulfate)

FIGURE (j,k) 4
Evaluation of Source Reduction Approaches
[per CCR § 67100.5 (j), (k), and (l)]

Source Reduction Approaches		Source Reduction Measures		Evaluation Criteria																Total RxW														
				1. Decrease in HW Generated					2. Technical Feasibility					3. Economic Evaluation					4. Employee H&S					5. Permits & Variances					6. Releases & Discharges			7. Institutional Implementability		
				W* = 15%		W* = 5%		W* = 10%		W* = 20%		W* = 5%		W* = 10%		W* = 10%		W* = 10%			W* = 15%													
R**	RxW	R**	RxW	R**	RxW	R**	RxW	R**	RxW	R**	RxW	R**	RxW	R**	RxW	R**	RxW	R**	RxW	R**	RxW													
Input changes	1	Substitute less hazardous material	10	1.5	10	.5	1	.1	10	2	10	.5	5	.5	5	.5	5	.5	5	.75	6.85													
	2	Use less hazardous material in a research setting	5	.75	1	.05	1	.1	10	2	10	.5	5	.5	5	.5	5	.5	1	1.5	5.05													
	3																																	
	4																																	
Operational Improvements	1	Drip rack, drag-out reduction	5	.75	10	.5	10	1	5	1	10	.5	5	.5	5	.5	5	.5	10	1.5	6.75													
	2																																	
	3																																	
	4																																	
Production process change	1	Eliminate plating from B77 processes	10	1.5	5	.25	5	.5	10	2	10	.5	5	.5	5	.5	5	.5	10	1.5	7.75													
	2																																	
	3																																	
	4																																	
Product reformulations	1																																	
	2																																	
	3																																	
	4																																	
Other	1																																	
	2																																	
	3																																	
	4																																	

*W-Weighting Factor
 **R-Rating
 U-Unknown
 N/A-Not Applicable

Waste Mercury

FIGURE (j,k) 5
Evaluation of Source Reduction Approaches
[per CCR § 67100.5 (j), (k), and (l)]

Source Reduction Approaches		Source Reduction Measures		Evaluation Criteria															Total															
				1. Decrease in HW Generated					2. Technical Feasibility					3. Economic Evaluation						4. Employee H&S					5. Permits & Variances					6. Releases & Discharges			7. Institutional Implementability	
				W* = 15%	W* = 5%	W* = 10%	W* = 20%	W* = 5%	W* = 10%	W* = 10%	W* = 10%	W* = 10%	W* = 15%	R**	RxW	R**	RxW	R**		RxW	R**	RxW	R**	RxW	R**	RxW	R**	RxW						
Input changes	1	Use less hazardous thermometers & barometers	10	1.5	10	.5	10	1	10	2	10	.5	5	.5	5	.5	5	.5	5	.5	10	1.5	8.5											
	2	Use different electrical switches	5	.75	10	.5	10	1	10	2	10	.5	5	.5	5	.5	5	.5	5	.5	10	1.5	7.75											
	3	Substitute w/ less hazardous mat. in research apparatus	5	.75	5	.25	1	.1	10	2	10	.5	5	.5	5	.5	5	.5	5	.5	5	.75	5.85											
	4																																	
Operational improvements	1																																	
	2																																	
	3																																	
	4																																	
Experiment process change	1	Redesign research apparatus to use less hazardous material or use less mercury	5	.75	5	.25	1	.1	10	2	10	.5	5	.5	5	.5	5	.5	5	.5	1	.15	5.25											
	2																																	
Product reformulations	1																																	
	2																																	
	3																																	
	4																																	
Other	1																																	
	2																																	
	3																																	
	4																																	

*W-Weighting Factor
**R-Rating
U-Unknown
N/A-Not Applicable

Aqueous Hazardous Wastewater (Acid)

FIGURE (j,k) 6
Evaluation of Source Reduction Approaches
[per CCR § 67100.5 (j), (k), and (l)]

Year: 1990
CWC: 131, 132, 135

Source Reduction Approaches		Source Reduction Measures		Evaluation Criteria																Total RxW		
				1. Decrease In HW Generated		2. Technical Feasibility		3. Economic Evaluation		4. Employee H&S		5. Permits & Variances		6. Releases & Discharges							7. Institutional Implementability	
														a. Air		b. Water		c. Land				
				W* = 15%		W* = 5%		W* = 10%		W* = 20%		W* = 5%		W* = 10%		W* = 10%		W* = 15%				
				R**	RxW	R**	RxW	R**	RxW	R**	RxW	R**	RxW	R**	RxW	R**	RxW	R**	RxW			
Input changes	1	Reduce volume of water	5	.75	10	.5	5	.5	5	1	1	.05	5	.5	5	.5	5	.5	10	1.5	5.80	
	2																					
	3																					
	4																					
Operational improvements	1																					
	2																					
	3																					
	4																					
Production process change	1																					
	2																					
	3																					
	4																					
Product reformulations	1																					
	2																					
	3																					
	4																					
Other	1																					
	2																					
	3																					
	4																					

*W-Weighting Factor
**R-Rating
U-Unknown
N/A-Not Applicable

Note: This is just for Building 70A. Reference Waste Minimization Opportunities Assessment Report for Buildings 25 and 77.

(l) *Any pertinent information, such as waste stream constituents and concentration, needed to evaluate and implement source reduction measures.*

The title of the waste stream implies the constituents listed in Section (i) of this plan.

(m) *A specification of, and rationale for, the technically feasible and economically practicable source reduction measures which will be taken for each waste stream.*

Administrative or operational source reduction measures that will be implemented, are described in LBL's Waste Minimization and Pollution Prevention Awareness Plan (*Attachment 1*).

Waste Oil (Non-Automotive) CWC 221

LBL was able to identify two of three source reduction measures as feasible and practicable. The two selected are:

- Maintenance on vacuum pumps
- Maintenance of hydraulic machinery

Task forces will be set up to look at maintenance procedures to study the vacuum pumps and hydraulic machinery. Maintenance part changes will also be considered.

Non-automotive waste oil is one of the largest onsite waste streams, with numerous pumps and machinery located throughout LBL. Keeping that information in mind, a 10% reduction goal has been set up to be achieved by 1994.

Waste Machining and Grinding Coolant/Water CWC 134

Only one source reduction avenue was evaluated that has not already been implemented. The evaporation technique would possibly reduce the volume by 85%, if the water could be effectively evaporated off. A treatment permit would need to be acquired before any process change could occur. Recycling excess water has been previously considered. Currently at the Building 77 shop there is no use for excess recycled water, and therefore no shortage of it either.

Spent Empty Drums \geq 30 Gallons CWC 512

- *Bulk containers:*

A task force will be set up to research applicability for the use of bulk containers. Also a temporary system could be set up during a trial period to evaluate the effectiveness of reusing empty containers (i.e., that would hold the same product as before).

- *Offsite Exchange Containers:*

This reduction measure will involve the coordination of both the generators and vendors. If this situation proves acceptable, a contract will be set up to refill specific containers. Waste oil will be the high emphasis area.

- *Reduction of Environmental Exposure:*

The goal would be to protect new product drums from environmental factors. New storage units are currently in the planning stage.

- *Onsite Exchange:*

A combined effort will be required between generators and the Hazardous Waste Handling Facility for a functional system. A realistic 10% reduction goal has been established for the end of 1993.

- *Spent Empty Drums:*

To establish a practical comprehensive reduction system, a task force will need to be set up. A complete listing of generators will need to be organized. By integrating all source reduction approaches, LBL is projecting a 50% reduction goal by 1994.

Waste Liquids of $\text{pH} \leq 2$ CWC 791

- *Drip Rack Drag Out Reduction:*

A more efficient system has been planned for Building 77. Reference *Waste Minimization Opportunities Assessment Report for Buildings 25 & 77 (Attachment 2)* for more details. LBL's goal is to minimize waste every year because of the involvement of higher concentrations of acids in the process tanks.

- *Substitute Less Hazardous Material:*

Many hours of research and development would be required in order to identify adequate alternative substitutes. Various task forces will be arranged to contact vendors/manufacturers who might possibly be able to provide equal substitutes.

- *Eliminate Plating Process From B77:*

Building 77 has chosen to eliminate their plating process from the plating and cleaning shop. Therefore, only the cleaning processes will be operational in 1993. The acid waste source reduction goal for 1991 is set at 15%.

Waste Mercury CWC 181

- *Use Thermometers and Barometers With Less Hazardous Material:*

A study of the largest generators of broken thermometers in the research areas will be conducted. The task force will then try to identify possible vendors/manufacturers who offer equivalent substitutions for mercury. Another review possibility would be the integration of more structurally sound features while still utilizing mercury.

- *Use Different Electrical Switches:*

A study of a variety of electrical switches available on the market will be performed by a task force. Electricians should definitely be involved on the task force.

Aqueous Hazardous Waste (Acid) CWC 131, 132, 135

- *Reduction in the Volume of Water:*

This reduction measure was implemented in September of 1991. The approach revolved around a total replumbing of the building. Before the reduction integration, the plumbing to all sinks and hoods were hooked together. This generated a tremendous volume of wastewater. Currently only two research labs are connected to the acid neutralization treatment unit. The volume of water has been reduced by at least 60%. In 1985 budget allocations began, and the project went on line in 1991.

- (n) *An evaluation, and to the extent practicable, a quantification, of the effects of any source reduction measure selected in subsection (m) on emissions and discharges to air, water, and land.*

Effects of the chosen source reduction measures cannot be quantified. Qualitative effects are included in the evaluation described in Section (j, k) of this plan and Figures (j, k)1 through (j, k)6.

- (o) *A list of each measure considered but not selected for detailed evaluation and the rationale for rejecting the measure.*

Taking into consideration the exorbitant costs involved and the excessively high number of research labs located throughout LBL, administrative controls and training will be relied upon for hazardous materials/practices integration for reduction purposes .

The following consist of the rejected measures:

Waste Oil (Non-Automotive)

- *Maintenance of machines in research labs*

Waste Liquids w/pH \leq 2

- *Use less hazardous material in research setting*

Waste Mercury

- *Redesign research apparatus to use less hazardous material or use less mercury*

- (p) *Timetable for implementation of source reduction measures.*

The timetable for site wide administrative and operational measures is included as part of the LBL Waste Minimization and Pollution Prevention Plan (*Attachment 1*, see appendix D). The timetable for researching and implementing source reduction measures is shown in Table (p)1.

Table (p) 1
Timetable for Implementing Source Reduction Measures
 [per CCR § 67100.5 (P)]

Major Waste Streams	Source Reduction Approach	Source Reduction Measure	Sep-91...	Sep-92	Dec-92	Mar-93	Jun-93	Sep-93	Dec-93	Mar-94	Jun-94	Sep-94	Dec-94	Mar-95	Jun-95	
			Waste Oil (Non-Automotive)	Operational Improvement	Maintenance On Vacuum Pumps						Task Force	Write Procedures or upgrade SOP	Approval	Training	Implementation	
Maintenance Of Hydraulic Machinery								Task Force	Write Procedures or upgrade SOP	Approval	Training	Implementation				
Waste Machining & Grinding Coolant Water	Production Process Change	Evaporate of H ₂ O Content							Prepare Document for Permit			Submit to Department of Toxic Substances Control				Training Implementation
Spent Empty Drums	Input Changes	Use Bulk Containers							Task Force	Write Procedures	Approval	Training	Implementation			
	Operational Changes	Offsite Exchange of Containers							Task Force	Write Procedures	Approval	Training	Implementation			
		Reduction to Environmental Exposure	Currently in Planning Stage													
		Onsite Exchange							Task Force	Write Procedures	Approval	Training	Implementation			

☐ Reassess approach and set another goal.

Table (p) 1 (CONTINUED)
Timetable for Implementing Source Reduction Measures
 [per CCR § 67100.5 (P)]

Major Waste Streams	Source Reduction Approach	Source Reduction Measure	Sep-91...	Sep-92	Dec-92	Mar-93	Jun-93	Sep-93	Dec-93	Mar-94	Jun-94	Sep-94	Dec-94	Mar-95	Jun-95
			Waste Liquids w/pH ≤ 2	Operational Improvement	Drip Rack, Dragout Reduction	Check the Schedule in the <i>Waste Minimization Opportunities Assessment Report for Buildings 25 and 77</i>									
Input Changes	Substitute Less Hazardous Material	Check the Schedule in the <i>Waste Minimization Opportunities Assessment Report for Buildings 25 and 77</i>													
Process Change	Eliminate Plating Processes From B77	To Begin in 1993													
Waste Mercury	Input Changes	Use Thermometers & Barometers w/ Less Hazardous Material													
		Use Different Electrical Switches													
Aqueous Waste Water	Input Change	Reduce Volume of Water	On line in September 1991												

Reassess approach and set another goal.

Table (f)1
Factor Alternative Considerations

WASTE STREAM	SOURCE REDUCTION MEASURE	QUANTITY	PROCESS OR ACTIVITY OF GENERATION	SOURCE REDUCTION APPROACH	SOURCE REDUCTION MEASURE	ECONOMIC OVERVIEW (capital, operating & maint. costs)	ESTIMATED SOURCE REDUCTION	BARRIERS/ OBSTACLES	DISCHARGE IMPACTS (air, water, land)
Waste Oil (Non-Automotive)	Maintenance on vacuum pumps & hydraulic machinery	2,970 lbs.	Fig (l) 1	Operational Improvement	Fig. (j,k) 1	No Waste Minimization Specialist avail. to perform study	10% by 1994		n/a
Waste Machining & Grinding Coolant Water	Evaporate off water content	13,365 lbs.	Fig (l) 2	Production Process Change	Fig (j,k) 2	No Waste Minimization Specialist avail. to perform study	85%	Permit from Dept. of Toxic Substances Control	Air
Spent Empty Drums ≥ 30 Gallons	Bulk containers	3,683 lbs.	Fig (l) 3	Input changes	Fig (j,k) 3	No Waste Minimization Specialist avail. to perform study	50% by 1994 all combined		n/a
	Offsite exchange of containers			Operational changes					
	Reduction to environmental exposure								
	Onsite exchange								
Liquid Waste w/pH ≤ 2	Drip rack, dragout reduction	25,925 lbs.	Fig (l) 4	Operational changes	Fig (j,k) 4	No Waste Minimization Specialist avail. to perform study	Acid waste reduction 15% by 1994 combined	Permit from BAAQMD	Air
	Substitute less hazardous material			Input change					n/a
	Eliminate plating processes from B77			Process change				To begin in 1993	
Waste Mercury	Use thermometers & barometers w/less hazardous material	1,686 lbs.	Fig (l) 5	Input change	Fig (j,k) 5	No Waste Minimization Specialist avail. to perform study	TBD		n/a
	Use different electrical switches								
Aqueous Hazardous Waste Water (acid)	Reduce volume of water	8,640,000	Fig (l) 6	Input change	Fig (j,k) 6	No Waste Minimization Specialist avail. to perform study	Implemented on Sept. 1991 60%	Permit to sanitary sewer	Water

TBD — To Be Determined

PART 2
SOURCE REDUCTION PLAN SUMMARY

PART 2

SOURCE REDUCTION PLAN SUMMARY

TABLE OF CONTENTS

Overview.....2-3

Approach (Summary Evaluation Source Reduction Measure)2-4

A Summary of Information Required by Source Reduction Measure.....2-4

A Summary of the Information Required by CCR Section 67100.1(o)
for Each Rejected Measure.....2-4

Abstract of Each Source Reduction Measure Implemented2-5

TABLES

Table (f)1 Factor Alternative Considerations.....2-5

PART 2

SOURCE REDUCTION PLAN SUMMARY**California Code of Regulations 67100.6****OVERVIEW**

This Source Reduction Plan Summary has been prepared by the Lawrence Berkeley Laboratory at Berkeley, California in accordance with California Code of Regulations (CCR) Section 67100.1 *et seq.* The numbered and lettered sections of this Plan Summary correspond to the numbers and letters contained in CCR Section 67100.6. Certification pursuant to CCR Section 67100.1 is contained in Part 5.

- (a) University of California
Lawrence Berkeley Laboratory
One Cyclotron Road
Berkeley, California 94720

Contact:.....Dr. Li Yang Chang, Environment Protection Group

Telephone No.:.....(510) 486-5923

EPA ID No:.....CA 4890008986

SIC Code:.....8733

- (b) BRIEF OVERVIEW OF REVIEW AND PLAN

LBL is a research institution, not a product manufacturer. It is a multiprogram national laboratory owned by the U.S. Department of Energy, and managed and operated by the University of California. The major role of LBL is to conduct energy research programs such as high-energy physics, nuclear physics, heavy-ion fusion, magnetic fusion energy, x-ray optics, biology and medicine.

Hazardous waste generated by laboratories and facilities onsite is accumulated at the hazardous waste handling facility located at building 75. The waste is characterized by individual generators. LBL contracts with a vendor who handles the waste and prepares it for shipping, disposal, and offsite recycling.

The Review and Plan (Part 1) identifies the waste streams that exceed 5% of the total routinely generated hazardous waste and the total extremely hazardous wastes generated.

APPROACH

- (c) *A summary of the information used for evaluation of each source reduction measure, required by CCR Section 67100.5(k).*

Information used to evaluate each source reduction measure included the following:

- a) Volume location - Hazardous Waste Handling Facility or individual labs
- b) Comparison of the application from various sources
- c) Institutional feasibility study based upon the number of generators
- d) Time of research and development versus percent of reduction

Note: *The only exception was the aqueous hazardous wastewater (acid) because of planning and initiation prior to 1991.*

For specific details of the source reduction measure evaluation and weighting factor description, please reference Pages 1-15 to 1-18.

A SUMMARY OF INFORMATION REQUIRED BY SOURCE REDUCTION MEASURE

- (d) *A summary of the information required by CCR Section 67100.5(m).*

A combination of generation sources, volumes, institutional applicability, research time, and reduction percentage were used to compile information used to evaluate the source reduction measures.

A SUMMARY OF INFORMATION REQUIRED BY CCR SECTION 67100.1(O) FOR EACH REJECTED MEASURE

- (e) *The overall summary of the information used to reject source reduction measures included:*

- a) Spread out site-wide
- b) Research and development
- c) Cost
- d) Too many applications

LBL will rely upon its Waste Minimization and Pollution Prevention Awareness Program to bring about a total awareness to employees of LBL for good housekeeping, training, and good lab practices.

ABSTRACT OF EACH SOURCE REDUCTION MEASURE IMPLEMENTED

- (f) *A brief abstract for each source reduction measure to be implemented or those which have been implemented in the reporting year.*

See Table (f)1.

PART 3

HAZARDOUS WASTE MANAGEMENT PERFORMANCE REPORT

PART 3

HAZARDOUS WASTE MANAGEMENT PERFORMANCE REPORT

TABLE OF CONTENTS

Information for Each Waste Stream Identified Pursuant to
CCR Section 67100.8(h):.....3-3

Current Hazardous Waste Management Approaches.....3-4

Assessment of Implemented Hazardous Waste Management Approaches.....3-5

Description of Factors That Have Affected Hazardous Waste Generation.....3-5

PART 3

HAZARDOUS WASTE MANAGEMENT PERFORMANCE REPORT

California Code of Regulations Section 67100.8

INFORMATION FOR EACH WASTE STREAM IDENTIFIED PURSUANT TO CCR SECTION 67100.8 (H)

This Hazardous Waste Management Report has been prepared by the Lawrence Berkeley Laboratory at Berkeley, California in accordance with California Code of Regulations (CCR) Section 67100.1 *et seq.* The numbered and lettered sections of this report correspond to the numbers and letters contained in CCR Section 67100.8(a). For this report, 1990 is both the baseline year and the current year. Certification pursuant to CCR Section 67100.1 is contained in Part 5.

- (1) University of California
Lawrence Berkeley Laboratory
One Cyclotron Road
Berkeley, California 94720
- (2) SIC code: 8733
- (3) All of the following information for each waste stream identified pursuant to CCR Section 67100.5(h):
 - (A) (Note: Current year is the same as the baseline year 1990)

Hazardous Waste

Waste Stream	CWC	Lbs. Generated	Managed	
			Lbs. Onsite	Lbs. Offsite
Waste Oil (Non-Automotive)	221	2,970	0%	100%
Waste Machining & Grinding Coolant/Water	134	13,365	0%	100%
Spent Empty Drums \geq 30 Gal.	512	3,663	0%	100%
Waste Liquids w/pH \leq 2 (Sulfuric, Nitric, Chromic Acids & Ammonium Persulfate)	791	25,925	0%	100%
Aqueous Hazardous Waste (Treatment Unit Influent)	135	25,083,000	100%	0%
Building 70A	132			
Building 25	131 &			
Building 77	135			

Extremely Hazardous Waste

Waste Stream	CWC	Lbs. Generated	Managed	
			Lbs. Onsite	Lbs. Offsite
Waste Mercury	181	1,686	0%	100%

CURRENT HAZARDOUS WASTE MANAGEMENT APPROACHES

- (B) *A description of current hazardous waste management approaches, and identification of all approaches implemented since the baseline year.*

Pickup, transportation, and disposal was contracted out. IT (Industrial Technologies Corporation) held the contract for most of 1990. As of November 1990, USPCI (United States Pollution Control, Inc.) has taken over the duties of waste management. USPCI has improved opportunities for offsite recycling. Because of the laboratory situation, the processes are multitude in nature, it is not appropriate to describe all of them at this time. Information will be provided upon request.

Waste Oil (Non-Automotive)

Under the service contract of the waste management company, the waste oil is being re-utilized or recycled offsite whenever possible.

Waste Machining & Grinding Coolant/Water

Coolant is continually reused until it begins to break down or becomes saturated with filing debris. At that time, the waste is considered unusable and, because of its metal content and toxicity, is disposed of as a non-RCRA, California hazardous waste.

Spent Empty Drums \geq 30 Gallons

The drums are classified a non-RCRA waste. Some are crushed and landfilled, while others are recycled offsite whenever possible.

Waste Liquids w/pH \leq 2

Compatible acids were consolidated for bulk shipment to facilitate offsite recycling whenever possible. After January 1991, combining of compatible acids was discontinued. Currently most are lab-packed and recycled whenever possible.

Waste Mercury

All mercury waste is handled by Quick Silver in South San Francisco and recycled at their facility.

Aqueous Hazardous Waste (Treatment Unit Influent)

- Building 70A:
The treatment unit was upgraded and completed in September of 1991. After reorganizing the plumbing, only two lab wastewater lines were being directed to the treatment unit.
- Building 25:
March 1991, a waste minimization study was completed. As of August 1991, the preventive maintenance program was implemented and the recordkeeping improved. The waste filter cake is disposed of as RCRA hazardous waste with metal hydroxide salts. The treated water is disposed of via the sanitary sewer.
- Building 77:
March 1991, a waste minimization study was completed. The generated filter cake is disposed of RCRA hazardous waste with metal hydroxide salts. The treated water is disposed of via the sanitary sewer.

ASSESSMENT OF IMPLEMENTED HAZARDOUS WASTE MANAGEMENT APPROACHES

- (C) *An assessment of the effect, since the baseline year, of each implemented hazardous waste management approach on the weight of hazardous waste generated, the properties which cause it to be classified as a hazardous waste, and/or the onsite and offsite management of hazardous waste. The report shall consider, but not limited to, source reduction, onsite or offsite recycling, and onsite or offsite treatment.*

The only implemented hazardous waste management approach has been the upgraded plumbing system for Building 70A. The effect being a reduction of the amount of influent to the waste stream. LBL has reduced the waste stream by approximately 60% to about 3,456,000 pounds generated per year.

DESCRIPTION OF FACTORS THAT HAVE AFFECTED HAZARDOUS WASTE GENERATION

- (D) *A description of factors during the current reporting year (1990) that have affected hazardous waste generation and onsite and offsite hazardous waste management since the baseline year, including, but not limited to, the following:*
1. *Changes in business activities*
 2. *Changes in waste classification*
 3. *Natural phenomena*
 4. *Other factors*

Research lab situations are constantly changing from year-to-year, depending on funding involved. Therefore, waste streams will tend to vary due to budget cycle allotments. LBL has changed waste management contractors resulting in more efficient waste handling. An increase in staff was a definite factor in improved management procedures and preparation for the State inspection in December 1990 and the Department of Energy's Tiger Team internal assessment performed January 1991. Additional staff was employed to respond and correct any LBL deficiencies.

PART 4

HAZARDOUS WASTE MANAGEMENT REPORT

SUMMARY

PART 4

HAZARDOUS WASTE MANAGEMENT REPORT SUMMARY

TABLE OF CONTENTS

Summary of the Information Required by CCR Section 67100.8(a)(3).....4-3

Abstracts for Each Source Reduction Implemented.....4-4

Assessment of the Changes in Business Activities.....4-4

PART 4

HAZARDOUS WASTE MANAGEMENT REPORT SUMMARY**California Code of Regulations Section 67100.9****SUMMARY OF INFORMATION REQUIRED BY CCR SECTION 67100.8(A)(3)**

This Hazardous Waste Management Report Summary has been prepared by the Lawrence Berkeley Laboratory at Berkeley, California in accordance with California Code of Regulations (CCR) Section 67100.1 *et seq.* The numbered and lettered sections of this Report Summary correspond to the numbers and letters contained in CCR Section 67100.9. Certification of this Report Summary is contained in Part 5.

- (a) University of California
Lawrence Berkeley Laboratory
One Cyclotron Road
Berkeley, California 94720
- (b) SIC code: 8733
- (c) Summary of the information required by CCR Section 67100.8(a)(3).
(1) (Note: Current year is the same as the baseline year 1990.)

Hazardous Waste

Waste Stream	CWC	Lbs. Generated	Managed	
			Lbs. Onsite	Lbs. Offsite
Waste Oil (Non-Automotive)	221	2,970	0%	100%
Waste Machining & Grinding Coolant/Water	134	13,365	0%	100%
Spent Empty Drums \geq 30 Gal.	512	3,663	0%	100%
Waste Liquids w/pH \leq 2 (Sulfuric, Nitric, Chromic Acids & Ammonium Persulfate)	791	25,925	0%	100%
Aqueous Hazardous Waste (Treatment Unit Influent)	135	25,083,000	100%	0%
Building 70A	132			
Building 25	131 &			
Building 77	135			

Extremely Hazardous Waste

Waste Stream	CWC	Lbs. Generated	Managed	
			Lbs. Onsite	Lbs. Offsite
Waste Mercury	181	1,686	0%	100%

ABSTRACTS FOR EACH SOURCE REDUCTION IMPLEMENTED

- (d) *Abstracts for each source reduction, recycling, or treatment technology implemented from the baseline year through the current year.*

The only implemented hazardous waste management approach has been the upgraded plumbing system for Building 70A. The effect being a reduction of the amount of influent to the waste stream. LBL has reduced the waste stream by approximately 60% to about 3,456,000 pounds generated per year.

ASSESSMENT IN CHANGES IN BUSINESS ACTIVITIES

- (e) *Where changes in business activity significantly affect waste generation, a narrative description of the change and a brief assessment of the effect.*

There were no changes in business activity that affected waste generation.

- (f) *Net waste reduction achieved by site if reporting year is different from baseline year.*

Not applicable; current reporting year is the same as the baseline year.

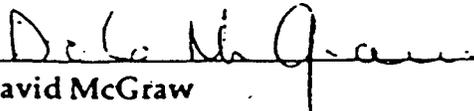
SB-14
PART 5
CERTIFICATIONS

PART 5

CERTIFICATIONS

- California Code of Regulations Section 67100.10

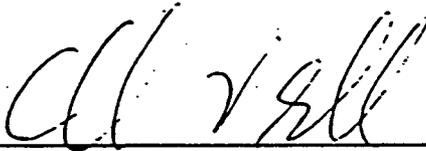
- (a) *Certification by a registered professional engineer, a registered environmental assessor, or an individual who is responsible for the processes and operations of the site. Certification that the Review and Plan and Plan Summary meet the following requirements:*
- 1) *The Review and Plan addresses each hazardous waste stream identified pursuant to CCR Section 67100.5(h).*
 - 2) *The Review and Plan addresses the source reduction approaches specified in CCR Section 67100.5(j).*
 - 3) *The Review and Plan clearly set forth the measures to be taken with respect to each hazardous waste stream for which source reduction has been found to be technically feasible and economically practicable, with timetables for making reasonable and measurable progress, and properly documents the rationale for rejecting available source reduction measures.*
 - 4) *The Plan Summary meets the requirements of CCR Section 67100.6*
 - 5) *The Review and Plan and Plan Summary does not merely shift hazardous waste from one environmental medium to another environmental medium by increasing emissions or discharges to air, water, or land.*
- (b) *Certification by a registered professional engineer, a registered environmental assessor, or an individual who is responsible for the processes and operations of the site. Certification that the report and report summary meet the following requirements:*
1. *The report identifies factors that affect the generation and onsite and offsite management of hazardous wastes and summarizes the effect of those factors on the generation and onsite and offsite management of hazardous wastes.*
 2. *The report summary complies with the requirements specified in CCR Section 67100.9*


 David McGraw
 DIRECTOR, ENVIRONMENT, HEALTH AND SAFETY DIVISION

3/17/92
 Date

- (c) *The Plan, Plan Summary, Report, and Report Summary shall be signed and dated by a person who is capable of committing financial resources necessary to implement the plan; either the owner, the operator, a responsible corporate officer, or an authorized individual.*

I certify that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or the persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for making false statements or representations to the Department, including the possibility of fines for criminal violations.



Charles V. Shank
DIRECTOR, LAWRENCE BERKELEY LABORATORY

3/26/92

Date

APPENDIX C

DOE Waste Reduction Policy Statement

memorandum

DATE: JUN 27 1990

REPLY TO: EH-1, EM-1, S-3
ATTN OF:

SUBJECT: WASTE REDUCTION POLICY STATEMENT

TO: Distribution

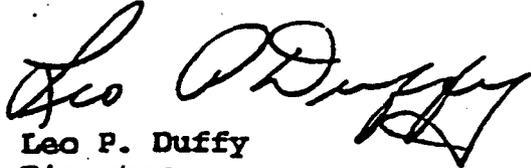
DOE Orders 5400.1, 5400.3 and 5820.2A require development and implementation of either a waste minimization or waste reduction program and plan. This policy statement provides an umbrella for consolidating these various requirements under waste reduction and is also the first step in a phased approach to developing a Department-wide pollution prevention program. The required waste minimization program and plan will be in accordance with the implementing guidance issued pursuant to the DOE Orders referenced above (Attachment 1).

It is the policy of the Department of Energy (DOE) to conduct its operations in a safe and environmentally sound manner. Protection of the environment and the public are responsibilities of paramount concern and importance to the Department. To this end, DOE is firmly committed to assuring incorporation of national environmental protection goals in the formulation and implementation of Departmental programs. Accordingly, all DOE Program Offices and DOE Field Organizations shall institute a waste reduction policy to reduce the total amount of waste that is generated and disposed of by DOE operating facilities through waste minimization (source reduction and recycling) and waste treatment.

Waste reduction shall be accomplished by following a hierarchy of environmental protection practices. First, eliminate or minimize the generation of waste through source reduction. Second, recycle (i.e. use, reuse or reclaim) those potential waste materials that cannot be eliminated or minimized. Third, treat all waste that is nevertheless generated to reduce volume, toxicity, or mobility prior to storage or disposal.

This policy statement applies to hazardous, non-hazardous solid, radioactive (transuranic, high level and low level), and radioactive mixed waste. Data and results from waste minimization and treatment activities shall be reported separately from each other, as specified in the attached implementing guidance.

Waste reduction will be a prime consideration in research activities, process design, facility upgrade or modernization, new facility design, facility operations and facility decontamination and decommissioning.


Leo P. Duffy
Director
Office of Environmental
Restoration and Waste Management


Peter N. Brush
Acting Assistant Secretary
Environment, Safety and
Health


John C. Tuck
Under Secretary

Attachment

APPENDIX D

WMin/PP Goals

Waste Minimization & Pollution Prevention Goals†

Waste Stream	Driver	Goal	Goal Responsibility	Baseline Year	Internal Reporting	Outside Reporting	Reporting Responsibility	Reference
Acids	Appendix F	5%/yr	ER	1993	monthly	annually	EM	1.1.d
Coolants	Appendix F	5%/yr	ER	1993	monthly	annually	EM	1.1.d
Contaminated Solids	Appendix F	5%/yr	ER	1993	monthly	annually	EM	1.1.d
Aggregate Total Waste*	Appendix F	10%/yr	ER	1993	monthly	annually	EM	1.1.d
Waste Oil (non automotive)	SB 14	10%	ER	1990	N/A	1995	EM	Table (f)1
Waste Machining & Grinding Coolant & H ₂ O	SB 14	85%	ER	1990	N/A	1995	EM	Table (f)1
Spent Empty Drums ≥ 30 gal.	SB 14	50%	EM	1990	N/A	1995	EM	Table (f)1
Waste Liquids w/ pH ≤ 2	SB 14	15%	ER	1990	N/A	1995	EM	Table (f)1
Waste Mercury	SB 14	TBD	ER	1990	N/A	1995	EM	Table (f)1
Aqueous Waste H ₂ O Treatment Influent	SB 14	60%	ER	1990	N/A	1995	EM	Table (f)1
Practice W. Min tech & recycle when possible; LBL will perform PWA & document (B25)	EB MUD	N/A	EPG/ER	July 1993	Biannually (to Ginny Lackner)	Sept. 1994	EM	Wastewater discharge permit # 066-00791
B77 Investigation	EB MUD	N/A	EPG/ER	July 1993	5/94	June 1994	ER	Wastewater discharge permit # 066-00791
1,1,1 TCA	TRI EPCRA 313	33% '97 DOE 50% '99	ER	TBD	N/A	July '94 (use data only)	EM	use must be ≥10,000 lbs/yr
Freon 113	TRI EPCRA 313	50% by '99	ER	1993	N/A	1999	EM	Report only to DOE
Toxic Chemicals	TRI EPCRA 313	50% by 1999	ER	1993	N/A	1999	EM	Executive Order 12856
Minimized volume & Toxicity	DOE Order 5400.1 III 4(b)	TBD	ER	TBD	TBD	TBD	EM	
Solid Waste	AB 939	25% by '95 50% by 2000**	ER	varies	annually	as requested	EM	CA Integrated Waste Mgmt Act of 1989

† All Appendix F goals apply for routin/recurring waste generation, not one time or D&D projects.

* Aggregate total includes solid, hazardous, medical, and rad/mixed waste streams.

** This goal specifically addresses landfill diversion.

April 25, 1994

**Appendix F Waste Streams
1993 Hazardous Waste Generation
From 1993 Biennial Report**

ACIDS & OTHER PLATING ETCHING, CLEANING AND STRIPPING SOLUTIONS

Biennial pg #	Waste stream identification	Weight (lbs)
2	Waste electroless nickel plating solution	4565
3	Waste electroless copper solution from electroplating and etching	1125
4	Corrosive/acidic liquids from pc board operations	59934
7	Corrosive/acidic solutions from electroplating operations	4540
15	Waste corrosive liquids (pH \leq 2) from various R&D/support activities	5914
NA	(Baseline adjust for new Acid Waste from B70A)	12000
Total weight		88078

CONTAMINATED SOLIDS/DEBRIS/ABSORBENT

Biennial pg #	Waste stream identification	Weight (lbs)
8	Hazardous solid from laboratory and support operations	1002
12	Non-RCRA solid (organic/inorganic contaminated debris) var activities	9434
44	Solids contaminated with metals from sand blast operations	15034
45	Solids contaminated with diesel, gasoline, & petroleum distillates	1920
46	Oily rags and solids from spill cleanup	15780
Total weight		43170

COOLANTS

Biennial pg #	Waste stream identification	Weight (lbs)
17	Waste off spec/used ethylene glycol from various operations	2232
33	Waste off spec machine coolant (Trimsol)	16140
Total weight		18372

**Appendix F Waste Streams
1993 Waste Generation Data
Baseline Information for Aggregate Total for all Wastes**

<u>Waste Type</u>	<u>Weight (metric tons)</u>
Solid (Non-Hazardous)	1420
Hazardous (Routine/Recurring)	152.6
Medical/Biohazardous	15.1
Radioactive/Mixed	6.5
TOTAL WEIGHT	1594.2

APPENDIX E

Committee Members

Site-Wide Waste Minimization Committee Members

Name	Division	Location	Phone	FAX
Mona Bernstein	EH&S	90-2148	x5258	6608
Steven Blair	Eng.	90G	x5927	4101
Li-Yang Chang	EH&S	75B-101	x4843	4776
Russell Ellis	Material Sci.	62-203	x4895	4995
Cheryl Fragiadakis	Admin.	90-1070	x7020	6457
Tanya Goldman *	DOE-BSO	50B-3238	x6344	4710
Nancy Humphrey	EH&S	90-2148	x6611	6608
Gale Moline *	EH&S	75B-101	x4826	4776
Bruce Nordman	E & E	90-4000	x7089	6996
Zelma Richardson	Admin	7-100	x4216	4747
Shelley Worsham	EH&S	75B-101	x6123	4776

* Non-appointed committee members

Generator Waste Minimization Committee Members

Name	Division	Location	Phone	FAX
Li-Yang Chang	EH&S	75B-101	x4843	4776
Tanya Goldman *	DOE-BSO	50B-3238	x6344	4710

* Non-appointed committee members

As of April 1994, no committee members have been officially appointed. When designated LBL employees have been appointed, the information will be inserted into the preceding table.

Affirmative Procurement Group

Name	Division	Location	Phone	FAX
James J. Bettencourt	Admin	7-100	x4215	7221
Monte A. Clevenger	Admin	42	x6242	5169
Marguerite Fernandes	Admin	7-100	x5158	7221
Jimmy E. Lovato	ICS	934-47A	x6444	4323
Chuck McDonald	Admin	7-100	x5156	4747
Gavin M. Robillard	Admin	69-102	x4184	5667
Zelma Richardson	Admin	7-100	x4216	4747
R. David Saucer	Admin	69-102	x4629	5667
Lanor Smith	LLNL	L-508	422-5450	422-7153
John P. Speros	Admin	69-201	x4219	4747
Kent Wilson	LLNL	L-626	423-2115	522-1395
Shelley Worsham	EH&S	75B-101	x6123	4776

APPENDIX F

**Environmental Management (EM)
Activity Data Sheets (ADS)**

Environmental Management
 FY96 Field Submission
 Activity Data Sheet

Page: 1
 SF-3914- - Date: 04/11/1994 Time: 11:20

Operations Office: SF ID No.: 3914- - Revision Date: 03/14/1994
 ADS Title: Waste Minimization Management
 WBS No.: 1. 3. 9. 1. 4. Category: WM
 Project Title: WASTE MIN. PLANNING (DEFE Facility/WAG: WASTE MINIMIZATION
 Installation: LAWRENCE BERKELEY LAB CID: SF00098 % OVHD: 56
 For Line Item Project: TPC: 0 TEC: 0
 Contig: 0

O.O. Manager: MARY GROSS Phone: 510-486-4346
 H.Q. Manager: GORDON LANGLIE Phone: 301-903-7119
 Auxiliary Fields: 1. 2. 3.

WASTE TYPES (% of FY96 Dollars)

HLW: 0 TRU: 5 TRU MIX: 0 LLW: 15 MLLW: 10 HAZ: 65 SANT: 5 SNF: 0

REGULATORY DRIVERS

Primary Regulatory Driver: RCRA

CAA: N CWA: N SDWA: N RCRA: Y R3004U: N TSCA: N CERCLA: N NEPA: N
 DOE: Y IAG: N OSHA: N ORD: N ST: Y TRI: N FED: Y FFCA: N
 OTHER 1: N OTHER 2: N OTHER 3: N

Summary Funding Profile

B&R	FY94 APPR	FY95 PRES	FY95 APPR
OE	0	350	0
CE	0	0	0
GPP	0	0	0
LI	0	0	0
TOTAL	0	350	0

FY96 DRIVER CATEGORY

	DECREMENT	TARGET	PLAN	IMM RISK
A	0	0	0	0
B	0	0	0	0
C	212	212	212	0
D	0	0	0	0
E	212	212	212	0
F	0	0	0	0
G	0	0	0	0
H	0	0	0	0
I	0	561	561	0

Summary Funding Profile Continued

Environmental Management
 FY96 Field Submission
 Activity Data Sheet

Page: 2
 SF-3914- - Date: 04/11/1994 Time: 11:20

Summary Funding Profile Continued

TOTAL	424	985	985	0
-------	-----	-----	-----	---

DECREMENT LEVEL (Dollars in Thousands)

B&R	FY96 DECR LEVEL
OE	424
CE	0
GPP	0
LI	0
TOTAL	424

TARGET LEVEL (Dollars in Thousands)

B&R Cat.	FY96	FY97	FY98	FY99	FY00
OE	985	1,004	1,025	1,045	1,066
CE	0	0	0	0	0
GPP	0	0	0	0	0
LI	0	0	0	0	0
TOTAL	985	1,004	1,025	1,045	1,066

FTEs	FY94	FY95
Direct	1	2
Indirect	0	0
Federal	0	0

FTEs	FY96	FY97	FY98	FY99	FY00
Direct	2	2	2	2	0
Indirect	0	0	0	0	0
Federal	0	0	0	0	0

PLANNING LEVEL (Dollars in Thousands)

B&R Cat.	FY96	FY97	FY98	FY99	FY00
OE	985	1,004	1,025	1,045	1,066
CE	0	0	0	0	0
GPP	0	0	0	0	0
LI	0	0	0	0	0

PLANNING LEVEL Continued

Environmental Management
 FY96 Field Submission
 Activity Data Sheet

Page: 3

SF-3914- - Date: 04/11/1994 Time: 11:20

PLANNING LEVEL Continued

TOTAL	985	1,004	1,025	1,045	1,066
<hr/>					
FTEs	FY94	FY95			
Direct	1	2			
Indirect	0	0			
Federal	0	0			
<hr/>					
FTEs	FY96	FY97	FY98	FY99	FY00
Direct	2	2	2	2	0
Indirect	0	0	0	0	0
Federal	0	0	0	0	0

BUDGET DETAIL PROFILE

DESC: ALL OTHER FIELD OFFICES, LABS AND P
 PROGRAM: EM TITLE: LBL HWHF Waste Minimization

APPR: N SUB-DESC:

B&R CODE	FY94 APPR	FY95 PRES	FY95 APPR
EX3120090	0	350	0
35EX31209	0	0	0
	0	0	0
	0	0	0
TOTAL	0	350	0

FY96 DRIVER CATEGORY

	DECREMENT	TARGET	PLAN	IMM RISK
A	0	0	0	0
B	0	0	0	0
C	212	212	212	0
D	0	0	0	0
E	212	212	212	0
F	0	0	0	0
G	0	0	0	0
H	0	0	0	0
I	0	561	561	0
TOTAL	424	985	985	0

DECREMENT LEVEL (Dollars in Thousands)

FY96 DECR

DECREMENT LEVEL Continued

Environmental Management
 FY96 Field Submission
 Activity Data Sheet

Page: 4
 SF-3914- - Date: 04/11/1994 Time: 11:20

DECREMENT LEVEL Continued

B&R CODE	LEVEL
EX3120090	424
35EX31209	0
	0
	0
TOTAL	424

TARGET LEVEL (Dollars in Thousands)

B&R CODE	FY 96	FY 97	FY 98	FY 99	FY 00
EX3120090	985	1,004	1,025	1,045	1,066
35EX31209	0	0	0	0	0
	0	0	0	0	0
	0	0	0	0	0
TOTAL	985	1,004	1,025	1,045	1,066

PLANNING LEVEL (Dollars in Thousands)

B&R CODE	FY96	FY97	FY98	FY99	FY00
EX3120090	985	1,004	1,025	1,045	1,066
35EX31209	0	0	0	0	0
	0	0	0	0	0
	0	0	0	0	0
TOTAL	985	1,004	1,025	1,045	1,066

A106 Cross References

A106 Number: SSFLBL0017	Date: / /
Title:	
Federal Facility Identification:	
Region:	Assessment:
Status:	Progress:

Tiger Team Cross References

Tiger Team Finding Number: WM/CF-4	Date: 10/01/1991
Title:	

FY95-99 ADS Cross References

ADS #: SAN 2017A
Title:
FY95-99 ADS Cross References Continued

Environmental Management
FY96 Field Submission
Activity Data Sheet

SF-3914- - Date: 04/11/1994 Page: 5
Time: 11:20

FY95-99 ADS Cross References Continued

Transferred in its entirety: N

Explanation of Change:

Conform to FIS reporting, alpha characters were dropped.

MILESTONES

Milestone No.: 151.69

Title: Submit revised WM/PPA Plan

Planning Date Target Date Decrement Date Level: FO Keyword: O
04/25/1994 04/25/1994 04/25/1994

Driver Name: DOE Driver Reference: DOE 5400.1, III, 2(d)

PRESENT IN Tiger Team: N Program Execution Guidance: N
Roadmap: N Current Year Workplan: N Safety and Health: N

Description:

Submit revised Waste Minimization and Pollution Prevention Awareness Plan. This is an annual milestone.

Milestone No.: 151.37

Title: Prepare & submit Annual Waste Reduction Report

Planning Date Target Date Decrement Date Level: FO Keyword: O
06/30/1994 06/30/1994 06/30/1994

Driver Name: DOE Driver Reference: DOE 5400.1 Ch III, 4(b)

PRESENT IN Tiger Team: N Program Execution Guidance: N
Roadmap: N Current Year Workplan: N Safety and Health: N

Description:

Provide HWHF information for submittal of a report that summarizes LBL waste reduction activities, including assessments. This is an annual milestone.

Milestone No.: 151.80

Title: Submit Hazardous Waste Recyclable Materials Report

Planning Date Target Date Decrement Date Level: FO Keyword: O
06/30/1994 06/30/1994 06/30/1994

Driver Name: ST Driver Reference: AB 1475 (H&SC Sec 25143.20)

PRESENT IN Tiger Team: N Program Execution Guidance: N
Roadmap: N Current Year Workplan: N Safety and Health: N

Description:

Provide HWHF info. for the Hazardous Waste Recyclable Materials Report. This milestone occurs in even-numbered years.

Milestone No.: 151.52

Title: Update HWSR&M Review

Planning Date Target Date Decrement Date Level: FO Keyword: O
09/30/1994 09/30/1994 09/30/1994

MILESTONES Continued

Environmental Management
FY96 Field Submission
Activity Data Sheet

SF-3914- - Date: 04/11/1994 Page: 6
Time: 11:21

MILESTONES Continued

Driver Name: ST Driver Reference: SB 14
PRESENT IN Tiger Team: N Program Execution Guidance: N
Roadmap: N Current Year Workplan: N Safety and Health: N

Description:

Supplement and certify the Hazardous Waste Source Reduction and Management Review.
This is an annual milestone.

NARRATIVE

Technical Scope Summary(Limit 15 lines or less):

This Activity Data Sheet supports site wide Waste Minimization planning and reporting activities at LBL's HWHF. This ADS assumes that planning and implementation of lab wide waste minimization activities (outside the HWHF) are landlord (Energy Research or Nuclear Energy) funded.

Technical Scope Detail(Limit 104 lines or less):

Planning includes identifying, evaluating and prioritizing: 1) Waste streams and associated processes to be minimized; 2) recycling opportunities; 3) material substitution; 4) methods to reduce volume &/or toxicity; 5) source process modifications; 6) technical & economic feasibility of all of the above.

Tracking and reporting the reduction in quantities of affected waste streams is required by Federal and State regulatory agencies and the DOE. Additional requirements are also expected in the next FY to plan the reduction of nonhazardous wastes under the Federal Pollution Prevention Act.

The HWHF waste minimization program also includes: a) training EM employees on techniques to properly segregate and dispose of waste to maximize reduction; b) conducting technology transfer across related departments within SLAC, LBL and ETEC to promote and plan the success of potential waste minimization measures and opportunities.

Activities Completed to Date/Current Year (FY 1994) Description:
(Limit 52 lines or less)

Following is a summary of the EM-funded WM/PP Program at LBL.

- o Waste Min/PP Organization and Infrastructure
 - o Maintain a site wide WMin/PP coordinator
 - o Plan site wide WMin/PP via the LBL Waste Minimization Committee
 - o Interface with and participate in the DOE/OAK and DOE/HQ WMin/PP program
- o Program Development

NARRATIVE Continued

Environmental Management
FY96 Field Submission
Activity Data Sheet

SF-3914- -

Date: 04/11/1994

Page: 7
Time: 11:21

NARRATIVE Continued

- o Update the LBL Waste Minimization and Pollution Prevention Awareness Plan
- o Further develop WMin/PP program objectives and establish quantitative goals
- o Further develop activity schedules for specific tasks and projects
- o Employee Involvement
 - o Develop and update employee general WMin/PP training
 - o Increase employee WMin/PP awareness
 - o Publicize WMin/PP progress in newsletters or other publications
- o Tracking
 - o Enhance site material inventory tracking for WMin/PP purposes
 - o Enhance site waste tracking for WMin/PP purposes
- o Reporting
 - o Determine and report CY93 waste generation baseline
 - o Fulfill all enforceable compliance reporting requirements
 - o Complete all WMin/PP DOE/HQ and DOE/OAK reporting requirements
 - o Report removal of wastes from environmental restoration activities
- o Plan site wide source reduction programs for hazardous, radioactive, and mixed waste streams
 - o Reduce the use of ozone-depleting substances by influencing LBL purchasing procedures
 - o Exchange excess chemicals by maintaining the LBL Chemical Exchange Database
- o Plan site wide source reduction and recycling programs for sanitary waste streams
 - o Plan site wide source reduction via the LBL Procurement Committee
 - o Influence LBL Sanitary Waste Contracts by inserting recycling requirements
- o Technical Assistance
 - o Coordinate with LBL generator WMin/PP Specialist
- o Information and Technology Exchange
 - o Participate in seminars, workshops, and meetings

Budget Year (FY 1995) Description(Limit 52 lines or less):

- o Waste Min/PP Organization and Infrastructure
 - o Maintain a site wide WMin/PP coordinator
 - o Plan site wide WMin/PP via the LBL Waste Minimization Committee
 - o Participate in the DOE/OAK and DOE/HQ WMin/PP program
- o Program Development
 - o Update the LBL WMin/PP Awareness Plan
 - o Further develop WMin/PP program objectives and quantitative goals
 - o Further develop activity schedules for specific tasks and projects
 - o Incorporate DOE QA objectives (DOE Order 5700.6C) into WMin/PP
- o Employee Involvement
 - o Develop and update employee general WMin/PP training
 - o Increase employee WMin/PP awareness
 - o Recognize employees for WMin/PP efforts

NARRATIVE Continued

Environmental Management
FY96 Field Submission
Activity Data Sheet

SF-3914- - Date: 04/11/1994 Page: 8
Time: 11:21

NARRATIVE Continued

- o Publicize WMin/PP progress in newsletters or other publications
- o Tracking
 - o Enhance site material inventory tracking for WMin/PP purposes
 - o Enhance site waste tracking for WMin/PP purposes
 - o Estimate waste management costs/benefits of WMin/PP
- o Reporting
 - o Measure progress against CY93 waste generation baseline
 - o Fulfill all enforceable compliance reporting requirements
 - o Complete all WMin/PP DOE/HQ and DOE/OAK reporting requirements
 - o Report removal of wastes from environmental restoration activities
- o Plan site wide source reduction for hazardous, radioactive, and mixed waste
 - o Reduce the use of ozone-depleting substances by influencing LBL purchasing procedures
 - o Maintain the LBL Chemical Exchange Database
- o Plan site wide recycling for hazardous, radioactive, and mixed waste
 - o Increase reuse or recycling of hazardous materials on-site
 - o Increase recycling of hazardous wastes off-site
- o Plan site wide source reduction and recycling for sanitary waste
 - o Plan site wide source reduction via the LBL Procurement Committee
- o Technical Assistance
 - o Coordinate with LBL generator WMin/PP Specialist
- o Information and Technology Exchange
 - o Participate in seminars, workshops, and meetings
 - o Participate in WMin/PP information clearinghouse
- o Program Evaluation
 - o Evaluate program performance against goals

Planning Year (FY 1996) Description(Limit 156 lines or less):

DECREMENT LEVEL:

- o Waste Min/PP Organization and Infrastructure
 - o Maintain a site wide WMin/PP coordinator
 - o Plan site wide WMin/PP via the LBL Waste Minimization Committee
 - o Participate in the DOE/OAK and DOE/HQ WMin/PP program
- o Program Development
 - o Update the LBL WMin/PP Awareness Plan
 - o Further develop WMin/PP program objectives and quantitative goals
 - o Further develop activity schedules for specific tasks and projects
 - o Incorporate DOE QA objectives (DOE Order 5700.6C)
- o Employee Involvement
 - o Develop and update employee general WMin/PP training
 - o Increase employee WMin/PP awareness
 - o Recognize employees for WMin/PP efforts
 - o Publicize WMin/PP progress in newsletters or other publications
- o Tracking
 - o Enhance site material inventory tracking for WMin/PP purposes
 - o Enhance site waste tracking for WMin/PP purposes

NARRATIVE Continued

Environmental Management
FY96 Field Submission
Activity Data Sheet

SF-3914- - Date: 04/11/1994 Page: 9
Time: 11:21

NARRATIVE Continued

- o Estimate and waste management costs/benefits of WMin/PP
- o Reporting
 - o Measure progress against CY93 waste generation baseline
 - o Fulfill all enforceable compliance reporting requirements
 - o Complete all WMin/PP DOE/HQ and DOE/OAK reporting requirements
 - o Report removal of wastes from environmental restoration activities
- o Plan site wide source reduction for hazardous, radioactive, and mixed waste streams
 - o Maintain the LBL Chemical Exchange Database
- o Plan site wide recycling for hazardous, radioactive, and mixed waste
 - o Increase reuse or recycling of hazardous materials on-site
 - o Increase recycling of hazardous waste off-site
- o Plan site wide source reduction and recycling for sanitary waste
 - o Plan site wide source reduction via the LBL Procurement Committee
- o Technical Assistance
 - o Coordinate with LBL generator WMin/PP Specialist
- o Information and Technology Exchange
 - o Participate in seminars, workshops, and meetings
 - o Participate in WMin/PP information clearinghouse
- o Program Evaluation
 - o Evaluate program performance against goals

TARGET LEVEL:

- o Begin site wide soil and ground water pollution prevention program (\$561K).

Outyears (FY 1997 - FY 2000) Description(Limit 78 lines or less):

Scope for these years is similar to FY96 scope.

Impacts/Assumptions(Limit 42 lines or less):

ASSUMPTIONS: ERWM will fund 2.5 full-time positions for conducting site wide waste minimization planning activities. The activities required to comply with regulations and DOE Orders will not increase dramatically in the budget and planning years.

IMPACTS: In FY96, LBL will not be able to perform the soil and ground water pollution prevention program at the decrement funding level.

Supporting Documents(Limit 5 lines or less):

LBL WMin/PP Awareness Plan; California SB 14 and AB 1475.

Performance Measures(Limit 15 lines or less):

The LBL WMin/PP program will determine the potential for waste management savings from WMin/PP at LBL by September 1995.

Environmental Management
FY96 Field Submission
Activity Data Sheet

SF-3914- -

Page: 10
Date: 04/11/1994 Time: 11:21

DESCRIPTION OF REGULATORY DRIVERS

DOE:

DOE Orders 5400.1, 5400.3, and 5820.2A require that hazardous, radioactive, and mixed waste be managed to minimize waste generation. 5400.1 also requires a Waste Minimization Program.

FED:

The Federal Pollution Prevention Act of 1992 requires the use of waste minimization techniques.

RCRA:

RCRA requires generators to certify on the HW manifest, that a waste minimization program exists at the generating facility.

ST:

Calif. H&S Code 25179.1 et seq. lists preferred waste management strategies that include waste minimization. Cal. SB 14 (H&S Code 25244.12 et seq.) requires LBL to implement a source reduction plan and submit performance reports, etc.

Environmental Management
 FY96 Field Submission
 Safety and Health Activity Data Sheet
 SF-3914- -

Revision Date: 03/21/1994

Date: 04/11/1994

Page: 11
 Time: 11:21

RESPONSIBLE MANAGER : Tim Wan

MANAGER TELEPHONE: 510-486-7073

DECREMENT COST SPREADSHEET (All costs are in Thousands) \$000s

TYPE	S&H DECR
OE	0
CE	0
GPP	.0
LI	0
TOTAL	0

TARGET COST SPREADSHEET (All costs are in Thousands) \$000s

TYPE	1994	1995
OE	0	0
CE	0	0
GPP	0	0
LI	0	0
TOTAL	0	0
FTE	0	0

TYPE	1996	1997	1998	1999	2000	OTHER	TOTAL
OE	0	0	0	0	0	0	0
CE	0	0	0	0	0	0	0
GPP	0	0	0	0	0	0	0
LI	0	0	0	0	0	0	0
TOT	0	0	0	0	0	0	0
FTE	0	0	0	0	0	0	0

PLANNED COST SPREADSHEET (All costs are in Thousands) \$000s

TYPE	1994	1995
OE	0	0
CE	0	0
GPP	0	0
LI	0	0
TOTAL	0	0
FTE	0	0

TYPE	1996	1997	1998	1999	2000	OTHER	TOTAL
OE	0	0	0	0	0	0	0

PLANNED COST SPREADSHEET (All costs are in Thousands) \$000s Continued

Environmental Management
 FY96 Field Submission
 Safety and Health Activity Data Sheet
 SF-3914- -

Revision Date: 03/21/1994

Date: 04/11/1994

Page: 12
 Time: 11:21

PLANNED COST SPREADSHEET (All costs are in Thousands) \$000s Continued

CE	0	0	0	0	0	0	0	0
GPP	0	0	0	0	0	0	0	0
LI	0	0	0	0	0	0	0	0
TOTAL	0	0	0	0	0	0	0	0
FTE	0	0	0	0	0	0	0	0

TARGET FUNCTIONAL AREAS

FY	FUNC AREA	% OF TARGET							TYPE	
		94	95	96	97	98	99	00	CCI	DVR
MO	Mgmt & Ovr									
EP	Emerg Prep									
FP	Fire Prot									
IS	Indus Safe									
IH	Indus Hlth									
NS	Nuc Safety									
MS	Occ Med Sv									
RP	Radtn Prot									
TS	Trans Safe									

PLANNING FUNCTIONAL AREAS

FY	FUNC AREA	% OF PLANNING							TYPE	
		94	95	96	97	98	99	00	CCI	DVR
MO	Mgmt & Ovr									
EP	Emerg Prep									
FP	Fire Prot									
IS	Indus Safe									
IH	Indus Hlth									
NS	Nuc Safety									
MS	Occ Med Sv									
RP	Radtn Prot									
TS	Trans Safe									

ADS LISTING

MILESTONE # MILESTONE TITLE

None

NARRATIVE ASSESSMENT:

REFERENCE:

NARRATIVE Continued

Environmental Management
FY96 Field Submission
Safety and Health Activity Data Sheet
SF-3914- -

Revision Date: 03/21/1994

Date: 04/11/1994

Page: 13
Time: 11:21

NARRATIVE Continued

ACTIVITIES DESCRIPTION:

Waste Minimization activities indirectly affect safety & health. If waste quantity or toxicity is reduced, the potential for inadvertent release to the workplace or environment is correspondingly reduced. However, there are no direct costs under this ADS that are clearly separable into the S&H functional areas.

Environmental Management
 FY96 Field Submission
 Activity Data Sheet

Page: 1

SF-3931- - Date: 04/11/1994 Time: 11:13

Operations Office: SF ID No.: 3931- - Revision Date: 03/14/1994

ADS Title: Facility Operations & Maintenance (Waste Management)

WBS No.: 1. 3. 9. 3. 1. Category: WM

Project Title: LBL FACILITY OPERATIONS & Facility/WAG: LAWRENCE BERKELEY LAB

Installation: LAWRENCE BERKELEY LAB CID: SF00098 % OVHD: 56

For Line Item Project: TPC: 0 TEC: 0

Contig: 0

O.O. Manager: MARY GROSS Phone: 510-637-1629

H.Q. Manager: GORDON LANGLIE Phone: 301-903-7119

Auxiliary Fields: 1. 2. 3.

WASTE TYPES (% of FY96 Dollars)

HLW: 0 TRU: 0 TRU MIX: 0 LLW: 40 MLLW: 8 HAZ: 52 SANT: 0 SNF: 0

REGULATORY DRIVERS

Primary Regulatory Driver: RCRA

CAA: Y CWA: N SDWA: N RCRA: Y R3004U: N TSCA: Y CERCLA: N NEPA: N

DOE: Y IAG: N OSHA: Y ORD: N ST: Y TRI: N FED: Y FFCA: N

OTHER 1: N OTHER 2: N OTHER 3: N

Summary Funding Profile

B&R	FY94 APPR	FY95 PRES	FY95 APPR
OE	0	8,733	0
CE	0	632	0
GPP	0	0	0
LI	0	0	0
TOTAL	0	9,365	0

FY96 DRIVER CATEGORY

	DECREMENT	TARGET	PLAN	IMM RISK
A	0	0	0	0
B	0	0	0	0
C	4,194	4,194	4,194	4,194
D	89	89	89	80
E	770	770	770	642
F	1,432	1,432	1,432	985
G	0	0	0	0
H	0	0	0	0
I	465	2,545	2,545	0

Summary Funding Profile Continued

Environmental Management
 FY96 Field Submission
 Activity Data Sheet

Page: 2

SF-3931- - Date: 04/11/1994 Time: 11:13

Summary Funding Profile Continued

TOTAL	6,950	9,030	9,030	5,901
-------	-------	-------	-------	-------

DECREMENT LEVEL (Dollars in Thousands)

B&R	FY96 DECR LEVEL
OE	6,793
CE	157
GPP	0
LI	0
TOTAL	6,950

TARGET LEVEL (Dollars in Thousands)

B&R Cat.	FY96	FY97	FY98	FY99	FY00
OE	8,873	6,806	6,932	7,064	7,196
CE	157	188	191	195	199
GPP	0	0	0	0	0
LI	0	0	0	0	0
TOTAL	9,030	6,994	7,123	7,259	7,395

FTEs	FY94	FY95
Direct	25	26
Indirect	0	0
Federal	0	0

FTEs	FY96	FY97	FY98	FY99	FY00
Direct	26	26	26	26	26
Indirect	0	0	0	0	0
Federal	0	0	0	0	0

PLANNING LEVEL (Dollars in Thousands)

B&R Cat.	FY96	FY97	FY98	FY99	FY00
OE	8,873	6,806	6,932	7,064	7,196
CE	157	188	191	195	199
GPP	0	0	0	0	0
LI	0	0	0	0	0

PLANNING LEVEL Continued

Environmental Management
 FY96 Field Submission
 Activity Data Sheet

Page: 3

SF-3931- - Date: 04/11/1994 Time: 11:13

PLANNING LEVEL Continued

TOTAL	9,030	6,994	7,123	7,259	7,395
FTEs					
	FY94	FY95			
Direct	25	26			
Indirect	0	0			
Federal	0	0			
FTEs					
	FY96	FY97	FY98	FY99	FY00
Direct	26	26	26	26	26
Indirect	0	0	0	0	0
Federal	0	0	0	0	0

BUDGET DETAIL PROFILE

DESC: ALL OTHER FIELD OFFICES, LABS AND P
 PROGRAM: EM TITLE: LBL Waste Handling & Disposal

APPR: N SUB-DESC:

B&R CODE	FY94 APPR	FY95 PRES	FY95 APPR
EX3120090	0	3,663	0
35EX31209	0	0	0
	0	0	0
	0	0	0
TOTAL	0	3,663	0

FY96 DRIVER CATEGORY

	DECREMENT	TARGET	PLAN	IMM RISK
A	0	0	0	0
B	0	0	0	0
C	2,418	2,418	2,418	2,418
D	80	80	80	80
E	479	479	479	479
F	0	0	0	0
G	0	0	0	0
H	0	0	0	0
I	0	1,687	1,687	0
TOTAL	2,977	4,664	4,664	2,977

DECREMENT LEVEL (Dollars in Thousands)

FY96 DECR

DECREMENT LEVEL Continued

Environmental Management
 FY96 Field Submission
 Activity Data Sheet

Page: 4
 SF-3931- - Date: 04/11/1994 Time: 11:13

DECREMENT LEVEL Continued

B&R CODE	LEVEL
EX3120090	2,977
35EX31209	0
	0
	0
TOTAL	2,977

TARGET LEVEL (Dollars in Thousands)

B&R CODE	FY 96	FY 97	FY 98	FY 99	FY 00
EX3120090	4,664	3,037	3,098	3,160	3,223
35EX31209	0	0	0	0	0
	0	0	0	0	0
	0	0	0	0	0
TOTAL	4,664	3,037	3,098	3,160	3,223

PLANNING LEVEL (Dollars in Thousands)

B&R CODE	FY96	FY97	FY98	FY99	FY00
EX3120090	4,664	3,037	3,098	3,160	3,223
35EX31209	0	0	0	0	0
	0	0	0	0	0
	0	0	0	0	0
TOTAL	4,664	3,037	3,098	3,160	3,223

BUDGET DETAIL PROFILE

DESC: ALL OTHER FIELD OFFICES, LABS AND P APPR: N SUB-DESC:
 PROGRAM: EM TITLE: LBL Compliance and Administration

B&R CODE	FY94 APPR	FY95 PRES	FY95 APPR
EX3120090	0	4,055	0
35EX31209	0	0	0
	0	0	0
	0	0	0
TOTAL	0	4,055	0

FY96 DRIVER CATEGORY

DECREMENT
TARGET
PLAN
IMM RISK

BUDGET DETAIL PROFILE Continued

Environmental Management
 FY96 Field Submission
 Activity Data Sheet

SF-3931- -

Page: 5
 Date: 04/11/1994 Time: 11:13

BUDGET DETAIL PROFILE Continued

A	0	0	0	0
B	0	0	0	0
C	1,682	1,682	1,682	1,682
D	0	0	0	0
E	237	237	237	109
F	1,432	1,432	1,432	985
G	0	0	0	0
H	0	0	0	0
I	465	858	858	0
TOTAL	3,816	4,209	4,209	2,776

DECREMENT LEVEL (Dollars in Thousands)

B&R CODE	FY96 DECR LEVEL
EX3120090	3,816
35EX31209	0
	0
	0
TOTAL	3,816

TARGET LEVEL (Dollars in Thousands)

B&R CODE	FY 96	FY 97	FY 98	FY 99	FY 00
EX3120090	4,209	3,769	3,834	3,904	3,973
35EX31209	0	0	0	0	0
	0	0	0	0	0
	0	0	0	0	0
TOTAL	4,209	3,769	3,834	3,904	3,973

PLANNING LEVEL (Dollars in Thousands)

B&R CODE	FY96	FY97	FY98	FY99	FY00
EX3120090	4,209	3,769	3,834	3,904	3,973
35EX31209	0	0	0	0	0
	0	0	0	0	0
	0	0	0	0	0
TOTAL	4,209	3,769	3,834	3,904	3,973

BUDGET DETAIL PROFILE

DESC: ALL OTHER FIELD OFFICES, LABS AND P

APPR: N SUB-DESC:

BUDGET DETAIL PROFILE Continued

Environmental Management
 FY96 Field Submission
 Activity Data Sheet

SF-3931- -

Page: 6
 Date: 04/11/1994 Time: 11:13

BUDGET DETAIL PROFILE Continued

PROGRAM: EM TITLE: LBL WM - Capital Equipment

B&R CODE	FY94 APPR	FY95 PRES	FY95 APPR
EX3120090	0	0	0
35EX31209	0	632	0
	0	0	0
	0	0	0
TOTAL	0	632	0

FY96 DRIVER CATEGORY

	DECREMENT	TARGET	PLAN	IMM RISK
A	0	0	0	0
B	0	0	0	0
C	94	94	94	94
D	9	9	9	0
E	54	54	54	54
F	0	0	0	0
G	0	0	0	0
H	0	0	0	0
I	0	0	0	0
TOTAL	157	157	157	148

DECREMENT LEVEL (Dollars in Thousands)

B&R CODE	FY96 DECR LEVEL
EX3120090	0
35EX31209	157
	0
	0
TOTAL	157

TARGET LEVEL (Dollars in Thousands)

B&R CODE	FY 96	FY 97	FY 98	FY 99	FY 00
EX3120090	0	0	0	0	0
35EX31209	157	188	191	195	199
	0	0	0	0	0
	0	0	0	0	0
TOTAL	157	188	191	195	199

Environmental Management
 FY96 Field Submission
 Activity Data Sheet

Page: 8

SF-3931- - Date: 04/11/1994 Time: 11:14

DECREMENT LEVEL Continued

TOTAL 0

TARGET LEVEL (Dollars in Thousands)

B&R CODE	FY 96	FY 97	FY 98	FY 99	FY 00
EX3120090	0	0	0	0	0
35EX31209	0	0	0	0	0
	0	0	0	0	0
	0	0	0	0	0
TOTAL	0	0	0	0	0

PLANNING LEVEL (Dollars in Thousands)

B&R CODE	FY96	FY97	FY98	FY99	FY00
EX3120090	0	0	0	0	0
35EX31209	0	0	0	0	0
	0	0	0	0	0
	0	0	0	0	0
TOTAL	0	0	0	0	0

A106 Cross References

A106 Number: SSFLBL0041

Date: / /

Title:

Federal Facility Identification:

Region:

Assessment:

Status:

Progress:

Tiger Team Cross References

FY95-99 ADS Cross References

ADS #: OR 228A

Title:

Transferred in its entirety: N

Explanation of Change:

ADS #: SAN 2018

Title:

Transferred in its entirety: N

Explanation of Change:

WM BASE CONTINUITY OF OPS.

FY95-99 ADS Cross References Continued

Environmental Management
FY96 Field Submission
Activity Data Sheet

Page: 9
SF-3931- - Date: 04/11/1994 Time: 11:14

FY95-99 ADS Cross References Continued

MILESTONES

Milestone No.: 221.15

Title: Conduct annual HWHF Inspection

Planning Date	Target Date	Decrement Date	Level: FO	Keyword: O
10/01/1993	10/01/1993	10/01/1993		

Driver Name: RCRA Driver Reference: 40 CFR 264.15(a)(b)(c)(d)

PRESENT IN Tiger Team: N Program Execution Guidance: N
Roadmap: N Current Year Workplan: N Safety and Health: N

Description:

Conduct inspection of the existing Hazardous Waste Handling Facility. This is an annual requirement.

Milestone No.: 223.230

Title: Submit Biennial HW Report

Planning Date	Target Date	Decrement Date	Level: FO	Keyword: O
03/01/1994	03/01/1994	03/01/1994		

Driver Name: RCRA Driver Reference: 40 CFR 262.41 (a)

PRESENT IN Tiger Team: N Program Execution Guidance: N
Roadmap: N Current Year Workplan: N Safety and Health: N

Description:

Submit LBL's Biennial Hazardous Waste Report to the State of CA and Federal EPA. This milestone occurs every two years (in even-numbered years).

Milestone No.:

Title: Prepare ADS

Planning Date	Target Date	Decrement Date	Level: FO	Keyword: O
04/11/1994	04/11/1994	04/11/1994		

Driver Name: DOE Driver Reference:

PRESENT IN Tiger Team: N Program Execution Guidance: N
Roadmap: N Current Year Workplan: N Safety and Health: N

Description:

Activity Data Sheet (ADS) completed, approved, and submitted to DOE/OAK. This milestone occurs annually, but required date may fluctuate -- due date shown is for FY94 only.

Milestone No.:

Title: Draft Baseline Package for FY95

Planning Date	Target Date	Decrement Date	Level: FO	Keyword: O
08/01/1994	08/01/1994	08/01/1994		

Driver Name: DOE Driver Reference:

MILESTONES Continued

Environmental Management
FY96 Field Submission
Activity Data Sheet

SF-3931- - Date: 04/11/1994 Page: 10
Time: 11:14

MILESTONES Continued

PRESENT IN Tiger Team: N Program Execution Guidance: N
Roadmap: N Current Year Workplan: N Safety and Health: N

Description:

Draft FY95 Cost, Schedule, Technical Baselines, Responsibility Assignment Matrix, and Milestone Control Log completed and submitted to DOE/OAK.

Milestone No.:

Title: Final Baseline Package for FY95

Planning Date Target Date Decrement Date Level: FO Keyword: O

09/15/1994 09/15/1994 09/15/1994

Driver Name: DOE Driver Reference:

PRESENT IN Tiger Team: N Program Execution Guidance: N
Roadmap: N Current Year Workplan: N Safety and Health: N

Description:

Final FY95 Cost, Schedule, Technical Baselines, and Milestone Control Log completed and submitted to DOE/OAK.

Milestone No.:

Title: Monthly PTS Reports

Planning Date Target Date Decrement Date Level: FO Keyword: O

09/18/1994 09/18/1994 09/18/1994

Driver Name: DOE Driver Reference:

PRESENT IN Tiger Team: N Program Execution Guidance: N
Roadmap: N Current Year Workplan: N Safety and Health: N

Description:

Monthly Progress Tracking System (PTS) report completed and submitted to DOE/OAK. This is a monthly milestone.

Milestone No.: 222.28

Title: Dispose of LLW

Planning Date Target Date Decrement Date Level: FO Keyword: D

09/30/1994 09/30/1994 09/30/1994

Driver Name: DOE Driver Reference: DOE Order 5820.2A, III(g)(h)(i)

PRESENT IN Tiger Team: N Program Execution Guidance: N
Roadmap: N Current Year Workplan: N Safety and Health: N

Description:

Ship LLW to the Hanford disposal facility. Quantity of waste shipped should be compared to the EM-30 Baseline. This milestone occurs annually.

Milestone No.:

Title: Dispose of MW

MILESTONES Continued

Environmental Management
FY96 Field Submission
Activity Data Sheet

Page: 11

SF-3931- - Date: 04/11/1994 Time: 11:14

MILESTONES Continued

Planning Date Target Date Decrement Date Level: FO Keyword: D
09/30/1994 09/30/1994 09/30/1994
Driver Name: RCRA Driver Reference:
PRESENT IN Tiger Team: N Program Execution Guidance: N
Roadmap: N Current Year Workplan: N Safety and Health: N

Description:

Ship mixed waste off-site for storage at Hanford or treatment at a commercial TSDF. The quantity of waste should be compared to the EM-30 baseline at the end of the fiscal year. This milestone occurs annually.

Milestone No.:

Title: Dispose of HW

Planning Date Target Date Decrement Date Level: FO Keyword: D
09/30/1994 09/30/1994 09/30/1994
Driver Name: RCRA Driver Reference: 40 CFR 261 et seq., 22 CCR
PRESENT IN Tiger Team: N Program Execution Guidance: N
Roadmap: N Current Year Workplan: N Safety and Health: N

Description:

Ship HW to off-site TSDFs. Quantity of waste should be compared to EM-30 Baseline. This milestone occurs annually.

Milestone No.:

Title: Complete EPA Annual Report

Planning Date Target Date Decrement Date Level: FO Keyword: O
03/01/1995 03/01/1995 03/01/1995
Driver Name: RCRA Driver Reference: 40 CFR 262.41 (a)
PRESENT IN Tiger Team: N Program Execution Guidance: N
Roadmap: N Current Year Workplan: N Safety and Health: N

Description:

Complete EPA report of waste shipment and generation. This milestone occurs every other year, in odd-numbered years (alternates with Biennial Report).

NARRATIVE

Technical Scope Summary(Limit 15 lines or less):

This Activity Data Sheet supports the on-going sitewide Waste Management (WM) Program at the Lawrence Berkeley Laboratory (LBL). The primary mission of the WM Program is to provide for the safe treatment, storage, transport, and disposal of hazardous, radioactive, and mixed wastes generated by LBL operations.

Technical Scope Detail(Limit 104 lines or less):

NARRATIVE Continued

Environmental Management
FY96 Field Submission
Activity Data Sheet

Page: 12

SF-3931- - Date: 04/11/1994 Time: 11:14

NARRATIVE Continued

The LBL WM Program represents a continuing effort necessary to comply with Federal, State, and local regulations and with the provisions of DOE Orders regarding waste handling activities. The Waste Management activities described in this ADS are also required to ensure that the environment is continually protected from accidental releases of toxic, hazardous or radioactive materials that originate at LBL.

Prior to FY91, all LBL site wide waste management functions were performed by LBL staff. The Tiger Team assessment of January, 1991 found that Hazardous Waste Management staffing levels at LBL were inadequate to allow compliance with Federal, State, and local regulations and the provisions of DOE Orders regarding waste management. In FY91, the Laboratory responded to the waste management staffing deficiencies by arranging for assistance from a waste handling contractor and a hiring plan was developed to provide adequate Waste Management staffing levels for FY92 and later years.

In FY92, WM worked to secure approval to operate from three parties. WM submitted a RCRA Part-B Permit application to the California Department of Toxic Substances Control, obtained DOE approval of Moratorium procedures, and obtained Hanford certification for low level waste shipments. WM also restarted off-site shipment of LLW after a 2-year hiatus by shipping 469 cubic feet of induced metals to Hanford. Chemical backlogs in research laboratories were cleared.

In FY93, WM received a new RCRA Part-B Permit. WM also continued to ship accumulated MW and LLW, using a waste stream-by-waste stream approach. WM shipped a total approximately 4,000 CF mixed and low level waste to Hanford. Backlogs of two waste streams (scintillation fluid MW and dry compacted LLW) were successfully shipped to Hanford. Shipments of these streams are now keeping pace with generation. LBL restarted operation of the waste compactor, as part of the effort to clear backlogs of dry compactible LLW.

Activities Completed to Date/Current Year (FY 1994) Description:
(Limit 52 lines or less)

- o Waste handling and Disposal
 - o Waste pickup and onsite transport to the Hazardous Waste Handling Facility (HWHF)
 - o Waste packaging and storage
 - o Legacy waste handling
 - o Hazardous waste transportation and offsite disposal
 - o Transportation of MW/LLW to Westinghouse-Hanford for storage (434 CF shipped FY94 through March)
 - o Transportation of legacy MW/LLW to Westinghouse-Hanford for storage (320 CF shipped FY94 through March)
- o Regulatory compliance

NARRATIVE Continued

Environmental Management
FY96 Field Submission
Activity Data Sheet

SF-3931- -

Page: 13
Date: 04/11/1994 Time: 11:14

NARRATIVE Continued

- o RCRA Part B Permit modifications
- o Waste acceptance
- o MW/LLW certification
- o Waste tracking
- o Payment of fees
- o Operations Projects
 - o Complete waste tracking software system
 - o Oversee HWHF Upgrades
 - o Begin LBL waste profiles
- o Regulatory Interactions
 - o DOE Interactions
 - o Respond to DOE requests for information
 - o Update/revise DOE-required plans
 - o Respond to DOE appraisals and audits
 - o Prepare EM-30 Baseline, Cost Savings Plan, Performance Measures
 - o DTSC Interactions
 - o DTSC Audit preparation (WM passed DTSC audit in 11/93 with no Findings)
 - o Conduct agency negotiations
 - o Prepare EPA biennial report
 - o Westinghouse-Hanford Interactions
 - o Hanford Audit preparation (WM passed Hanford Audit in 2/94 with no Findings)
 - o Complete Hanford 30-year waste projection
- o Quality Assurance
 - o Chemical QA lab analyses
 - o Radiological QA lab analyses
 - o TSDF audits (two completed 12/31/93)
 - o Procedures maintenance
- o Facility Maintenance
- o Administration - Personnel; Team building; Planning; Training; TOM

Budget Year (FY 1995) Description(Limit 52 lines or less):

- o Waste handling and Disposal
 - o Waste pickup and onsite transport to the HWHF
 - o Waste packaging and storage
 - o Complete legacy waste handling
 - o Hazardous waste transportation and offsite disposal
 - o Transportation of MW/LLW to Westinghouse-Hanford for storage
 - o Complete transportation of legacy MW/LLW to Westinghouse-Hanford for storage
 - o Begin LLW solidification
- o Regulatory compliance
 - o Waste acceptance
 - o MW/LLW certification
 - o Waste tracking
 - o Payment of fees

NARRATIVE Continued

Environmental Management
FY96 Field Submission
Activity Data Sheet

Page: 14

SF-3931- - Date: 04/11/1994 Time: 11:14

NARRATIVE Continued

- o Operations Projects
 - o Oversee replacement HWHF construction (ADS 3934 related project cost - activity and funds will be transferred to ADS 3934 in FY96)
 - o Manage a Safety Analysis Report (SAR) for WM operations in the new HWHF. (ADS 3934 related project cost - activity and funds will be transferred to ADS 3934 in FY96)
 - o Initiate a pre-operational survey of the new HWHF. (ADS 3934 related project cost - activity and funds will be transferred to ADS 3934 in FY96)
 - o Complete LBL waste profiles
- o Regulatory Interactions
 - o DOE Interactions
 - o Respond to DOE requests for information
 - o Update/revise DOE-required plans
 - o Respond to DOE appraisals and audits
 - o DTSC Interactions
 - o DTSC Audit preparation
 - o Conduct agency negotiations
 - o Prepare EPA annual report
 - o Westinghouse-Hanford Interactions
 - o Hanford Audit preparation
 - o Complete Hanford 30-year waste projection
- o Quality Assurance
 - o Chemical QA lab analyses
 - o Radiological QA lab analyses
 - o TSDF audits
 - o Procedures maintenance
- o Facility Maintenance
- o Administration - Personnel; Team building; Planning; Training; TQM

Planning Year (FY 1996) Description(Limit 156 lines or less): DECREMENT LEVEL:

- o Waste handling and Disposal
 - o Waste pickup and onsite transport to the HWHF
 - o Waste packaging and storage
 - o Hazardous waste transportation and offsite disposal
 - o Transportation of MW/LLW to Westinghouse-Hanford for storage
 - o LLW solidification
 - o Begin MW neutralization and consolidation
- o Regulatory compliance
 - o RCRA Part B Permit Class III modifications
 - o Waste acceptance
 - o MW/LLW certification
 - o Waste tracking
 - o Payment of fees
- o Regulatory Interactions
 - o DOE Interactions
 - o Respond to DOE requests for information
 - o Update/revise DOE-required plans

NARRATIVE Continued

Environmental Management
FY96 Field Submission
Activity Data Sheet

SF-3931- - Date: 04/11/1994 Page: 15
Time: 11:14

NARRATIVE Continued

- o Respond to DOE appraisals and audits
- o DTSC Interactions
 - o DTSC Audit preparation
 - o Conduct agency negotiations
 - o Prepare EPA biennial report
- o Westinghouse-Hanford Interactions
 - o Hanford Audit preparation
 - o Complete Hanford 30-year waste projection
- o Quality Assurance
 - o Chemical QA lab analyses
 - o Radiological QA lab analyses
 - o TSDF audits
 - o Procedures maintenance
- o Facility Maintenance
- o Administration - Personnel; Team building; Planning; Training; TOM

TARGET LEVEL:

o Automate compliance inspection tracking (\$393K) This is the first-priority target level activity under this ADS. This activity involves design and implementation of electronic field inspection checklists. One-time investment in this project could achieve a cost savings in labor costs required to track the results of internal inspections.

o Ship 13,000 CF induced concrete to Westinghouse-Hanford (\$1,687K). This is the second-priority target activity under ADS 3931. If this activity is not completed, LBL may continue to store this material at LBL. An alternative would be to ship the concrete blocks to another DOE facility for use as shielding; however, LBL may have difficulty in locating a DOE facility with a need for additional shielding.

Outyears (FY 1997 - FY 2000) Description(Limit 78 lines or less):

- o Waste handling and Disposal
 - o Waste pickup and onsite transport to the HWHF
 - o Waste packaging and storage
 - o Hazardous waste transportation and offsite disposal
 - o Transportation of MW/LLW to Westinghouse-Hanford for storage
 - o LLW solidification
 - o MW neutralization and consolidation
- o Regulatory compliance
 - o Waste acceptance
 - o MW/LLW certification
 - o Waste tracking
 - o Payment of fees
- o Regulatory Interactions
 - o DOE Interactions
 - o Respond to DOE requests for information

NARRATIVE Continued

Environmental Management
FY96 Field Submission
Activity Data Sheet

SF-3931- -

Page: 16
Date: 04/11/1994 Time: 11:14

NARRATIVE Continued

- o Update/revise DOE-required plans
- o Respond to DOE appraisals and audits
- o DTSC Interactions
 - o DTSC Audit preparation
 - o Conduct agency negotiations
 - o Prepare EPA annual/biennial reports
- o Westinghouse-Hanford Interactions
 - o Hanford Audit preparation
 - o Complete Hanford 30-year waste projection
- o Quality Assurance
 - o Chemical QA lab analyses
 - o Radiological QA lab analyses
 - o TSDF audits
 - o Procedures maintenance
- o Facility Maintenance
- o Administration - Personnel; Team building; Planning; Training

Impacts/Assumptions(Limit 42 lines or less):

Assumptions:

- o Continuing disposal of radioactive and mixed waste at the Westinghouse Hanford Facility will be possible in FY94 and beyond.
- o Additional nationwide treatment and disposal options for mixed waste will become available in FY95.
- o The Waste Isolation Pilot Plant (WIPP) will accept LBL's TRU waste and TRU/MW as scheduled.
- o The Federal Facility Compliance Act Site Treatment Plan will not include new mixed waste treatment beyond those already permitted.
- o Regulatory and reporting demands will not change significantly from those currently experience by the LBL WM program.
- o The Waste Mangement program will reach a steady-state in FY97.

Impacts at Decrement Level:

In FY96, LBL will not be able to ship 13,000 CF of concrete LLW to Hanford, and will not be able to computerize its compliance inspection program at the decrement funding level. Noncompletion of these activities is not expected pose a threat to the basic safety and compliance aspects of the LBL WM mission.

Supporting Documents(Limit 5 lines or less):

40 CFR; 49 CFR; 29 CFR; 10 CFR; 22 CCR; WAC 173-303. DOE Orders.
RCRA Part B Permit. Hanford Waste Acceptance Criteria.

Performance Measures(Limit 15 lines or less):

LBL WM Performance Measures will focus on the quantity of MW and LLW shipped to Hanford for storage or disposal.

Environmental Management
FY96 Field Submission
Activity Data Sheet

SF-3931- - Date: 04/11/1994 Page: 17
Time: 11:15

DESCRIPTION OF REGULATORY DRIVERS

CAA:

Emissions monitoring for potential presence of radionuclides at the HWHF is required by 40 CFR Part 61, Subparts A and H.

DOE:

The following DOE Orders are applicable to WM activities at LBL: 5400.1, 5400.3, 5482.1B, 5480.4, 6430.1A, and Secretary of Energy Notice SEN-0-89.

FED:

The Federal Facility Compliance Act required facilities such as LBL to begin payment of waste-related fees.

OSHA:

WM personnel are subject to the medical monitoring and training requirements of 29 CFR 1910.120.

RCRA:

40 CFR Part 260 et seq. governs the storage and disposal of hazardous and mixed wastes at and from the HWHF.

ST:

Calif. Health & Safety Code Sec. 25100 et seq. contains more stringent requirements than RCRA, notably a broader definition of hazardous waste, a "Permit-by Rule" system, and no small-quantity generator exemption.

TSCA:

LBL is projected to generate PCB and asbestos wastes in FY96, placing the HWHF under the jurisdiction of TSCA.

Environmental Management
 FY96 Field Submission
 Safety and Health Activity Data Sheet
 SF-3931- -

Revision Date: 03/16/1994

Date: 04/11/1994

Page: 18
 Time: 11:15

RESPONSIBLE MANAGER : Tim Wan

MANAGER TELEPHONE: 510-486-7073

DECREMENT COST SPREADSHEET (All costs are in Thousands) \$000s

TYPE	S&H DECR
OE	118
CE	0
GPP	0
LI	0
TOTAL	118

TARGET COST SPREADSHEET (All costs are in Thousands) \$000s

TYPE	1994	1995					TOTAL
OE	114	116					
CE	0	0					
GPP	0	0					
LI	0	0					
TOTAL	114	116					
FTE	0	0					

TYPE	1996	1997	1998	1999	2000	OTHER	TOTAL
OE	118	121	123	125	128	0	845
CE	0	0	0	0	0	0	0
GPP	0	0	0	0	0	0	0
LI	0	0	0	0	0	0	0
TOT	118	121	123	125	128	0	845
FTE	0	0	0	0	0	0	0

PLANNED COST SPREADSHEET (All costs are in Thousands) \$000s

TYPE	1994	1995					TOTAL
OE	114	116					
CE	0	0					
GPP	0	0					
LI	0	0					
TOTAL	114	116					
FTE	0	0					

TYPE	1996	1997	1998	1999	2000	OTHER	TOTAL
OE	118	121	123	125	128	0	845

PLANNED COST SPREADSHEET (All costs are in Thousands) \$000s Continued

Environmental Management
 FY96 Field Submission
 Safety and Health Activity Data Sheet

Revision Date: 03/16/1994

SF-3931- -

Date: 04/11/1994

Page: 19
 Time: 11:15

PLANNED COST SPREADSHEET (All costs are in Thousands) \$000s Continued

CE	0	0	0	0	0	0	0	0
GPP	0	0	0	0	0	0	0	0
LI	0	0	0	0	0	0	0	0
TOTAL	118	121	123	125	128	0	0	845
FTE	0	0	0	0	0	0	0	0

TARGET FUNCTIONAL AREAS

FY	FUNC AREA	% OF TARGET							TYPE	
		94	95	96	97	98	99	00	CCI	DVR
MO	Mgmt & Ovr									
EP	Emerg Prep									
FP	Fire Prot									
IS	Indus Safe									
IH	Indus Hlth									
NS	Nuc Safety									
MS	Occ Med Sv									
RP	Radtn Prot									
TS	Trans Safe									

PLANNING FUNCTIONAL AREAS

FY	FUNC AREA	% OF PLANNING							TYPE	
		94	95	96	97	98	99	00	CCI	DVR
MO	Mgmt & Ovr									
EP	Emerg Prep									
FP	Fire Prot									
IS	Indus Safe									
IH	Indus Hlth									
NS	Nuc Safety									
MS	Occ Med Sv									
RP	Radtn Prot									
TS	Trans Safe									

ADS LISTING

MILESTONE # MILESTONE TITLE

None

NARRATIVE

ASSESSMENT:

REFERENCE:

ACTIVITIES DESCRIPTION:

NARRATIVE Continued

Environmental Management
FY96 Field Submission
Safety and Health Activity Data Sheet
SF-3931- -

Revision Date: 03/16/1994

Date: 04/11/1994

Page: 20
Time: 11:15

NARRATIVE Continued

Core Activities: The LBL Waste Management Program (WM) conducts core safety & health activities as required by federal, state, and local regulations. The principal driver for S&H activities at the Hazardous Waste Handling Facility (HWHF) is the facility RCRA Part B Permit. Emergency planning is accomplished by maintaining the HWHF Contingency Plan included in the Part B Permit. Emergency and fire protection equipment is purchased as required by the contingency plan and applicable fire codes. HWHF personnel attend training on fire prevention, detection, and control, industrial safety, and hazardous waste operations and emergency response. WM responds to external audits and appraisals, and conducts weekly, monthly, and quarterly internal audits of the HWHF.

WM purchases equipment and supplies for personnel protection, such as protective clothing and gear, air monitoring instruments, and ventilation equipment as needed to meet the requirements of the RCRA Part B permit, OSHA requirements, other applicable state and federal standards, and DOE Orders.

WM transportation safety activities are limited to a brief safety inspection of commercial waste hauling vehicles before waste is shipped off-site.

Improvement Activities: In FY95, WM will evaluate the implementation of the new Radiological control manual and monitor the effectiveness of waste management procedures. WM will coordinate oversight efforts and inspections with DOE, U.S. EPA, California DTSC, OSHA, the City of Berkeley, and other oversight agencies. WM will focus on improving documentation of S&H activities, and completing a preoperational Safety Analysis Report for the new HWHF.

Environmental Management
 FY96 Field Submission
 Activity Data Sheet

Page: 1
 Date: 04/06/1994 Time: 18:35

SF-3934- -

Operations Office: SF ID No.: 3934- - Revision Date: 03/23/1994
 ADS Title: Hazardous Waste Handling Facility
 WBS No.: 1. 3. 9. 3. 4. Category: WM
 Project Title: HAZARDOUS WASTE HANDLING Facility/WAG: LBL BLDG. 85
 Installation: LAWRENCE BERKELEY LAB CID: SF00098 % OVHD: 0
 For Line Item Project: 88R812 TPC: 16825 TEC: 12625
 Contig: 1654

O.O. Manager: MARY GROSS/JONES HOM Phone: 510-637-1613
 H.Q. Manager: GORDON LANGLIE/SUNIL PATEL Phone: 301-903-7964
 Auxiliary Fields: 1. 2. 3.

WASTE TYPES (% of FY96 Dollars)

HLW: 0 TRU: 0 TRU MIX: 0 LLW: 0 MLLW: 0 HAZ: 0 SANT: 0 SNF: 0

REGULATORY DRIVERS

Primary Regulatory Driver: RCRA
 CAA: N CWA: N SDWA: N RCRA: Y R3004U: N TSCA: N CERCLA: N NEPA: N
 DOE: Y IAG: N OSHA: N ORD: N ST: Y TRI: N FED: N FFCA: N
 OTHER 1: N OTHER 2: N OTHER 3: N

Summary Funding Profile

B&R	FY94 APPR	FY95 PRES	FY95 APPR
OE	0	0	0
CE	0	0	0
GPP	0	0	0
LI	0	625	0
TOTAL	0	625	0

FY96 DRIVER CATEGORY

	DECREMENT	TARGET	PLAN	IMM RISK
A	0	0	0	0
B	0	0	0	0
C	638	638	638	638
D	0	0	0	0
E	0	0	0	0
F	0	0	0	0
G	0	0	0	0
H	0	0	0	0
I	0	0	0	0

Summary Funding Profile Continued

Environmental Management
 FY96 Field Submission
 Activity Data Sheet

Page: 2
 SF-3934- - Date: 04/06/1994 Time: 18:35

Summary Funding Profile Continued

TOTAL	638	638	638	638
-------	-----	-----	-----	-----

DECREMENT LEVEL (Dollars in Thousands)

B&R	FY96 DECR LEVEL
OE	467
CE	0
GPP	0
LI	171
TOTAL	638

TARGET LEVEL (Dollars in Thousands)

B&R Cat.	FY96	FY97	FY98	FY99	FY00
OE	467	0	0	0	0
CE	0	0	0	0	0
GPP	0	0	0	0	0
LI	171	0	0	0	0
TOTAL	638	0	0	0	0

FTEs	FY94	FY95
Direct	3	4
Indirect	0	0
Federal	0	0

FTEs	FY96	FY97	FY98	FY99	FY00
Direct	2	0	0	0	0
Indirect	0	0	0	0	0
Federal	0	0	0	0	0

PLANNING LEVEL (Dollars in Thousands)

B&R Cat.	FY96	FY97	FY98	FY99	FY00
OE	467	0	0	0	0
CE	0	0	0	0	0
GPP	0	0	0	0	0
LI	171	0	0	0	0

PLANNING LEVEL Continued

Environmental Management
 FY96 Field Submission
 Activity Data Sheet

Page: 4
 SF-3934- - Date: 04/06/1994 Time: 18:36

DECREMENT LEVEL - Continued

B&R CODE	LEVEL
EX3130090	0
35EX31309	0
39EX31309	0
39EX31309	171
TOTAL	171

TARGET LEVEL (Dollars in Thousands)

B&R CODE	FY 96	FY 97	FY 98	FY 99	FY 00
EX3130090	0	0	0	0	0
35EX31309	0	0	0	0	0
39EX31309	0	0	0	0	0
39EX31309	171	0	0	0	0
TOTAL	171	0	0	0	0

PLANNING LEVEL (Dollars in Thousands)

B&R CODE	FY96	FY97	FY98	FY99	FY00
EX3130090	0	0	0	0	0
35EX31309	0	0	0	0	0
39EX31309	0	0	0	0	0
39EX31309	171	0	0	0	0
TOTAL	171	0	0	0	0

BUDGET DETAIL PROFILE

DESC: ALL OTHER FIELD OFFICES, LABS AND P . APPR: N SUB-DESC:
 PROGRAM: EM TITLE: LBL HWHF Construction Oth.Proj.Cost

B&R CODE	FY94 APPR	FY95 PRES	FY95 APPR
EX3120090	0	0	0
35EX31209	0	0	0
	0	0	0
	0	0	0
TOTAL	0	0	0

FY96 DRIVER CATEGORY

DECREMENT
TARGET
PLAN
IMM RISK

BUDGET DETAIL PROFILE Continued

Environmental Management
 FY96 Field Submission
 Activity Data Sheet

Page: 5
 Date: 04/06/1994 Time: 18:36

SF-3934- -

BUDGET DETAIL PROFILE Continued

A	0	0	0	0
B	0	0	0	0
C	467	467	467	467
D	0	0	0	0
E	0	0	0	0
F	0	0	0	0
G	0	0	0	0
H	0	0	0	0
I	0	0	0	0
TOTAL	467	467	467	467

DECREMENT LEVEL (Dollars in Thousands)

B&R CODE	FY96 DECR LEVEL
EX3120090	467
35EX31209	0
	0
	0
TOTAL	467

TARGET LEVEL (Dollars in Thousands)

B&R CODE	FY 96	FY 97	FY 98	FY 99	FY 00
EX3120090	467	0	0	0	0
35EX31209	0	0	0	0	0
	0	0	0	0	0
	0	0	0	0	0
TOTAL	467	0	0	0	0

PLANNING LEVEL (Dollars in Thousands)

B&R CODE	FY96	FY97	FY98	FY99	FY00
EX3120090	467	0	0	0	0
35EX31209	0	0	0	0	0
	0	0	0	0	0
	0	0	0	0	0
TOTAL	467	0	0	0	0

A106 Cross References

A106 Cross References Continued

Environmental Management
FY96 Field Submission
Activity Data Sheet

SF-3934- - Date: 04/06/1994 Page: 6
Time: 18:36

A106 Cross References Continued

A106 Number: SSFLBL007 Date: / /
Title: -
Federal Facility Identification:
Region: Assessment:
Status: Progress:

Tiger Team Cross References

FY95-99 ADS Cross References

ADS #: SAN 2001
Title:
Transferred in its entirety: N
Explanation of Change:
WBS renumbering, also SAN 1827

ADS #: SAN 2001
Title:
Transferred in its entirety: N
Explanation of Change:
WBS renumbering

MILESTONES

Milestone No.: 271.04
Title: **Complete Sitework Construction
Planning Date Target Date Decrement Date Level: FO Keyword: O
11/30/1993 11/30/1993 11/30/1993
Driver Name: DOE Driver Reference: DOE Order 4700.1 Ch V,C,3
PRESENT IN Tiger Team: N Program Execution Guidance: N
Roadmap: N Current Year Workplan: N Safety and Health: N
Description:
Complete sitework construction for the new Hazardous Waste Handling Facility.

Milestone No.: 271.05
Title: Revise Building Design Title II
Planning Date Target Date Decrement Date Level: FO Keyword: O
04/30/1994 04/30/1994 04/30/1994
Driver Name: DOE Driver Reference: DOE Order 4700.1,Ch V,C,2.
PRESENT IN Tiger Team: N Program Execution Guidance: N
Roadmap: N Current Year Workplan: N Safety and Health: N
Description:

MILESTONES Continued

Environmental Management
FY96 Field Submission
Activity Data Sheet

SF-3934- - Date: 04/06/1994 Page: 7
Time: 18:36

MILESTONES Continued

Revise building construction documents to include FY94 design changes (final design)..

Milestone No.: 271.07

Title: Begin Building Construction

Planning Date Target Date Decrement Date Level: FO Keyword: O
05/30/1994 05/30/1994 05/30/1994

Driver Name: DOE Driver Reference: DOE Order 4700.1, Ch V, C, 3.

PRESENT IN Tiger Team: N Program Execution Guidance: N
Roadmap: N Current Year Workplan: N Safety and Health: N

Description:

Begin construction of the new Hazardous Waste Handling Facility.

Milestone No.: 271.11

Title: Submit Final Safety Analysis Report

Planning Date Target Date Decrement Date Level: HQ Keyword: O
10/01/1995 10/01/1995 10/01/1995

Driver Name: DOE Driver Reference: DOE Order 5481.1B & 5480.23

PRESENT IN Tiger Team: N Program Execution Guidance: N
Roadmap: N Current Year Workplan: N Safety and Health: Y

Description:

Submit the Final Safety Analysis Report (FSAR) to DOE for approval.

Milestone No.: 271.09

Title: **Complete Building Construction

Planning Date Target Date Decrement Date Level: FO Keyword: O
01/20/1996 01/20/1996 01/20/1996

Driver Name: DOE Driver Reference: DOE Order 4700.1, Ch V, C, 3.

PRESENT IN Tiger Team: N Program Execution Guidance: N
Roadmap: N Current Year Workplan: N Safety and Health: N

Description:

Complete the construction of the new Hazardous Waste Handling Facility.

Milestone No.: 271.10

Title: **Complete Title III.

Planning Date Target Date Decrement Date Level: FO Keyword: O
02/28/1996 02/28/1996 02/28/1996

Driver Name: DOE Driver Reference: DOE Order 4700.1, Ch V, C, 3.

PRESENT IN Tiger Team: N Program Execution Guidance: N
Roadmap: N Current Year Workplan: N Safety and Health: N

Description:

Complete Title 3.

Milestone No.: 271.13

MILESTONES Continued

Environmental Management
FY96 Field Submission
Activity Data Sheet

SF-3934- - Date: 04/06/1994 Page: 8
Time: 18:36

MILESTONES Continued

Title: Completion of Operational Readiness Review

Planning Date Target Date Decrement Date Level: FO Keyword: O
03/01/1996 03/01/1996 03/01/1996

Driver Name: DOE Driver Reference: DOE Order 4700.1, Ch V, C, 2

PRESENT IN Tiger Team: N Program Execution Guidance: N

Roadmap: N Current Year Workplan: N Safety and Health: N

Description:

Independent team will review new facilities operations prior to certification facility can operate.

Milestone No.: 271.14

Title: Initiate Facility Operations (KD-4)

Planning Date Target Date Decrement Date Level: FO Keyword: O
04/30/1996 04/30/1996 04/30/1996

Driver Name: DOE Driver Reference: DOE Order 4700.1, Ch V, C, 3

PRESENT IN Tiger Team: N Program Execution Guidance: N

Roadmap: N Current Year Workplan: N Safety and Health: N

Description:

Upon completion of ORR facility will receive KD-4 prior to operation.

Milestone No.:

Title: Complete replacement HWHF Preoperational Survey

Planning Date Target Date Decrement Date Level: FO Keyword: O
04/30/1996 04/30/1996 04/30/1996

Driver Name: DOE Driver Reference: DOE Order 5484.1 III(1)

PRESENT IN Tiger Team: N Program Execution Guidance: N

Roadmap: N Current Year Workplan: N Safety and Health: N

Description:

Completion date linked to replacement HWHF startup date.

Milestone No.: 271.12

Title: Transfer Old HWHF to EM-40 for RCRA Closure

Planning Date Target Date Decrement Date Level: FO Keyword: O
05/01/1996 05/01/1996 05/01/1996

Driver Name: DOE Driver Reference: DOE Order 4700.1, Ch V, C, 3

PRESENT IN Tiger Team: N Program Execution Guidance: N

Roadmap: N Current Year Workplan: N Safety and Health: N

Description:

Existing hazardous waste handling facilities will undergo RCRA closure (via EM-40) upon the activation of new HWHF.

Milestone No.:

MILESTONES Continued

Environmental Management
FY96 Field Submission
Activity Data Sheet

SF-3934- - Date: 04/06/1994 Page: 9
Time: 18:36

MILESTONES Continued

Title: Complete move to replacement HWHF

Planning Date Target Date Decrement Date Level: FO Keyword: O
05/30/1996 05/30/1996 05/30/1996

Driver Name: RCRA Driver Reference: 40 CFR; Part B Permit IV.B.6,7

PRESENT IN Tiger Team: N Program Execution Guidance: N

Roadmap: N Current Year Workplan: N Safety and Health: N

Description:

Remove all HW and MW from the existing HWHF and move to replacement HWHF; move all other items out of existing HWHF to facilitate RCRA closure.

NARRATIVE

Technical Scope Summary(Limit 15 lines or less):

This Activity Data Sheet supports the construction of a replacement Hazardous Waste Handling Facility (HWHF) at Lawrence Berkeley Laboratory (LBL).

Technical Scope Detail(Limit 104 lines or less):

A new HWHF for chemical and radioactive wastes will be constructed to replace an aged existing facility that is no longer adequate to meet the Laboratory's waste management needs. The new HWHF will consolidate existing waste storage and processing activities presently conducted in several older buildings and cargo containers into a new and specially designed facility with improved containment features and additional work and office space. The increased waste handling efficiency and operating space will result in reduced health and safety risks to employees and the public. Waste from the new facility will be shipped off-site to approved disposal sites.

The new, two-story building contains 12,900 gross square feet of area with adjoining side yards of 5,000 and 6,000 sf. The lower level contains space for radioactive and mixed waste compacting, solidification, decontamination, handling and storage. This level also contains space for storage of dry/clean materials and for mechanical and electrical equipment. The upper level contains space for chemical waste preparation and storage, mechanical equipment, and administrative support. This layout provides separation of the hazardous waste streams from the mixed and radioactive waste streams, as required by Waste Acceptance Criteria and the DOE Moratorium. The project scope includes construction of an access road, two side yards with spill containment features for shipping and receiving waste, a covered flammable liquid storage area, four prefabricated safety storage buildings for flammable solvents, oxidizers, PCBs, asbestos and a diesel generator for emergency power. Seven essential safety systems for hazardous waste facilities are included: glovebox and fume hood

NARRATIVE Continued

Environmental Management
FY96 Field Submission
Activity Data Sheet

SF-3934- - Date: 04/06/1994 Page: 10
Time: 18:36

NARRATIVE Continued

confinement, ventilation, air sampling, fire protection, emergency power, eyewash and emergency showers, and emergency exits.

Activities to be housed in the new HWHF will include volume reduction, radioactive waste declassification (decontamination, decay), liquid radioactive and mixed waste immobilization (solidification), mixed waste declassification (neutralization), packaging, and providing disposal documentation. The facility has an annual capacity to process 800 drums of chemical waste, 350 cubic feet of induced metals, 9 drums of TRU waste, 320 drums of radioactive waste, and 320 drums of radioactive/mixed waste.

Planning for this project began with Authorization of funding in 1988. The NEPA Environmental Assessment (EA) was completed and submitted for DOE review in June, 1990. Additional revisions requested by DOE/HQ were incorporated and the document was submitted to DOE/OAK in February 1991, and again in November, 1991. Final DOE/HQ approval of the EA was received in October 1992. The RCRA Part B Permit renewal application was first submitted in FY90, and a revised application was submitted to the California Department of Toxic Substances Control (DTSC) on August 17, 1992. A new Part B Permit was approved on May 4, 1993. The preliminary Safety Analysis Review (SAR) for this project was approved by DOE/OAK in November, 1991.

According to current project plans, the replacement HWHF will be complete by the 2nd Quarter of FY96. Waste handling operations are expected to commence in the new facility in the 3rd Quarter FY96. The existing HWHF is scheduled to be closed by the 3rd Quarter FY96, at which time EM-40 decontamination and decommissioning activities can commence.

Activities Completed to Date/Current Year (FY 1994) Description:
(Limit 52 lines or less)

- o Completed sitework construction for the replacement HWHF.
- o Complete Title II design revisions for the replacement HWHF.
- o Complete Bid and Award of the replacement HWHF construction.
- o Begin building construction for the replacement HWHF.

Budget Year (FY 1995) Description(Limit 52 lines or less):

- o Continue construction of the replacement HWHF.
- o Submit a Final Safety Analysis Review (FSAR) for HQ approval.

Planning Year (FY 1996) Description(Limit 156 lines or less):

- o Complete the building construction for the replacement HWHF, and initiate facility operations. (Line Item funds).
- o Complete third-party safety review. (Operating funds)
- o Move equipment from the existing HWHF to the replacement HWHF. (Operating funds).
- o Complete RCRA Part B Class III Permit modifications. (Operating funds)

NARRATIVE Continued

Environmental Management
FY96 Field Submission
Activity Data Sheet

SF-3934- - Date: 04/06/1994 Page: 11
Time: 18:36

NARRATIVE Continued

The request of \$171K in FY96 is for reinstatement of funds diverted to the Federal earthquake relief effort in FY94. OE-funded activities and their costs have been transferred from ADS 3931, in order to facilitate DOE/HQ review.

Outyears (FY 1997 - FY 2000) Description(Limit 78 lines or less):
Under current plans, activities under this ADS will be complete in FY96.

Impacts/Assumptions(Limit 42 lines or less):

Assumptions:

Funding will be approved. DOE will approve the FSAR by 3/01/96.

Impacts:

This Line Item project has already received funding at a level of \$12M through FY94. In FY94, \$171K was diverted from this project for the federal earthquake relief effort. The FY95 request for \$625K will enable LBL to prepare and submit the FSAR in order to operate the new HWHF for its intended purpose. The FY96 LI request for \$171K is to reinstate funds diverted in FY94. OE funds requested in FY96 are for project-related costs, such as completion of a third-party safety review and moving of equipment from the existing facility. Should the additional requests be denied, the proposed facility would not be usable for its intended purpose and LBL would fail to meet the requirements of its RCRA Part B Permit.

Target, Decrement, and Planning level funding is adequate to meet project needs.

Supporting Documents(Limit 5 lines or less):

Tiger Team Corrective Action Plan, RCRA Part B Permit, California Title 22.

Performance Measures(Limit 15 lines or less):

DESCRIPTION OF REGULATORY DRIVERS

DOE:

The DOE Moratorium highlighted the need for sufficient space to separate hazardous, radioactive, and mixed waste. The Tiger Team also recommended increasing waste management staff and operations space.

RCRA:

40 CFR Part 260 et seq. governs the storage of hazardous and mixed wastes at the HWHF.

ST:

Calif. Health & Safety Code Sec. 25100 et seq. contains more stringent requirements than RCRA.

Environmental Management
 FY96 Field Submission
 Safety and Health Activity Data Sheet
 SF-3934- -

Revision Date: 03/17/1994

Page: 12
 Date: 04/06/1994 Time: 18:37

RESPONSIBLE MANAGER : Tim Wan

MANAGER TELEPHONE: 510-486-7073

DECREMENT COST SPREADSHEET (All costs are in Thousands) \$000s

TYPE	S&H DECR
OE	0
CE	0
GPP	0
LI	0
TOTAL	0

TARGET COST SPREADSHEET (All costs are in Thousands) \$000s

TYPE	1994	1995					
OE	0	0					
CE	0	0					
GPP	0	0					
LI	0	625					
TOTAL	0	625					
FTE	0	0					

TYPE	1996	1997	1998	1999	2000	OTHER	TOTAL
OE	0	0	0	0	0	0	0
CE	0	0	0	0	0	0	0
GPP	0	0	0	0	0	0	0
LI	0	0	0	0	0	0	625
TOT	0	0	0	0	0	0	625
FTE	0	0	0	0	0	0	0

PLANNED COST SPREADSHEET (All costs are in Thousands) \$000s

TYPE	1994	1995					
OE	0	0					
CE	0	0					
GPP	0	0					
LI	0	625					
TOTAL	0	625					
FTE	0	0					

TYPE	1996	1997	1998	1999	2000	OTHER	TOTAL
OE	0	0	0	0	0	0	0

PLANNED COST SPREADSHEET (All costs are in Thousands) \$000s Continued

Environmental Management
 FY96 Field Submission
 Safety and Health Activity Data Sheet

SF-3934- -

Page: 13

Revision Date: 03/17/1994

Date: 04/06/1994

Time: 18:37

PLANNED COST SPREADSHEET (All costs are in Thousands) \$000s Continued

CE	0	0	0	0	0	0	0	0	0
GPP	0	0	0	0	0	0	0	0	0
LI	0	0	0	0	0	0	0	0	625
TOTAL	0	0	0	0	0	0	0	0	625
FTE	0	0	0	0	0	0	0	0	0

TARGET FUNCTIONAL AREAS

FY	FUNC AREA	% OF TARGET							TYPE	
		94	95	96	97	98	99	00	CCI	DVR
MO	Mgmt & Ovr									
EP	Emerg Prep									
FP	Fire Prot									
IS	Indus Safe									
IH	Indus Hlth									
NS	Nuc Safety									
MS	Occ Med Sv									
RP	Radtn Prot									
TS	Trans Safe									

PLANNING FUNCTIONAL AREAS

FY	FUNC AREA	% OF PLANNING							TYPE	
		94	95	96	97	98	99	00	CCI	DVR
MO	Mgmt & Ovr									
EP	Emerg Prep									
FP	Fire Prot									
IS	Indus Safe									
IH	Indus Hlth									
NS	Nuc Safety									
MS	Occ Med Sv									
RP	Radtn Prot									
TS	Trans Safe									

ADS LISTING

MILESTONE # MILESTONE TITLE

271.11 Submit Final Safety Analysis Report

NARRATIVE ASSESSMENT:

REFERENCE:

NARRATIVE Continued

Environmental Management
FY96 Field Submission
Safety and Health Activity Data Sheet
SF-3934- -

Revision Date: 03/17/1994

Date: 04/06/1994

Page: 14
Time: 18:37

NARRATIVE Continued

ACTIVITIES DESCRIPTION: A Final Safety Analysis Review (FSAR) will be completed in FY95.

APPENDIX G

**Energy Research (ER)
Activity Data Sheets (ADS)**

U. S. DEPARTMENT OF ENERGY
 ES&H Management Plan Information System
 ACTIVITY DATA SHEET
 LAWRENCE BERKELEY LABORATORY

ACTIVITY DATA SHEET IDENTIFICATION SECTION

1. Facility: LBL 2. Name: LAWRENCE BERKELEY LABORATORY
- ADS No: A94D0051 3. Title: WASTE MIN AND POLLUTION PREVENTION CORE (EP4)
4. Data Sheet Status Code: OPEN
5. Line Item Project ID.:
 6. Original Identifier...:
 7. Work Package Number...:
 8. Account Number.....:
 9. Work Breakdown Struc.:
 10. Reference ADS Number.:
 11. Responsible SO Code...: ER - OFFICE OF ENERGY RESEARCH
 12. Resp. Contractor Code: CAU - CALIFORNIA, UNIVERSITY OF
 13. Contractor Division...: EH&S
 14. Contractor Department: ENVR PRCTCT
 15. Contractor Manager...: MCGRAW DAVID 16. Phone: (510) 486-5551
 17. DOE Manager.....: SAMUELSON SCOTT 18. Phone: (510) 486-4345

ADS CATEGORY SECTION

19. Category: () Safety & Health (X) Environmental () Other:
21. Is activity an A-106 Plan Activity? [X] Yes [] No
22. Functional Breakdown:

<u>FA.SA</u>	<u>Pct</u>	<u>Functional Area/Sub-Area Title</u>
PP.01	30	Program Planning & Development
PP.02	30	Education, Training & Awareness Programs
PP.03	40	Waste Min/PP Opportunity Assessments

ADS TYPE SECTION

24. ADS Type: (X) Core () Compliance () Improvement
25. External Drivers:

<u>P/S</u>	<u>Typ</u>	<u>Driver Code</u>	<u>Driver Title</u>
Pri	LAW	RCRA	Resource Conservation and Recovery Act (RCRA*)
Sec	ORD	DOE 5400.01	General Environmental Protection Program
Sec	STD	[OTHER]	Other Standard - Specify

U. S. DEPARTMENT OF ENERGY
 ES&H Management Plan Information System
 ACTIVITY DATA SHEET (continued)
 LAWRENCE BERKELEY LABORATORY

26. Compliance Comments

STD[OTHER]: California - CA SB 14
 STD[OTHER]: Federal Pollution - FPPA

Other relevant compliance drivers are as follows:

Calif. HWCL [H&SC Sec. 25100 et seq.]

Calif. AB-1475

Calif. HWCL [H&SC Sec. 25100 et seq.], Calif. AB-1475 [H&SC Secs. 25143.20], Calif. SB-1726 [H&SC Sec. 25719.7]

Federal Facility Compliance Act (FFCA)

Executive Order 12856, Federal Compliance with Right to Know and Pollution Prevention Requirements

Executive Order 12843, Procurement Requirements and Policies for Ozone-Depleting Substances

Executive Order 12844, Federal Use of Alternative Fueled Vehicles

Executive Order 12845, Requiring Agencies to Purchase Energy Efficient Computer Equipment

Executive Order 12873, Federal Acquisition, Recycling and Waste Prevention

DOE Orders 5400.3 [6(d)], and 5820.2A [Chapter I, 7(a), (b) Chapter II, 3(b), Chapter III, 3(c) and (f)]

EBMUD waste water discharge permits [SC Secs. 25143.20]

Calif. SB-1726 [H&SC Sec. 25719.7]

EBMUD waste water discharge permits

DOE Orders 5400.3 [6(d)], and 5820.2A [Chapter I, 7(a), (b) Chapter II, 3(b), Chapter III, 3(c) and (f)]

UC Contract 98, Appendix F Performance Measures for Waste Minimization

27. ADS DESCRIPTION SECTION

Lawrence Berkeley Laboratory (LBL) personnel conduct a wide variety of research and associated support activities that result in the generation of hazardous, radioactive, and mixed waste. These activities require the support of professional, technical, and administrative staff to apply waste minimization and pollution prevention techniques to research and support operations. For the past several years, LBL has carried out at an EM-funded waste minimization and pollution prevention program from the perspective of the on-site hazardous waste handling facility (HWHF), a RCRA-permitted facility at which LBL wastes are packaged and temporarily stored prior to disposal at licensed, off-site facilities. This EM-funded program has included site-wide planning elements, but is principally focused on end-of-stream activities rather than generator programs. In FY94, LBL augmented this program by hiring a waste minimization and pollution prevention specialist using indirect (overhead) funding, thus providing the seeds of an ER-funded program that will focus on waste minimization and pollution prevention issues at the generator level.

U. S. DEPARTMENT OF ENERGY
ES&H Management Plan Information System
ACTIVITY DATA SHEET (continued)
LAWRENCE BERKELEY LABORATORY

Specific FY94 activities are limited to those of a Base Program, as described in the FY96-2000 Environment, Safety and Health Management Plan Guidance Manual, including the the following

- 1). Program Planning and Development - Through close coordination with the existing EM-funded site-wide planning efforts, activities are focused on initiating waste minimization baselines against which progress can be defined, and on developing generator specific programs. Some reporting functions such as SB14 reporting and production of the 1994 Waste Minimization and Pollution Prevention Awareness Plan are focused on waste generation, and will be carried out by this program.
- 2). Education and Training - LBL will begin to develop training materials and to implement training to the broader Laboratory community, to accelerate culture change required to minimize the unnecessary generation of solid, hazardous, radioactive, and low-level mixed wastes. For example, although only about 10% of LBL's hazardous waste is produced directly by scientists in small laboratories, much of this generated waste could be eliminated through more careful procurement, materials substitution, careful waste segregation, miniaturization of experimental setups, etc. These and other strategies will be disseminated to the LBL scientific community through newspaper articles, statements of management policy, involvement in Divisional ES&H meetings, and both formal and informal training sessions.
- 3). Waste Minimization and Pollution Prevention Opportunity Assessments - The initial focus will be on three of LBL's five major waste streams: contaminated solid waste, acids, and coolants. These three waste streams offer the best opportunities for minimization through changes in operations (waste sorting, janitorial training) or through demonstrated waste treatment (acid neutralization) or recycling/reuse techniques (coolant regeneration). Reduction goals have been specified in UC's operating contract at 5% per year for each of these waste streams. Other waste-specific and facility-specific assessments, such as tritium waste, radioactive wastes, medical wastes, and solvent wastes will be carried out.

A waste minimization and pollution prevention Compliance ADS requests ER funding for support of a Waste Minimization and Pollution Prevention Implementation Program, as defined in the FY96-2000 Environment, Safety and Health Management Plan Guidance Manual. This Implementation Program will include activities focused on source reduction of hazardous and radioactive materials; reuse and recycling activities for non-hazardous, hazardous, and radioactive materials; waste minimization and pollution prevention RD&D projects, and specifications reviews of LBL projects and technical documents.

U. S. DEPARTMENT OF ENERGY
 ES&H Management Plan Information System
 ACTIVITY DATA SHEET (continued)
 LAWRENCE BERKELEY LABORATORY

In addition, a variety of Compliance ADSs request support for specific waste minimization and pollution prevention projects that are sufficiently well developed to warrant funding at this time.

LBL Waste Minimization and Pollution Prevention Goals

Waste Stream	Driver	Goal	Goal Responsibility	Baseline
Acids	Appendix F	5%/yr	ER	1993
Coolants	Appendix F	5%/yr	ER	1993
Contaminated Solids	Appendix F	5%/yr	ER	1993
Aggregate Total Waste	Appendix F	10%	ER	1993
Waste Oil (non automotive)	SB 14	10%	ER	1990
Waste Machining & Grinding Coolant & H2O	SB 14	85%	ER	1990
Spent Empty Drums >30 gal.	SB 14	50%	EM	1990
Waste Liquids w/ pH <2	SB 14	15%	ER	1990
Waste Mercury	SB 14	TBD	ER	1990
Aqueous Waste				
H2O Treatment Influent	SB 14	60%	ER	1990
Practice W. Min tech & recycle when possible; perform PWA & document (B25) 1993	EBMUD	N/A	EPG/ER	July
B77 Investigation 1993	EBMUD	N/A	EPG/ER	July
1,1,1 TCA	TRI/EPCRA 313 DOE	33% by 1997 50% by 1999	ER	TBD
Freon 113	TRI/EPCRA 313	50% by 1999	ER	1993
Toxic Chemicals	TRI/EPCRA 313	50% by 1999	ER	1993
Minimize volume & Toxicity	DOE 5400.1	TBD	ER	TBD

Performance Measures found in
 1 Appendix F of the DOE/UC Contract 98
 2 California Senate Bill 14
 3 East Bay Municipal Utilities District

28. APPRAISAL SECTION

U. S. DEPARTMENT OF ENERGY
 ES&H Management Plan Information System
 ACTIVITY DATA SHEET (continued)
 LAWRENCE BERKELEY LABORATORY

ADS SCORING SECTION

29. ADS Scoring	<- Before Scoring ->	<- After Scoring ->	
	<u>Csq L'hood</u> <u>Score</u>	<u>Csq L'hood</u> <u>Score</u>	
Public Safety & Health			
Site Personnel Safety & Health			
Compliance			
Mission Impact			
Investment Impact			
Environmental Protection			
 NET BEFORE AND AFTER:	 0.0000		 0.0000
NET SCORE.....:	0.0000		
30. Contractor Adj:	0.0000	31. Other Score:	0.0000
Ops Office Adj:	0.0000	32. Priority...:	0
Sec Office Adj:	0.0000	33. Scored By...:	
TOTAL ADJUSTED.....:	0.0000	34. Score Date..:	/ /

ADS RESOURCE DATA SECTION

36. Funding:	37. Fund Case:	38. Resource Structure Code:
() Program	() Decrement	39. Budget & Reporting Code:
(X) Indirect SI	(X) Target	
() Outside	() Planning	40. Start Year: 1994
by:	() Unfunded	41. End Year:

FY	OE	CE	GPP	LIP	TOTAL	Fed FTE	Ctr FTE
1993	0.0	0.0	0.0	0.0	0.0	0.00	0.00
1994	77.0	0.0	0.0	0.0	77.0	0.00	0.90
1995	104.0	0.0	0.0	0.0	104.0	0.00	1.20
1996	107.0	0.0	0.0	0.0	107.0	0.00	1.20
1997	110.0	0.0	0.0	0.0	110.0	0.00	1.20
1998	114.0	0.0	0.0	0.0	114.0	0.00	1.20
1999	117.0	0.0	0.0	0.0	117.0	0.00	1.20
2000	121.0	0.0	0.0	0.0	121.0	0.00	1.20
2001	0.0	0.0	0.0	0.0	0.0	0.00	0.00

Escalated? Yes No

45. Cost Estimate Notes

Cost estimates are based on the cost of one technical EH&S employee (\$80K/FTE), escalated as per DOE guidance for operating expenses. This ADS covers 0.7 technical FTE in FY94 (Hired 02/06/94) and 0.2 technical manager FTE. \$5K of the FY94 total is for Divisional administrative

U. S. DEPARTMENT OF ENERGY
 ES&H Management Plan Information System
 ACTIVITY DATA SHEET (continued)
 LAWRENCE BERKELEY LABORATORY

support. The small increase in FY95 over the FY94 estimate reflects the employment of the new hire for a full 12 months in FY95.

ADS TRACKING SECTION

- 47. Management Approval? Yes No
- 48. Activity In-process? Yes No
- 49. Design Plan Completion...: / /
- 50. Construction Start.....: / /
- 51. Construction Completion...: / /
- 52. Final Compliance Required: / /
- 53. Fiscal Year Completed.....

ADDITIONAL A-106 DATA REQUIREMENTS

- 54. Multiple Sites? Yes No
- 55. Pollutant Category Driver: RCRA
Code: POLP
- 56. Compliance Status: ESDP - Standard Deadline Passed (Class I)
- 57. Progress Code: WRK - Work on-going (non-construction)
- 58. Program Category: CA - Corrective Activities WM - Waste Managem
 ER - Envir. Restoration OT - Other Activit

U. S. DEPARTMENT OF ENERGY
ES&H Management Plan Information System
ACTIVITY DATA SHEET
LAWRENCE BERKELEY LABORATORY

ACTIVITY DATA SHEET IDENTIFICATION SECTION

- 1. Facility: LBL 2. Name: LAWRENCE BERKELEY LABORATORY
- ADS No: A94D0068 3. Title: WASTE MIN & POLLUTION PREV. IMPLEMENTATION COM
- 4. Data Sheet Status Code: OPEN
- 5. Line Item Project ID.:
- 6. Original Identifier.:
- 7. Work Package Number.:
- 8. Account Number.....:
- 9. Work Breakdown Struc.:
- 10. Reference ADS Number.:
- 11. Responsible SO Code.: ER - OFFICE OF ENERGY RESEARCH
- 12. Resp. Contractor Code: CAU - CALIFORNIA, UNIVERSITY OF
- 13. Contractor Division.: EH&S
- 14. Contractor Department: ENVR PRTCT
- 15. Contractor Manager...: MCGRAW DAVID 16. Phone: (510) 486-5551
- 17. DOE Manager.....: SAMUELSON SCOTT 18. Phone: (510) 486-4345

ADS CATEGORY SECTION

- 19. Category: () Safety & Health (X) Environmental () Other:
- 21. Is activity an A-106 Plan Activity? [X] Yes [] No
- 22. Functional Breakdown:

<u>FA.SA</u>	<u>Pct</u>	<u>Functional Area/Sub-Area Title</u>
PP.04	50	Source Reduction - Hazardous & Radioactive
PP.05	10	Reuse & Recycling - Hazardous & Radioactive
PP.06	10	Source Reduction/Reuse/Recycling - Non-Hazardous
PP.07	10	Waste Min/PP Research, Development & Demonstration
PP.08	20	Specifications Review

ADS TYPE SECTION

- 24. ADS Type: () Core (X) Compliance () Improvement
- 25. External Drivers:

<u>P/S</u>	<u>Typ</u>	<u>Driver Code</u>	<u>Driver Title</u>
Pri	LAW	RCRA	Resource Conservation and Recovery Act (RCRA*)
Sec	ORD	DOE 5400.01	General Environmental Protection Program
Sec	STD	[OTHER]	Other Standard - Specify

U. S. DEPARTMENT OF ENERGY
 ES&H Management Plan Information System
 ACTIVITY DATA SHEET (continued)
 LAWRENCE BERKELEY LABORATORY

26. Compliance Comments

STD[OTHER]: CA SB 14 California
 FPPA Federal Pollution

Other relevant compliance drivers are as follows:

Calif. HWCL [H&SC Sec. 25100 et seq.], Calif. AB-1475 [H&SC Secs. 25143.20], Calif. SB-1726 [H&SC Sec. 25719.7]

Federal Facility Compliance Act (FFCA)

Executive Order 12856, Federal Compliance with Right to Know and Pollution Prevention Requirements
 Executive Order 12843, Procurement Requirements and

Policies for Ozone-Depleting Substances

Executive Order 12844, Federal Use of Alternative Fueled Vehicles

Executive Order 12845, Requiring Agencies to Purchase Energy Efficient Computer Equipment

Executive Order 12873, Federal Acquisition, Recycling and Waste Prevention

DOE Orders 5400.3 [6(d)], and 5820.2A [Chapter I, 7(a), (b) Chapter II, 3(b),

Chapter III, 3(c) and (f)]

EBMUD waste water discharge permits

UC/DOE Contract 98, Appendix F Performance Measures

27. ADS DESCRIPTION SECTION

Lawrence Berkeley Laboratory (LBL) personnel conduct a wide variety of research and associated support activities that result in the generation of hazardous, radioactive, and mixed waste. These activities require the support of professional, technical, and administrative staff to apply waste minimization and pollution prevention (WMin/PP) techniques to research and support operations. For the past several years, LBL has carried out at an EM-funded WMin/PP program at the on-site hazardous waste handling facility (HWHF), an EM-funded, RCRA-permitted facility at which LBL wastes are packaged and temporarily stored prior to disposal at licensed, off-site facilities. This EM-funded program has included both site-wide planning elements and a focus on end-of-stream activities at the HWHF.

In FY94, LBL augmented this program by hiring a waste minimization and pollution prevention specialist using indirect (overhead) funding, thus providing the seeds of an ER-funded program that will focus on waste minimization and pollution prevention issues at the generator level. The currently funded program is restricted to a base program with a focus on generators. This ADS covers activities currently not funded by either EM or through indirect funding, specifically the development of a

U. S. DEPARTMENT OF ENERGY
 ES&H Management Plan Information System
 ACTIVITY DATA SHEET (continued)
 LAWRENCE BERKELEY LABORATORY

Waste Minimization and Pollution Prevention Implementation Program with a focus on LBL generators.

Implementation Program Compliance Activities (1.5 FTE):

- 1). Source Reduction Activities for Hazardous and Radioactive Materials (0.5 FTE) - Activities focused on generators designed to reduce the generation of hazardous, radioactive, and mixed wastes at LBL. Includes identification of alternative chemicals for the 33/50 program, chemicals on the EPCRA Toxic Release Inventory list, ozone-depleting chemicals, tritiated waste, tritiated mixed waste, and other regulated hazardous materials.
- 2). Reuse and Recycling Activities for Hazardous waste and radioactive waste (0.1 FTE) - Activities focused on reducing the volume of hazardous, radioactive, or mixed wastes through reuse or recycling, including affirmative procurement practices related to hazardous, radioactive, and mixed materials, such as reduced volume orders, non-hazardous materials substitution, etc.
- 3). Source Reduction, Reuse and Recycling for Non-Hazardous Materials (0.1 FTE) - Activities focused on reducing the volume of non-hazardous materials released to the environment, through source reduction, reuse, or recycling. Includes affirmative procurement practices related to non-hazardous materials such as purchasing targets for recycled materials, etc.
- 4). WMin/PP Research, Development and Demonstration (0.1 FTE) - Activities necessary to obtain new technology solutions to critical WMin/PP areas identified by LBL waste generators.
- 5). Specification Review (0.2 FTE) - Activities related to review and revision of technical standards or documents such as MILSPECS, MILSTDS, MEPA documents, operating standards, procurement requests, construction project documents, and QA plans.
- 6). Administrative Data Management Support for Generator Base and Implementation Program Activities (0.5 FTE) - Prepares correspondence, technical reports, maintains site-wide databases important to WMin/PP, other general administrative duties relating to the site-wide WMin/PP program.

Waste Stream	Driver	Goal	Goal Responsibility	Baseline
Acids	Appendix F	5%/yr	ER	1993
Coolants	Appendix F	5%/yr	ER	1993
Contaminated Solids	Appendix F	5%/yr	ER	1993

U. S. DEPARTMENT OF ENERGY
 ES&H Management Plan Information System
 ACTIVITY DATA SHEET (continued)
 LAWRENCE BERKELEY LABORATORY

Aggregate Total Waste	Appendix F	10%	ER	1993
Waste Oil (non automotive)	SB 14	10%	ER	1990
Waste Machining & Grinding Coolant & H2O	SB 14	85%	ER	1990
Spent Empty Drums >30 gal.	SB 14	50%	EM	1990
Waste Liquids w/ pH <2	SB 14	15%	ER	1990
Waste Mercury	SB 14	TBD	ER	1990
Aqueous Waste H2O Treatment Influent	SB 14	60%	ER	1990
Practice W. Min tech & recycle when possible; perform PWA & document (B25)	EBMUD	N/A	EPG/ER	July 1993
B77 Investigation	EBMUD	N/A	EPG/ER	July 1993
1,1,1 TCA	TRI/EPCRA 313 DOE	33% by 1997 50% by 1999	ER	TBD
Freon 113	TRI/EPCRA 313	50% by 1999	ER	1993
Toxic Chemicals	TRI/EPCRA 313	50% by 1999	ER	1993
Minimize volume & Toxicity	DOE 5400.1	TBD	ER	TBD

Performance Measures found in
 1 Appendix F of the DOE/UC Contract 98
 2 California Senate Bill 14
 3 East Bay Municipal Utilities District

28. APPRAISAL SECTION

Public Safety & Health:

Risk/Impact:

An incremental negative impact on the Public safety and health.

Benefit:

An incremental positive impact on the Public safety and health.

Site Personnel Safety & Health:

Risk/Impact:

Slight possibility of exposure and adverse health effects to site personnel.

Benefits:

Slightly reduced possibility of exposure and adverse health effects to site personnel.

Compliance:

Risk/Impact:

In the event that ER support for a WMin/PP Implementation program is not forthcoming, LBL will be out of compliance with a variety of DOE Orders and Executive Orders regarding the need for WMin/PP Implementation

U. S. DEPARTMENT OF ENERGY
ES&H Management Plan Information System
ACTIVITY DATA SHEET (continued)
LAWRENCE BERKELEY LABORATORY

programs. Non-compliance could result in forced shutdown of programs that generate waste at LBL. Lack of support for a WMin/PP Implementation Program would also make it very difficult for LBL to comply with Appendix F Performance Measures found in the contract negotiated between the DOE and the University of California, requiring 5%/yr reductions in three of LBL 5 major waste streams over the next five years. Because currently funded WMin/PP activities at LBL focus on the development of goals and of projects to meet these goals, funding for project implementation is sorely needed. Non-compliance with the Appendix F Performance Measures will negatively influence performance ratings of the Laboratory, and of its uppermost managers.

Benefit:

If the activities supported by this ADS are funded by ER, LBL will be in complete compliance with all regulatory drivers regarding WMin/PP Implementation programs, and will be able to perform well on Performance Measures found in Appendix F of the DOE/UC contract.

Mission Impact:

Risk/Impact:

In the event that ER support for a WMin/PP Implementation program is not forthcoming, LBL will be out of compliance with a variety of DOE Orders and Executive Orders regarding the need for WMin/PP Implementation programs. Non-compliance could result in forced shutdown of programs that generate waste at LBL.

Investment Impact:

Risk/Impact:

In the event that ER support for a WMin/PP Implementation program is not forthcoming, LBL will be out of compliance with a variety of DOE Orders and Executive Orders regarding the need for WMin/PP Implementation programs. Non-compliance could result in forced shutdown of programs that generate waste at LBL. The investment impact is unlikely to exceed \$5M/yr, but could be as high as \$1M/yr.

Benefit:

If the activities supported by this ADS are funded by ER, LBL will be in complete compliance with all regulatory drivers regarding WMin/PP Implementation programs, and will be able to perform well on Performance Measures found in Appendix F of the DOE/UC contract. LBL research programs will not be threatened with shutdown due to lack of compliance with WMin/PP directives.

Environmental Impact:

Risk/Impact:

An incremental negative impact on environmental quality.

Benefit:

An incremental positive impact on environmental quality.

Other Factors:

U. S. DEPARTMENT OF ENERGY
 ES&H Management Plan Information System
 ACTIVITY DATA SHEET (continued)
 LAWRENCE BERKELEY LABORATORY

Appendix F Performance Measures:

There is a growing National consensus that the long term health of our citizens and the restoration of our environment to a more habitable state will require an intense and continuing focus on the minimization of the wastes produced in the work place, and on preventing wastes from entering the environment through unplanned releases. If there is no support for WMin/PP Implementation at LBL, then the facility will be expending considerable effort in this area, but with little payout. In particular, it would be difficult for LBL to succeed in reducing 3 of its 5 major waste streams by 5%/yr for the next five years, as is required in Performance Measures found in Appendix F of the UC/DOE contract.

ADS SCORING SECTION

29. ADS Scoring	<- Before Scoring ->			<- After Scoring ->		
	<u>Csg</u>	<u>L'hood</u>	<u>Score</u>	<u>Csg</u>	<u>L'hood</u>	<u>Score</u>
Public Safety & Health						
Site Personnel Safety & Health						
Compliance	9	A	75.0000	9	D	0.0075
Mission Impact	13	A	75.0000	13	D	0.0075
Investment Impact	15	A	15.0000	15	D	0.0015
Environmental Protection						
NET BEFORE AND AFTER:			165.0000			0.0165
NET SCORE.....:			164.9835			
30. Contractor Adj:			0.0000	31. Other Score:		0.0000
Ops Office Adj:			0.0000	32. Priority...:		1
Sec Office Adj:			0.0000	33. Scored By...:	BRIAN M. SMITH	
TOTAL ADJUSTED.....:			164.9835	34. Score Date..:	02/20/1994	

35. Scoring Comments

Public Safety & Health:

A WMin/PP Implementation program is not likely to reduce the risk of exposure or injury to the general public, except in an incremental fashion.

Site Personnel Safety & Health:

A WMin/PP Implementation program is not likely to reduce the risk to site personnel of exposure or injury, except in an incremental fashion.

Compliance:

In the event that this ADS is not supported, LBL will be out of compliance with a variety of DOE Orders and Executive Orders regarding the need for WMin/PP programs. Non-compliance could result in fines and

U. S. DEPARTMENT OF ENERGY
 ES&H Management Plan Information System
 ACTIVITY DATA SHEET (continued)
 LAWRENCE BERKELEY LABORATORY

forced shutdown of programs that generate waste, as well as poor performance on the Appendix Performance Measure relating to WMin/PP.

Mission Impact:

In the event that this ADS is not supported, LBL will be out of compliance with a variety of DOE Orders and Executive Orders regarding the need for WMin/PP programs. Non-compliance could result in fines and forced shutdown of programs that generate waste. Such shutdowns might have a moderate negative impact on the Laboratory's ability to accomplish its mission. Particularly problematic in this regard are wastes generated by the National Tritium Labeling Facility and waste materials comprising the Bevatron, now awaiting D&D.

Investment Impact:

In the event that this ADS is not supported, LBL will be out of compliance with a variety of DOE Orders and Executive Orders regarding the need for WMin/PP programs. Non-compliance could result in fines and forced shutdown programs that generate waste. A forced shutdown of such programs would have a moderate negative economic impact on the Laboratory which could easily exceed \$1M/yr.

Environmental Impact:

A WMin/PP Implementation program is not likely to reduce the risk of environmental damage due to LBL operations, but would be useful in incrementally reducing the amount of waste generated by LBL and the risk of eventual damage to the environment from that waste.

ADS RESOURCE DATA SECTION

- | | | |
|--------------|----------------|--|
| 36. Funding: | 37. Fund Case: | 38. Resource Structure Code: YA0901 |
| (X) Program | () Decrement | 39. Budget & Reporting Code: KG0000000 |
| () Indirect | () Target | |
| () Outside | (X) Planning | 40. Start Year: 1994 |
| by: | () Unfunded | 41. End Year: 2000 |

U. S. DEPARTMENT OF ENERGY
ES&H Management Plan Information System
ACTIVITY DATA SHEET
LAWRENCE BERKELEY LABORATORY

ACTIVITY DATA SHEET IDENTIFICATION SECTION

- 1. Facility: LBL 2. Name: LAWRENCE BERKELEY LABORATORY
- ADS No: A94D0058 3. Title: ABRASIVES HAZARDOUS WASTE REDUCTION (EP11)
- 4. Data Sheet Status Code: OPEN
- 5. Line Item Project ID.:
- 6. Original Identifier.:
- 7. Work Package Number.:
- 8. Account Number.....:
- 9. Work Breakdown Struc.:
- 10. Reference ADS Number.:
- 11. Responsible SO Code...: ER - OFFICE OF ENERGY RESEARCH
- 12. Resp. Contractor Code: CAU - CALIFORNIA, UNIVERSITY OF
- 13. Contractor Division...: EH&S
- 14. Contractor Department: ENVR PRTCT
- 15. Contractor Manager....: MCGRAW DAVID 16. Phone: (510) 486-5551
- 17. DOE Manager.....: SAMUELSON SCOTT 18. Phone: (510) 486-4345

S CATEGORY SECTION

- 19. Category: () Safety & Health (X) Environmental () Other:
- 21. Is activity an A-106 Plan Activity? [X] Yes [] No
- 22. Functional Breakdown:

FA.SA Pct Functional Area/Sub-Area Title
PP.05 100 Reuse & Recycling - Hazardous & Radioactive

ADS TYPE SECTION

- 24. ADS Type: () Core (X) Compliance () Improvement
- 25. External Drivers:

<u>P/S</u>	<u>Typ</u>	<u>Driver Code</u>	<u>Driver Title</u>
Pri	LAW	[OTHER]	Other Law - Specify
Sec	ORD	DOE 5400.01	General Environmental Protection Program
Sec	OTH	[OTHER]	Other Driver - Specify
Sec	STD	[OTHER]	Other Standard - Specify

26. Compliance Comments

LAW[OTHER]: CA SB 14 - California
STD[OTHER]: FPPA - Federal

U. S. DEPARTMENT OF ENERGY
 ES&H Management Plan Information System
 ACTIVITY DATA SHEET (continued)
 LAWRENCE BERKELEY LABORATORY

OTH [OTHER]: UC/DOE Contract 98 Appendix F

Other relevant waste minimization and pollution prevention compliance documents relevant to LBL are as follows:

Calif. HWCL [H&SC Sec. 25100 et seq.], Calif. AB-1475 [H&SC Secs. 25143.20], Calif. SB-1726 [H&SC Sec. 25719.7]

Federal Facility Compliance Act (FFCA)

Executive Order 12856, Federal Compliance with Right to Know and Pollution Prevention Requirements

Executive Order 12843, Procurement Requirements and Policies for Ozone-Depleting Substances

Executive Order 12844, Federal Use of Alternative Fueled Vehicles

Executive Order 12845, Requiring Agencies to Purchase Energy Efficient Computer Equipment

Executive Order 12873, Federal Acquisition, Recycling and Waste Prevention

DOE Orders 5400.3 [6(d)], and 5820.2A [Chapter I, 7(a), (b) Chapter II, 3(b), Chapter III, 3(c) and (f)]

EBMUD waste water discharge permits

27. ADS DESCRIPTION SECTION

The Lawrence Berkeley Laboratory (LBL) has been operating for more than 50 years on a 130-acre site with a FY94 population of nearly 4000 research and support staff. Maintenance of the many research and support facilities includes various abrasive stripping activities, mostly to prepare surfaces for repair, repainting, or sealing from the environment. Currently, the spent abrasives produced from the stripping activities are collected in 55-gallon drums, temporarily stored in WAA's, then transported to the on-site hazardous waste handling facility, where they are shipped as hazardous waste to an approved, off-site disposal facility.

Waste Minimization Performance Measures found in Appendix F of DOE/UC Contract 98 require the Laboratory to reduce 3 of its 5 largest waste streams by an average of 5%/yr for five years, and to reduce the aggregate total weight of LBL waste by 10% over the same time period. Contaminated solid waste is one of the 3 hazardous waste streams selected for minimization to address the Appendix F Performance Measures. Abrasives residues currently comprise about 10% of this waste stream.

Various options are available to reduce the amount of abrasive residues requiring disposal. To evaluate these alternatives, however, it is necessary to better understand the origins and chemistries of the various LBL abrasives waste streams, to develop and implement improved operational controls such as segregation of hazardous and non-hazardous abrasive residues, and to further explore options for future use of

U. S. DEPARTMENT OF ENERGY
 ES&H Management Plan Information System
 ACTIVITY DATA SHEET (continued)
 LAWRENCE BERKELEY LABORATORY

hazardous and non-hazardous abrasive residues.

The activities supported by this ADS include development of an abrasives residue management plan and tracking system, an operational and analytical assessment of the various existing abrasives waste streams, development of a methodology to recognize non-hazardous abrasives and to segregate them from hazardous abrasives, modifications of existing abrasives residues storage practices, and an assessment of the opportunities for recycling or reuse of hazardous and non-hazardous abrasives waste streams. Current costs of handling and disposing of LBL's spent abrasives residues are approximately \$30K/yr and the total cost estimate for this project is \$79K. The calculated payback period is, therefore, 2.6 years, making this an EPA Priority 1 project.

Milestones:

February, 1996: Complete process waste assessment (data review, generator interviews, point of generation sampling/analysis)

March, 1996: Complete design of storage/segregation facility

May, 1996: Complete recycling system technical/economic feasibility study

June, 1996: Complete evaluation and selection of suitable off-site recyclers

July 1, 1996: Complete construction of storage/segregation facility

August, 1996: Provide technical assistance including waste segregation and separation education

September, 1996: Perform WM/PP best management practices education and training

28. APPRAISAL SECTION

Public Safety & Health:

Risk/Impact:

An incremental negative impact on the Public safety and health.

Benefit:

An incremental positive impact on the Public safety and health.

Site Personnel Safety & Health:

Risk/Impact:

Slight possibility of exposure and adverse health effects to site personnel.

Benefits:

Slightly reduced possibility of exposure and adverse health effects to site personnel.

Compliance:

Risk/Impact:

In the event that this project is not supported, LBL will be unable to reduce this solid hazardous waste stream, estimated at about 6825 kg/yr.

U. S. DEPARTMENT OF ENERGY
ES&H Management Plan Information System
ACTIVITY DATA SHEET (continued)
LAWRENCE BERKELEY LABORATORY

This represents approximately 41 % of the Laboratory's total solid hazardous waste stream. Lack of support would make it more difficult for LBL to comply with Appendix F Performance Measures found in the contract negotiated between the DOE and the University of California, requiring 5%/yr reductions in 3 of LBL's 5 major waste streams over the next five years and 10% reduction in the total weight of LBL waste over the same time period. Contaminated solids are one of the waste streams chosen for reduction. Non-compliance with these performance measures will influence performance ratings of the Laboratory, and of its top managers.

Benefit:

If the activities supported by this ADS are funded, LBL will be able to meet one of the Performance Measures found in Appendix F of the DOE/UC contract.

Mission Impact:

Risk/Impact:

Slight negative impact on Mission, due to increasingly costly operation of maintenance operations.

Benefit:

Slight positive impact due to optimized economics of maintenance operations involving abrasive blasting.

Investment Impact:

The total estimated cost for this project is \$79K. Estimated savings in waste disposal costs (\$30K/yr), leading to a calculated payback period of 2.6 years using currently available data. It is likely, however, that waste disposal costs will rise more quickly than general inflation. Thus, the best estimate for payback period is less than 2.6 years, with real savings of more than \$30K/yr beginning in FY97 or FY98.

Environmental Impact:

Risk/Impact:

An incremental negative impact on environmental quality.

Benefit:

An incremental positive impact on environmental quality.

Other Factors:

Appendix F Performance Measures:

There is a growing National consensus that the long term health of our citizens and the restoration of our environment to a more habitable state will require an intense and continuing focus on the minimization of the wastes produced in the work place, and on preventing wastes from entering the environment through unplanned releases. If there is no support for WMin/PP Implementation projects at LBL, then the facility will be expending considerable effort in this area, but with little payout. In particular, it would be difficult for LBL to succeed in reducing 3 of its 5 major waste streams by 5%/yr for the next five

U. S. DEPARTMENT OF ENERGY
 ES&H Management Plan Information System
 ACTIVITY DATA SHEET (continued)
 LAWRENCE BERKELEY LABORATORY

years, as is required in Performance Measures found in Appendix F of the UC/DOE contract.

ADS SCORING SECTION

29. ADS Scoring	<- Before Scoring ->			<- After Scoring ->		
	<u>Csq</u>	<u>L'hood</u>	<u>Score</u>	<u>Csq</u>	<u>L'hood</u>	<u>Score</u>
Public Safety & Health	3	C	0.3000	3	D	0.0030
Site Personnel Safety & Health	7	C	0.1000	7	D	0.0010
Compliance	10	A	20.0000	11	D	0.0001
Mission Impact	13	A	75.0000	13	D	0.0075
Investment Impact						
Environmental Protection	18	C	0.2000	18	D	0.0020
NET BEFORE AND AFTER:			95.6000			0.0136
NET SCORE.....:			95.5864			
30. Contractor Adj:			0.0000	31. Other Score:		0.0000
Ops Office Adj:			0.0000	32. Priority...:		0
Sec Office Adj:			0.0000	33. Scored By...:	BRIAN M. SMITH	
TAL ADJUSTED.....:			95.5864	34. Score Date.:	03/12/1994	

35. Scoring Comments

Public Safety & Health:

Implementation of this project will slightly reduce the likelihood of low-level exposures to the general public (from medium to low probability) through reduction of the amount of LBL hazardous wastes handled by persons off-site during transportation and disposal.

Site Personnel Safety & Health:

Implementation of this project will slightly reduce the likelihood of negligible illness to LBL personnel (from medium to low probability) through reduction of the amount of hazardous wastes handled by LBL staff prior to transport and disposal.

Compliance:

Implementation of this project will enhance LBL's compliance status from the current certainty of marginal non-compliance to a low probability of significant deviations from best management practices.

Mission Impact:

Implementation of this project will enhance LBL's ability to achieve the major mission goal of environmental compliance, especially with regards to Appendix F Performance Measures in UC/DOE Contract 98.

Investment Impact:

U. S. DEPARTMENT OF ENERGY
 ES&H Management Plan Information System
 ACTIVITY DATA SHEET (continued)
 LAWRENCE BERKELEY LABORATORY

Although there is an estimated \$30K/yr savings after an initial, three year payback period, this is below the level required to score points for investment impact.

Environmental Impact:

Implementation of this project will slightly reduce the likelihood of minor damage to the environment (from medium to low probability) through reduction of the amount of hazardous wastes transported off site for disposal.

Other Scores:

Appendix F Performance Measures Adjustment

ADS RESOURCE DATA SECTION

36. Funding: 37. Fund Case: 38. Resource Structure Code: YA0901
 (X) Program () Decrement 39. Budget & Reporting Code: KG0000000
 () Indirect () Target
 () Outside (X) Planning 40. Start Year: 1994
 by: () Unfunded 41. End Year:

FY	OE	CE	GPP	LIP	TOTAL	Fed FTE	Ctr FTE
1993	0.0	0.0	0.0	0.0	0.0	0.00	0.00
1994	0.0	0.0	0.0	0.0	0.0	0.00	0.00
1995	0.0	0.0	0.0	0.0	0.0	0.00	0.00
1996	123.0	0.0	0.0	0.0	123.0	0.00	0.25
1997	0.0	0.0	0.0	0.0	0.0	0.00	0.00
1998	0.0	0.0	0.0	0.0	0.0	0.00	0.00
1999	0.0	0.0	0.0	0.0	0.0	0.00	0.00
2000	0.0	0.0	0.0	0.0	0.0	0.00	0.00
2001	0.0	0.0	0.0	0.0	0.0	0.00	0.00

Escalated? Yes No

45. Cost Estimate Notes

Costs include 56% overhead factor.

Costs are estimated from level of effort estimates for evaluation and outreach activities at a rate of \$80K/FTE, the FY94 rate for EHS Division employees, and are escalated as per DOE guidance for escalating operating expenses. Costs above salary include \$25K analytical costs and \$30K for a storage and segregation area.

U. S. DEPARTMENT OF ENERGY
ES&H Management Plan Information System
ACTIVITY DATA SHEET
LAWRENCE BERKELEY LABORATORY

ACTIVITY DATA SHEET IDENTIFICATION SECTION

- 1. Facility: LBL 2. Name: LAWRENCE BERKELEY LABORATORY
- ADS No: A94D0059 3. Title: PHOTOFAB SHOP WASTEWATER TRTMNT UNT UPGRADE (E
- 4. Data Sheet Status Code: OPEN
- 5. Line Item Project ID.:
- 6. Original Identifier...:
- 7. Work Package Number...:
- 8. Account Number.....:
- 9. Work Breakdown Struc.:
- 10. Reference ADS Number.:
- 11. Responsible SO Code...: ER - OFFICE OF ENERGY RESEARCH
- 12. Resp. Contractor Code: CAU - CALIFORNIA, UNIVERSITY OF
- 13. Contractor Division...: EH&S
- 14. Contractor Department: ENVR PRTCT
- 15. Contractor Manager...: MCGRAW DAVID 16. Phone: (510) 486-5551
- 17. DOE Manager.....: SAMUELSON SCOTT 18. Phone: (510) 486-4345

ADS CATEGORY SECTION

- 19. Category: () Safety & Health (X) Environmental () Other:
- 21. Is activity an A-106 Plan Activity? [X] Yes [] No
- 22. Functional Breakdown:

<u>FA.SA</u>	<u>Pct</u>	<u>Functional Area/Sub-Area</u>	<u>Title</u>
PP.05	100	Reuse & Recycling - Hazardous & Radioactive	

ADS TYPE SECTION

- 24. ADS Type: () Core (X) Compliance () Improvement
- 25. External Drivers:

<u>P/S</u>	<u>Typ</u>	<u>Driver Code</u>	<u>Driver Title</u>
Pri	LAW	[OTHER]	Other Law - Specify
Sec	ORD	DOE 5400.01	General Environmental Protection Program
Sec	OTH	[OTHER]	Other Driver - Specify
Sec	STD	[OTHER]	Other Standard - Specify

26. Compliance Comments

LAW[OTHER]: CA SB 14 - California
STD[OTHER]: FPPA - Federal

U. S. DEPARTMENT OF ENERGY
ES&H Management Plan Information System
ACTIVITY DATA SHEET (continued)
LAWRENCE BERKELEY LABORATORY

OTH[OTHER]: UC/DOE Contract 98 Appendix F

Other relevant waste minimization and pollution prevention compliance documents relevant to LBL are as follows:

Calif. HWCL [H&SC Sec. 25100 et seq.], Calif. AB-1475 [H&SC Secs. 25143.20], Calif. SB-1726 [H&SC Sec. 25719.7]

Federal Facility Compliance Act (FFCA)

Executive Order 12856, Federal Compliance with Right to Know and Pollution Prevention Requirements

Executive Order 12843, Procurement Requirements and Policies for Ozone-Depleting Substances

Executive Order 12844, Federal Use of Alternative Fueled Vehicles

Executive Order 12845, Requiring Agencies to Purchase Energy Efficient Computer Equipment

Executive Order 12873, Federal Acquisition, Recycling and Waste Prevention

DOE Orders 5400.3 [6(d)], and 5820.2A [Chapter I, 7(a), (b) Chapter II, 3(b), Chapter III, 3(c) and (f)]

EBMUD waste water discharge permits

27. ADS DESCRIPTION SECTION

The Lawrence Berkeley Laboratory (LBL) has been operating for more than 50 years on a 130-acre site with a FY94 population of nearly 4000 research and support staff. One of the important support functions of the Laboratory involves the manufacturing of printed circuit boards at LBL's Photofabrication Shop in Building 25. Approximately 700 gallons/week of metals contaminated acids are generated by this operation. The current acid wastewater treatment unit at Building 25 (FTU 002) is based on chemical precipitation and clarification treatment technology. Currently, effluent characterization, chemical selection and application, and treatment process efficiency are not satisfactory.

The activities supported by this ADS include bench scale tests for chemical selection, acid wastewater characterization, and a process waste assessment to optimize operating conditions. Based on this information, the treatment process will be redesigned as a closed-loop, zero-discharge system which may use reverse osmosis or ion exchange systems as polishing or backup units. Once the unit is installed, the process will be periodically monitored for operational efficiency as a waste minimization and pollution prevention progress measure.

The objectives of this project are to improve the treatment efficiency of this wastewater treatment unit, to reduce pure water purchasing and compliance costs related to California Tiered permitting, to eliminate non-compliant discharges or wastewater "hold-up" situations, to reduce the cost of shipping waste to approved, off-site disposal facilities, and to recycle treated water and reduce the quantity of hazardous sludge

U. S. DEPARTMENT OF ENERGY
 ES&H Management Plan Information System
 ACTIVITY DATA SHEET (continued)
 LAWRENCE BERKELEY LABORATORY

produced. Total costs of the project are estimated at \$144K (GPP), with an estimated annual savings of \$50K/yr. The calculated payback period is 2.9 years, making this an EPA Priority 1 project.

Waste Minimization Performance Measures found in Appendix F of DOE/UC Contract 98 require the Laboratory to reduce 3 of its 5 largest waste streams by an average of 5%/yr for five years, and to reduce the aggregate total weight of LBL waste by 10% over the same time period. Acids represent one of the 3 hazardous waste streams selected for minimization to address the Appendix F Performance Measures. It is, therefore, critical that LBL develop processes that enhance the Laboratory's abilities to control and treat acid waste streams, such as those at the Building 25 Photofabrication Shop.

Milestones:

February, 1996: Complete process waste assessment (data review, generator interviews)

May, 1996: Complete design of B25 closed-loop wastewater treatment system

August, 1996: Provide technical assistance including cooling recycling education

September, 1996: Complete construction of B25 closed-loop wastewater treatment system

September, 1996: Perform WM/PP best management practices education and training

28. APPRAISAL SECTION

Public Safety & Health:

Risk/Impact:

If this project is not supported, there will be continuing problems with the wastewater treatment unit at Building 25. Because treated fluids are currently discharged to the sewer system, it is possible that inadvertent discharges of water containing elevated levels of metals could result in exposures to the general public.

Benefit:

An efficient, closed loop, zero-discharge system will preclude the inadvertent release of hazardous materials from the Building 25 wastewater treatment unit, and will eliminate the possibility of low level exposures to the general public.

Site Personnel Safety & Health:

Risk/Impact:

If this project is not supported, there will be continuing problems with the wastewater treatment unit at Building 25. Because treated fluids are sometimes hazardous, it is possible that inadvertent discharges of water containing elevated levels of metals could result in exposures to the site personnel.

U. S. DEPARTMENT OF ENERGY
ES&H Management Plan Information System
ACTIVITY DATA SHEET (continued)
LAWRENCE BERKELEY LABORATORY

Benefit:

An efficient, closed loop, zero-discharge system will preclude the inadvertent release of hazardous materials from the Building 25 wastewater treatment unit, and will reduce the possibility of negligible illnesses or injuries to site personnel.

Compliance:**Risk/Impact:**

If this project is not supported, there will be continuing problems with the wastewater treatment unit at Building 25. Because treated fluids are sometimes hazardous, it is possible that inadvertent discharges of water containing hazardous metals could result in release of hazardous materials to the environment. Such non-compliant discharges would violate the conditions of the permit to operate this unit, and could result in significant fines to the facility and shut-down of the Photofabrication unit. In addition, if this project is not supported, LBL will continue to have difficulties in reducing this acidic liquid hazardous waste stream. Lack of support would make it more difficult for LBL to comply with Appendix F Performance Measures found in the contract negotiated between the DOE and the University of California, requiring 5%/yr reductions in 3 of LBL's 5 major waste streams over the next five years and 10% reduction in the total weight of LBL waste over the same time period. Acids are one of the waste streams chosen for reduction. Non-compliance with these performance measures will influence performance ratings of the Laboratory, and of its uppermost managers.

Benefit:

An efficient, closed loop, zero-discharge system will preclude the inadvertent release of hazardous materials from the Building 25 wastewater treatment unit, and will eliminate the possibility of non-compliant discharges to the environment. This would reduce the enforcement options of regulators and would facilitate compliance with existing permits. In addition, if the activities supported by this ADS are funded, LBL will be able to meet one of the Performance Measures found in Appendix F of the DOE/UC contract.

Mission Impact:**Risk/Impact:**

If this project is not supported, there will be continuing problems with the wastewater treatment unit at Building 25. Because treated fluids are sometimes hazardous, it is possible that inadvertent discharges of water containing hazardous metals could result in release of hazardous materials to the environment. Such non-compliant discharges would violate the conditions of the permit to operate this unit, and could result in significant fines to the facility and shut-down of the Photofabrication unit.

Benefit:

An efficient, closed loop, zero-discharge system will preclude the

U. S. DEPARTMENT OF ENERGY
ES&H Management Plan Information System
ACTIVITY DATA SHEET (continued)
LAWRENCE BERKELEY LABORATORY

inadvertent release of hazardous materials from the Building 25 wastewater treatment unit, and will eliminate the possibility of non-compliant discharges to the environment. This would reduce the enforcement options of regulators and would facilitate compliance with existing permits, thereby assuring the continuing operation of the Photofabrication Shop and the research supported there.

Investment Impact:

Risk/Impact:

If this project is not supported, there will be continuing problems with the wastewater treatment unit at Building 25. Because treated fluids are sometimes hazardous, it is possible that inadvertent discharges of water containing hazardous metals could result in release of hazardous materials to the environment. Such non-compliant discharges would violate the conditions of the permit to operate this unit, and could result in significant fines to the facility and shut-down of the Photofabrication unit.

Benefit:

An efficient, closed loop, zero-discharge system will preclude the inadvertent release of hazardous materials from the Building 25 wastewater treatment unit, and will eliminate the possibility of non-compliant discharges to the environment. This would reduce the enforcement options of regulators and would facilitate compliance with existing permits, thereby assuring the continuing operation of the Photofabrication Shop and the research supported there.

Environmental Impact:

Risk/Impact:

If this project is not supported, there will be continuing problems with the wastewater treatment unit at Building 25. It is possible that inadvertent discharges of untreated wastewater could result in release of hazardous materials to the sanitary sewer system.

Benefit:

An efficient, closed loop, zero-discharge system will preclude the inadvertent release of hazardous materials from the Building 25 wastewater treatment unit, and will eliminate the possibility of non-compliant discharges to the environment.

Other Factors:

Public Perception:

This is a time of increasing public scrutiny of DOE operations, including those at LBL. The City of Berkeley has recently accelerated its program of inspections, the DOE and State of California have increased their oversight of environmental quality through the Agreement in Principle Program, and the local community and press have shown a renewed interest in the potential for hazardous, toxic, and radioactive air emissions from Laboratory operations. LBL's image as a premier National Laboratory and its relationship to neighboring communities

U. S. DEPARTMENT OF ENERGY
 ES&H Management Plan Information System
 ACTIVITY DATA SHEET (continued)
 LAWRENCE BERKELEY LABORATORY

could be degraded by accidental releases to the environment. The design and construction of closed loop, zero-discharge wastewater treatment unit for the Building 25 Photofabrication Shop will eliminate the possibility of non-compliant wastewater discharges from this facility, and will go far to protect our public image.

Appendix F Performance Measures: There is a growing National consensus that the long term health of our citizens and the restoration of our environment to a more habitable state will require an intense and continuing focus on the minimization of the wastes produced in the work place, and on preventing wastes from entering the environment through unplanned releases. If there is no support for WMin/PP Implementation projects at LBL, then the facility will be expending considerable effort in this area, but with little payout. In particular, it would be difficult for LBL to succeed in reducing 3 of its 5 major waste streams by 5%/yr for the next five years, as is required in Performance Measures found in Appendix F of the UC/DOE contract.

ADS SCORING SECTION

29. ADS Scoring	<- Before Scoring ->			<- After Scoring ->		
	<u>Csq</u>	<u>L'hood</u>	<u>Score</u>	<u>Csq</u>	<u>L'hood</u>	<u>Score</u>
Public Safety & Health	3	C	0.3000	3	D	0.0030
Site Personnel Safety & Health	7	C	0.1000	7	D	0.0010
Compliance	8	A	150.0000	11	D	0.0001
Mission Impact	13	B	7.5000	13	D	0.0075
Investment Impact	15	B	1.5000	15	D	0.0015
Environmental Protection	18	C	0.2000	17	D	0.0200
NET BEFORE AND AFTER:			159.6000			0.0331
NET SCORE.....:			159.5669			
30. Contractor Adj:			0.0000	31. Other Score:		0.0000
Ops Office Adj:			0.0000	32. Priority...:		1
Sec Office Adj:			0.0000	33. Scored By...:		RON PAUER
TOTAL ADJUSTED.....:			159.5669	34. Score Date..:		03/13/1994

35. Scoring Comments

Public Safety & Health:
 Completion of these activities will reduce the risk of low level exposure to the general public from the current medium likelihood to low likelihood.

Site Personnel Safety & Health:
 Completion of these activities will reduce the risk of negligible injuries or illnesses from the current medium likelihood to low likelihood.

U. S. DEPARTMENT OF ENERGY
 ES&H Management Plan Information System
 ACTIVITY DATA SHEET (continued)
 LAWRENCE BERKELEY LABORATORY

Compliance:

Completion of these activities will reduce the very high likelihood of fines or penalties due to non-compliant releases to a very low likelihood. In addition, the Laboratory will be better able to meet one of the Performance Measures found in Appendix F of the DOE/UC contract.

Mission Impact:

Completion of these activities will greatly enhance the Laboratory's ability to achieve the stated operational goal of environmental compliance. Operation of the Photofabrication Shop will also be much less likely to be disrupted.

Investment Impact:

Although the positive economic benefit, estimated at \$40K/yr after a 2.5 year payback period, makes this an EPA Priority 1 project, this savings is not sufficient to score points on the RPM.

Environmental Impact:

Completion of these activities will reduce the risk of inadvertent release of metals contaminated wastewaters to the environment.

Other Scores:

Public Perception and Appendix F Performance Measures Adjustment

ADS RESOURCE DATA SECTION

36. Funding: 37. Fund Case: 38. Resource Structure Code: YA0901
 (X) Program () Decrement 39. Budget & Reporting Code: KG0000000
 () Indirect () Target
 () Outside (X) Planning 40. Start Year: 1994
 by: () Unfunded 41. End Year:

FY	OE	CE	GPP	LIP	TOTAL	Fed FTE	Ctr FTE
1993	0.0	0.0	0.0	0.0	0.0	0.00	0.00
1994	0.0	0.0	0.0	0.0	0.0	0.00	0.00
1995	0.0	0.0	0.0	0.0	0.0	0.00	0.00
1996	0.0	0.0	156.0	0.0	156.0	0.00	0.20
1997	0.0	0.0	0.0	0.0	0.0	0.00	0.00
1998	0.0	0.0	0.0	0.0	0.0	0.00	0.00
1999	0.0	0.0	0.0	0.0	0.0	0.00	0.00
2000	0.0	0.0	0.0	0.0	0.0	0.00	0.00
2001	0.0	0.0	0.0	0.0	0.0	0.00	0.00

Escalated? Yes No

U. S. DEPARTMENT OF ENERGY
 ES&H Management Plan Information System
 ACTIVITY DATA SHEET (continued)
 LAWRENCE BERKELEY LABORATORY

45. Cost Estimate Notes

Cost estimates are based on conceptual design and include 0.2 FTE (at \$80K/yr/FTE) and 20% contingency, escalated as per DOE guidance for construction projects. Costs include 8.6% overhead factor.

ADS TRACKING SECTION

- 47. Management Approval? Yes No
- 48. Activity In-process? Yes No
- 49. Design Plan Completion...: 05/01/1996
- 50. Construction Start.....: 06/01/1996
- 51. Construction Completion...: 09/01/1996
- 52. Final Compliance Required: / /
- 53. Fiscal Year Completed.....:

ADDITIONAL A-106 DATA REQUIREMENTS

- 54. Multiple Sites? Yes No
- 55. Pollutant Category Driver: SFND
Code: WMIN
- 56. Compliance Status: ESDF - Standard Deadline Future (Class II)
- 57. Progress Code: PP - Preliminary Planning
- 58. Program Category: () CA - Corrective Activities (X) WM - Waste Managem
() ER - Envir. Restoration () OT - Other Activit

U. S. DEPARTMENT OF ENERGY
 ES&H Management Plan Information System
 ACTIVITY DATA SHEET
 LAWRENCE BERKELEY LABORATORY

ACTIVITY DATA SHEET IDENTIFICATION SECTION

1. Facility: LBL 2. Name: LAWRENCE BERKELEY LABORATORY
- ADS No: A94D0061 3. Title: ON-SITE DEIONIZATION RESIN REGENERATION
4. Data Sheet Status Code: OPEN
5. Line Item Project ID.:
 6. Original Identifier...:
 7. Work Package Number...:
 8. Account Number.....:
 9. Work Breakdown Struc.:
 10. Reference ADS Number.:
 11. Responsible SO Code...: ER - OFFICE OF ENERGY RESEARCH
 12. Resp. Contractor Code: CAU - CALIFORNIA, UNIVERSITY OF
 13. Contractor Division...: EH&S
 14. Contractor Department: ENVR PRTCT
 15. Contractor Manager...: MCGRAW DAVID 16. Phone: (510) 486-5551
 17. DOE Manager.....: SAMUELSON SCOTT 18. Phone: (510) 486-4345

ADS CATEGORY SECTION

19. Category: () Safety & Health (X) Environmental () Other:
21. Is activity an A-106 Plan Activity? [X] Yes [] No
22. Functional Breakdown:

FA.SA Pct Functional Area/Sub-Area Title
 PP.05 100 Reuse & Recycling - Hazardous & Radioactive

ADS TYPE SECTION

24. ADS Type: () Core (X) Compliance () Improvement
25. External Drivers:

<u>P/S Typ Driver Code</u>	<u>Driver Title</u>
Sec EO [OTHER]	Other Executive Order - Specify
Pri LAW FFCA	Federal Facilities Compliance Act
Sec LAW [OTHER]	Other Law - Specify
Sec ORD DOE 5400.01	General Environmental Protection Program

26. Compliance Comments

EO[OTHER]: EO 12856 - Federal
 LAW[OTHER]: Pollution Prevention - East Bay

U. S. DEPARTMENT OF ENERGY
ES&H Management Plan Information System
ACTIVITY DATA SHEET (continued)
LAWRENCE BERKELEY LABORATORY

Other relevant compliance documents are as follows:
UC/DOE Contract 98, Appendix F Performance Measures on Waste
Minimization

27. ADS DESCRIPTION SECTION

There are six locations at LBL where low conductivity water (LCW) is prepared and locally used in recirculating systems. These systems contain mixed resin beds which remove metallic contaminants (principally copper, with minor cadmium, chromium, or nickel) resulting from corrosion of pipes and joints. Beginning in FY95, additional mixed resin beds will be used in a closed-loop waste water recycling system at Building 77, to allow reuse of the process waste water and to eliminate discharges of waste water to the environment.

For the past few years, the supplier of the deionizing resins has refused to transport or regenerate beds containing high concentrations of metal contaminants. The highly contaminated resin beds are currently being shipped in drums as hazardous waste for disposal at an approved, off-site facility. Other, lightly contaminated beds are currently shipped off site for regeneration.

This project would allow on-site regeneration of the contaminated beds for reuse, thereby reducing the amount of hazardous waste generated, as well as the costs associated with disposal, off site regeneration, and purchases of new beds. Metal ladens acids produced thorough this regeneration process will be treated and neutralized in the acid neutralization system currently being designed for Building 77. The total cost of the resin regeneration project is estimated to be \$170K. Savings are estimated to be a minimum of \$54.4K/yr and a maximum of \$80K/yr. As the deionization column regeneration unit will not require special permitting by the State of California, there will be no increased costs due to permitting requirements. See page 2c for a more detailed account of the payback period calculated to be 2.6 ± 0.5 years. This payback period of less than 3 years makes this an EPA Priority 1 project.

A Treatment Plan for the acid effluent from the deionization regenerators will be prepared, and an on-site deionization regeneration unit will be fabricated and installed. The work will involve the installation of a make-up water tank, carbon tanks, polishing tanks, foundation and secondary containment, including pumps, piping, instrumented leak detection system, and seismic framing. Institutional funding of \$150K in FY91 and FY92 provided for development of conceptual plans, as well as for modification and up-grade of the existing LCW system to use uniform resins. The preferred site for regeneration unit is near the site of the closed-loop waste water treatment system being

U. S. DEPARTMENT OF ENERGY
 ES&H Management Plan Information System
 ACTIVITY DATA SHEET (continued)
 LAWRENCE BERKELEY LABORATORY

constructed at Building 77.

Milestones:

June, 1994: Request funding for the deionization regeneration project
 September, 1995: Complete final design of the deionization regeneration equipment
 March, 1996: Complete construction related to the deionization regeneration project
 July, 1996: Complete installation of deionization regeneration equipment

28. APPRAISAL SECTION

Public Safety & Health:

Risk/Impact:

An incremental negative impact on the Public safety and health.

Benefit:

An incremental positive impact on the Public safety and health.

Site Personnel Safety & Health:

Risk/Impact:

Slight possibility of exposure and adverse health effects to site personnel.

Benefits:

Slightly reduced possibility of exposure and adverse health effects to site personnel.

Compliance:

Risk/Impact:

In the event that support for this project is not forthcoming, LBL will be unable to reduce this hazardous solids waste stream, estimated at ~2000 kg/yr. Lack of support would make it more difficult for LBL to comply with Appendix F Performance Measures found in the contract negotiated between the DOE and the University of California, requiring 5%/yr reductions in three of LBL's 5 major waste streams over the next five years. Contaminated solids are one of the waste streams chosen for reduction. Non-compliance with these performance measures will influence performance ratings of the Laboratory, and of its uppermost managers.

Benefit:

If the activities supported by this ADS are funded by ER, LBL will be in complete compliance with regulations regarding WMin/PP Implementation programs, and will be able to perform well on one of the Performance Measures found in Appendix F of the DOE/UC contract.

Mission Impact:

Risk/Impact:

U. S. DEPARTMENT OF ENERGY
ES&H Management Plan Information System
ACTIVITY DATA SHEET (continued)
LAWRENCE BERKELEY LABORATORY

Slight negative impact on Mission, due to increasingly costly operation of LCW and waste water systems.

Benefit:

Slight positive impact due to optimized economics of operating the LCW and closed-loop waste water systems.

Investment Impact:

The total estimated cost for this project is \$170K. Estimated savings are as follows (maximum and minimum cases, respectively):

CASE 1 (maximum savings): All resin beds are disposed of as hazardous waste and new beds are purchased: \$80K/yr savings. Payback period for CASE 1 is \$170K/\$80K per year = 2.15 years.

CASE 2 (minimum savings): Only the most contaminated beds are disposed of and repurchased, all others are sent off site for regeneration: \$54.4K/yr savings. Payback period for CASE 2 is \$170K/\$54.4K per year = 3.12 years.

Because the actual savings are likely to be near the midpoint between CASE 1 and CASE 2, the actual payback period is calculated to be 2.6 +/- 0.5 years

Environmental Impact:

Risk/Impact:

Incremental negative impact due to the release of hazardous materials to the environment (at the disposal site).

Benefit:

Incremental positive impact due to minimized release of hazardous materials to the environment (at the disposal site).

Other Factors:

Appendix F Performance Measures:

There is a growing National consensus that the long term health of our citizens and the restoration of our environment to a more habitable state will require an intense and continuing focus on the minimization of the wastes produced in the work place, and on preventing wastes from entering the environment through unplanned releases. If there is no support for WMin/PP Implementation projects at LBL, then the facility will be expending considerable effort in this area, but with little payout. In particular, it would be difficult for LBL to succeed in reducing 3 of its 5 major waste streams by 5%/yr for the next five years, as is required in Performance Measures found in Appendix F of the UC/DOE contract.

U. S. DEPARTMENT OF ENERGY
 ES&H Management Plan Information System
 ACTIVITY DATA SHEET (continued)
 LAWRENCE BERKELEY LABORATORY

ADS SCORING SECTION

29. ADS Scoring	<- Before Scoring ->			<- After Scoring ->		
	Csq	L'hood	Score	Csq	L'hood	Score
Public Safety & Health	3	C	0.3000	3	D	0.0030
Site Personnel Safety & Health	7	C	0.1000	7	D	0.0010
Compliance	10	A	20.0000	11	D	0.0001
Mission Impact	13	A	75.0000	13	D	0.0075
Investment Impact						
Environmental Protection	18	C	0.2000	18	D	0.0020
NET BEFORE AND AFTER:			95.6000			0.0136
NET SCORE.....:			95.5864			
30. Contractor Adj:			0.0000	31. Other Score:		0.0000
Ops Office Adj:			0.0000	32. Priority...:		1
Sec Office Adj:			0.0000	33. Scored By...:	BRIAN M. SMITH	
TOTAL ADJUSTED.....:			95.5864	34. Score Date.:	03/05/1994	

35. Scoring Comments

Public Safety & Health:

Implementation of this project will slightly reduce the likelihood of low-level exposures to the general public (from medium to low probability) through reduction of the amount of LBL hazardous wastes handled by persons off-site during transportation and disposal.

Sit Personnel Safety & Health:

Implementation of this project will slightly reduce the likelihood of "negligible" illnesses to LBL personnel (from medium to low probability) through reduction of the amount of LBL hazardous wastes handled by LBL staff prior to transport and disposal.

Compliance:

Implementation of this project will enhance LBL's compliance status from the current certainty of marginal non-compliance to a low probability of significant deviations from best management practices.

Mission Impact:

Implementation of this project will enhance LBL's ability to achieve the major mission goal of environmental compliance, especially with regards to Appendix F Performance Measures in UC/DOE Contract 98.

Investment Impact:

Although there is an estimated \$60K/yr savings after an initial, three year payback period, this is below the level required to score points for investment impact.

U. S. DEPARTMENT OF ENERGY
 ES&H Management Plan Information System
 ACTIVITY DATA SHEET (continued)
 LAWRENCE BERKELEY LABORATORY

Environmental Impact:

Implementation of this project will slightly reduce the likelihood of minor damage to the environment (from medium to low probability) through reduction of the amount of hazardous wastes transported off site for disposal.

Other Scores:

Appendix F Performance Measures Adjustment:

ADS RESOURCE DATA SECTION

36. Funding: 37. Fund Case: 38. Resource Structure Code: YA0901
 (X) Program () Decrement 39. Budget & Reporting Code: KG000000
 () Indirect () Target
 () Outside (X) Planning 40. Start Year: 1996
 by: () Unfunded 41. End Year: 1996

FY	OE	CE	GPP	LIP	TOTAL	Fed FTE	Ctr FTE
1993	0.0	0.0	0.0	0.0	0.0	0.00	0.00
94	0.0	0.0	0.0	0.0	0.0	0.00	0.00
1995	0.0	0.0	0.0	0.0	0.0	0.00	0.00
1996	0.0	0.0	188.0	0.0	188.0	0.00	0.00
1997	0.0	0.0	0.0	0.0	0.0	0.00	0.00
1998	0.0	0.0	0.0	0.0	0.0	0.00	0.00
1999	0.0	0.0	0.0	0.0	0.0	0.00	0.00
2000	0.0	0.0	0.0	0.0	0.0	0.00	0.00
2001	0.0	0.0	0.0	0.0	0.0	0.00	0.00

Escalated? Yes No

45. Cost Estimate Notes

Cost estimate is based on conceptual design (original 10/91, revised 3/94), and includes 25% contingency. Costs include 8.6% overhead factor.

ADS TRACKING SECTION

47. Management Approval? Yes No
 48. Activity In-process? Yes No
 49. Design Plan Completion...: 09/30/1994
 50. Construction Start.....: 02/01/1995
 51. Construction Completion...: 09/01/1995
 52. Final Compliance Required: / /
 53. Fiscal Year Completed.....:

U. S. DEPARTMENT OF ENERGY
ES&H Management Plan Information System
ACTIVITY DATA SHEET (continued)
LAWRENCE BERKELEY LABORATORY

ADDITIONAL A-106 DATA REQUIREMENTS

54. Multiple Sites? [] Yes [X] No

55. Pollutant Category Driver: CWA
Code: WMIN

56. Compliance Status: ESDF - Standard Deadline Future (Class II)

57. Progress Code: PP - Preliminary Planning

58. Program Category: () CA - Corrective Activities (X) WM - Waste Managem
() ER - Envir. Restoration () OT - Other Activit

U. S. DEPARTMENT OF ENERGY
 ES&H Management Plan Information System
 ACTIVITY DATA SHEET
 LAWRENCE BERKELEY LABORATORY

ACTIVITY DATA SHEET IDENTIFICATION SECTION

1. Facility: LBL 2. Name: LAWRENCE BERKELEY LABORATORY
 ADS No: A94D0062 3. Title: NPDES/BAT UPGRADES
4. Data Sheet Status Code: OPEN
5. Line Item Project ID.:
 6. Original Identifier...:
 7. Work Package Number...:
 8. Account Number.....:
 9. Work Breakdown Struc.:
 10. Reference ADS Number.:
 11. Responsible SO Code...: ER - OFFICE OF ENERGY RESEARCH
 12. Resp. Contractor Code: CAU - CALIFORNIA, UNIVERSITY OF
 13. Contractor Division...: EH&S
 14. Contractor Department: ENVR PRTCT
 15. Contractor Manager...: MCGRAW DAVID 16. Phone: (510) 486-5551
 17. DOE Manager.....: SAMUELSON SCOTT 18. Phone: (510) 486-4345

S CATEGORY SECTION

19. Category: () Safety & Health (X) Environmental () Other:
 21. Is activity an A-106 Plan Activity? [X] Yes [] No
 22. Functional Breakdown:

FA.SA Pct Functional Area/Sub-Area Title
 CW.02 100 Permitting Application & Maintenance

ADS TYPE SECTION

24. ADS Type: () Core (X) Compliance () Improvement
 25. External Drivers:

<u>P/S Typ Driver Code</u>	<u>Driver Title</u>
Pri LAW CWA	Clean Water Act (CWA*)
Sec OTH [OTHER]	Other Driver - Specify

26. Compliance Comments

OTH[OTHER]: LBL SWPPP - LBL'S Storm Water Pollution Prevention Plan

Other relevant compliance documents are:
 National Pollutant Discharge Elimination System (NPDES) General Permit

U. S. DEPARTMENT OF ENERGY
ES&H Management Plan Information System
ACTIVITY DATA SHEET (continued)
LAWRENCE BERKELEY LABORATORY

27. ADS DESCRIPTION SECTION

Facilities such as LBL are required to obtain a National Pollutant Discharge Elimination System (NPDES) General Permit under Clean Water Act regulations (40 CFR 122, 123, and 124). In accordance with this permit, LBL must implement Best Available Technology Economically Achievable (BAT) and Best Conventional Pollutant Control Technology (BCT) to reduce or eliminate storm water pollution. The permit requires dischargers of storm water to control and eliminate the sources of pollutants in storm water through the development and implementation of Storm Water Pollution Prevention Plans (SWPPP). LBL drafted its SWPPP in FY92 and reviews it annually.

LBL's SWPPP identified two sources of discharge as candidates for BAT implementation; storm runoff and vehicle service areas. This ADS requests funding for the construction of a carport in B76 Motor Pool area and the construction of a dedicated, zero-discharge vehicle washing area within an existing facility. Presently, the B76 Motor Pool gasoline dispensing area is exposed to the environment. During rainfall events, storm water runoff from the B76 roof and the dispensing area drains into the storm sewer. Likewise, discharge into the storm sewer from vehicle washing activity is not allowable under the NPDES General Permit. Vehicle washing at LBL encompasses motor pool vehicles, shuttle buses, and fire and emergency vehicles, as well as maintenance vehicles. A new, dedicated area that is engineered to properly contain and recycle the vehicle wash water will satisfy BAT requirements.

Significant Milestones or Scheduled Accomplishments

- April, 1994: Request GPP funds for designing and construction of BAT systems.
- October, 1995: Begin Design of B76 carport and new vehicle washing facility.
- August, 1996: Begin construction of B76 carport and new vehicle washing facility.
- February, 1997: Complete B76 carport and new vehicle washing facility.

28. APPRAISAL SECTION

Public Safety & Health:

Risk/Impact:

Storm water runoff contaminated with petroleum fuels will enter the storm drain system resulting in low-levels of exposure to members of the general public.

Benefits:

If the activities described in this ADS are implemented, LBL will reduce the risk of exposures to the general public through reduction of the

U. S. DEPARTMENT OF ENERGY
 ES&H Management Plan Information System
 ACTIVITY DATA SHEET (continued)
 LAWRENCE BERKELEY LABORATORY

pollutants entering the storm sewers.

Site Personnel Safety & Health:

Risk/Impact:

Negligible risk of exposure to LBL workers and guests who come into contact with storm water runoff contaminated with petroleum fuels.

Benefits:

Reducing the amount of storm water runoff in the Building 76 area will reduce the potential for accidents during activities around the Motor Pool, which is where vehicle washing is also performed. It will also slightly reduce the risk of low level exposure to LBL employees and guests.

Compliance:

Risk/Impact:

Failure to implement Best Available Technology control measures for already identified non-compliant discharges represents a violation of the NPDES General Permit which dictates allowable storm sewer discharges. Violations are subject to the limitation of fines and penalties authorized by the Clean Water Act:

Notice of Violation

Administrative Compliance Order

Federal Facilities Compliance Agreement

Criminal fines for negligent behavior

Civil penalties

Citizen suits

Benefits:

Implementing Best Available Technology control measures for storm water and vehicle washing runoff represents compliance under the NPDES General Permit and greatly reduces the enforcement options available against LBL.

Mission Impact:

Risk/Impact:

LBL has committed in its Mission Statement to abide by all applicable environmental regulations. Failure to implement BAT or BCT control measures for already identified non-compliant discharges represents a violation of the NPDES General Permit and goes counter to the LBL mission statement. Enforcement of LBL violations in this area could negatively impact motor pool operations, which serve the entire site.

Benefits:

Implementing these control measures keeps LBL within its Mission to conduct its activities in compliance with environmental regulations, and helps to ensure the continuing operation of the LBL motor pool in support of a wide variety of research and operations activities.

Investment Impact:

Risk/Impact:

U. S. DEPARTMENT OF ENERGY
 ES&H Management Plan Information System
 ACTIVITY DATA SHEET (continued)
 LAWRENCE BERKELEY LABORATORY

Failure to implement BAT or BCT control measures for already identified non-compliant discharges represents a violation of the NPDES General Permit and goes counter to the LBL mission statement. Enforcement of LBL violations in this area could negatively impact the investment in the Laboratory; costs could exceed \$1M/yr in litigation fees, fines, and substitute motor pool support.

Benefits:

Implementing these control measures will allow LBL to conduct its activities in compliance with environmental regulations, and helps to ensure that the enforcement options available are kept to a minimum.

Environmental Impact:

Risk/Impact:

Discharges to the storm sewer system would be widespread, for the storm waters would enter Strawberry Creek through the storm drain system, and ultimately would enter the San Francisco Bay.

Benefits:

Reducing or eliminating non-compliant discharges to the storm sewer system benefits aquatic life in the water ecosystems of Strawberry Creek and the San Francisco Bay.

Other Factors:

Public Perception: This is a time of increasing public scrutiny of DOE operations, including those at LBL. The City of Berkeley has accelerated its program of inspections at the Laboratory and the local community has shown a renewed interest in the ecologic health of Strawberry Creek and the San Francisco Bay. LBL's image as a premier National Laboratory could be degraded by accidental releases to these local waters through connections to the storm water system.

ADS SCORING SECTION

29. ADS Scoring	<- Before Scoring ->			<- After Scoring ->		
	Csg	L'hood	Score	Csg	L'hood	Score
Public Safety & Health	3	C	0.3000	3	D	0.0030
Site Personnel Safety & Health	7	C	0.1000	7	D	0.0010
Compliance	8	A	150.0000	11	D	0.0001
Mission Impact	13	B	7.5000	13	D	0.0075
Investment Impact	15	A	15.0000	15	D	0.0015
Environmental Protection	18	C	0.2000	18	D	0.0020
NET BEFORE AND AFTER:			173.1000			0.0151

U. S. DEPARTMENT OF ENERGY
 ES&H Management Plan Information System
 ACTIVITY DATA SHEET (continued)
 LAWRENCE BERKELEY LABORATORY

NET SCORE.....:	173.0849	
30. Contractor Adj:	0.0000	31. Other Score: 0.0000
Ops Office Adj:	0.0000	32. Priority...: 1
Sec Office Adj:	0.0000	33. Scored By...: RON PAUER
TOTAL ADJUSTED....:	173.0849	34. Score Date.: 02/26/1994

35. Scoring Comments

Public Safety and Health:

Implementation of the NPDES compliance activities will reduce the medium likelihood of low-level exposures to hazardous materials to low risks for the same types of exposures.

Site Personnel Safety and Health:

Implementation of the NPDES compliance activities will reduce the very high likelihood of "negligible" exposures to hazardous materials to low risks for the same types of exposures. There would also be a slight reduction in the likelihood of marginal injuries to site personnel and guests who may have accidents on slippery surfaces due to poor storm water management.

Compliance:

If the activities described in this ADS are not carried out, LBL will be in violation of provision of the Clean Water Act. Enforcement options could include major fines or imprisonment. Implementation of the NPDES BAT practices will greatly reduce the risk of non compliance with this Federal Law and would put LBL storm water management practices with the Best Available Technologies.

Mission:

Implementation of the NPDES compliance activities will allow LBL to attain a major program goal stated in the Laboratory Mission Statement - one of environmental compliance. If the activities described in this ADS are not carried out, this Mission goal will not be attained and there is a risk that motor pool operations may be curtailed through enforcement of the Clean Water Act until BAT storm water practices are implemented.

Investment: Compliance:

If the activities described in this ADS are not carried out, LBL will be in violation of provision of the Clean Water Act. Enforcement options could include major fines, litigation fees, and costs of replacing the function of the LBL motor pool, with an estimated aggregate that could exceed \$1M/yr. It is likely that such action could occur within a year or two. Implementation of the NPDES BAT practices will greatly reduce the investment risks of non-compliance with this Federal Law.

U. S. DEPARTMENT OF ENERGY
 ES&H Management Plan Information System
 ACTIVITY DATA SHEET (continued)
 LAWRENCE BERKELEY LABORATORY

Environmental:

Implementation of the NPDES compliance activities will reduce the medium likelihood of short-term, widespread environmental damage due to releases of hazardous materials to the storm sewers, the Strawberry Creek watershed, and the San Francisco Bay.

ADS RESOURCE DATA SECTION

36. Funding: 37. Fund Case: 38. Resource Structure Code: YA0901
 (X) Program () Decrement 39. Budget & Reporting Code: KG0000000
 () Indirect () Target
 () Outside (X) Planning 40. Start Year: 1996
 by: () Unfunded 41. End Year: 1997

FY	OE	CE	GPP	LIP	TOTAL	Fed FTE	Ctr FTE
1993	0.0	0.0	0.0	0.0	0.0	0.00	0.00
1994	0.0	0.0	0.0	0.0	0.0	0.00	0.00
1995	0.0	0.0	0.0	0.0	0.0	0.00	0.00
1996	0.0	0.0	166.0	0.0	166.0	0.00	0.00
1997	0.0	0.0	115.0	0.0	115.0	0.00	0.00
1998	0.0	0.0	0.0	0.0	0.0	0.00	0.00
1999	0.0	0.0	0.0	0.0	0.0	0.00	0.00
2000	0.0	0.0	0.0	0.0	0.0	0.00	0.00
2001	0.0	0.0	0.0	0.0	0.0	0.00	0.00

Escalated? Yes No

45. Cost Estimate Notes

NPDES/BAT Compliance

Cost estimates are based on preliminary design requirements and historical costs for similar projects at the Laboratory. Estimates include all design/construction costs including contingency, and are escalated as per DOE guidance for escalation of GPP funds, including 8.6% overhead allocation

ADS TRACKING SECTION

47. Management Approval? Yes No
 48. Activity In-process? Yes No
 49. Design Plan Completion...: 03/01/1996
 50. Construction Start.....: 05/01/1996
 51. Construction Completion..: 02/28/1997
 52. Final Compliance Required: / /
 53. Fiscal Year Completed.....:

U. S. DEPARTMENT OF ENERGY
ES&H Management Plan Information System
ACTIVITY DATA SHEET (continued)
LAWRENCE BERKELEY LABORATORY

ADDITIONAL A-106 DATA REQUIREMENTS

54. Multiple Sites? Yes No

55. Pollutant Category Driver: CWA
Code: SWPS

56. Compliance Status: ESDP - Standard Deadline Passed (Class I)

57. Progress Code: PP - Preliminary Planning

58. Program Category: CA - Corrective Activities WM - Waste Managem
 ER - Envir. Restoration OT - Other Activit

U. S. DEPARTMENT OF ENERGY
ES&H Management Plan Information System
ACTIVITY DATA SHEET
LAWRENCE BERKELEY LABORATORY

ACTIVITY DATA SHEET IDENTIFICATION SECTION

- 1. Facility: LBL 2. Name: LAWRENCE BERKELEY LABORATORY
- ADS No: A94D0063 3. Title: COOLANT WASTE REDUCTION
- 4. Data Sheet Status Code: OPEN
- 5. Line Item Project ID.:
- 6. Original Identifier.:
- 7. Work Package Number.:
- 8. Account Number.....:
- 9. Work Breakdown Struc.:
- 10. Reference ADS Number.:
- 11. Responsible SO Code.: ER - OFFICE OF ENERGY RESEARCH
- 12. Resp. Contractor Code: CAU - CALIFORNIA, UNIVERSITY OF
- 13. Contractor Division.: EH&S
- 14. Contractor Department: ENVR PRTCT
- 15. Contractor Manager...: MCGRAW DAVID 16. Phone: (510) 486-5551
- 17. DOE Manager.....: SAMUELSON SCOTT 18. Phone: (510) 486-4345

ADS CATEGORY SECTION

- 19. Category: () Safety & Health (X) Environmental () Other:
- 21. Is activity an A-106 Plan Activity? [X] Yes [] No
- 22. Functional Breakdown:

FA.SA Pct Functional Area/Sub-Area Title
PP.05 100 Reuse & Recycling - Hazardous & Radioactive

ADS TYPE SECTION

- 24. ADS Type: () Core (X) Compliance () Improvement
- 25. External Drivers:

<u>P/S Typ Driver Code</u>	<u>Driver Title</u>
Pri LAW [OTHER]	Other Law - Specify
Sec ORD DOE 5400.01	General Environmental Protection Program
Sec OTH [OTHER]	Other Driver - Specify
Sec STD [OTHER]	Other Standard - Specify

26. Compliance Comments

LAW[OTHER]: CA SB 14 California
STD[OTHER]: FPPA Federal

U. S. DEPARTMENT OF ENERGY
ES&H Management Plan Information System
ACTIVITY DATA SHEET (continued)
LAWRENCE BERKELEY LABORATORY

OTH[OTHER]: UC/DOE Contract 98 Appendix F

Other relevant waste minimization and pollution prevention compliance documents relevant to LBL are as follows:

Calif. HWCL [H&SC Sec. 25100 et seq.], Calif. AB-1475 [H&SC Secs. 25143.20], Calif. SB-1726 [H&SC Sec. 25719.7]

Federal Facility Compliance Act (FFCA)

Executive Order 12856, Federal Compliance with Right to Know and Pollution Prevention Requirements

Executive Order 12843, Procurement Requirements and Policies for Ozone-Depleting Substances

Executive Order 12844, Federal Use of Alternative Fueled Vehicles

Executive Order 12845, Requiring Agencies to Purchase Energy Efficient Computer Equipment

Executive Order 12873, Federal Acquisition, Recycling and Waste Prevention

DOE Orders 5400.3 [6(d)], and 5820.2A [Chapter I, 7(a), (b) Chapter II, 3(b), Chapter III, 3(c) and (f)]

EBMUD waste water discharge permits

27. ADS DESCRIPTION SECTION

The Lawrence Berkeley Laboratory (LBL) has been operating for more than 50 years on a 130-acre site with a FY94 population of nearly 4000 research and support staff. Much of the Laboratory's reputation as a preminent National Laboratory is attributable to the operation of accelerators and other big science equipment. Temperature control of this research equipment, and of support equipment for accelerator and other research activities has required the use of coolants, principally chlorofluorocarbons (CFC's). LBL is currently initiating a program to phase out the use of ozone depleting substances such as CFC's, through the development of GPE and GPP projects. However, there will continue to be some use of coolants at LBL, and there is a need to reduce the amounts of these coolants that will be shipped off site as liquid hazardous waste.

Waste Minimization Performance Measures found in Appendix F of DOE/UC

U. S. DEPARTMENT OF ENERGY
 ES&H Management Plan Information System
 ACTIVITY DATA SHEET (continued)
 LAWRENCE BERKELEY LABORATORY

Contract 98 require the Laboratory to reduce 3 of its 5 largest waste streams by an average of 5%/yr for five years, and to reduce the aggregate total weight of LBL waste by 10% over the same time period. Coolants represent one of the 3 hazardous waste streams selected for minimization to address the Appendix F Performance Measures. The most recent information available shows the amount of coolants shipped as hazardous waste is 452 kg/year.

Various options are available to reduce the amount of coolants requiring disposal, the simplest of which is to regenerate them for reuse, on site. To evaluate this alternatives, however, it is necessary to better understand the total current and projected use of coolants at LBL, to develop and implement improved operational controls on coolant use, and to further explore options for future on-site coolant regeneration.

The activities supported by this ADS include development of an LBL coolant management plan and tracking system, an operational and analytical assessment of the various existing coolant waste streams, development of a methodology to regenerate the coolants on site, and design and construction of an operational coolant regeneration system. Current costs of handling and disposing of LBL's spent coolants are approximately \$20K/yr and the total cost estimate for this project is \$59K. The calculated payback period is, therefore, 2.9 years, making this an EPA Priority 1 project.

Milestones:

February, 1996: Complete process waste assessment (data review, generator interviews)
 May, 1996: Complete design of B77 cooling recycling system
 July, 1996: Complete construction of B77 cooling recycling system
 August, 1996: Provide technical assistance including cooling recycling education and tracking system
 September, 1996: Perform WM/PP best management practices education and training

28. APPRAISAL SECTION

Public Safety & Health:

Risk/Impact:

An incremental negative impact on the Public safety and health.

Benefit:

An incremental positive impact on the Public safety and health.

Site Personnel Safety & Health:

Risk/Impact:

Slight possibility of exposure and adverse health effects to site

U. S. DEPARTMENT OF ENERGY
ES&H Management Plan Information System
ACTIVITY DATA SHEET (continued)
LAWRENCE BERKELEY LABORATORY

personnel.

Benefits:

Slightly reduced possibility of exposure and adverse health effects to site personnel.

Compliance:

Risk/Impact:

In the event that this project is not supported, LBL will be unable to reduce this liquid hazardous waste stream, estimated at 452 kg/yr. Lack of support would make it more difficult for LBL to comply with Appendix F Performance Measures found in the contract negotiated between the DOE and the University of California, requiring 5%/yr reductions in 3 of LBL's 5 major waste streams over the next five years and, 10% reduction in the total weight of LBL waste over the same time period. Coolants are one of the waste streams chosen for reduction.

Non-compliance with these performance measures will influence performance ratings of the Laboratory, and of its uppermost managers.

Benefit:

If the activities supported by this ADS are funded, LBL will be able to perform well on one of the Performance Measures found in Appendix F of the DOE/UC contract.

Mission Impact:

Risk/Impact:

Slight negative impact on Mission, due to increasingly costly operation of maintenance refrigeration units.

Benefit:

Slight positive impact due to optimized economics of maintenance operations involving coolants.

Investment Impact:

The total estimated cost for this project is \$57K. Estimated savings in waste disposal costs (\$20K/yr), leading to a calculated payback period of 2.7 years using currently available data. It is likely, however, that waste disposal costs will rise more quickly than general inflation. Thus, the best estimate for payback period is less than 2.7 years, with real savings of more than \$20K/yr beginning in FY98.

Environmental Impact:

Risk/Impact:

An incremental negative impact on environmental quality.

Benefit:

An incremental positive impact on environmental quality.

Other Factors:

Appendix F Performance Measures:

There is a growing National consensus that the long term health of our citizens and the restoration of our environment to a more habitable

U. S. DEPARTMENT OF ENERGY
 ES&H Management Plan Information System
 ACTIVITY DATA SHEET (continued)
 LAWRENCE BERKELEY LABORATORY

state will require an intense and continuing focus on the minimization of the wastes produced in the work place, and on preventing wastes from entering the environment through unplanned releases. If there is no support for WMin/PP Implementation projects at LBL, then the facility will be expending considerable effort in this area, but with little payout. In particular, it would be difficult for LBL to succeed in reducing 3 of its 5 major waste streams by 5%/yr for the next five years, as is required in Performance Measures found in Appendix F of the UC/DOE contract.

ADS SCORING SECTION

29. ADS Scoring	<- Before Scoring ->			<- After Scoring ->		
	<u>Csg</u>	<u>L'hood</u>	<u>Score</u>	<u>Csg</u>	<u>L'hood</u>	<u>Score</u>
Public Safety & Health	3	C	0.3000	3	D	0.0030
Site Personnel Safety & Health	7	C	0.1000	7	D	0.0010
Compliance	10	A	20.0000	11	D	0.0001
Mission Impact	13	A	75.0000	13	D	0.0075
Investment Impact						
Environmental Protection	18	C	0.2000	18	D	0.0020
NET BEFORE AND AFTER:			95.6000			0.0136
NET SCORE.....:			95.5864			
30. Contractor Adj:			0.0000	31. Other Score:		0.0000
Ops Office Adj:			0.0000	32. Priority...:		1
Sec Office Adj:			0.0000	33. Scored By...:		BRIAN M. SMITH
TOTAL ADJUSTED.....:			95.5864	34. Score Date...:		03/12/1994

35. Scoring Comments

Public Safety & Health:

Implementation of this project will slightly reduce the likelihood of low-level exposures to the general public (from medium to low probability) through reduction of the amount of LBL hazardous wastes handled by persons off-site during transportation and disposal.

Site Personnel Safety & Health:

Implementation of this project will slightly reduce the likelihood of "negligible" illnesses to LBL personnel (from medium to low probability) through reduction of the amount of hazardous wastes handled by LBL staff during transportation and disposal.

Compliance:

Implementation of this project will enhance LBL's compliance status from the current certainty of marginal non-compliance to a low probability of significant deviations from best management practices.

U. S. DEPARTMENT OF ENERGY
 ES&H Management Plan Information System
 ACTIVITY DATA SHEET (continued)
 LAWRENCE BERKELEY LABORATORY

Mission Impact:

Implementation of this project will enhance LBL's ability to achieve the major mission goal of environmental compliance, especially with regards to Appendix F Performance Measures in UC/DOE Contract 98.

Investment Impact:

Although there is an estimated \$20K/yr savings after an initial, three year payback period, this is below the level required to score points for investment impact.

Environmental Impact:

Implementation of this project will slightly reduce the likelihood of minor damage to the environment (from medium to low probability) through reduction of the amount of hazardous wastes transported off site for disposal.

ADS RESOURCE DATA SECTION

6. Funding: 37. Fund Case: 38. Resource Structure Code: YA0901
 (X) Program () Decrement 39. Budget & Reporting Code: KG000000
 () Indirect () Target
 () Outside (X) Planning 40. Start Year: 1996
 by: () Unfunded 41. End Year: 1996

<u>FY</u>	<u>OE</u>	<u>CE</u>	<u>GPP</u>	<u>LIP</u>	<u>TOTAL</u>	<u>Fed FTE</u>	<u>Ctr FTE</u>
1993	0.0	0.0	0.0	0.0	0.0	0.00	0.00
1994	0.0	0.0	0.0	0.0	0.0	0.00	0.00
1995	0.0	0.0	0.0	0.0	0.0	0.00	0.00
1996	92.0	0.0	0.0	0.0	92.0	0.00	0.25
1997	0.0	0.0	0.0	0.0	0.0	0.00	0.00
1998	0.0	0.0	0.0	0.0	0.0	0.00	0.00
1999	0.0	0.0	0.0	0.0	0.0	0.00	0.00
2000	0.0	0.0	0.0	0.0	0.0	0.00	0.00
2001	0.0	0.0	0.0	0.0	0.0	0.00	0.00

Escalated? Yes No

45. Cost Estimate Notes

Cost include 56% overhead factor.
 Costs are estimated from level of effort estimates for evaluation and outreach activities at a rate of \$80K/FTE, the FY94 rate for EHS Division employees, and are escalated as per DOE guidance for escalating operating expenses. Costs above salary include \$35K to upgrade coolant

U. S. DEPARTMENT OF ENERGY
 ES&H Management Plan Information System
 ACTIVITY DATA SHEET (continued)
 LAWRENCE BERKELEY LABORATORY

FY	OE	CE	GPP	LIP	TOTAL	Fed FTE	Ctr FTE
1993	0.0	0.0	0.0	0.0	0.0	0.00	0.00
1994	160.0	0.0	0.0	0.0	160.0	0.00	0.00
1995	0.0	0.0	0.0	0.0	0.0	0.00	0.00
1996	434.0	0.0	0.0	0.0	434.0	0.00	0.00
1997	0.0	0.0	0.0	0.0	0.0	0.00	0.00
1998	0.0	0.0	0.0	0.0	0.0	0.00	0.00
1999	0.0	0.0	0.0	0.0	0.0	0.00	0.00
2000	0.0	0.0	0.0	0.0	0.0	0.00	0.00
2001	0.0	0.0	0.0	0.0	0.0	0.00	0.00

Escalated? Yes No

45. Cost Estimate Notes

Cost for FY96 includes 56% overhead factor.
 Cost estimate from preliminary engineering and past experience is \$11K/connection, with 20 illicit connections to be corrected. Total of \$278K includes 20% contingency and escalation to FY96 costs, as per DOE guidance for escalating operating expenses.

ADS TRACKING SECTION

- 47. Management Approval? Yes No
- 48. Activity In-process? Yes No
- 49. Design Plan Completion...: 09/30/1994
- 50. Construction Start.....: 10/01/1995
- 51. Construction Completion...: 03/30/1996
- 52. Final Compliance Required: 03/30/1995
- 53. Fiscal Year Completed.....:

ADDITIONAL A-106 DATA REQUIREMENTS

- 54. Multiple Sites? Yes No
- 55. Pollutant Category Driver: CWA
Code: PSCS
- 56. Compliance Status: CMPA - Compliance Agreement (Class I)
- 57. Progress Code: DES - Design
- 58. Program Category: CA - Corrective Activities WM - Waste Managem
 ER - Envir. Restoration OT - Other Activit

U. S. DEPARTMENT OF ENERGY
ES&H Management Plan Information System
ACTIVITY DATA SHEET
LAWRENCE BERKELEY LABORATORY

ACTIVITY DATA SHEET IDENTIFICATION SECTION

- 1. Facility: LBL 2. Name: LAWRENCE BERKELEY LABORATORY
- ADS No: A94D0066 3. Title: OZONE-DEPLETING SUBSTANCES REDUCTION COMP. (GP)
- 4. Data Sheet Status Code: OPEN
- 5. Line Item Project ID.:
- 6. Original Identifier.:
- 7. Work Package Number.:
- 8. Account Number.....:
- 9. Work Breakdown Struc.:
- 10. Reference ADS Number.:
- 11. Responsible SO Code.: ER - OFFICE OF ENERGY RESEARCH
- 12. Resp. Contractor Code: CAU - CALIFORNIA, UNIVERSITY OF
- 13. Contractor Division.: EH&S
- 14. Contractor Department: ENVR PRCT
- 15. Contractor Manager...: MCGRAW DAVID 16. Phone: (510) 486-5551
- 17. DOE Manager.....: SAMUELSON SCOTT 18. Phone: (510) 486-4345

ADS CATEGORY SECTION

- 19. Category: () Safety & Health (X) Environmental () Other:
- 21. Is activity an A-106 Plan Activity? [X] Yes [] No
- 22. Functional Breakdown:

FA.SA Pct Functional Area/Sub-Area Title
PP.04 100 Source Reduction - Hazardous & Radioactive

ADS TYPE SECTION

- 24. ADS Type: () Core (X) Compliance () Improvement
- 25. External Drivers:

<u>P/S Typ Driver Code</u>	<u>Driver Title</u>
Pri LAW CAA	Clean Air Act (CAA*)
Sec OTH [OTHER]	Other Driver - Specify

26. Compliance Comments

OTH[OTHER]: EO-POLL PREVENTION Federal

Executive Order Number 12843, Procurement Requirements and Policies for Ozone-Depleting Substances

U. S. DEPARTMENT OF ENERGY
ES&H Management Plan Information System
ACTIVITY DATA SHEET (continued)
LAWRENCE BERKELEY LABORATORY

EPA Draft Vapor Degreasing Systems Rule
City of Berkeley Ordinance No. 6131

27. ADS DESCRIPTION SECTION

In the past few years, considerable world-wide emphasis has been placed on the phaseout of ozone-depleting substances (ODS), such as 1,1,1-trichloroethane (TCA), because of their demonstrated damage to the earth's stratospheric ozone layer. ODSs are categorized as either Class I or II. Class I ODSs have the greater depletion potential of the two. TCA, a Class I ODS, is a common substance used as the cleaning agent in vapor degreasing systems. LBL presently has 4 vapor degreasing systems of various sizes that operate with TCA. Each vapor degreasing system provides cleaning operations to functional units at a minimum and the entire Laboratory at a maximum.

Beginning with the Montreal Protocol international agreement in 1988 and established as a statutory requirement in the United States in 1990 with passage of the Clean Air Act Amendments, these actions declared timetables for eliminating both the production and consumption of ODSs. The current production phaseout date for Class I ODSs is December 31, 1995. Already the cost of these ODSs has increased several fold in just the last few years in response to the anticipated phase out.

Title VI of the Clean Air Act Amendments gave the U.S. Environmental Protection Agency (EPA) an aggressive schedule for promulgating regulations on the production, consumption, use, and treatment of ODSs. Included in the Act is Section 613 which requires that EPA issue a rule obligating Federal Agencies to modify their procurement regulations to maximize the use of safe alternatives to ODSs. This rule was promulgated as a final rule in October, 1993. Prior to this final rule, the President of the United States issued Executive Order Number 12843 on April 21, 1993, reaffirming the procurement requirements of the Act. Section 613, E.O. 12843, and the EPA rule all establish an affirmative procurement program for Federal agencies that will maximize the substitution of safe alternatives to ODSs and implement other policies and requirements of Title VI. In addition, EPA has drafted a vapor degreasing systems rule which limits emissions from these systems through installation of control devices. Extra administrative measures are also included in the rule. Therefore, the TCA required by the present systems will become considerably more difficult to obtain in the future and the compliance oversight effort will increase.

Locally, the City of Berkeley passed a broad-based Ordinance (No. 6131) in 1991 addressing the reduction and elimination of ODS emissions from various sources, including solvent cleaning, packaging materials,

U. S. DEPARTMENT OF ENERGY
ES&H Management Plan Information System
ACTIVITY DATA SHEET (continued)
LAWRENCE BERKELEY LABORATORY

refrigeration and air conditioning units, and fire extinguishers. Also, the East Bay Municipal Utility District (EBMUD) has shown an interest in the TCA used in the vapor degreasing systems. At present, EBMUD's only compliance requirement has been the development and submittal of a report on LBL's efforts to find substitute cleaning agents for TCA.

To address the successful conversion to safe alternative substances, EPA has drafted in rule form a Significant New Alternatives Program. This program does not yet include enough detail on the segment of solvent cleaning most relevant to LBL; precision cleaning. Therefore, in the summer of 1993, LBL conducted a series of tests on acceptable substitute cleaning agents subjected to conditions common to LBL. After completion of these tests, LBL was able to develop a list of minimum specifications for a cleaning system that could function in a setting like LBL where standards for ultra high cleaning are a necessity. This ADS follows up on these specifications and requests support for final design, purchasing, and installation of acceptable replacement systems for 3 of the 4 remaining vapor degreasing systems, to be constructed through GPP funding. An additional ADS is being submitted to request support for the 4th unit, to be substituted with a portable machine that can be purchased and installed through existing GPE funding.

Significant Milestones or Scheduled Accomplishments

April, 1994: Request GPP funds for replacing 3 systems in FY96.
October, 1995: Begin final design of replacement systems.
April, 1996: Begin construction of replacement systems.
September, 1996: Complete construction of replacement systems.

28. APPRAISAL SECTION

Public Safety & Health:

Risk/Impact:

From a global perspective, ODSs have been demonstrated to cause a reduction in the earth's protective stratospheric ozone layer. The presence of these materials at LBL maintains the potential threat that any release of such material will cause further damage to this protective layer. Locally, emissions of TCA from the vapor degreasers pose one of the more significant health risk impacts on and near the site due to the volume of TCA released.

Benefit:

Elimination of ODSs at LBL reduces the threat to a small degree of exacerbating the loss of the earth's protective stratospheric ozone layer and reduction in the risk of low-level exposures to the general public.

Site Personnel Safety & Health:

U. S. DEPARTMENT OF ENERGY
 ES&H Management Plan Information System
 ACTIVITY DATA SHEET (continued)
 LAWRENCE BERKELEY LABORATORY

Risk/Impact:

Vapor degreasing systems heat the cleaning solvent which releases fumes to the work environment. The presence of these fumes exposes workers in the vicinity to substances that have adverse health impacts from workplace exposure.

Benefits:

Replacement systems to vapor degreasing are designed to perform with aqueous or semi-aqueous cleaning agents. These substances are significantly less toxic than TCA.

Compliance:**Risk/Impact:**

Vapor degreasers are open loop systems rather than closed loop systems like centrifugal chillers. As a result, throughput and emissions are considerably greater since the recovery systems capture just a fraction of the vaporized solvent. With regulations, policies, and Executive Orders maximizing the use of safe alternatives, procurement of new ODSs would violate these mandates. Violations are subject to the limitation of fines and penalties authorized by the Clean Air Act. Risks include:

Notice of Violation

Administrative Compliance Order

Federal Facilities Compliance Agreement

Criminal fines for negligent behavior

Civil penalties

Citizen suits

Benefit:

Eliminating Class I ODS vapor degreasing systems at LBL abolishes the potential for fines and penalties associated with non-compliance actions.

Mission Impact:**Risk/Impact:**

The mission of LBL to perform its functions in compliance with environmental regulations as well as to perform world class research is threatened if these sources of ODSs are not replaced. The vapor degreasing systems operating at LBL either directly or indirectly service the entire Laboratory. Down time to operations resulting from the inability to obtain the needed vapor cleaning agent will have a significant negative impact to the mission of LBL on several levels.

Benefit:

This project will minimize unanticipated service and operations curtailments, while improving LBL's mission capabilities by converting its vapor cleaning systems to a type that is less suspect to regulatory and economic factors.

Investment Impact:**Risk/Impact:**

Failure to convert the remaining vapor degreasing units to safe

U. S. DEPARTMENT OF ENERGY
ES&H Management Plan Information System
ACTIVITY DATA SHEET (continued)
LAWRENCE BERKELEY LABORATORY

alternatives means that operating costs will escalate significantly as TCA becomes less available after the Class I ODS phase out date. Eventually, TCA will not be available, rendering LBL's vapor degreasing units essentially useless. Converting to safe alternatives is a cost effective move. Also, with uncertain supplies of TCA in the future, the threat of service and operations curtailments translates into additional competitive loss in investment for LBL.

Benefit:

LBL maximizes its research potential whenever full service capacity is maintained. Tests have shown that some of the newer aqueous and semi-aqueous cleaning agents actually clean better than the present method which uses TCA.

Environmental Impact:

Risk/Impact:

Releases of ODSs contribute to the deterioration of the earth's protective stratospheric ozone layer. Vapor degreasers are currently LBL's greatest emitters of ODSs because of their use of TCA.

Benefit:

Elimination of ODSs at LBL will minimize the Lab's contribution to the damaging consequences of stratospheric ozone depletion. Additionally, ODSs in the systems identified by this project will be recovered and recycled wherever possible in accordance with other environmental regulations.

Other Factors:

Pollution Prevention and Public Perception:

In the past few years, considerable world-wide emphasis has been placed on the phaseout of ozone-depleting substances (ODS), such as 1,1,1-trichloroethane (TCA), because of their demonstrated damage to the earth's stratospheric ozone layer. This issue not only has received the special attention of the President of the United States, but the EPA and DOE have recently focused their attention on pollution prevention in general, and ozone-depleting substances in particular. The general public is very aware of the issue of stratospheric ozone depletion, due to repeated emphasis in the local and National press. It would be prudent for a premiere National Laboratory to have demonstrable evidence of conscientious efforts in this area, to avoid adverse publicity and a negative image in the view of the surrounding community.

U. S. DEPARTMENT OF ENERGY
 ES&H Management Plan Information System
 ACTIVITY DATA SHEET (continued)
 LAWRENCE BERKELEY LABORATORY

ADS SCORING SECTION

29. ADS Scoring	<- Before Scoring ->			<- After Scoring ->		
	Csg	L'hood	Score	Csg	L'hood	Score
Public Safety & Health	3	C	0.3000	3	D	0.0030
Site Personnel Safety & Health	6	B	10.0000	7	D	0.0010
Compliance	8	A	150.0000	11	D	0.0001
Mission Impact	13	B	7.5000	13	D	0.0075
Investment Impact	15	B	1.5000	15	D	0.0015
Environmental Protection	18	B	2.0000	18	D	0.0020

NET BEFORE AND AFTER: 171.3000 0.0151

NET SCORE.....: 171.2849

30. Contractor Adj:	0.0000	31. Other Score:	0.0000
Ops Office Adj:	0.0000	32. Priority...:	1
Sec Office Adj:	0.0000	33. Scored By..:	BRIAN M. SMITH
TOTAL ADJUSTED....:	171.2849	34. Score Date.:	02/24/1994

35. Scoring Comments

Public Safety & Health:

Replacement of TCA in LBL degreasers will reduce the very high risk of low-level exposure to low risk of low-level exposure to the general public near the LBL site.

Site Personnel Safety & Health:

Replacement of TCA in LBL degreasers will reduce the high risk of marginal injury or illness to a low risk of negligible injury or illness to site personnel and guests.

Compliance:

Replacement of TCA in LBL degreasers will reduce the very high risk of enforcement actions involving significant fines or penalties to a low probability of any enforcement actions.

Mission Impact:

Replacement of TCA in LBL degreasers will reduce the very high risk of a moderate negative impact on LBL operations to a low probability of any negative impact on the LBL Mission.

Investment Impact:

Replacement of TCA in LBL degreasers will reduce the very high risk of a moderate negative investment impact on LBL operations which might exceed \$1M/yr to a low probability of any negative impact on the LBL Mission.

Environmental Impact:

U. S. DEPARTMENT OF ENERGY
 ES&H Management Plan Information System
 ACTIVITY DATA SHEET (continued)
 LAWRENCE BERKELEY LABORATORY

Replacement of TCA in LBL degreasers will reduce the certainty of a minor impact on the earth's stratosphere to a very low probability of any environmental damage due to degreaser operations.

ADS RESOURCE DATA SECTION

36. Funding: 37. Fund Case: 38. Resource Structure Code: YA0901
 (X) Program () Decrement 39. Budget & Reporting Code: KG0000000
 () Indirect () Target
 () Outside (X) Planning 40. Start Year: 1996
 by: () Unfunded 41. End Year: 1996

FY	OE	CE	GPP	LIP	TOTAL	Fed FTE	Ctr FTE
1993	0.0	0.0	0.0	0.0	0.0	0.00	0.00
1994	0.0	0.0	0.0	0.0	0.0	0.00	0.00
1995	0.0	0.0	0.0	0.0	0.0	0.00	0.00
1996	0.0	0.0	380.0	0.0	380.0	0.00	0.00
1997	0.0	0.0	0.0	0.0	0.0	0.00	0.00
1998	0.0	0.0	0.0	0.0	0.0	0.00	0.00
1999	0.0	0.0	0.0	0.0	0.0	0.00	0.00
2000	0.0	0.0	0.0	0.0	0.0	0.00	0.00
2001	0.0	0.0	0.0	0.0	0.0	0.00	0.00

Escalated? Yes No

45. Cost Estimate Notes

Cost estimate is based on conceptual design and is order of magnitude. Refined cost schedule will be available when Preliminary design is complete. Costs include 8.6% overhead factor.

ADS TRACKING SECTION

47. Management Approval? Yes No
 48. Activity In-process? Yes No
 49. Design Plan Completion....: 02/28/1996
 50. Construction Start.....: 05/01/1996
 51. Construction Completion...: 09/30/1996
 52. Final Compliance Required: 12/31/1995
 53. Fiscal Year Completed.....:

U. S. DEPARTMENT OF ENERGY
ES&H Management Plan Information System
ACTIVITY DATA SHEET (continued)
LAWRENCE BERKELEY LABORATORY

ADDITIONAL A-106 DATA REQUIREMENTS

54. Multiple Sites? Yes No
55. Pollutant Category Driver: CAA
Code: POLP
56. Compliance Status: ESDF - Standard Deadline Future (Class II)
57. Progress Code: PP - Preliminary Planning
58. Program Category: CA - Corrective Activities WM - Waste Managem
 ER - Envir. Restoration OT - Other Activit

U. S. DEPARTMENT OF ENERGY
ES&H Management Plan Information System
ACTIVITY DATA SHEET
LAWRENCE BERKELEY LABORATORY

ACTIVITY DATA SHEET IDENTIFICATION SECTION

- 1. Facility: LBL 2. Name: LAWRENCE BERKELEY LABORATORY
- ADS No: A94D0067 3. Title: SPCC UPGRADES
- 4. Data Sheet Status Code: OPEN
- 5. Line Item Project ID.:
- 6. Original Identifier.:
- 7. Work Package Number.:
- 8. Account Number.....:
- 9. Work Breakdown Struc.:
- 10. Reference ADS Number.:
- 11. Responsible SO Code.: ER - OFFICE OF ENERGY RESEARCH
- 12. Resp. Contractor Code: CAU - CALIFORNIA, UNIVERSITY OF
- 13. Contractor Division.: EH&S
- 14. Contractor Department: ENVR PRCT
- 15. Contractor Manager...: MCGRAW DAVID 16. Phone: (510) 486-5551
- 17. DOE Manager.....: SAMUELSON SCOTT 18. Phone: (510) 486-4345

ADS CATEGORY SECTION

- 19. Category: () Safety & Health (X) Environmental () Other:
- 21. Is activity an A-106 Plan Activity? [X] Yes [] No
- 22. Functional Breakdown:

FA.SA Pct Functional Area/Sub-Area Title
PP.04 100 Source Reduction - Hazardous & Radioactive

ADS TYPE SECTION

- 24. ADS Type: () Core (X) Compliance () Improvement
- 25. External Drivers:

<u>P/S Typ</u>	<u>Driver Code</u>	<u>Driver Title</u>
Pri	LAW CWA	Clean Water Act (CWA*)
Sec	LAW RCRA	Resource Conservation and Recovery Act (RCRA*)
Sec	ORD DOE 5400.01	General Environmental Protection Program
Sec	STD [OTHER]	Other Standard - Specify

U. S. DEPARTMENT OF ENERGY
ES&H Management Plan Information System
ACTIVITY DATA SHEET (continued)
LAWRENCE BERKELEY LABORATORY

26. Compliance Comments

STD[OTHER]: CA H&S Code California Health

Other relevant compliance drivers are as follows:
Spill Prevention Control and Countermeasures Plan
Hazardous Materials Bulk Storage Plan

27. ADS DESCRIPTION SECTION

Lawrence Berkeley Laboratory (LBL) operations involve the use of hazardous materials that must be managed in compliance with Federal, State, and local environmental regulations, and with DOE Orders. This Activity Data Sheet describes compliance activities required to safely store petroleum products in above ground storage tanks (ASTs). ASTs include above ground tanks containing gasoline and diesel fuel, transformers, and drum storage areas which contain 55 gallon drums of petroleum products.

Many of the ASTs at LBL do not have secondary containment as required by 40 CFR 112, Oil Pollution Prevention Regulations. In some cases, repairs to secondary containment are required. Some ASTs are fed by underground storage tanks (USTs) which do not have any leak control. If one of these ASTs began to leak, the UST would continue to feed the AST and the secondary containment would become overfilled, with the potential release of petroleum products to the environment.

To mitigate these above described problems, LBL has embarked on a program of assessing and modifying deficient AST areas to meet current requirements. Compliance determinations are being made based on a number of possible courses of action: (1) removal, (2) draining and leaving in place, (3) replacement, (4) retrofitting, and (5) placement of spill kits. Placement of spill kits is used only when the AST is small (<42 gallons) or the AST is scheduled for removal in the near future. Approximately 30 AST areas are being brought into compliance in FY94 through NONCAP project funding. Preliminary engineering has been completed for an additional 9 AST areas (Priority 2), scheduled to be brought into compliance in FY95 if FY94 funding is not available. The FY96 request assumes a total of 10 Priority 3 AST projects would bring the Laboratory into full compliance.

List significant milestones:

- (1) March, 1993: Request funds for Priority 1 projects. (\$115K AST & \$265K SPCC = \$380K Total [revised 1/18/94, B. Camper])
- (2) May, 1993: Complete site wide audit of more than 70 areas storing petroleum products.

U. S. DEPARTMENT OF ENERGY
 ES&H Management Plan Information System
 ACTIVITY DATA SHEET (continued)
 LAWRENCE BERKELEY LABORATORY

- (3) June, 1994: Request funds to complete Priority 2 projects.
 - (4) September, 1994 - Complete Priority 1 projects.
 - (5) June, 1995- Request funds for Priority 3 projects.
 - (6) September, 1996- Complete FY96 funded (Priority 2) projects.
 - (7) September, 1997- Complete FY97 funded (Priority 3) projects.
-

28. APPRAISAL SECTION

Public Safety & Health:

Risk/Impact:

Accidental spills of petroleum products into the storm drain system may result in low-level exposures to the public in nearby residential areas.

Benefit:

Reduced likelihood and severity of occurrences.

Site Personnel Safety & Health:

Risk/Impact:

Accidental spills of hazardous materials into the storm drain system may result in marginal illness to LBL employees working in storm drain system.

Benefits:

Reduced likelihood and severity of occurrence.

Compliance:

Risk/Impact:

The following enforcement actions may occur:

- 1) Notice of Violation
- 2) Administrative Compliance Order
- 3) Federal Facilities Compliance Agreement
- 4) Criminal penalties
- 5) Civil penalties of up to \$5,000 per day for first offense and \$10,000 per day for second offense for violations of the Oil Pollution Prevention regulations (40CFR112).
- 6) Civil penalties of up to \$25,000 per day per violation for violations of the Clean Water Act (accidental spill to storm drain).
- 7) Citizen suits
- 8) Adverse publicity and a negative image in the view of the surrounding community

Benefit:

Save many man-hours and costs associated with negotiating compliance agreements with regulatory agencies, preparing corrective action plans and status reports, and possible court litigations. LBL will maintain a positive image in the view of the regulatory agencies. Oversight from these agencies will not increase. Image of LBL in the view of the surrounding community would not be damaged.

U. S. DEPARTMENT OF ENERGY
ES&H Management Plan Information System
ACTIVITY DATA SHEET (continued)
LAWRENCE BERKELEY LABORATORY

Mission Impact:

It is unlikely that an environmental release of petroleum products would have an immediate adverse affect on the scientific mission of the Laboratory. Such a release, however, might tarnish the environmental record of the Laboratory at a time when LBL is gaining a reputation as a particularly responsible facility with regards to environmental contamination. Many talented scientists do not wish to work at a facility that neglects environmental concerns. Thus, it is important to the mission of the Laboratory that projects such as this are carried out in a timely fashion, and that AST areas are maintained in a compliant condition.

Investment Impact:

There is an investment impact that parallels the Mission impact described above, one connected to the reputation of the Laboratory as a conscientious environmental steward. In addition, there is an investment impact connected to save remedial costs, in particular the cost of treatment or disposal of contaminated soil and of remediating hydrocarbon contaminated groundwater. These costs could be as high as \$5M without proper management.

Environmental Impact:**Risk/Impact:**

An accidental release of hazardous materials to the environment may resulting in:

Emergency response action

DOE and regulatory agency notification

Formal investigation

Occurrence reporting to DOE and regulatory agencies

Remediation of contaminated areas

Benefit:

LBL will maintain a positive image in the view of the regulatory agencies and the surrounding community.

Other Factors:**Public Perception:**

Increased public interest in the environment, coupled with continuing focus in the national and local press regarding past DOE practices and increased risk to workers and the public have resulted in increased oversight in an environment of general mistrust. Public perception studies show that environmental quality is particularly important to the American public, highlighting the need for LBL to become fully compliant with all laws and standards regarding protection of the environment. Continued support in this area will bring LBL into full compliance with laws regarding the aboveground storage of petroleum products, and will ultimately be very important to building a relationship founded on trust with our neighbors.

U. S. DEPARTMENT OF ENERGY
 ES&H Management Plan Information System
 ACTIVITY DATA SHEET (continued)
 LAWRENCE BERKELEY LABORATORY

ADS SCORING SECTION

29. ADS Scoring	<- Before Scoring ->			<- After Scoring ->		
	Csq	L'hood	Score	Csq	L'hood	Score
Public Safety & Health	3	C	0.3000	3	D	0.0030
Site Personnel Safety & Health	6	C	1.0000	7	D	0.0010
Compliance	8	A	150.0000	10	D	0.0020
Mission Impact	13	B	7.5000	13	D	0.0075
Investment Impact	15	B	1.5000	15	D	0.0015
Environmental Protection	18	B	2.0000	18	D	0.0020
NET BEFORE AND AFTER:			162.3000			0.0170
NET SCORE.....:	162.2830					
30. Contractor Adj:	0.0000			31. Other Score:	0.0000	
Ops Office Adj:	0.0000			32. Priority...:	1	
Sec Office Adj:	0.0000			33. Scored By...:	BRIAN M. SMITH	
TOTAL ADJUSTED.....:	162.2830			34. Score Date...:	03/15/1994	

35. Scoring Comments

Public Safety & Health:

Carrying out this activity will reduce the risk for a moderate to low-level exposure to the general public from medium to low likelihood of occurrence.

Site Personnel Safety & Health:

Carrying out this activity will reduce the risk of a negligible exposure to site personnel from medium to low likelihood.

Compliance:

Carrying out this activity will reduce the current, very high risk of major non-compliance to a medium risk of marginal non-compliance.

Mission Impact:

If these activities are not carried out, there is a medium likelihood of a moderate impact to the site mission. Implementation of these activities will reduce the likelihood to low.

Investment Impact:

If these activities are not carried out, there is a high likelihood of a moderate investment impact, relating to contaminated soil cleanup costs. Implementation of these activities will reduce the likelihood to low.

Environmental Impact:

Carrying out this activity will reduce the current, high level of risk

U. S. DEPARTMENT OF ENERGY
 ES&H Management Plan Information System
 ACTIVITY DATA SHEET (continued)
 LAWRENCE BERKELEY LABORATORY

of minor to moderate environmental damage to a low level of risk for minor to moderate environmental damage.

ADS RESOURCE DATA SECTION

36. Funding: 37. Fund Case: 38. Resource Structure Code: YA0901
 (X) Program () Decrement 39. Budget & Reporting Code: KG0000000
 () Indirect () Target
 () Outside (X) Planning 40. Start Year: 1994
 by: () Unfunded 41. End Year: 1997

FY	OE	CE	GPP	LIP	TOTAL	Fed FTE	Ctr FTE
1993	0.0	0.0	0.0	0.0	0.0	0.00	0.00
1994	380.0	0.0	0.0	0.0	380.0	0.00	0.00
1995	0.0	0.0	0.0	0.0	0.0	0.00	0.00
1996	222.0	0.0	0.0	0.0	222.0	0.00	0.00
1997	170.0	0.0	0.0	0.0	170.0	0.00	0.00
1998	0.0	0.0	0.0	0.0	0.0	0.00	0.00
1999	0.0	0.0	0.0	0.0	0.0	0.00	0.00
2000	0.0	0.0	0.0	0.0	0.0	0.00	0.00
2001	0.0	0.0	0.0	0.0	0.0	0.00	0.00

Escalated? Yes No

45. Cost Estimate Notes

Costs include 56% overhead factor.
 FY95 costs are estimated from preliminary analysis of projects to be performed in FY96, using FY94 costs for similar projects as a baseline. FY96 costs are based on estimates to complete the AST secondary containment work on the site, assuming that corrective actions at 10 such sites in FY97 would bring the Laboratory into full compliance. All estimates are escalated as per DOE guidance for operating costs.

ADS TRACKING SECTION

47. Management Approval? Yes No
 48. Activity In-process? Yes No
 49. Design Plan Completion....: 03/01/1996
 50. Construction Start.....: 10/01/1996
 51. Construction Completion...: 06/01/1997
 52. Final Compliance Required: 09/30/1996
 53. Fiscal Year Completed.....: 1996

U. S. DEPARTMENT OF ENERGY
ES&H Management Plan Information System
ACTIVITY DATA SHEET (continued)
LAWRENCE BERKELEY LABORATORY

ADDITIONAL A-106 DATA REQUIREMENTS

54. Multiple Sites? [] Yes [X] No

55. Pollutant Category Driver: CWA
Code: SPCC

56. Compliance Status: INOV - Inspection/NOV (Class I)

57. Progress Code: WRK - Work on-going (non-construction)

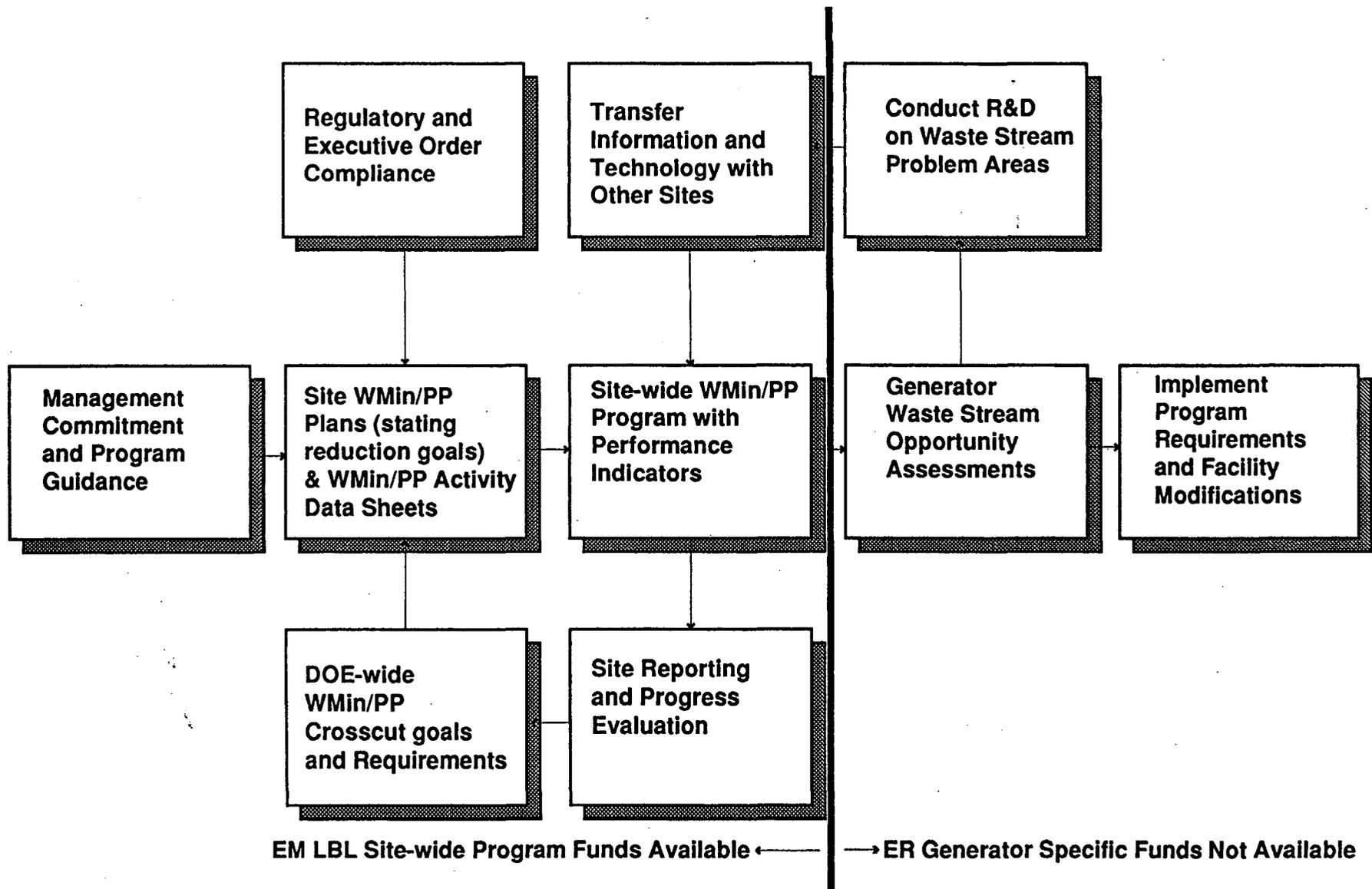
58. Program Category: (X) CA - Corrective Activities () WM - Waste Managem
() ER - Envir. Restoration () OT - Other Activit

APPENDIX H

Development of Responsive

**LBL Site-wide WMin/PP Plans and Generator Specific Programs
for
Successful Crosscut Planning**

Development of Responsive LBL Site-wide WMin/PP Plans & Generator Specific Programs for Successful Crosscut Planning



APPENDIX I

Waste Minimization Techniques Applicable to Site Wastes

Appendix I will be expanded as waste assessments/surveys are completed.

Waste Minimization Techniques Applicable to Site Wastes

Appendix I will be expanded as waste assessments/surveys are completed.

(1) Input Chemical/Material Changes

- Substitute or reduce volume of 1,1,1-Trichloroethane (TCA) used in a process because it is one of the 17 chemicals targeted for source reduction in the EPA Pollution and Prevention Strategy released in February, 1991.
- Substitute for extremely hazardous chemicals, like concentrated sulfuric acid or cyanide, with more dilute solutions or another chemical.

(2) Operational Improvements

- Building 77, Plating Shop Rinsewater Treatment - underway.
- Building 25, Printed Circuit Board Shop, metal flocculation treatment - underway.
- Building 70A, install new piping systems to recover acid wastes and send to the acid neutralization system.
- Replace carbon sorbent material currently used in 55 gallon closed-head drums with specially designed drums that facilitate reclamation.
- Evaluate the use of a filter to remove excess flocculate in the carbon sorption drums mentioned above.
- Install funnels with lids that lock to control addition of a waste to a container (improved segregation - special emphasis here is on mixed waste).
- Control conductivity's of LBL's low conductivity water (LCW) to reduce metal stripping of pipe lines.

(3) R&D Experiment Process Changes

- Identify research projects for source reduction, recycling, reuse or treatment technologies and prepare "California Hazardous Waste Reduction Program" grant application for current year. Be familiar with the available grants and the application process.
- Investigate using a shredder at the HWHF for hazardous, mixed, and radioactive laboratory and shop debris. Shredding would facilitate the sampling and laboratory analysis of these wastes, resulting in more precise characterization.

(4) Recycling and Reuse

- Building 77 Plating Baths - follow up and implement recycling and zero-discharge opportunities researched by Plating Shop personnel.
- Building 25, Photo-fabrication shop - develop and implement closed-loop and recycling systems for printed circuit board processes.

- Contamination abrasive materials - segregation of non-hazardous with hazardous and recycling the non-hazardous abrasive materials at cement or asphalt facilities.
- Production and Maintenance Shop cleaning rags (replace paper towels with cloth rags). This program is in place for oil contaminated rags used in the machine shops.
- Batteries - only automotive; checking into rechargeable battery replacement
- Machining and grinding coolant - feasibility study says "no way"; need to research substitutions.
- Flammable solvent safety cans - reuse
- Empty drums - increase the number recycled
- Fluorescent light bulbs - utilize recycling vendor and replace with longer life (energy saving) bulbs.
- X-ray and photoprocessing chemicals, paper and film - complete survey of all x-ray units and photo labs, gather all relevant documentation (material safety data sheets, manufacturer information on equipment, paper and film), identify recycling opportunities and vendors.
- Contaminated ion exchange resin segregation and reuse program for LCW systems.

(5) Administrative Steps

- Good housekeeping and laboratory practices
- Proper identification and characterization of all waste by generator, supported by user or process knowledge that will withstand an audit.
- Develop on-the-job training for commingling of compatible waste streams.
- Lab packs - scrutinize wastes that are lab packed for land fill. Recommend candidates for commingling and recycling.
- Conduct surveillance of waste handling practices.
- Take advantage of LBL's Waste Analysis QA/QC plan by sharing results with the generator and by scrutinizing the results for proper characterization and non-hazardous waste. This may offer segregation information and may reduce cost of disposal.
- Set up a tour for plumbers and researchers of the East Bay Municipal Utility District (EBMUD) water treatment plant, located in Richmond, CA.
- Publish the cost of waste disposal by gallon, pound, or 55 gallon units (with which the individual generator can identify). For example, the disposal cost of a

solvent mixed with halogenated compounds is much higher than non-halogenated, non-halogenated solvents.

- Review the disposal of small containers and packages (e.g., adhesive kits) that may be non-hazardous after admixing and therefore do not require handling as hazardous waste.
- Vacuum pumps - Improve record keeping practices on the use, out-of-servicing, or removal of pumps to facilitate metal recycling or reuse. Pumps with poorly documented history require extensive laboratory analysis of the oil, sludge or residue and careful reconstruction of their history prior to certifying as non-radioactive for disposal.
- Review all of plant operations, processes, new research programs, facility modification, or new facility construction.

(6) Other

- Evaluate the feasibility of treating lead shielding, thereby eliminating the need to dispose of it as mixed waste.
- Review the locations and generation of induced metals.
- Request speaker(s) from City of Berkeley to be involved in the Waste Minimization Campaign.
- Investigate partnership opportunities with other DOE facilities or University of California campus for waste minimization assessments, information exchange, disposal, or treatment.
- Evaluate the use and handling of mercury and mercury compounds, and suggest procedures that may help minimize the amount being sent for recycling. Mercury is a California extremely hazardous waste.
- Set an example to LBL contractors by requiring them to have an implemented waste minimization program. Follow-up by evaluating the plans periodically.
- Accommodate the DOE's mandate for the use of recycled paper with at least a 20% post consumer content.
- Promote environmental ethics at home and at LBL.
- Invite community to LBL during the waste minimization annual campaign.
- Develop and publish a waste analysis plan (WAP) that includes decision flowcharts, descriptions of waste streams, and the appropriate laboratory tests. This plan would be an aid to generators when they characterize their waste, as well as an educational material. Hazardous, extremely hazardous, radioactive, and mixed waste will be addressed. Using this WAP, individual procedures can be written when necessary.
- Update the Waste Minimization and Pollution Prevention Awareness Plan.

APPENDIX J

Waste Minimization Technology Projects

This appendix is reserved for technology transfer projects that are scheduled to be identified Fiscal Year 1995 (October, 1994 - September, 1995).

APPENDIX K

Record of Revisions to this Plan

This section is reserved for memoranda regarding updates and revisions to this plan.

LAWRENCE BERKELEY LABORATORY
Environment, Health & Safety Division
Building 75B Rm. 127 Ext. 6123

June 7, 1994
HW-94-230

MEMORANDUM

TO: Committee Members
FROM: Shelley A. Worsham *SAW*
SUBJECT: Waste Minimization Committee Meeting 2/28/94

Attendees: N. Humphrey, S. Blair, Z. Richardson, R. Ellis, T. Goldman (BSO),
L. Chang, B. Smith and S. Worsham.

The February meeting was kicked off by introducing several new members. With the retirement package, we lost Bonnie Rasmussen. She has been replaced with Zelma Richardson. Additional new members include Li-Yang Chang and Brian Smith. Their focus is on ER Waste Minimization activities.

The LBL Waste Oil (non-automotive) Process Waste Assessment (PWA) report was handed out for all committee members to review and comment. The return due date was set for March 13, 1994. All changes will be reviewed and incorporated into the document. The knowledge of PWAs appears to be minimal at LBL. For that reason B. Smith identified possible PWA training held several times per year at the Kansas City Plant.

The Employee Awareness Campaign for FY94 is focused on Pollution Prevention. A variety of activities are scheduled throughout the FY. Several articles have appeared in Currents highlighting awareness of Pollution Prevention. Waste Minimization will participate in the LBL Earth Day month long activities. Also, divisional safety meetings are being addressed to reach a wide expanse of individuals. Several members suggested expanding upon the Waste Minimization information in the general handbook.

DOE-HQ has requested an updated WMin/PPA Plan. This plan is required to be revised every three years. The DOE-OAK due date is 4/25/94. I will be handling the majority of the changes. Upon completion, all members will receive a copy.

The Empty Container Policy continues to be an issue on the front burner. A handout of the latest revision of the policy was provided to all members. The unusual feature about this particular policy is that it is optional. If generators so choose, they may send their empties to the HWHF. There must be a distinction between sharps and recyclable glass. The custodians have been unclear in the past as to what they should and shouldn't pick up. Specific training has been provided to the custodians for clarification of these issues.

The Chemical Exchange Database (CED) continues to progress along in a positive light. Surplus storage has been identified at B51. The B51 WAA storage lockers were donated to Chemical Exchange Database. Product/material that generators absolutely are unable to keep, lab close-outs, and virgin product sent to the HWHF are likely candidates for these storage cabinets. The database is constantly being updated. LLNL and LBL are discussing the possibility of sharing Chemical Exchange Database information and surplus chemicals.

Discussion still abounds as to whether Pollution Prevention incentives are necessary or justified. The incentives should highlight the "biggest changes". One page reviews seem to be the most practical.

An area of high visibility is the Appendix F performance measures. Waste Minimization has 4 specific goals which must be achieved for FY94. Three of the largest waste streams were chosen for reduction purposes of at least 5%. The total aggregate waste must be minimized by 10% for CY94. A goal such as the aggregate reduction will require the effort and participation of all employees.

Large Waste Minimization posters were printed up for the awareness activities. Each committee member was provided one for placement in their area.

CC: S. Blair
L. Chang
R. Ellis
C. Fragiadakis
T. Goldman (BSO)
N. Humphrey
G. Moline
B. Nordman
Z. Richardson
B. Smith

LAWRENCE BERKELEY LABORATORY
Environment, Health & Safety Division
Building 75B Rm. 127 Ext. 6123

June 7, 1994
HW-94-231

MEMORANDUM

TO: Committee Members
FROM: Shelley A. Worsham *Saw*
SUBJECT: Waste Committee Meeting 4/14/94

Attendees: C. Fragiadakis, B. Nordman, R. Ellis, N. Humphrey, L. Chang, S. Blair and S. Worsham

L. Chang started the April meeting by discussing the Process Waste Assessment (PWA) he completed for B25 in the summer of 1993. His view graphs were very helpful in explaining the process and results. Future PWAs include the B77 Wastewater Treatment Process Upgrade and B70A Acid Neutralization. The B77 PWA is for the reduction of acid waste in accordance with Appendix F Waste Minimization goals. Results of each PWA will be shared with the committee.

Efforts continue with the '94 LBL Employee Awareness Campaign. The pollution prevention focus offers a wide gamut of activity opportunities. Waste minimization is working on a booth for the Eco-Fair scheduled for April 20. As divisional safety meetings are held, I try to get WMin/PP on as one of the agenda items.

Progress is being made on the WMin/PPA Plan revision. With the DOE due date of 4/25/94, concentrated effort are being made. A final copy will be presented to each member at the next meeting.

The plans for a pilot program are being developed to help segregate empty glass containers under the Empty Container Policy. Various types of receptacles for glass segregation have been ordered. The idea of starting as a pilot program will allow flexibility and feedback prior to a full blown project.

The communication between LLNL & LBL regarding the Chemical Exchange Databases has been excellent. I met with various representatives from LLNL to actually set up the necessary procedures for a compliant exchange program. LLNL specified that only sealed containers would be in the loop, they would be free (no charge), and government transportation vehicles would be utilized for the movement of the chemicals.

Another awareness "hands-on" item is the Pollution Prevention Wheel. These will be handed out to the LBL employees for alternative/reuse opportunities. The information is useful for both home and work environments.

The function of the WMin/PP committee has changed drastically. The next meeting will address these changes in reference to the revised WMin/PPA Plan. A general evaluation form will be presented for comments on the committee itself, its function and objectives.

The next meeting will also address the WMin Appendix F goals and how they affect the lab.

**NEXT MEETING IS JUNE 21, 1994 AT 1:30 PM IN B69
CONFERENCE ROOM.**

SAW:sh

cc: S. Blair B. Nordman
L. Chang Z. Richardson
R. Ellis B. Smith
C. Fragiadakis
N. Humphrey
~~G. Moline~~