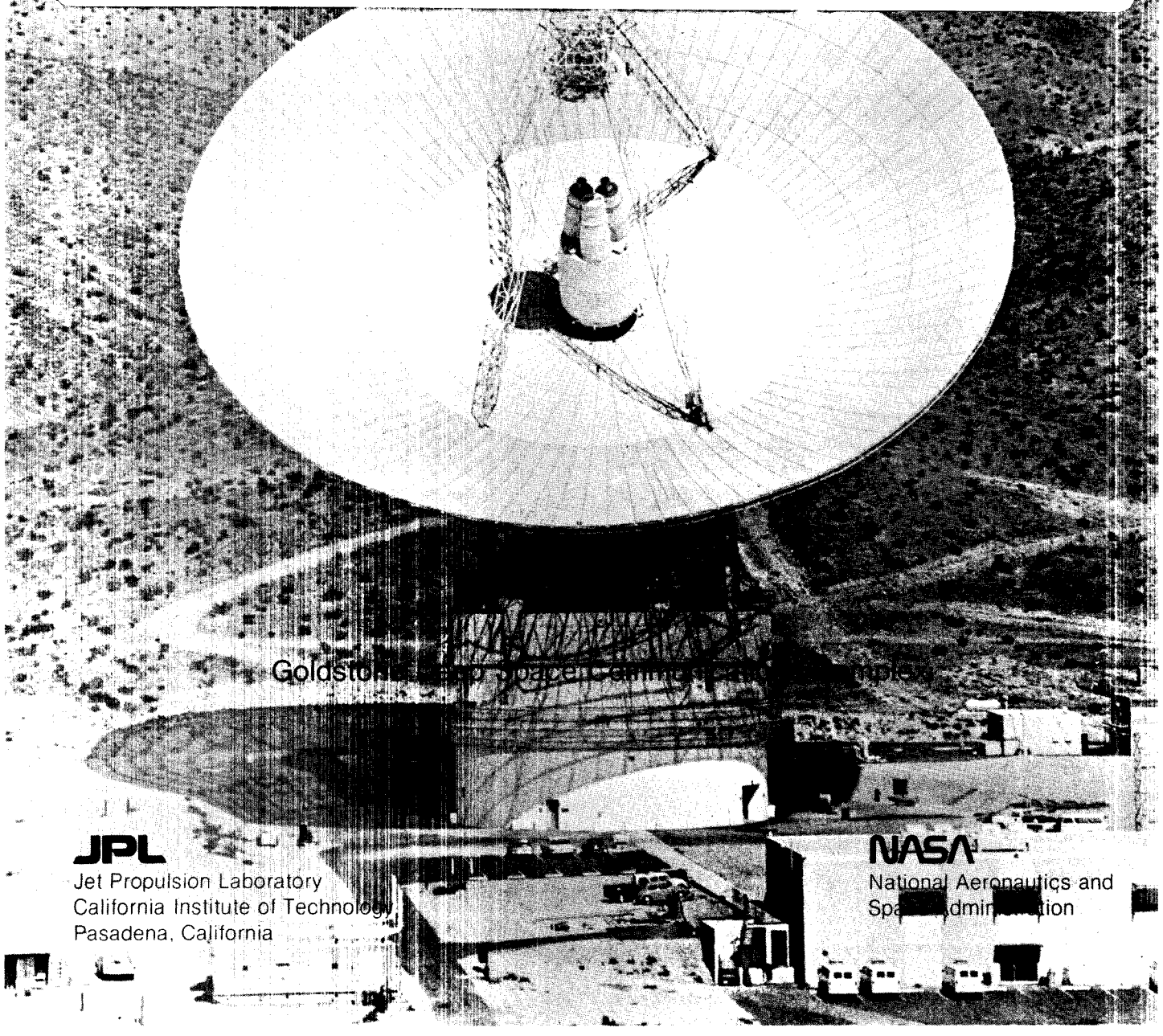
JPL Publication 87-4

September 15, 1987

Environmental Projects: Volume 3

Environmental Compliance Audit
Final Report



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California Institute of Technology
Pasadena, California

NASA
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Space Administration

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September 15, 1987

TO: Recipients of Goldstone Environmental Protection Reports

The Office of Telecommunications and Data Acquisition (TDA) at JPL is publishing a series of reports that describes several environmental projects at the Goldstone Deep Space Communications Complex. A report will be issued as each project in the Goldstone Environmental Protection Program is completed.

The three-fold objectives of these reports are:

1) To provide Goldstone Maintenance and Operations personnel with details of task implementation.

2) To serve as a basis for the documentation of environmental activities at Goldstone, as required by regulatory agencies.

3) To provide prototype samples of reports that can be referred to by other organizations that may be planning similar environmental protection and compliance projects.

The planned TDA reports include the following:

Volume Number	Compliance Task	Approximate Issue Date
1	Polychlorinated Biphenyls (PCB)	Issued
2	Underground Storage Tanks, Testing	Issued
3	Environmental Compliance Audit	9/15/87
4	Asbestos Survey	12/1/87
5	Environmental Assessment (Venus Site) & Environmental Resource Document (Goldstone Complex)	TBD
6	Subsurface Contamination Investigation	TBD
7	Asbestos Abatement	TBD
8	Modifications of Underground Storage Tanks	TBD
9	Upgrade of Hazardous Material Storage Areas	TBD
10	Modifications of Waste Water Treatment Ponds	TBD
11	Modifications of Solid Waste Disposal Areas	TBD

If additional copies, information, or details are desired, contact Len Kushner, TDA Safety and Environmental Protection Engineer, telephone (818) 354-1844, FTS 792-1844.

I.J. Justice, Manager
TDA Resources and Safety

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Environmental Compliance Audit
Final Report

Goldstone Deep Space Communications Complex

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NASA
National Aeronautics and
Space Administration

The work described in this publication was carried out under the direction of the Jet Propulsion Laboratory, California Institute of Technology, and was supported by the National Aeronautics and Space Administration.

ABSTRACT

The Goldstone Deep Space Communications Complex (GDSCC), located in the Mojave Desert about 45 miles north of Barstow, California, and about 150 miles northeast of Pasadena, is part of the National Aeronautics and Space Administration's (NASA's) Deep Space Network, one of the world's largest and most sensitive scientific telecommunications and radio navigation networks. The Goldstone Complex is managed, technically directed, and operated for NASA by the Jet Propulsion Laboratory (JPL) of the California Institute of Technology in Pasadena, California.

Activities at the GDSCC are carried out in support of six large parabolic dish antennas. These activities may give rise to environmental hazards: use of hazardous chemicals, asbestos, and underground storage tanks as well as the generation of hazardous wastes. Federal, state, and local laws governing the management of hazardous substances, asbestos, and underground storage tanks have become so complex there is a need to devise specific programs to comply with the many regulations that implement these laws.

In support of the national goal of the preservation of the environment and the protection of human health and safety, NASA, JPL and the GDSCC have adopted a position that their operating installations shall maintain a high level of compliance with these laws.

M.B. Gilbert Associates (MBGA), Long Beach, California, was retained by JPL to carry out a comprehensive environmental audit of GDSCC operations and records. The thorough audit conducted by MBGA determined present-day compliance with regulations at the GDSCC with respect to hazardous waste, solid waste, air pollution control, waste water, pesticides, and release of hazardous substances to the environment. This report essentially is a JPL-version of the original environmental audit report compiled and submitted by MBGA.

The MBGA audit report identifies both general and specific items of non-compliance at the GDSCC and provides recommendations for corrective actions. The audit findings revealed, however, that non-compliance with environmental regulations at the GDSCC is not significant. Furthermore, the major part of environmental non-compliance at the GDSCC involves such administrative issues as recordkeeping and reporting. Thus, there are no significant hazards to either the environment or to the health and safety of personnel at the GDSCC.

GLOSSARY

APCD	Air Pollution Control District
APCO	Air Pollution Control Officer
AQMD	Air Quality Management District
ARB	Air Resources Board
BACT	Best Available Control Technology
BHP	Brake Horsepower
BTU/h	British thermal units per hour
CAC	California Adminstrative Code
CARB	California Air Resources Board
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
CO	Carbon monoxide
CO_2	Carbon dioxide
CWA	Clean Water Act
DEHS	Department of Environmental Health Sciences (San Bernardino County)
DHS	Department of Health Services (State of California)
DOT	U.S. Department of Transportation
DSCC	Deep Space Communications Complex
DSN	Deep Space Network
DSS	Deep Space Station
EC	Environmental Coordinator
ECA	Environmental Coordinator's Assistant
EPA	Environmental Protection Agency
ERV	Emergency Response Vehicle

FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FOP	Facility Operations Plan
FY	Fiscal Year
Gal/day	Gallons per day
GCF	Ground Communication Facility
GDSCC	Goldstone Deep Space Communications Complex
GPO	Government Printing Office
GSA	General Services Administration
HC	Hydrocarbons
HP	Horsepower
HSWA	Hazardous and Solid Waste Amendments
H_2S	Hydrogen sulfide
HW	(a) hazardous waste (b) hot water
HWTCS	Hazardous Waste and Toxic Control Section
IC	internal combustion
JPL	Jet Propulsion Laboratory
LPG	liquified petroleum gas
LRWQCB	Lahontan Regional Water Quality Control Board
M	Thousand
MBGA	M. B. Gilbert Associates
MM	Million
MSDS	Material Safety Data Sheet
MTF	Microwave Test Facility
NASA	National Aeronautics and Space Administration
NEPA	National Environmental Policy Act
NESHAPS	National Emission Standards for Hazardous Air Pollutants

NIOSH	National Institute for Occupational Safety and Health
NOAA	National Oceanic and Atmospheric Administration
NOCC	Network Operations Control Center
NOD	Notice of Delinquency
NOV	Notice of Violation
NO_x	Various species of nitrogen oxides
NTIS	National Technical Information Service
O&M	Operation and Maintenance
ORM	other regulated material
OSHA	Occupational Safety and Health Administration
PCB	polychlorinated biphenyl
PM	particulate matter
ppm	Parts per million
psia	pounds per square inch absolute
psig	pounds per square inch gauge
PV	pressure valve
RCRA	Resource Conservation and Recovery Act
RQ	reportable quantity (of a specified hazardous substance)
RV	release valve
RWQCB	Regional Water Quality Control Board
SARA	Superfund Amendments and Reauthorization Act
SBC/DEHS/HWTCS	San Bernardino County/Department of Environmental Health Services/Hazardous Waste and Toxic Control Section
S/N	serial number
SOP	Standard Operating Procedure
SO_x	various species of sulfur oxides
SO_2	Sulfur dioxide

Stm	steam
SWAT	Solid Waste Assessment Test
SWDA	Solid Waste Disposal Act
SWMB	Solid Waste Management Board (State of California)
SWRCB	State Water Resources Control Board (California)
TDA	Office of Telecommunications And Data Acquisition (JPL)
TSCA	Toxic Substances Control Act
TSD	treatment, storage, and disposal
TSP	trisodium phosphate
USCG	United States Coast Guard
USEPA	U.S Environmental Protection Agency
UST	underground storage tank(s)
VOC	volatile organic component
VP	vapor pressure

CONTENTS

SECTION I

INTRODUCTION

A. GOLDSTONE DEEP SPACE COMMUNICATIONS COMPLEX

The Goldstone Deep Space Communications Complex (GDSCC) is located in a natural, bowl-shaped depression in the Mojave Desert, in San Bernardino County about 45 miles north of Barstow, California, and about 150 miles northeast of Pasadena, California, where the Jet Propulsion Laboratory (JPL) is located.

The GDSCC is part of the National Aeronautics and Space Administration's (NASA) Deep Space Network (DSN), one of the world's largest and most sensitive scientific telecommunications and radio navigation networks. The Goldstone Complex is managed, technically directed, and operated for NASA by the Jet Propulsion Laboratory of the California Institute of Technology in Pasadena, California. The primary purpose of the DSN is to support the tracking of both manned and unmanned spacecraft missions and to provide instrumentation for radio and radar astronomy in the exploration of the solar system and the universe.

The 52-square-mile Goldstone Complex lies within the western part of the Fort Irwin Military Reservation on land NASA leases from the U.S. Army (Figure 1). The GDSCC is a self-sufficient, working community with its own roads, airstrip, cafeteria, electrical power, and telephone systems and is equipped to conduct all necessary maintenance, repairs, and domestic support services. Facilities at the GDSCC include about 100 buildings and structures that were constructed during a 30-year period from the 1950s through the 1980s. New buildings and structures continue to be constructed at the GDSCC.

Goldstone is one of three Deep Space Communications Complexes (DSCCs) located on three continents: at Goldstone in Southern California's Mojave Desert; in Spain, near Madrid; and at Tidbinbilla, in Australia, near Canberra. Because these three DSCCs are approximately 120 degrees apart in longitude, a spacecraft always is in view of one of the DSCCs as the Earth rotates on its axis (Figure 2).

The Network Operations Control Center (NOCC), which controls and monitors the DSN, is located at JPL in Pasadena. A Ground Communications Facility (GCF) of the DSN operates to link together the NOCC at JPL and the three DSCCs.

Activities at the GDSCC operate in support of six, large, parabolic dish antennas, at sites called Deep Space Stations (DSSs): four DSSs are operational, one is devoted to research and development (R&D) activities, and one has been deactivated. There also are four, similar, operational DSSs in Spain and in Australia. Thus, the NASA DSN consists of a worldwide network of 12 operational DSSs. A seventh parabolic dish antenna at Goldstone is operated by the National Oceanic and Atmospheric Administration (NOAA).

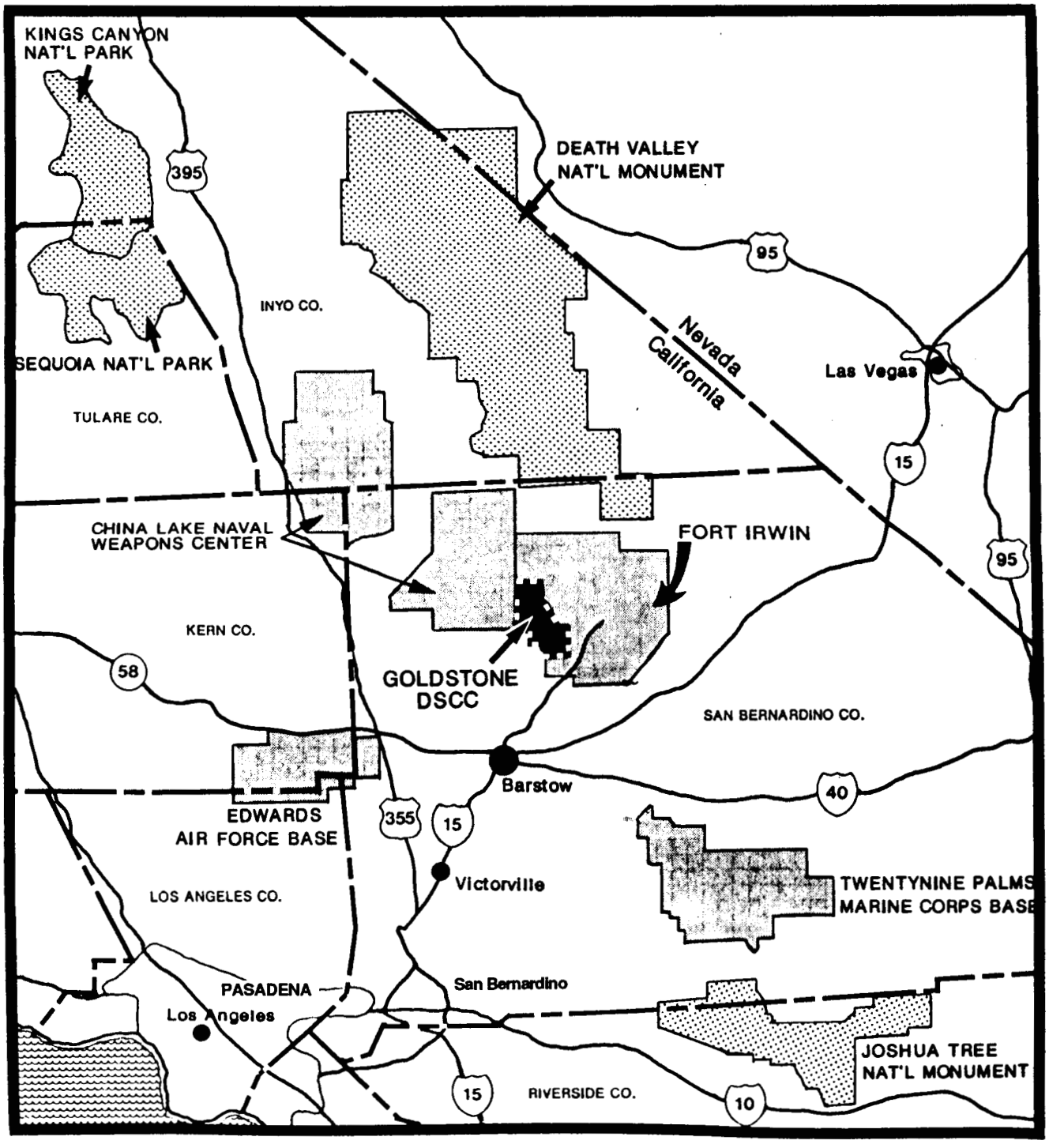


Figure 1. Geographic Relationship of the Goldstone Deep Space Communications Complex to JPL in Pasadena

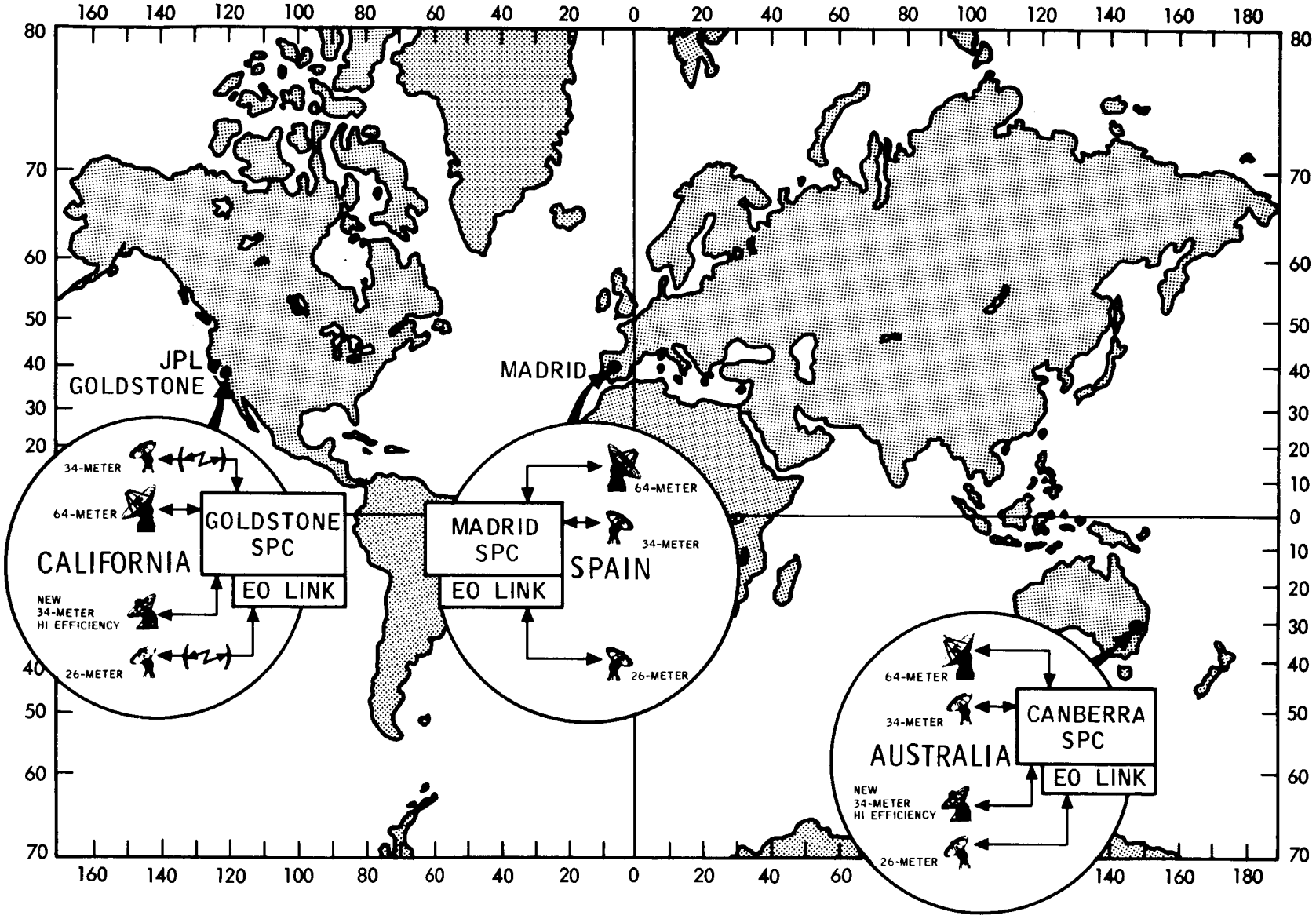


Figure 2. The Three-Continent NASA Deep Space Network as it Existed in 1986

B. ANTENNA STATIONS AT THE GOLDSTONE COMPLEX

The following is a brief historical description of the six NASA/JPL antenna-stations at Goldstone (Figure 3). This environmental audit report deals with environmental surveys of the Echo, Mars, Apollo, Venus, and Mojave Base Sites. The Pioneer Site was not included in the surveys because it now lies outside of the Goldstone Complex. The conventional terminology used in this report refers to an antenna and its appurtenant buildings and structures as a "site," while the antenna itself is called a "station."

1. Operational Deep Space Stations (DSSs)

a. Echo Site: DSS 12 (Echo Station). Originally built in 1959, the 26-meter (85-ft) antenna first was used in 1960 in support of the Echo Project, an experiment to transmit voice communications coast-to-coast by bouncing radio signals off the reflective Mylar surface of a passive ballon-type satellite. In 1978, the antenna was extended to 34 meters (111.5 ft).

b. Mars Site: DSS 14 (Mars Station). Built in 1966, the 64-meter (210 ft) antenna, standing more than 234 ft tall, permitted the DSN's transmitter power and receiver sensitivity to increase 6.5 times compared to that of a 26-meter antenna. It also extended the range of the DSN into deep space by 2.5 times. The 64-meter parabolic dish is to be extended to 70 meters (230 ft) in time to be ready for the Voyager 2 spacecraft's encounter with the planet Neptune in August 1989.

c. Uranus Site: DSS 15 (Uranus Station). Built in 1984, this latest antenna-addition at the Goldstone DSCC is a 34-meter (111.5-ft), high-efficiency (HEF) antenna that first was used to support the Voyager 2 spacecraft's encounter with the planet Uranus in January 1986.

d. Apollo Site: DSS 16 (Apollo Station). This 26-meter (85 ft) antenna, built in 1965 by the NASA Goddard Space Tracking and Data Network (STDN) to support the manned Apollo missions to the Moon, was transferred to the DSN in October 1984. The antenna is used to support satellites in both low- and high-Earth orbits as well as STS (Space Shuttle) missions.

2. Research and Development Deep Space Station

a. Venus Site: DSS 13 (Venus Station). The 26-meter (85-ft) antenna at the Venus Site, originally was located at the Echo Site, and was moved here in 1962. It first was used in a radar astronomy study of the planet Venus. New systems and equipment are thoroughly tested here for performance and reliability before they operationally are introduced into the DSN. A new 34-meter (111.5-ft) antenna has been proposed to replace the 26-meter antenna.

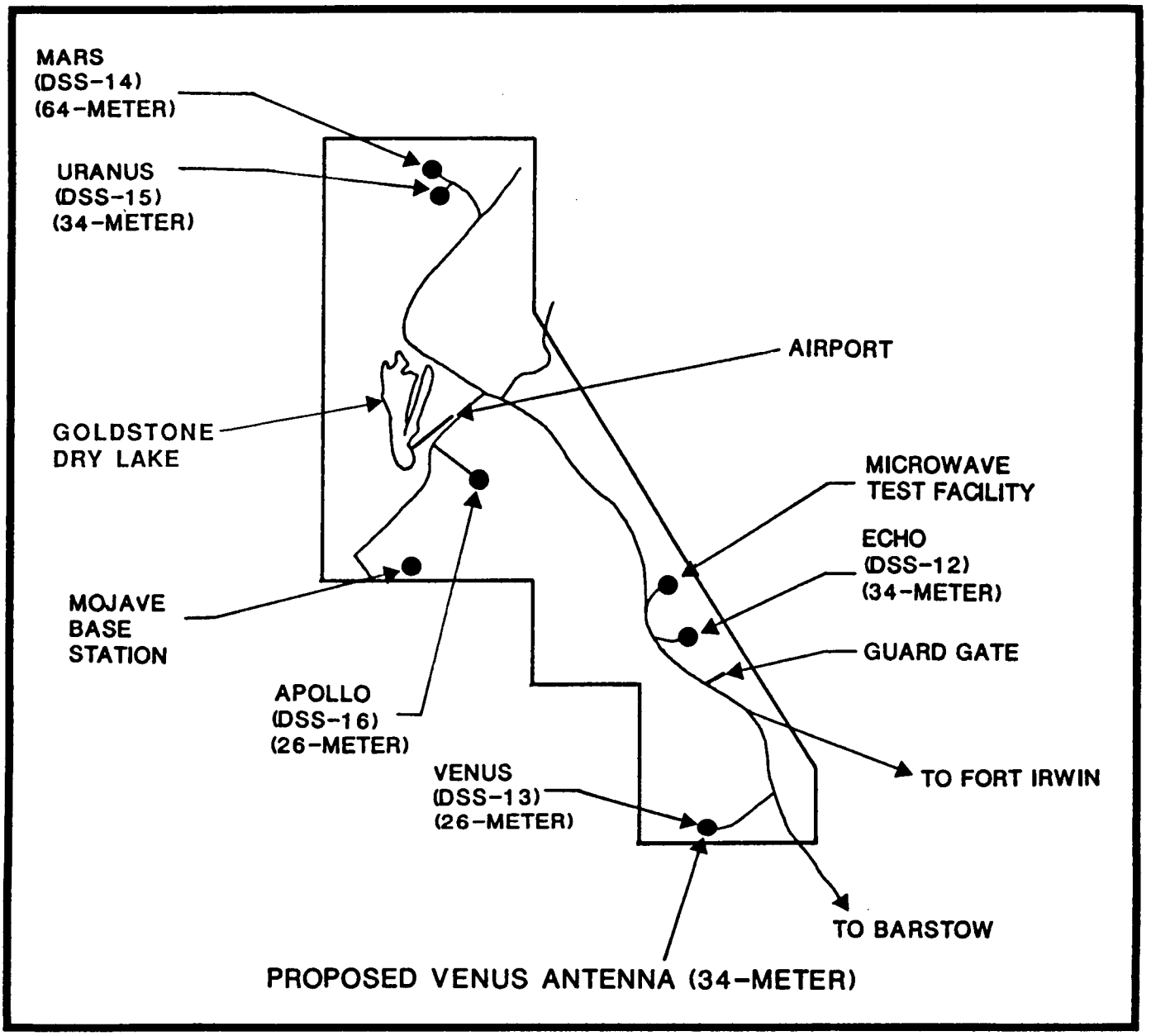


Figure 3. Schematic Map of the Goldstone DSCC Showing Locations of the Six NASA Deep Space Stations (DSSs)

3. Deactivated Deep Space Station

a. Pioneer Site: DSS 11 (Pioneer Station). Built in 1958, the 26-meter (85 ft) antenna first was used in support of the Pioneer 3 spacecraft mission. The antenna was deactivated in 1981, and in 1985, the Pioneer antenna-site was designated a National Historical Landmark by the U.S. Department of Interior. In 1986, the Pioneer antenna-site was returned to the U.S. Army and is no longer located within the Goldstone Complex.

4. National Oceanic and Atmospheric Administration (NOAA): Mojave Base Site

In addition to the six NASA/JPL DSSs the Goldstone Complex also has a 12-meter (40-ft) antenna station at the Mojave Base Site, located near DSS 16, the Apollo Site. This antenna now is operated by NOAA.

C. POTENTIAL ENVIRONMENTAL HAZARDS AT THE GOLDSTONE COMPLEX

Operation and maintenance (O&M) of the various sites at the GDSCC result in the use of hazardous chemical substances and the generation of hazardous wastes. It was reported in 1985 that 20 tons of hazardous wastes were generated at GDSCC including waste oils, cleaning solvents, antifreeze, acids and bases, spent batteries, paints, and thinners. A large portion of these was transported off-site for recycling. The remainder went off-site to permitted hazardous waste disposal facilities. GDSCC also operates an on-site, Class III solid waste landfill. This facility is permitted to receive non-hazardous solid waste generated at GDSCC including garbage, grass and tree clippings, construction debris, and paper materials.

The GDSCC has underground storage capacity for diesel fuels and gasoline used primarily for power generators, service vehicles, and heavy equipment. There are 27 underground storage tanks (USTs) at GDSCC that either are presently in service or temporarily closed, pending removal or replacement. These tanks range in size from 500 to 12,000 gal capacity.

In addition, about 38% of the already-constructed buildings and structures at the GDSCC incorporate asbestos-containing materials, the majority of which is presently in non-friable form such as partitions, floor tile, roofing paper, transite wallboard, underground transite water pipe, and telephone wire conduit. A small quantity of friable asbestos also is found in pipe and boiler insulating materials.

It was because of these potential environmental hazards that NASA/JPL decided to conduct an environmental audit at the GDSCC. M.B. Gilbert Associates (MBGA), Long Beach, California, was retained to carry out this environmental audit at the Goldstone complex.

D. COMPLIANCE WITH ENVIRONMENTAL REGULATIONS

Federal, state, and local laws governing the management of asbestos, hazardous substances, and underground storage tanks (USTs) have become so complex that there is a need to structure programs to comply with the many

regulations implementing these laws. NASA, JPL, and GDSCC, in supporting the national goal of preserving the environment and protecting human health and safety, have adopted a position that their operating installations shall maintain a high level of compliance with these laws based on a policy of prevention rather than reaction. Under supervision of JPL's Office of Telecommunications and Data Acquisition (TDA), efforts have been initiated to develop and implement programs that focus on environmental compliance auditing, UST leak-detection and monitoring, asbestos control and abatement, and the abatement of polychlorinated biphenyls (PCBs).

The TDA office at JPL now is in the process of publishing a series of reports with the general title, "Environmental Projects," that describes the accomplishments of these environmental compliance programs at the GDSCC. Volume 1 describes the Polychlorinated Biphenyl (PCB) Abatement Program. Volume 2 addresses storage of hazardous materials in USTs. This volume, Volume 3, deals with the Environmental Compliance Audit carried out at the GDSCC by the M.B. Gilbert Associates (MBGA), Long Beach, California. The fourth volume in the series of "Environmental Projects" describes the Asbestos Survey and Management/Abatement Plan at the GDSCC. Further volumes on other environmental projects at the GDSCC will be forthcoming in the future.

E. ENVIRONMENTAL COMPLIANCE AUDIT

This volume, which describes the Environmental Compliance Audit, includes the results of a comprehensive audit of GDSCC operations and records conducted by MBGA. The audit was to determine current compliance with regulations on hazardous waste, solid waste, air pollution control, waste water, pesticides, and releases of hazardous substances to the environment. This extensive audit report, prepared by MGBA, identifies specific non-complying items as well as general categories of non-compliance, and provides recommendations for corrective actions. Detailed checklists presented in the report and used to record audit findings can be used by the GDSCC for future routine audits to ensure that a high level of compliance is being maintained on a routine basis. Audit findings reveal that the GDSCC is in significant compliance with regulations. The majority of non-compliance is associated with administrative issues such as recordkeeping and reporting.

Environmental compliance activities were not included in the original scope of work of the Allied/Bendix Field Engineering Corporation, the Operational Contractor at the GDSCC. Yet, as a result of self-motivated interests, the Contractor has responded rapidly to the findings of this environmental audit with continuing efforts to achieve environmental compliance.

Special findings of the audit include the discovery of inconsistency in designating the installation owner and operator, deficiencies in registration for the hazardous waste generator, and lack of procedures for document control. A more detailed discussion of who is the "owner" of the GDSCC, and who is the "generator" of waste at the GDSCC, is found in Section III, B9, pgs. 3-2 and 3-3.

SECTION II

ENVIRONMENTAL COMPLIANCE AUDIT AT THE GOLDSTONE COMPLEX

A. PROJECT OBJECTIVES

The National Aeronautics and Space Administration (NASA) has initiated a program to audit compliance with environmental regulations at each of its centers and facilities. In response to this program, the TDA Office at JPL awarded a contract to M.B. Gilbert Associates, Long Beach, California to audit those O&M practices that are subject to environmental regulations at the GDSCC. The GDSCC is located within the Ft. Irwin Military Reservation, about 40 miles northeast of Barstow, California.

The three objectives of the audit and this report are to:

(1) Assess compliance with environmental regulations including: hazardous waste management regulations, solid (non-hazardous) waste management regulations, air pollution control regulations, wastewater management regulations, pesticide application regulations, and Superfund regulations. The scope of this report, Volume 3, involving the environmental compliance audit at the GDSCC, does not include an assessment of compliance with regulation of PCBs, USTs, or asbestos. The latter are treated respectively in Volumes 1, 2, and 4 of this series of environmental compliance reports.

(2) Provide recommendations for the correction of any non-compliance.

(3) Provide guidance to conduct routine self-audits to maintain a high level of environmental compliance in the future.

B. AUDIT PROTOCOL AND PROCEDURES

1. Background

During the last few years, a process has emerged by which a facility can verify its compliance with environmental laws and regulations. This process, called an "environmental audit," can function as an information management system to guide environmental coordinators in their day-to-day effort to achieve regulatory compliance. It also can function to alert management to potential risks associated with facility operations before any injury is done to personnel health or the environment.

Non-compliance can result in fines (state agencies are not restricted from assessing fines on federal facilities), or in criminal actions brought against responsible parties. Non-compliance can result in obvious damage to the environment (a chemical spill), or in insidious damage (causing health effects in employees or the general public years after an environmental incident has occurred).

Because of the issue of long-term health risks, risk assessment has become a second aspect of the auditing process. California voters recently passed the Toxics Initiative (Proposition 65). This proposition requires industry to be accountable for the prevention of conditions that result in risks to the public health through releases to the environment of toxic chemicals (primarily carcinogens). As a result, various operating facilities now have the task to assess their usage of various chemicals and to take measures to ensure that specified chemicals are properly managed.

Proposition 65 specifically excludes Federal facilities from its regulations. These facilities, however, are not immune from the consequences of their actions, particularly when these actions involve damage to human health. Although the GDSCC audit was not intended to assess risks arising from non-compliance, the audit does send a message that facilities must take the initiative to make these assessments, with or without the force of legal requirements. More and more, facilities are using the audit process to set their own compliance standards for conditions that have not as yet been regulated.

Auditing can focus mainly on regulatory compliance. Most facilities that become proficient in auditing, however, find that their audits become increasingly more complex. It becomes apparent quite early in the audit process that there is an integral relationship between the ability to achieve compliance and the management controls and procedures that should be in place to ensure compliance. The GDSCC audit also includes a review of appropriate management controls.

2. Methodology

There are five basic phases to an environmental audit:

(1) Phase 1: Pre-audit Planning and Research. This phase involves:

(a) Review of facility maps, engineering plans, and drawings.

(b) Review of current laws and regulations at Federal, state, and local levels.

(c) Acquiring of copies of facility permits and plans.

(d) Identification of sources of emissions, types of discharges, status of a facility as a treatment, storage, or disposal facility, history of spills, notices of violation, and other background information that will assist the auditor in setting up the audit and assigning the appropriate staff to the audit team.

Pre-audit planning is achieved by discussions with the facility management and staff and use of a pre-audit questionnaire. Additional information is obtained from

facility engineering, appropriate local environmental agencies, and the facility environmental coordinator. The audit team then compiles the background information and organizes it for the second phase of the audit.

(2) Phase 2: Review of Management Controls. The second phase of the audit involves understanding management systems already in place that support the facility's environmental program. This requires meeting with management to discuss duties and responsibilities of staff, organizational structure and staffing of environmental activities, accountability systems, and specific environmental concerns. The audit team uses a management checklist as an aid to collect information on programs, procedures, and responsibilities for each compliance area (hazardous waste, air pollutions, etc.). A facility tour then is conducted to permit the audit team to become familiar with processes, operations, and the physical plant.

(3) Phase 3: Records Review and Field Survey. The third phase of the audit involves the confirmation of compliance with laws and regulations. Efforts in this phase involve an examination of records and files for completeness and accuracy. Permits are examined and a determination is made as to whether operations are properly permitted and whether permit conditions are being met. Each section of the regulations is reviewed to determine facility compliance with its provisions. A detailed field survey then is conducted.

(4) Phase 4: Information Compilation and Analysis. The fourth phase of the audit is to evaluate information compiled during Phases 1 through 3 and to prepare a report of audit findings. This phase can involve a single audit, or an audit followed by a period for coming into compliance followed by a second audit. This second approach is beneficial for facilities that either have no programs or emerging programs, since the preliminary audit is of an instructional nature and helps facility personnel to move through the learning curve at a faster rate.

(5) Phase 5: Presentation of Audit Findings. The fifth and final phase of the audit is the out-briefing, in which the auditor makes a presentation of findings to key staff at the facility. This step is essential because the audited party often has difficulty accepting audit findings. Substantial benefits can come from an open-forum discussion not only of these findings, but also of the consequences of not acting on the recommendations presented.

The MBGA audit team initiated its pre-audit investigation by compiling inspection checklists for use during interviews and field investigations by obtaining essential engineering drawings and records for preliminary review, by conducting preliminary telephone interviews with cognizant JPL and GDSCC personnel, and by contacting local regulatory agencies to verify permitting requirements and the status of newly approved regulations.

During May 1986, the MBGA audit team met at GDSCC with JPL and GDSCC staff to conduct in-field inspections of GDSCC operations, facilities, utilities, and records. The audit team consisted of of an environmental engineer, chemical engineer, civil engineer, industrial hygienist, sanitary engineer, chemist, and geologist. This range of disciplines provided the technical diversification and necessary range of experience needed to assess considerations required of an environmental compliance audit. Both JPL and GDSCC personnel accompanied and guided members of the audit team throughout the course of the audit. To ensure that accurate information was being conveyed, appropriate staff were re-interviewed following each inspection period. At appropriate times, inspections were conducted in a formal manner simulating, as much as possible, the climate that might exist during an actual agency inspection. Personnel were interrogated in detail and their responses critically evaluated. The purpose of this exercise was to prepare staff for an actual agency inspection.

MBGA staff then briefed key GDSCC personnel on the audit findings. Areas of non-compliance were identified, solutions to problems were discussed, and strategies for achieving general compliance were developed during the meeting. Throughout the next few months, GDSCC staff responded to and corrected many of the deficiencies noted at the audit meeting. The GDSCC staff consulted with MBGA as needed.

In February 1987, MBGA staff again met with JPL and GDSCC staff to discuss progress made to date and to conduct a final in-field inspection. Audit findings were updated, and the GDSCC staff was given a final briefing prior to preparation of the audit report.

C. REPORT ORGANIZATION

This report has been organized into 11 sections and 4 appendixes. Sections 1 through 4 include introductory material, a summary, and a guidance for using this compliance audit report. The remaining 7 sections each address a separate area of environmental regulations (hazardous waste management, solid waste management, etc.) and, wherever applicable, contain a compliance checklist. The internal organization of sections may differ somewhat, depending on the complexity of the regulations and the variety of facilities affected by the regulations. The 4 appendixes deal with waste discharge requirements for wastewater ponds, annual reports for wastewater ponds, examples of environmental forms, and a publications list.

SECTION III

SUMMARY AND CONCLUSIONS OF ENVIRONMENTAL COMPLIANCE AUDIT

A. COMPLIANCE AUDIT FINDINGS

A detailed compliance audit conducted at the Goldstone Complex finds that Goldstone is not in significant non-compliance with environmental regulations. The deficiencies and non-complying conditions that have been identified in this report do not seem to have any substantial impact on public health and the environment.

Most of the deficiencies noted in this audit are administrative in nature and are primarily a result of poor definition of the duties and responsibilities of the GDSCC on-site contractor as expressed in its former work agreement with JPL. As a result of self-motivated interests, however, the on-site contractor has responded rapidly to the findings of the environmental audit with continuing efforts to achieve environmental compliance. A new work agreement recently has been prepared that specifically addresses requirements for an environmental management program, and these requirements have been implemented by the GDSCC contractor.

B. COMPLIANCE STATUS

The GDSCC recently has developed a formal Environmental Management Program for tracking regulatory requirements. Compliance with regulations in the past has been mostly arbitrary, except when the GDSCC responded to mandatory agency directives. It is to the credit of JPL and the GDSCC on-site contractor that discharges from operations in the past have been controlled, and environmental impacts have been minimal.

Because the GDSCC staff had not analyzed environmental regulations in sufficient detail, the audit team had expected to find deficiencies in compliance when the compliance is measured against each section of the code. This is precisely the situation that existed at Goldstone. Although waste management facilities are well-operated and are especially well-kept, some of the details of compliance have been overlooked.

It should be noted that the GDSCC now is coming into compliance and that many of the deficiencies that were identified in this report are being eliminated. Areas of non-compliance at the GDSCC can be generalized as follows:

(1) Program Management. The GDSCC did not have a written policy concerning environmental management nor did it have a structured management program. Although not required by law, these are essential if compliance is to be achieved.

(2) Recordkeeping. A formal recordkeeping system had not been established at the GDSCC. For this reason, many required records were not being maintained, and pertinent data were not being

collected in the field to support recordkeeping requirements. It is important to note that although the GDSCC had few serious environmental infractions, there was very little on record to document its good behavior. Guidance for organizing a filing system is provided in Table C-3 in Appendix C.

(3) Reports and Plans. Required reports and plans neither were being prepared nor were they being prepared correctly. For example, the GDSCC had not prepared the following: (a) an Emergency Preparedness/Spill Contingency Plan, (b) a procedure for Exception Reporting, (c) deficiency reports, (d) operating and maintenance logs for the solid waste landfill and wastewater ponds, and (e) essential standard operating procedures.

(4) Inspections. There was no formalized Inspection Program for any of the waste management facilities. Routine inspection of all waste management facilities (landfills, ponds, and storage areas) is not only required by law, but is in support of a preventive rather than reactive approach to compliance. The inspection program can and should be used as a tool for ensuring that facilities are operated in a safe and environmentally sound manner.

(5) Training. As yet, personnel training requirements have not been met in full. Not only is the GDSCC responsible for meeting specific training requirements for personnel directly involved in waste management activities, but it also should take responsibility for providing general environmental and safety awareness training for all GDSCC personnel.

(6) Environmental Monitoring of Waste Management Facilities. Monitoring plans to determine ground-water quality and to detect generation of gases, leachate, and air emissions at the active Echo Site landfill have not been prepared and submitted to the appropriate agencies. Periodic testing of the effluent going to the wastewater ponds, to determine whether industrial chemicals are entering the ponds, is not being done.

(7) Operations. None of the waste management facilities (including ponds, landfill, and waste storage areas) are operated in full compliance with regulations. There are no written standard operating procedures (SOPs) to provide guidance for proper operation of facilities.

(8) Labeling, Marking and Posting of Signs. Non-compliance in this area was facility-wide.

(9) Signatures on Permits and Other Legal Documents. There is no consistency in the designation on either permits or correspondence of who is the legal owner/operator/generator of GDSCC. It is of utmost importance that action be taken immediately to establish which organization(s) is(are) to be designated, and which signatures are to appear on official external documents. The issue of who is to be registered as "generator" must also be addressed.

Another issue that also must be considered is how the GDSCC, as a Government facility, can have a non-Government entity as "owner" and retain the designation of a Federal facility. As a Government facility, the GDSCC typically would have either Ft. Irwin or NASA designated as "owner" of facilities to be recorded on permits and other compliance-oriented documents. Operators of Government facilities, however, can be Government agencies or private parties without affecting the status of the facility as a Federal facility. In the second case, the private party generally assumes primary responsibility for compliance. The Government entity designated as "owner", however, is not subsequently relieved of responsibility (refer to Section V.E6d, page 5-27, and Section V.H, page 5-39). The issue of owner/operator is central to compliance responsibility for all environmental laws.

The issue of who is "generator" is important in the context of the law dealing with hazardous wastes. Either a Government or private sector party (or both parties) can take responsibility as the generator of hazardous waste at a Federal facility (or any type of facility) and not affect the status of that facility. The only constraints are that the generator must have applied for and received an Environmental Protection Agency (EPA) generator's identification number and, where local rules so stipulate, must have a generator's permit from the local agency. An owner may take responsibility as generator for all waste generated on the property regardless of who actually generates the waste. For this situation, however, the owner must have both an EPA identification number and a local agency generator's permit (if a local permit is required). If a party applies for a local generator's permit, it must also apply for an EPA generator's identification number.

(10) Accountability. At present, there is no effective procedure for internal review of all documents issued from the GDSCC (permits, correspondence, reports, and manifests). A procedure should be developed and implemented as soon as possible to ensure that information contained in these documents is accurate. Far too many documents were released that contain incorrect information and that are not representative of conditions at the GDSCC (see Section V.E6d).

Accountability also should extend to the management and operation of the GDSCC Environmental Compliance Program. Periodic review and evaluation of the effectiveness of the GDSCC program should be conducted by JPL to ensure that a high level of compliance is being achieved. By becoming involved in this manner, JPL can control and minimize its liability for future enforcement actions that might arise should the GDSCC program fail to meet its objectives.

C. RECOMMENDED CORRECTIVE ACTIONS

The recommended criteria for establishing priorities for corrective action to be applied in the assessment of the relative priority of projects are listed below in order of importance:

(1) Is the condition impacting or threatening to impact public health and safety?

(2) Is the condition impacting or threatening to impact the environment (air, soil, and water)?

(3) Is the condition impacting or threatening to impact property?

(4) Is the condition or deficiency of administrative importance (e.g., inspection records are not on file)?

When conflicts arise, the condition with the highest priority (based on the criteria presented above) must be addressed with as rapid a response as the condition warrants. If two conditions are ranked of equivalent importance, both conditions must be acted upon. If a facility does not have the resources to respond to both conditions, outside assistance should be brought in at once.

Table 1 lists conditions and deficiencies at the GDSCC that require corrective action. Items in the table have been ranked according to priority, based on what seem to be prevailing conditions. Studies have not been conducted to validate whether criteria are appropriately applied. Priorities identified in the table, therefore, should be carefully reviewed by JPL and the GDSCC staff prior to preparation of a final plan and schedule to take corrective action.

Action items are ranked according to the following designations:

(1) A condition that impacts or threatens to impact public health is ranked 1.

(2) A condition that impacts or threatens to impact the environment is ranked 2.

(3) A condition that impacts or threatens to impact property is ranked 3.

(4) An administrative or program management deficiency that involves major non-compliance or has adverse impact on the effective operation of the environmental program is ranked 4-1.

(5) An administrative or program management deficiency that involves minor non-compliance, but that adversely would impact the effective operation of the environmental program is ranked 4-2.

(6) An administrative or program management deficiency that involves minor non-compliance and has little or no adverse impact on the efficient operation of the environmental program is ranked 4-3.

Table 1. Corrective Action Projects Ranked According to their Priority[a]

Action Item	Ranking[b]
I. GENERAL	
A. Prepare a plan of action and schedule for achieving and maintaining environmental compliance	4-1
B. Designate who is the facility owner and operator at GDSCC to whom permits should be issued and correspondence sent	4-1
C. Designate an environmental regulatory liaison	4-1
D. Become familiar and stay current with environmental regulations	4-1
E. Prepare policy, program, and management plans	4-1
F. Develop a plan for the issue of press releases regarding incidents involving releases of chemicals to the environment	4-3
G. Prepare program-planning documents for both short and long term "needs"	4-3
H. Complete and maintain a regulatory and technical library	4-1
I. Obtain Material Safety Data Sheets (MSDS) for all products used at the GDSCC	4-1

[a]Items listed in this table are generalizations taken from the full text of this document. Whenever action is taken to correct a non-compliance, it is recommended that this table be used in conjunction with the more detailed discussions contained in the text.

[b]A ranking of:

1 implies actual or impending impact on public health and safety.
2 implies actual or impending impact on environment.
3 implies actual or impending impact on property.
4-1 implies administrative issue with major compliance and program management impact.
4-2 implies administrative issue with minor compliance and major program management impact.
4-3 implies administrative issue with minor compliance and minor program management impact.

Table 1. (Cont'd)

Action Item	Ranking[b]
J. Develop Standard Operating Procedures (SOPs) for a filing system	4-1
K. Develop SOPs for recordkeeping and reporting	4-1
L. Develop SOP for responding to Notices of Violation (NOV)	4-2
M. Develop SOP and checklists for a weekly inspection program, including deficiency reporting	4-1
N. Develop standard forms for collection of field data	4-3
O. Compile list of required records and reports	4-1
P. Develop procedure for tracking compliance	4-2
Q. Investigate the use of the computer for data management	4-3
R. Develop a Personnel Training Plan	4-1
S. Develop accountability procedure for internal review of all documents to ensure information contained in documents is accurate	4-1
II. HAZARDOUS WASTE MANAGEMENT	
A. Studies/Cleanup	
1. Clean up spills at hazardous waste collection points (Mars, Echo, and Apollo Sites)	1[c],2
2. Conduct investigation at storage yard near Power Generator Building G-81 at the Mars Site	1[c],2
3. Clean up contaminated soil and asphalt at the storage yard near Power Generator Building G-81	1[c],2
4. Clean up soil in area of engine generators, and fix leaking engine generators at the Venus Site	2

[c]There is no evidence that health now is being affected by contaminants in the soil. Criteria 1 has been applied because of potential exposure of workers to chemicals in the soil during sampling and cleanup activities.

Table 1. (Cont'd)

Action Item	Ranking[b]
B. Safety	
1. Inspect storage areas at the Venus Site	1[c]
2. Provide appropriate grounding and bonding of containers	1[c]
C. Construction	
1. Plan design for new centralized storage facility at Yard 1, Echo Site	2
2. Construct new centralized hazardous waste storage facility at Yard 1, Echo Site	2,3
3. Construct conforming storage facility at storage yard near Power Generator Building G-81 at the Mars Site	2,3
4. Construct conforming storage facility at Logistics' storage pad at the Apollo Site	2,3
5. Relocate collection point at Building G-42 at the Echo Site	2
6. Upgrade facilities and equipment at collection points to address deficiencies	2
7. Provide necessary emergency/spill cleanup kits at waste storage areas	2
8. Provide for required equipment for waste oil tank at both the Echo and Mars Sites	2
9. Repair visual gauge on sulfuric acid tank at the Mars Site and keep containment area free from debris	1,2
D. Administrative/Management	
1. Address issue of who is the owner/generator/ operator at the GDSCC	4-1
2. Define all wastes generated as hazardous, extremely hazardous, recyclable (hazardous), recyclable (non-hazardous), non-hazardous. Provide a basis for these selected definitions	4-1

Table 1. (Cont'd)

Action Item	Ranking[b]
3. Conduct site visits to commercial off-site waste management facilities and determine their status from the State Department of Health Services (DHS)	4-3
4. Determine whether the facility will adopt a Proposition 65-type program for controlling release of carcinogens to the environment	4-3
5. Review hazardous waste landfill "ban" regulations and develop a long range plan for restricting/substituting products purchased and managing wastes to reduce the quality of restricted wastes generated at the GDSCC	4-3
E. Develop Standard Operating Procedures (SOPs)	
1. Develop SOPs for managing less-than-90-day storage facilities	4-1
2. Develop SOP for manifest tracking and exception reporting	4-1
3. Prepare SOP for pre-transportation procedures	4-1
4. Prepare SOP for determining and displaying waste accumulation start dates	4-1
5. Develop SOP for weekly inspection program, including deficiency reporting	4-1
6. Develop SOP for labeling and marking of containers	4-1
7. Develop policy and procedure for management of spent lead-acid batteries	4-2
8. Develop SOP for management of empty containers	4-1
9. Develop policy for turn-in and collection of hazardous and recyclable wastes	4-1
10. Develop SOP for prohibitions concerning the ordering of restricted products for use at GDSCC	4-2
11. Develop a policy for the solidification of hazardous wastes	4-3

Table 1. (Cont'd)

Action Item	Ranking[b]
F. Prepare Necessary Plans	
1. Prepare a Waste Minimization Plan	4-1
2. Prepare a Waste Management Table	4-1
3. Develop a Personnel Training Plan	1, 4-1
III. SOLID WASTE MANAGEMENT	
A. Studies/Cleanup	
1. Conduct investigation of Mojave Base Station dump site	1[c],2
2. Close Mojave Base Station dump site	1[c],2
B. Administration/Management	
1. Prepare a study of the short and long term disposal capacity at the GDSCC	4-3
C. Develop Standard Operating Procedures	
1. Develop SOP for waste separation, reclamation for recovery, recycling, and collection	4-2
2. Develop SOP for recording weights or volumes of wastes deposited into the landfill, and procedures for calculating the rate of waste disposal and the remaining capacity	4-1
3. Develop SOP concerning types of wastes accepted for burial at the GDSCC landfill, and wastes restricted from burial. Identify those wastes that are restricted from collection dumpsters	4-1
D. Prepare Necessary Plans and Reports	
1. Prepare Ground-Water Detection Monitoring Program Plan, or obtain written waiver from the Regional Board	2

Table 1. (Cont'd)

Action Item	Ranking[b]
2. Prepare Closure Plan for active landfill at the Echo Site[d]	2
3. Prepare a Design Report	2
4. Prepare an Operation Plan	1,2
5. Prepare a site description and map for all Echo, Mars, and Mojave Site landfills, to be filed with the county recorder and the local agency that maintains the county's solid-waste management plan	1,2
6. Complete a 5-year report to be prepared by a Professional Engineer, that evaluates the site design, implementation, and operation plan	2
7. Prepare Solid Waste Assessment Test (SWAT) reports (all SWAT reports, Closure Plans, Operations Plans, Design Reports, and Ground-Water Monitoring Program Plans can be incorporated in the Report of Waste Discharge)	2
E. Operation and Maintenance	
1. Maintain a site log, and record information on the length and depth of cuts in terrain where fill is placed. Also record fires, floods, and other unusual occurrences	2
2. Post all required signs	1
3. Inspect and properly maintain active and closed sites. Document this effort	2
IV. AIR POLLUTION CONTROL	
A. Administration/Management	
1. When annual permits are renewed, suggest to the District that equipment be identified on permit with a GDSCC serial number	4-3

[d]Although a Closure Plan is not required until 180 days prior to closure, MBGA recommends that the closure plan be prepared and reviewed by the Regional Water Quality Control Board (RWQCB), so that engineering, construction, and budgets can be programmed with ample lead time.

Table 1. (Cont'd)

Action Item	Ranking[b]
2. Determine permit status of Item 48 from Table 13 in Section VII	4-1
3. Apply for permits for oil/water separators or request an exemption	4-1
4. Post facsimiles of all permits within 25 ft of permitted equipment	4-1
5. Obtain current MSDS from all vendors of coatings and solvents	4-1
6. Determine photochemical reactivity classification for all coatings and solvents used at the GDSCC	4-1
7. Obtain data on sulfur content from vendors in the format used in Air Pollution Rule 431 (see Section VII.E2)	4-1
8. Obtain usage data for coatings and solvents used for painting and degreasing operations	4-1
V. WASTEWATER MANAGEMENT	
A. Studies/Cleanup	
1. Take soil samples from inactive pond at Mojave Base Site	2
2. Close Mojave Base Site Oxidation Pond	2
B. Administrative/Management	
1. Establish schedules for O&M and inspection activities	4-1
C. Develop Standard Operating Procedures	
1. Prepare SOP for operation and maintenance of the ponds	4-1
2. Prepare SOP for system users, defining restricted discharges to the system	4-1
3. Develop O&M log sheet and procedures for its use	4-1

Table 1. (Cont'd)

Action Item	Ranking[b]
4. Compile required information on the wastewater system	4-1
D. Operations and Maintenance	
1. Maintain the slopes and clear the weeds from ponds as required	4-1
2. Monitor user practices routinely to ensure that restricted discharges are not entering the ponds	4-1
3. Maintain an O&M log sheet	4-1
VI. PESTICIDE SUBSTANCE MANAGEMENT	
A. Administrative/Management	
1. Develop a Pesticide Management Plan that addresses authorized use of pesticides, frequency of use, spill prevention, safety, inspections, recordkeeping, and applications policies, restrictions, and procedures	4-2
VII. REPORTING OF RELEASES OF CHEMICALS TO THE ENVIRONMENT IN REPORTABLE QUANTITIES	
A. Administrative/Management	
1. Develop a procedure for defining reportable quantity (RQ) and for calculating quantities spilled	4-2
2. Develop an external reporting procedure	4-2
3. Develop a plan to issue press releases regarding incidents involving reportable spills	4-3
4. Develop a file procedure for documenting releases on a monthly basis, including statements that serve to document when no spills have occurred	4-1

It is assumed in the above discussion and rankings that whenever a response to an incident is necessary, all efforts will be made to protect whatever NASA/JPL mission is underway in conjunction with the criteria presented above. Management will act responsibly in making decisions that seem to be in conflict. For these reasons, protection of NASA/JPL missions was not specifically included in the ranking system.

D. ESTIMATED LABOR REQUIREMENTS TO OPERATE THE GDSCC ENVIRONMENTAL MANAGEMENT PROGRAM

To have an effective Environmental Management Program, the GDSCC environmental group should have sufficient staff with appropriate skills and training. Once the group is established, the Environmental Coordinator can initiate the process of developing the program management tools. A list of these management tools and associated labor estimates are provided in Table 2. The work products identified in the table are items to be accomplished during the first 6 months of program development. The content of these work products, however, should not be viewed as monolithic. The Environmental Coordinator should update management documents to reflect changes in the program, and should review these documents at least annually to ensure that they reflect both the most recent conditions at the GDSCC and the most recent environmental regulations.

Staffing requirements to operate the Environmental Management Program on a day-to-day basis are presented in Table 3. Labor hours can be added to those in Table 2 to obtain total first year labor estimates for operating the GDSCC program. Not included in these estimates is neither a factor for emergencies/contingencies nor the resource requirements for special projects. Special projects and larger, more complex efforts, such as design and construction projects or cleanup efforts, are listed in Table 1.

E. CONCLUSIONS

It should be noted that California has an aggressive, expanding environmental regulatory program. Agencies are enforcing the regulations and non-compliance can be very costly. By the same token, new regulations are emerging so rapidly that achieving compliance has become a dynamic process. Environmental management must commit considerable man-hours each month to remain current with emerging regulations. Management also must be able to interpret the regulations and determine how they affect the facility's compliance status. The findings presented in this report, therefore, should not be construed to represent a static condition. JPL and the GDSCC must continue to track the regulations and re-evaluate compliance status on a routine basis. A prudent view would be to consider staying in compliance as an ongoing project.

Table 2. Development of Management Tools for the Environmental Management Program at the GDSCC (Minimum First Year Work Effort)[a]

Item	Estimated Project Duration[b]	Projected Staffing[c]	Estimated Labor Hours
Prepare Policy Statement, Program Plan, and Management Plan	2 months	EC	160
		ECA	80
		Clerical	40
Prepare Operations Plans for Landfill, Ponds and Storage Facilities	3 months	EC	176
		ECA	360
		Clerical	120
Prepare Standard Operating Procedures	6 months	EC	304
		ECA	120
		Clerical	48
Develop an Inspection and Audit Program	1 month	EC	24
		ECA	48
		Clerical	16
Develop Contingency/Emergency Plan for Releases, Fires, and Explosions	1 month	EC	40
		ECA	48
		Clerical	32
Develop a Training Program Plan	1 month	EC	64
		ECA	24
		Clerical	8
Develop a Waste Minimization Plan	1 month	EC	24
		ECA	48
		Clerical	16
Prepare a Hazardous Waste Table	2 weeks	EC	8
		ECA	32
		Clerical	16
Establish a Formal Recordkeeping and Reporting System	2 weeks	EC	32
		ECA	8
		Clerical	16
Maintain an Environmental Regulations and Technical Library	Ongoing	EC	8
		ECA	8
		Clerical	32
Estimated labor hours for program development (first year):			980

[a]Does not include PCB, Underground Tank, and Asbestos Management Programs.

[b]Project duration means the length of time to prepare necessary documents, draft review and rewrite, and final review and write-up.

[c]EC means Environmental Coordinator; ECA means Environmental Coordinator's Assistant.

Table 3. Estimated Staffing Requirements to Operate an Environmental Management Program[a]

Program Area	Program Element/Labor Function[b]	Estimated Labor, h/yr
Hazardous Waste	Project Management	
	Environmental Coordinator	640
	Field Inspector	1,200
	Clerical/Word Processor[c]	
	Operations and Maintenance	
	Storage Facility Manager[d]	200
	Laborer/Driver (waste collection)	48
	Laboratory (cost, outside lab)	0
	Clerical[c]	
Solid Waste	Project Management	
	Environmental Coordinator	107
	Field Inspector	30
	Clerical/Librarian[c]	
	Operations and Maintenance	
	Equipment Operator	248
	Litter Control Labor	208
	Engineering[e]	48
	Clerical[c]	
Wastewater	Project Management	
	Environmental Coordinator	240
	Field Inspector	160
	Clerical/Librarian[c]	
	Operations and Maintenance	
	Equipment Operator	80
	Maintenance Mechanic	Undetermined

[a]Staffing needed to operate Asbestos, PCB, and Underground Tank Programs is not included in this estimate. Allowances should be made when considering staffing for the Environmental Management Program.

[b]The Safety Coordinator must support all environmental management functions.

[c]The clerical/computer/librarian support function will require one full-time person.

[d]Manifesting, labeling, marking, inventory management, storage site surveillance, operations supervision.

[e]Engineering support includes surveying, measuring locations of trenches and cuts, and calculation of fill volumes.

Table 3. (Cont'd)

Program Area	Program Element/Labor Function[b]	Estimated Labor, h/yr
Air Pollution	Project Management	
	Environmental Coordinator	24
	Field Inspector	40
	Clerical/Librarian[c]	
	Operations and Maintenance	
	Maintenance Mechanic	Undetermined
Pesticides	Project Management	
	Environmental Coordinator	4
	Safety Coordinator	12
	Clerical/Librarian[c]	
	Field Inspection	
	Safety Coordinator	40
Superfund	Project Management	
	Environmental Coordinator	8
	Clerical[c]	
	Estimated annual labor requirements:	5,417

A reasonable and constant level of compliance will not be achieved without a firm commitment of resources as well as support from upper management. If upper management is not already aware of its responsibilities under the law, every effort should be made to convey this message to it. Management should not be isolated from environmental matters and should be kept informed through tools such as a monthly state-of-compliance report.

An accountability system should be established for tracking compliance and for ensuring that the environmental management program is meeting its objectives. This can be accomplished through a program of regular inspections of facilities and records, review of actions taken with respect to deficiency reports, and the monthly state-of-compliance report. JPL also could offer assistance in assuring the GDSCC accountability through an independent facility inspection program.

SECTION IV

USE OF THE ENVIRONMENTAL COMPLIANCE AUDIT

A. CORRECTIVE ACTION RESPONSE PLANS

As soon as the GDSCC Environmental Coordinator has access to the final audit report, a preliminary corrective action plan, based upon the findings of this audit report, should be prepared. One approach to preparation of the plan is to compile lists of non-complying conditions according to their relative importance. For example, the list might group items by health and safety impact, by environmental impact, and by impact to property. A second list might group items relating to deficiencies in the management system, and a third list might group remaining administrative items.

A completion schedule should be prepared for each line item, and staff should be assigned to work problems on the list. A format example is provided in Table 4. The completed preliminary plan should be submitted for review to the management of the TDA Office at JPL. A meeting might be scheduled for more detailed discussions.

Following approval of the preliminary plan, detailed strategy and corrective action plans should be prepared for major projects. These detailed plans should be submitted by the GDSCC to JPL TDA as soon as they are completed for review. Staffing and budget requirements can be discussed at a meeting following receipt of review comments from management.

Details for each major project should be worked out, a final completion schedule should be prepared, contacts with agencies should be made, as necessary, and implementation of the projects should proceed as soon as is practicable.

Records should be maintained on file to document completion of all action items. Progress reports submitted to JPL/TDA should identify progress made toward compliance.

A periodic accountability audit should be conducted by JPL/TDA to ensure that corrective actions are being taken, solutions are correct and effective, and that work is proceeding on schedule.

B. IMPORTANCE OF MANAGEMENT INVOLVEMENT

The report of audit findings is like a snapshot of a facility's compliance status at any given point in time. For this reason, and for more obvious reasons relating to the severe consequences of non-compliance, a facility should enter into a corrective action program as rapidly as possible. Senior management commitment is critical to the immediate and continuing success of the compliance effort and ultimately to the Environmental Management Program. For this reason, the corrective action program and schedule outlined by the Environmental Coordinator must be reviewed by appropriate JPL TDA managers.

Progress reports or state of compliance reports should be prepared at least monthly by the Environmental Coordinator for management review. This is one means by which the Environmental Coordinator can inform management of critical issues. It is essential in today's regulatory climate that management go on record as having knowledge of conditions at the facility and as having taken a proactive role in supporting programs that protect health, safety, and the environment.

Table 4. Illustrative Format for Corrective Action Plan and Schedule

Action Item	Ranking	Project Start Date	Schedule (Weeks) 0	1	2	3	4	5	6	7	8
SAFETY											
Inspect storage areas at Venus Site	1										
Provide appropriate grounding and bonding of containers	1										
Post all required signs at collection points	1										
Post all required signs at landfill	1										
Repair visual gauge on sulfuric acid tank at Mars Site and keep containment area free from debris	1,2										
STUDIES/CLEANUP											
Clean up spills at hazardous waste collection points (Mars, Echo, and Apollo Sites)	1,2										
Conduct investigation at storage yard near Power Generator Building G-81 at Mars Site	1,2										
Clean up contaminated soil and asphalt at the storage yard near Power Generator Building G-81	1,2										
Conduct investigation of Mojave Base Site dumpsite	1,2										
Close Mojave Base Site dumpsite	1,2										

Table 4. (Cont'd)

Action Item	Ranking	Project Start Date	Schedule (Weeks) 0	1	2	3	4	5	6	7	8
PLANS/REPORTS											
Preparation of a landfill operation Plan is recommended	1,2										
Prepare a site description and map for all Echo, Mars, and Mojave Site landfills to be filed with the county recorder and the local agency that maintains the county's solid waste management plan	1,2										

SECTION V

HAZARDOUS WASTE MANAGEMENT

A. BACKGROUND

Regulations promulgated under the Resource Conservation and Recovery Act (RCRA) are included in 40 Code of Federal Regulations (CFR) Parts 122 and 260-271: Environmental Protection Agency Hazardous Waste Management System. These regulations address the management of hazardous wastes (and not hazardous materials) by generators, transporters, and owners and operators of treatment, storage, and disposal facilities.

Under 40 CFR Part 271, individual states may receive authorization from the EPA to operate their own Hazardous Waste Management Programs, providing those programs are at least as stringent as the Federal program. Although the California DHS has not as yet received full EPA authorization, it is functionally responsible for administrating the state's Hazardous Waste Management Program. Full authorization is anticipated to be granted in 1987. Statutes affecting the program are presented in the Health and Safety Code, Chapter 6.5, Hazardous Waste Control, Sections 25100 through 25249. Pursuant to the code, regulations have been enacted and published in the California Administrative Code (CAC), Title 22, Division 4, Chapter 30: Minimum Standards for Management of Hazardous and Extremely Hazardous Wastes.

The subsections that follow provide the following information: (1) Articles in CAC, Title 22, addressing management of hazardous waste (Section 5.2), (2) a statement of conditions at the GDSCC (Section 5.3), (3) correlation between the GDSCC compliance status and the articles identified in Section 5.2 (Section 5.5), (4) compliance with state, local, and Federal laws (Sections 5.6, 5.7 and 5.8, respectively), and (5) recommendations for bringing the GDSCC into compliance (Section 5.9).

B. SYNOPSIS OF CALIFORNIA HAZARDOUS WASTE REGULATIONS

Hazardous waste regulations are extremely complex. For the past decade they have been subject to almost continual change. The synopsis of CAC Title 22 regulations, provided in the text that follows, is extremely general and intends only to provide the reader with a concept of the topics addressed by the regulations. Details of compliance are presented in the compliance checklists presented in Tables 5 and 6.

Article 1: Presents definitions of terms used in the regulations. It is important to review these definitions and those presented in the Health and Safety Code to avoid misinterpretation of the regulations.

Article 2: Provides information on the applicability of the regulations, procedures for classifying a waste as hazardous or nonhazardous, variances, and procedures for applying for permits.

Article 3: Describes enforcement proceedings and facility inspections, orders, appeals, and rewards for informants.

Article 4: Presents detailed procedures for the preparation of a permit application for a hazardous waste facility.

Article 5: This article addresses procedures for registering as a hazardous waste hauler.

Article 6: Describes requirements for generators of hazardous waste.

Article 6.5: Describes requirements for transporters of hazardous waste.

Article 7: Describes requirements for the management of wastes designated in the regulations as extremely hazardous wastes (refer also to Articles 9 and 11).

Article 8: Addresses fees for on-site and off-site disposal of hazardous wastes, and also provides a mechanism for waiver of fees.

Article 9: Lists the chemical and common names of substances that may be classified as hazardous wastes when offered for disposal.

Article 10: (Does not exist at this time).

Article 11: Lists criteria for identifying whether or not substances qualify for being classified as hazardous or extremely hazardous.

Article 12: Describes criteria for classifying wastes as recyclable and requirements for managing recyclable hazardous wastes and recycling facilities.

Article 13: Presents requirements for management of infectious wastes.

Article 14: Presents prohibitions for chemical toilet additives.

Article 15: Addresses land disposal restrictions and schedules, and provides a list of wastes to be restricted from disposal into or onto land. Exemptions, variances, and emergency variances are also addressed.

Article 16: Presents selection and ranking criteria for hazardous waste sites requiring remedial action. Sites presently owned by the Federal Government may not be selected for ranking.

Article 17: Addresses financial requirements for hazardous waste management facility closure and post-closure maintenance care and insurance requirements for liabilities associated with sudden and non-sudden accidental coverage.

Article 18: Provides general facility requirements for less-than-90-day storage facilities, interim status facilities, and permitted facilities. Included in the article are rules for waste analysis, security, inspections, training, management of ignitable, reactive, or incompatible wastes, and special design standards.

Article 19: Addresses requirements for preparedness and prevention related to facility design and operation, and equipment testing and maintenance.

Article 20: Lists requirements for the preparation of contingency plans and emergency procedures.

Article 21: Addresses requirements for manifest deficiency reporting and for maintenance of operating logs and other records.

Article 22: Addresses requirements for environmental monitoring at interim status and permitted facilities.

Article 23: Identifies requirements for preparation of closure and post-closure plans for interim status and permitted facilities.

Article 24: Provides requirements for the use and management of containers that store hazardous wastes.

Article 25: Lists requirements for tanks that store hazardous wastes.

Articles 26 through 32: Address requirements for interim status and permitted treatment and disposal facilities.

Article 33: Applies to the certification of hazardous waste testing laboratories.

A discussion that applies the requirements of these articles to compliance at the GDSCC is found in Section V.E of this report.

Table 5. Compliance Checklist for Hazardous Waste (From CAC, Title 22)

Section	Section Description	In Compliance? Yes	No	N/A
ARTICLE 6	REQUIREMENTS FOR GENERATORS OF HAZARDOUS WASTE Does the generator use the following methods to determine if wastes are hazardous:			
66471	Determine if waste is excluded from regulation		X	
66471(a)	Determine if waste is a listed hazardous waste (HW)	X		
66471(b)	Determine if waste is identified in CAC Title 22 by either:			
66471(b)(1)	Testing the waste	X		
66471(b)(2)	Applying knowledge of the hazard characteristic of the waste in light of the materials or processes used	X		
66472(a)(b)	Has the generator received an EPA ID number before treating, storing, disposing, or transporting HW	X[a]		
66472(b)	Has the generator obtained an EPA ID number by applying to DHS	X[a]		
66472(c)	Does the generator ensure that no HW is offered to transporters or treatment, storage, and disposal (TSD) facilities that have not received an EPA ID number	X[b]		
66480(a)	Does the generator prepare a manifest before transporting HW off-site	X		
66481(a)	Only the Uniform Hazardous Waste Manifest is used	X		

[a]JPL has an ID number, the GDSCC contractor does not.

[b]More careful scrutiny is required in the case of the GSA oil-recycling contractor.

Table 5. (Cont'd)

Section	Section Description	In Compliance? Yes	No	N/A
66481(b)	Applicable sections are accurately completed for all wastes transported off-site		X	
	The following is on all manifests:[c]			
66482(a)(1)	Manifest document number	X		
66482(a)(2)	Name, mailing address, phone number, EPA ID number of generator, Five-digit serialized manifest number	X		
66482(a)(3)	Name, and EPA ID number of transporter(s)	X		
66482(a)(4)	Name, address, and EPA ID number of designated facility	X		
66482(a)(5)	U.S. Department of Transportation (DOT) description of waste(s)		X	
66482(a)(6)	Total quantity of waste(s) and type/number of containers	X[d]		
66482(b)	Certification statement	X		
	Copies of manifest available for review	X		
	Properly completed copies submitted monthly to DHS	X[e]		
66484(a)(1)	Does the generator sign the manifest certification	X		
66484(a)(2)	Does the generator obtain signature of initial transporter and date of accepted manifest	X		
66484(a)(3)	Does the generator retain the proper copies of the manifest	X[e]		
66484(b)	Does the generator give the transporter remaining copies of the manifest	X[e]		
66484(f)	Does the generator submit to the DHS within 30 days of shipment, a legible copy of each manifest used	X[e]		
66504(a)	Is waste packaged in accordance with DOT regulations in 49 CFR 172.101	X		
66504(b)	Are waste packages labeled in accordance with DOT regulations in 49 CFR 172.101		X[f]	

[c]In most cases, non-compliances can mean that the item occurs on the manifest incorrectly, or that item generally does not appear on manifest.

[d]In compliance in all cases except with GSA contract hauler.

[e]Compliance assumed. The GDSCC does not keep a log of manifests or any record of manifest submittals to the DHS.

[f]Compliance uncertain. Labels are not on drums in storage.

Table 5. (Cont'd)

Section	Section Description	In Compliance? Yes	No	N/A
66504(b)	Are containers marked in accordance with DOT regulations in 49 CFR 172.101, including proper shipping name, proper ID number, proper "other regulated material" (ORM) designation for containers of ORM-A,B,C,D, or E wastes		X	
66504(c)	Are containers of 110 gal or less marked with the following words:			
	"Hazardous Waste: Federal Law Prohibits Improper Disposal. If found, contact the nearest police or public safety authority or the California Department of Health Services."	X[g]		
	Generator's name and address	X[g]		
	Manifest document number	X[g]		
66504(b)	Does the generator ensure that the transporter has appropriate placards as per 49 CFR 172 Subpart F	X[h]		

[g]Compliance assumed. MBGA has never been present during shipping of wastes off-site.

[h]Generator leaves this responsibility to the hauler.

Table 6. Compliance Checklist for Owners/Operators of Less-than-90-Day Hazardous Waste Storage Facilities (From CAC, Title 22)

Section	Section Description	In Compliance? Yes	No	N/A
From Health and Safety Code:	Storage of 5,000 gal or 45,000 lb waste in any tank for any period of time defines a hazardous waste facility requiring a permit	a		
	Accumulation start-time begins when facility generates more than 220 lb of hazardous waste or more than 2.2 lb of extremely hazardous waste. If facility generates this quantity in any one month, then start time is the first day that waste went into storage		X[a]	
ARTICLE 4	HAZARDOUS WASTE FACILITY PERMIT			
66371(c)(1)	If waste is stored for less than 90 days, a permit is not required, provided there is compliance with Article 6, Section 66508		X[b]	
66371(c)(2)	A permit is not required for adding absorbent to waste or waste to absorbent, providing that this is done when waste is first placed in containers	X		
ARTICLE 6	REQUIREMENTS FOR GENERATORS OF HAZARDOUS WASTE			
66492	Copies of manifests are retained. Copies of Biennial Reports and Exception Reports are retained. Records of results of waste analyses are retained		X[c]	
66508(a)(1)	Waste must be placed in containers and generator complies with Article 24 as applies to interim status facilities, or		X[b]	
	Waste is in tanks, and generator complies with Article 25 as applies to interim status facilities (except for Section 67258)		X[b]	

[a]GDSCC doesn't log accumulation time on containers.

[b]In compliance except for weekly inspections.

[c]GDSCC is not aware of the requirement for exception reporting. A log is required to document compliance.

Table 6. (Cont'd)

Section	Section Description	In Compliance? Yes	No	N/A
66508(a)(2)	Accumulation start-date is marked and visible on each container	X[a]		
66508(a)(3)	Each container or tank is labeled or marked HAZARDOUS WASTE		X[d]	
66508(c)(1)	If non-stationary, show composition and physical state of the waste		X	
66508(c)(2)	If non-stationary, show the hazard class (e.g., flammable, reactive)		X	
66508(c)(3)	If non-stationary, show the name and address of the waste producer		X	
66508(a)(4)	The storage area must comply with requirements for Preparedness and Prevention (Article 19), Contingency and Emergency Procedures (Article 20), and Personnel Training (Article 18, Section 67105)		X	
ARTICLE 7	ADDITIONAL REQUIREMENTS FOR MANAGEMENT OF EXTREMELY HAZARDOUS WASTES			
66570	An extremely hazardous waste permit has been obtained, if necessary		X	
ARTICLE 18	GENERAL FACILITY STANDARDS FOR INTERIM STATUS AND PERMITTED FACILITIES			
67105(a)(1)	Personnel have classroom or on-the-job training		X	
67105(a)(2)	The training program is directed by a qualified person		X	

[d]The GDSCC tanks are not labeled.

Table 6. (Cont'd)

Section	Section Description	In Compliance? Yes	No	N/A
67105(a)(3)	At a minimum, the training program teaches emergency preparedness		X	
67105(b)	Employees must complete training within 6 months of hire, and cannot work unsupervised until training is complete		X	
67105(c)	Annual refresher training is provided		X	
67105(d)	Training documents and records are maintained		X	
67105(e)	Training records are maintained for the required length of time		X	
ARTICLE 19	PREPAREDNESS AND PREVENTION FOR INTERIM STATUS AND PERMITTED FACILITIES			
67120(a)	The facilities are operated to minimize the possibility of a fire, explosion, or any unplanned, sudden, or non-sudden release of hazardous waste to air, soil, or surface water that could threaten human life or the environment		X	
67120(b)	A contingency plan has been developed for facilities that lie within the 100-yr floodplain			X
67121	The facilities are equipped with the following, if necessary: Internal alarm or communications system (voice or signal) Telephone or two-way radio Portable fire extinguisher and equipment (e.g., foam), spill equipment and decontamination equipment Adequate water supply for fire-fighting		X[e]	

[e]Small facilities are in compliance, Yard 1 and storage area near equipment shop at Echo Site are out of compliance.

Table 6. (Cont'd)

Section	Section Description	In Compliance? Yes	No	N/A
67123	Two-way radio and/or alarm is available if waste is being poured or if employee is working alone	X		
67124	Aisle space is adequate, if determined to be necessary	X		
67126	Emergency response arrangements have been made with local authorities	X		
ARTICLE 20	CONTINGENCY PLAN AND EMERGENCY PROCEDURES FOR INTERIM STATUS AND PERMITTED FACILITIES			
67140	A contingency plan has been prepared for the facility		X	
67141	The plan contains information on response actions, arrangements made with responders and local authorities, information on emergency coordinators, list of equipment at facility, and an evacuation plan		X	
67142	Copies of the contingency plan have been distributed to responders		X	
67143	The plan is kept up-to-date and is amended when necessary		X	
67144	Responsibilities of the emergency coordinator have been defined		X	
67145	Emergency procedures have been established		X	
ARTICLE 24	USE AND MANAGEMENT OF CONTAINERS			
67241	Containers must be in good, non-leaking condition	X		

Table 6. (Cont'd)

Section	Section Description	In Compliance? Yes	No	N/A
67242	Wastes must be compatible with their containers or container liners	X		
67243(a)	Container must be stored closed, unless waste is being added or removed	X		
67243(b)	Handling of containers must be so as not to damage containers or cause them to leak	X		
67244	Weekly inspections are required that note leaking containers, deterioration of containers and the containment system		X	
67246	Containers holding flammables and reactives must be at least 50 ft from facility property line	X		
67247(a)	If incompatible wastes/materials are placed in the same container precautions must be taken to prevent a reaction (in accordance with 67106(b)	X		
67247(b)	Wastes are not placed in unwashed containers that previously held an incompatible substance	X		
67247(c)	Containers, etc., holding incompatible substances shall be separated by berms, walls, dikes or other devices	X		
ARTICLE 25	TANKS AT INTERIM STATUS AND PERMITTED FACILITIES			
67257(a)	If incompatible wastes/materials are placed in the same tank, precautions must be taken to prevent a reaction [in accordance with 67106(b)]	X		
67257(b)	Hazardous substances, which could cause the tank to rupture or fail before the end of its intended life, are not placed in tanks	X		

Table 6. (Cont'd)

Section	Section Description	In Compliance? Yes	No	N/A
67257(c)	Uncovered tanks are operated with 2 ft of freeboard, unless the tank is equipped with a containment structure, drainage control system, or diversion structure (e.g., standby tank with capacity greater than the volume of the 2-ft freeboard)			X
67257(d)	Tank that is continuously fed with a waste has a cutoff system or a bypass system to a standby tank		X[f]	
67259(a)	Waste tanks are inspected for the following equipment, if they are present: Discharge control system (once in an operating day) Pressure and temperature gauges (once in an operating day) Liquid level in tank (once in an operating day) Materials of tank construction for leaks or deterioration (weekly) Condition of containment structures (weekly)		X	
67260	Tanks have been properly closed, if no longer in use	X		
67261(a)	Ignitable and reactive waste is not placed in the same tank except under allowable conditions	X		
67262	Wastes are not placed in an unwashed tank that previously held an incompatible substance, except as provided in 67106(b)	X		

[f]Waste oil tank at Mars Site may not be in compliance.

C. STATEMENT OF CONDITIONS AT THE GDSCC

The GDSCC is a contractor-operated facility. Until recently, the contractor's performance agreement with JPL did not stipulate responsibility for environmental management. Under a new agreement, the contractor has assumed responsibility for operating the GDSCC in compliance with all applicable environmental regulations. The contractor has responded rapidly to this responsibility by correcting many of the non-compliance action items that were identified in May 1986 during a preliminary MBGA audit of hazardous waste activities conducted at the GDSCC.

As defined in CAC, Title 22, the GDSCC is a generator of hazardous waste. An EPA Generator's Identification Number and San Bernardino County Generator's Permit have been obtained. The GDSCC operates no hazardous waste treatment, storage, or disposal facilities that would require a Hazardous Waste Facilities Operating Permit. The GDSCC, however, does maintain several hazardous waste storage facilities (known as Collection Points). These serve as small volume waste collection points for accumulation of hazardous and recyclable wastes such as oils, solvents, antifreeze, ethylene glycol, and batteries. None of these collection points stores wastes in excess of 90 days and a permit is not needed under present rules. It should be noted that although a permit to operate is not required, less than 90-day collection points are subject to regulation. Specific regulations for these facilities are listed in Table 6.

The GDSCC has a waste minimization program that focuses primarily on recycling waste for reuse. Effort in the future may also include reducing the quantities of new materials purchased. It should be noted that the GDSCC presently generates moderate quantities of waste annually. Information provided by the GDSCC contractor personnel to the California Board of Equalization in 1985 estimated waste generation to be about 20 tons. This estimate may include the quantity of waste recycled as well as the quantity shipped for off-site disposal.

At the present time, the GDSCC has no structured environmental management program and has insufficient staff to support such a program. Efforts are currently underway to correct these deficiencies.

Although the GDSCC is not in full compliance with environmental regulations, its operations are not presently endangering the environment.

D. SURVEY FINDINGS

The following is a narrative of findings based on a series of field surveys conducted at the GDSCC during May 1986 and February 1987. Field surveys were augmented by interviews with the GDSCC contractor, JPL, and NASA personnel. Findings from the earlier survey were updated by the re-survey conducted during February 1987. Many of the non-complying conditions found during the earlier survey have been corrected by the GDSCC contractor. The following narrative describes conditions as of the second survey in February 1987. A comparison of conditions at the GDSCC with each article of

the state hazardous waste regulations is provided in Section V.E of this report. All references to Articles of the regulations refer to the CAC, Title 22, Division 4, Chapter 30: Minimum Standards for Management of Hazardous and Extremely Hazardous Wastes.

1. Echo Site

a. Acid Storage Pad Located Near the Solid Waste Landfill. This is a concrete pad enclosed by a chain-link fence. The fence gate is supplied with a lock. The pad is used primarily to store drums of new acid used as an additive in the Mars Site reverse osmosis unit (Building G-89). Spent lead-acid storage batteries also are stored on the pad. The area is posted with "Danger-Acid" and caution signs. As long as the spent batteries are stored on the pad, hazardous waste rules apply. At a minimum, the batteries must be labeled as hazardous wastes and be posted with the type of waste and accumulation start date. Special rules applying to the management of spent lead-acid batteries should be consulted. These rules are found in Article 12, Section 66822. Although there are no state requirements for the storage of hazardous materials, it is suggested that, at a minimum, equivalent standards be applied to these facilities as are applied to less-than-90-day hazardous waste storage facilities.

b. Solid Waste Disposal Site. Although this area is not generally used for managing hazardous wastes, it was being used temporarily as a collection and processing point for empty drums. This measure was reported to have been taken on a one-time basis to rid the complex of all of its empty containers. The drums no longer are present, the soil in the area used for temporary storage shows no evidence of staining or spillage, and the area will not be used for this purpose again. The GDSCC presently is planning a central waste processing area in Yard 1, Echo Site.

c. Yard 1, Station Complex Supply. Plans for this area are to construct a staging and storage facility suitable for handling about 50 hazardous waste drums. At the time of survey, there were four hazardous waste drums stored here along with non-hazardous, recyclable empties. Most drums now are stored directly on the ground, but the GDSCC has chemical-resistant, non-flammable pallets on order.

Three of the waste drums were labeled with the standard yellow hazardous waste label, but the accumulation start-date had not been posted. Labels did not have correct DOT Proper Shipping Names, EPA Waste Numbers were missing, and one label had no DOT name at all on the label (although the composition of the waste mixture was posted).

Empty drums did not carry labels identifying the drums as now empty but formerly containing a hazardous material. It is suggested that Article 6, Section 66508(c) and the Department of Health Services, Los Angeles Region be consulted to determine proper labeling and marking requirements. If the yellow label is to be used for on-site storage (rather than a GDSCC label),

Article 6, Section 66504 and 49 CFR 172 should be consulted. Note that although the label in Section 66504 need only be applied prior to transport off-site, Section 66508 requires that containers be labeled with specified information during on-site storage.

It is recommended that prior to using the yard for storage, the GDSCC consult the requirements for operating less-than-90-day storage facilities, as well as the requirements for designing and operating interim status and permitted storage facilities. Although the more stringent standards are not required by law, they are designed to minimize the potential for accidents that impact health and environment and should be applied as a matter of good safety and engineering judgment.

d. Flammable Drum Storage Area Adjacent to Building G-42 Equipment Shop. Although some improvements have been made, this area has not been properly operated since the time of the first MBGA inspection. It is used as a hazardous materials dispensing area as well as a hazardous recyclable waste collection point. Materials present are primarily oils and solvents. Drums were labeled, but accumulation start-dates were not posted on waste drums. Posting of proper signs was lacking. Cigarette butts were on the ground next to the drums.

A possibly hazardous situation may result from the fact that the area is situated on a rise and discharges from drums can flow onto the surrounding dirt. This condition is exacerbated by allowing hose drainage from equipment washdown (which occurs just above the storage area) to flush the area of discharge on a regular basis. The resultant flow carries contaminants out of the area and down a natural drainage ditch that has been cut into the dirt. Small drip pans, placed beneath spigots of the dispensing drums, alleviate this problem somewhat.

It is recommended that the drums should be moved out of the path of hose drainage to a flatter area offering better protection from spills. If equipment cleaning involves the use of chemicals, the practice of discharging washdown to the ground also should be eliminated. Contaminated soil from the area should be removed and containerized for proper disposal.

Leaking spigots should be fixed or replaced, and all drums properly labeled. The area should be posted with the appropriate signs indicating caution and no smoking. The GDSCC has ordered the following equipment for this area: pressure relief valves for drums containing flammable liquids, funnels with closeable lids, and siphon pumps for transfer of liquids.

e. Storage Behind Building G-39 Paint Shop. A hazardous waste accumulation drum used to store a flammable liquid is too close to the building. The GDSCC is planning to move the drum. The label on the drum bears an incorrect DOT Shipping Name and no accumulation start-date. A drum of flammable hazardous material labeled "lacquer thinner" is stored at the front of Building G-39. This drum was found to be leaking and should be fixed or replaced. GDSCC should consolidate storage of these drums with the drums stored a few yards away at Building G-42. A more suitable area should be selected as the storage site.

f. Drum Storage at the Hydromechanical Building G-34. This area is maintained in a clean and safe condition. All drums are labeled and in good, non-leaking condition. This is an exemplary site. All small storage and dispensing areas should be maintained in a similar condition.

g. Drum Storage Rack at the DSS-12 Echo Station. This rack is situated on unpaved ground outside of the fenced area that surrounds the antenna. The rack, with drums that store new ethylene glycol, is placed here for convenience, is out of the way of traffic, and is used for storage and not for dispensing. As long as the area is inspected routinely, there does not seem to be a reason for providing more elaborate storage facilities.

h. Drum Storage Area Behind Machine at Shop Building G-28. This area has been maintained below acceptable condition since the earlier MBGA survey. All three drums have spigots dripping contents to the asphalt. It is recommended that this area be cleaned up, new drums be provided with spigots that do not leak, drip pans be provided to collect dripping from spigot use, a no smoking sign be posted, and an inspection of this area be conducted routinely until personnel using the area can maintain proper conditions. In addition to cleanup of spills, some repaving is recommended.

There is a pipe leading from oil-filled equipment inside of the building to the ground outside. The pipe is reported to be valved. It is recommended that the pipe be capped to prevent discharge of oil to the ground. Removal of contaminated soil beneath the pipe is recommended, even though the contamination seems to be minor and restricted to the surface.

i. Waste Oil Tank Behind Power Generator at Building G-24. Just behind Building G-24 is an aboveground waste oil tank of 1,000 gal capacity. Waste oil is piped to the tank from the adjacent power generator building. Although the tank can be filled manually, this is not the current practice. The tank is unmarked and there are no caution signs.

A concrete berm, which surrounds the tank, is in good condition and has been constructed with a closeable drain pipe at the low end. The berm, however, has been underdesigned and is insufficient as a containment structure for a 1,000 gal tank. This deficiency can be addressed by emptying the tank to half capacity. Because the tank must be emptied at least every 90 days, this should not present a storage problem.

The containment area was filled with combustible debris and the drain pipe valve was in the open position. Requirements stipulate that drains must remain closed, except when in use.

It is recommended that the containment area be kept free from debris and the drain pipe valve be closed (the valve should be of a lockable, positive-closing type). The tank should be pumped at least every 90 days and should not be filled beyond half capacity. Proper signs also should be installed, the accumulation start-date should be posted, and the tank should be marked or stenciled "Waste Oil" unless a sign is provided that states that the tank contains waste oil.

2. Mars Site

a. Underground Waste Oil Tank at the Power Generator Building G-81. Just outside of the building is a small, concrete pad surrounded by a curb. Beneath this pad is a 500 gal tank. Through underground piping, the tank receives waste oil from engine generators and an external fill port is accessible for adding waste oil manually from containers. The tank recently was precision-tested and found to be in non-leaking condition. Waste oil is removed from the tank about every 2 months by an outside hauler and is sent to a recycler. Tank capacity does not exceed 5,000 gal and, therefore, does not require a permit under provisions of the California Health and Safety Code, Section 25123.3(a)(2).

As an underground waste storage tank, this tank is subject to the provisions of the California Health and Safety Code, Division 20, Chapter 6.7: Underground Storage of Hazardous Substances, Section 25284.1 (Monitoring and Inspections). It also is subject to the requirements for less-than-90-day storage facilities, including provisions of Article 8, Section 67106(b) and Article 25, Sections 67257 (General Operating Requirements) and 67259 (Inspections).

It is recommended that a no-smoking sign be posted as well as a sign or placard describing the contents of the tank along with an accumulation start-date. A post fitted with an easel covered by a plexiglas cover can be installed for this purpose. Updated information regarding the contents of the tank and the accumulation start-date can be inserted beneath the plexiglas cover each time the tank is emptied.

It also is recommended that a silicone or other effective sealer be applied around the fill port/concrete juncture to ensure that liquids accumulating in the spill collar do not seep into soil through the juncture. Curbs should be inspected regularly for leakage because they were observed to be cracked during the field survey. The GDSCC should maintain verification that this tank is emptied at least every 90 days.

Spillage just outside of the curbed pad was observed and should be cleaned up. Housekeeping associated with use of the tank can be improved through a memo issued to users and can be enforced through the GDSCC Waste Management Facility Inspection Program. It is recommended that manual use of the tank either be discontinued or be controlled in a better fashion. Mobile oil bowsers (rolling tanks) could be purchased and used to pick up oil at the various antenna stations for recycling.

b. Hazardous Material Storage and Dispensing Area Adjacent to Power Generator Building G-81. This is an asphalted and fenced area used to store equipment, supplies, and about 20 drums of flammable liquids. Dispensing of liquids also occurs inside the fenced area. During the first MBGA survey, the facility also was used to store hazardous waste. At that time, soil and asphalt in the area showed evidence of contamination from spills.

During the February 1987 survey, it was noted that hazardous wastes no longer were being stored. GDSCC personnel indicated that the facility would not be used for waste storage in the future. Further inspection showed that

drums were no longer leaking to the ground as before. There is still no fire extinguisher in the immediate area and the only warning signs posted are on the fence along the side of the facility. No signs are posted at the front gate, and "No Smoking" signs are not visible from inside the compound in the vicinity of the flammable liquid drums. Because there is no absorbent material at the facility, it is recommended that a spill response kit be stored near the drums.

Contaminated dirt along the northeast fence and dirt inside the compound should be removed, and the exposed dirt should be sampled to ensure that cleanup is complete. This facility should then be paved in areas where drums are presently stored on the soil. A berm should be constructed around drum storage areas to provide containment in the event of a spill. It is also recommended that the facility be roofed, proper signs be posted, and a fire extinguisher and emergency/spill kit be provided. As long as wastes are not stored in the compound, the facility is not subject to Title 22 rules. As recommended above, however, it is prudent to design and operate hazardous materials storage facilities using similar criteria as is used for waste storage facilities.

Next to the paint shed, an area adjacent to the compound is no longer used for storage of hazardous materials or wastes. It appears that small spills observed in the area have been cleaned up since the earlier survey. Storage in this area should not be permitted in the future.

c. Acid Storage at Reverse Osmosis Building G-89. There is a 400-gal sulfuric acid storage tank located inside a bermed area adjacent to the building. The berm is sufficiently sized. The visual level gauge showed the tank to be empty, but the tank was observed to be full at the time of survey. There is no valved drainage pipe in the berm wall. Any liquid that accumulates in the bermed area, therefore, will require pumping if it is to be removed.

The tank's containment area was filled with combustible debris at the time of survey and there was evidence of leakage, most probably from pipe connections. The tank is labeled "Acid Storage Tank."

Although it is not a hazardous waste facility, the tank should be properly maintained. It is recommended that the visual level gauge be repaired, the containment area be cleaned up, and observations be made for leakage. A spill kit should be stored nearby.

The safety officer should review procedures used to fill this tank to ensure that, at a minimum, splash masks are used.

3. Mojave Base Site

a. Drum Storage at Operations Building M-8 (National Oceanographic and Atmospheric Administration). Drums of waste in storage at this facility have been removed. At the time of re-survey, the only drums stored here were two empty oil and solvent recycle drums. Accumulation start-dates were not posted on these drums and warning signs were not posted. A flammable

materials storage shed, which had been stored adjacent to the antenna, had been moved to the old Mojave Dump Site area. Although no wastes are stored in the shed, it should be inspected periodically to ensure that leakage through flooring is not occurring. Caution signs should be posted.

b. Drum Storage at Building Power Generator Building M-9. Two small drums, which are not being used, are still being stored next to the building near the transformers. If the materials are still usable, the two drums should be removed for use by another station as a preference over disposal. A small leak in one of the transformers observed during the first survey has been repaired.

4. Venus Site

a. Engine Generator Set Adjacent to Laboratory-Office Building G-60. There is a small fuel leak to the soil adjacent to the pad. This should be cleaned up and the generator equipment inspected periodically to ensure that leaking does not continue.

b. Engine Generator Set Adjacent to Transmitter Building G-53A. An old oil spill observed during the first survey has not been cleaned up, although the leaking equipment has been repaired. The contaminated soil should be cleaned up and the generator equipment inspected periodically to ensure that leaking does not continue.

c. Flammable Liquid Storage Shed Adjacent to Workshop-Warehouse Building G-63. This shed is not vented and no signs are posted. Hazardous wastes are not stored in the shed. The Safety Officer should inspect the shed and evaluate its continued use for flammables.

d. Hazardous Materials Container Storage Areas in the Vicinity of Building G-63. An area across from the flammable liquid storage shed was used for storage of both hazardous materials and wastes at the time of the first MBGA survey. Since that time, hazardous wastes have been removed. Some of the remaining containers are stored on pallets. Other items are stored in rectangular storage units supported above the ground on wooden legs. It is not known whether the storage units hold liquids directly or whether they hold containers of liquids. The wooden containers may be a work station for the cleaning of waveguide parts. It is suspected that strong acids are being stored.

The GDSCC Environmental Coordinator and Safety Officer should inspect and evaluate this area to determine whether it constitutes safe and proper storage. A single posted sign warns of caustics. A workable eyewash also is adjacent to the wooden units.

Two hazardous materials drum storage areas are located, respectively, behind Building G-63, and to the side, behind the antenna. Housekeeping in the area behind the building has improved since the first MBGA survey. The

contained storage area behind the antenna has always been well maintained. Four drums are on a dispensing rack in a concrete paved area. One drum, used to accumulate waste oil, is not properly labeled and an accumulation start-date has not been posted on the container. Because this area is used to store waste, all applicable storage rules apply. The area is walled on three sides and bermed on the fourth side. There is no grounding or bonding provided at this location or at any drum-storage location at the GDSCC. The necessity for grounding and bonding should be investigated at all drum-storage locations by the GDSCC Safety Officer.

5. Apollo Site

a. Logistics Hazardous Materials Storage Pad. The GDSCC on-site contractor uses this pad to store most of the new drums of liquids that are to be used in support of its activities at the complex. The drums are stored on metal racks on a concrete pad. The pad originally was a base for an antenna and is underlain with a concrete electrical pit and conduit trenches. The pit and trenches, which are covered by metal grid, now are empty. The pad is not bermed and no other spill containment is provided. There are no warning signs posted. A fire extinguisher is mounted on a nearby structure. The drums are in good, non-leaking condition and all are labeled. The pad is clean and free from evidence of leaks or spills. This is an improvement from conditions observed during the first MBGA survey. At that time, many of the drums were damaged and most had leaking bungs. The pit and trenches were not fully covered, and there was evidence of spillage not only on the pad, but on soil surrounding the pad. The GDSCC contractor has significantly improved general housekeeping in the area of the pad. The pad has been cleaned, damaged drums are no longer being accepted from supply (drums were being shipped to GDSCC in damaged condition), and bung closures have been tightened.

An effort also had been made to remove contaminated soil from around the pad. It is recommended that the cleanup effort be completed. Specifically, the area needs to be regraded and compacted. It also is recommended that this site be inspected at least weekly to ensure that drums are not leaking, that berms be constructed to provide containment, that a roof be installed, that warning signs be posted, and that an emergency/spill response box be provided to service the pad (refer to discussion for Article 19, page 4-34).

Along one side of the pad are several drums containing chemicals used by personnel who service the antenna. These drums were stored on the dirt alongside the pad at the time of the first MBGA survey. Subsequently, the drums have been moved onto the pad. Their spigots, however, are over the dirt. There is some dripping from the spigots into the drainage pans that have been placed on the dirt, underneath the spigots. Contaminated soil has as yet not been removed. There also are two waste accumulation drums used to collect oil and solvent for recycling. The pad, therefore, technically is used for waste storage and subject to requirements for less-than-90-day storage facilities. There are no accumulation start dates posted on the recycle drums. It is suggested that the rules for storage be applied to this area.

b. Hazardous Materials Storage Shed, Logistics Storage Building A-14. This storage shed is well-maintained. Storage is on metal shelves and is comprised mainly of small containers (5 gal or less) of paint, solvent, corrosives, batteries, and other substances. Incompatibles are stored on different shelving units. It is recommended that the GDSCC Safety Officer inspect this shed to determine whether or not it is properly ventilated and to provide guidance on the length of time personnel should stay in the shed.

c. Management and Administrative Deficiencies. In general, the entire Goldstone Complex is well kept and operations are carefully managed. The reasons for most non-compliance with environmental rules are:

(1) A lack of understanding of the rules.

(2) A lack of judgment on how to apply the rules.

(3) The absence of an organized environmental program, staff, and budget for implementing that program.

(4) The lack of standard operating procedures for operating environmental management facilities.

(5) The absence of short and long range planning protocol for environmental projects.

It should be noted that the present on-site contractor was not required to implement an environmental program under the contractor's scope of work. All efforts made by the contractor to achieve compliance have been a result of self-motivated interest.

Specific administrative deficiencies include the following:

(1) There is no written management plan.

(2) There is no written emergency/spill plan.

(3) There is no written environmental policy statement.

(4) There are no written standard operating procedures for the following operations:

(a) Manifesting.

(b) Inspections.

(c) Pre-transportation requirements for shipping of hazardous waste.

(d) Recordkeeping.

(e) Training.

(f) Use of containers.

(g) Recycling.

(h) Waste minimization.

(i) Reporting requirements.

(5) There is no written schedule or suspense file that flags deadlines for required reports and renewal of permits.

(6) There is no formal requirement to check new facilities and operations in the project planning or design stages for environmental compliance.

E. COMPLIANCE STATUS

Based on existing operations involving hazardous wastes, the GDSCC must comply with applicable portions of Title 22, Articles 1, 2, 3, 4, 6, 7, 9, 11, 12, 15, 18, 19, 20, 24, and 25. Table 5 defines the compliance status of the GDSCC as a waste generator for each applicable section of CAC Title 22 compared to corresponding sections of the Federal regulations. Table 6 defines the compliance status of the GDSCC as an owner/operator of less-than-90-day storage facilities. The discussion that follows identifies non-compliance at the GDSCC for each of these articles by site (Echo and Mars Sites).

1. Article 1: Definitions (Sections 66001-66240)

There is no issue of compliance with respect to this article. To be in compliance with other articles, however, the GDSCC must have a thorough understanding of the meaning of expressions used throughout Title 22, Chapter 30. The GDSCC is strongly advised to review the definitions presented in Article 1, as well as those definitions presented in the Health and Safety Code, prior to reading the regulations. It is suggested that whenever the GDSCC has need to analyze a specific section of the regulations, the definitions used in that section should be reviewed. This will minimize misinterpretation of the rule. At the time of the MBGA compliance survey, key GDSCC staff had not as yet sufficiently reviewed the definitions, and were not applying the definitions to facilitate interpretation of the rules.

2. Article 2: Scope and Procedures (Sections 66300-66316.3)

a. Overview. This article specifies which parties, facilities, and operations are subject to the provisions of Title 22, Chapter 30. Familiarity with Article 1 is essential to applying the information provided in Article 2. Furthermore, the reader is referred to Section 25117 of the Health and Safety Code for the definition of Hazardous Waste, which is the definition that applies when interpreting the provisions of Article 2.

In addition to a discussion concerning applicability of the rule, the article addresses methods for classifying wastes as hazardous and non-hazardous, and variances from the provisions of Title 22, Chapter 30. Other sections of the article do not apply to the GDSCC at this time and are not discussed in this report.

b. Applicability (Section 66300). The GDSCC is subject to the provisions of Title 22, Chapter 30, based on Sections 66300(a)(1-3), management of any liquid, semisolid, solid, or gaseous waste that is a hazardous waste. Other applicable sections include:

(1) Section 66300(e)(4) which addresses less-than-90-day storage.

(2) Section 66300(e)(6) which pertains to wastes generated as a result of spills.

(3) Section 66300(e)(8) which pertains to adding absorbent material to wastes containing free liquids.

(4) Section 66300(f) which establishes responsibility for designing, constructing, and operating a facility that will protect public health and the environment.

c. Classification of a Waste as Hazardous or Non-Hazardous (Section 66305). Section 66305 essentially states that it is the responsibility of the waste producer to determine whether a waste is or is not hazardous. If the producer determines a waste to be non-hazardous, he/she then has the option to handle the waste as non-hazardous, or may seek concurrence with the State DHS. The waste producer may seek to delist a hazardous waste if it can be demonstrated that this waste does not pose a significant threat to public health and the environment.

The GDSCC correctly has identified most of its hazardous waste with the exception perhaps of smaller, discarded containers and wiping rags saturated with a hazardous substance. These latter items are suspected to be discarded in dumpsters because no items of this type have been noted on manifests. An effort should be made to keep such wastes (if they are classified as hazardous) out of dumpsters, and to package them for proper disposal.

In addition to the above items, MBGA questioned GDSCC personnel on disposal practices for contaminated dirt. Knowledge generally was lacking that hazardous material spilled onto land potentially results in a hazardous waste. The designated Environmental Coordinator (EC) should prepare a SOP for general distribution that explains what constitutes a hazardous waste, and should provide a telephone number to call should any person need to know how to handle such waste.

A policy on empty containers should be established that defines which types of containers are classified as hazardous and which are not. An SOP should be prepared that outlines procedures for turn-in of empties for proper management.

d. Variances (Section 66310). To apply for a variance from provisions of this chapter, the GDSCC would have to establish that any specific waste that is generated is produced in such small quantities or low concentrations or has such characteristics as not to pose a significant threat to public health and safety, livestock, or wildlife. Wastes regulated by another agency may be subject to a variance under Title 22, Chapter 30. Given the present database on wastes generated at the GDSCC, it cannot be determined whether application for a variance is either necessary or valid.

3. Article 3: Enforcement and Inspections (Sections 66320-66364)

This article authorizes the State DHS to authorize a representative of the DHS to inspect a facility. This representative may be from the DHS or may be a designated local agency or contractor.

The EC should have complete familiarity with this article. It is good to know the rights and responsibilities of inspectors as well as the facility's rights and responsibilities. For example, whenever an inspector takes a sample off-site for testing, the facility has the right to obtain a replicate sample before the sample is taken from the property. The EC may also want to take photographs of the sample location and the sampling equipment. Detailed notes should be taken on sampling techniques including type of container, container lid liner, preservatives used, cleanliness of sampling equipment, and manner in which the sample is placed in the sample container.

It is important to note that Section 66320(d) stipulates that the response to deficiencies reported by an agency must be provided to the facility in writing. This practice has recently been implemented at the GDSCC, which is now fully documenting all interactions with agencies. The EC must, however, develop a procedure for ensuring that all necessary correspondence has been received by the agency, and that copies of correspondence are kept in appropriate files. Recommendations for a formal filing system will be discussed in a later section.

4. Article 4: Hazardous Waste Facility Permit (Sections 66370-66408)

This article states the authority for requirements for facility permits and lists types of facilities that do not require permits. According to Section 66371(c), the GDSCC does not require a hazardous waste facility permit, provided:

(1) It does not accumulate waste on site for 90 days or more.

(2) It does not solidify wastes after the wastes have been containerized. Such solidification would constitute treatment.

Facility personnel have been made aware of these restrictions and have been advised of a method for counting the 90-day period. Full details on requirements for a less than 90-day storage facility are provided in Table 6. The GDSCC should have a procedure for documenting the 90-day limit.

Technically, all wastes accumulating in movable containers must bear a label on which the accumulation start date is posted. The GDSCC is routinely out of compliance with this standard at most waste accumulation points facility-wide. This problem easily is corrected and only requires that the date be written on the hazardous waste label at the time that the label is affixed to a container.

Apparently, agency inspectors have been extremely casual in their regard for legal formality. As an example, on an inspection report dated May 8, 1985, one inspector wrote his observations in the violations section of his inspection sheet. The GDSCC signed off on the sheet without noting that information listed as a violation was in fact a comment and not a violation.

On occasion, agency personnel advise GDSCC staff that it does not have to comply with certain requirements because the facility is well run. Apparently, agencies have suggested that the GDSCC does not have to keep logs or submit certain required reports.

By taking this advice, the GDSCC is breaking the law. The GDSCC should comply with all requirements of the law unless the agency has issued a variance or waiver in writing. Failure to submit required reports or to disregard the law in any manner, even on the verbal advice of an agency, can create later compliance problems for the GDSCC. At some future time when personnel have changed at the agency or inspections become less casual, the GDSCC will not be able to provide evidence that they have been in compliance. Historically, as rules have become more strict, waste producers have been held responsible for their past bad actions. It is strongly urged that the GDSCC police its own activities, abiding with the rules and applying good safety and engineering judgment. The argument that one's actions are acceptable because one has not been reprimanded by an agency is invalid, as evidenced by the nationwide history of environmental enforcement actions.

5. Hazardous Waste Hauler Registration (Sections 66420-66465)

This article does not apply to the GDSCC directly because the GDSCC facility does not transport its own hazardous waste off-site. This statement is made with some reservation, because at the time of the MBGA survey waste was being transferred between Barstow and the GDSCC in GDSCC contractor vehicles, and between the GDSCC and Pasadena in JPL vehicles. It was recommended to JPL and the GDSCC that this practice cease at once if such practice did, in fact, occur as reported. Neither the contractor nor JPL are registered haulers, and vehicles used for transportation have not been issued certificates of compliance.

With respect to the use of commercial haulers, the GDSCC should be knowledgeable of the requirements of Article 5 for the purpose of evaluating whether its contract haulers are operating in compliance. Specifically, the GDSCC should verify that the hauler has:

(1) A valid hazardous waste hauler's registration.

(2) Valid insurance in the amount stipulated by law.

(3) A certificate of compliance for vehicles used in transporting hazardous waste.

If the hauler cannot produce evidence of these items, the GDSCC should not use that hauler. The GDSCC currently is using registered haulers.

It is recommended that the GDSCC contact the State DHS to obtain information on generator and hauler procedures when using haulers permitted to use one manifest for multiple customer pickups of waste oil. The GDSCC currently uses a Government Services Administration (GSA) contract hauler for waste oil pickups. The GDSCC staff is not familiar with DHS policy, nor has it investigated the recycle facility to which the waste is transported. It is also recommended that the GDSCC contact DHS regarding the history of compliance of the recycle facility and perhaps visit the facility to inspect conditions.

6. Article 6: Requirements for Generators of Hazardous Waste (Sections 66470-66564)

a. Overview. The GDSCC is subject to the provisions of Article 6. In addition to establishing the scope and applicability for determining the need for compliance (Section 66470), the article addresses the following areas of compliance:

(1) Methods for determining whether wastes are hazardous.

(2) EPA identification numbers for generators.

(3) Manifest procedures for generators.

(4) Recordkeeping requirements for generators.

(5) Biennial reporting requirements for generators.

(6) Pre-transportation requirements for generators.

(7) Waste accumulation time requirements for generators.

(8) International shipping requirements for generators.

At present, the GDSCC is subject to all of the requirements listed above with the exception of Item 8. The facility does not ship wastes overseas. It is recommended that for clarification the GDSCC EC read 40 CFR 262 found in the Federal requirements for generators.

b. Scope and Applicability (Section 66470). The GDSCC is a generator of hazardous waste and subject to the provisions of Article 6. There is some clarification needed to determine exactly who is to be designated as the generator for the GDSCC. Is it NASA, JPL, the on-site contractor, or Ft. Irwin? This is important in that the generator must have an EPA Generator's Identification Number and hold a generator's permit from

San Bernardino County/Department of Environmental Health Services/Hazardous Waste and Toxic Control Section (SBC/DEHS/HWTCS). At present, there is no decided policy to be applied in determining who the generator is at the GDSCC. MBGA found that documents issued to the GDSCC by agencies carry numerous combinations of owner/operator names and addresses. This issue will be discussed in more detail in Section V.E6d.

c. Hazardous Waste Determination Requirement for the Generator (Section 66471). Generators are required to make their own determination as to whether or not wastes are hazardous. This may be done by any of three methods:

(1) By reference to the hazardous waste lists in Article 9 and Article 11.

(2) By testing the waste using methods prescribed in Article 11.

(3) By declaring the waste to be hazardous based on available information on the components of the waste or criteria stated in Article 11.

The GDSCC is in partial non-compliance with this section. Refer to Section E.2.c above for a discussion.

d. EPA Identification Numbers for Generators (Section 66472). The rules under this article are straightforward. The generator (owner/operator) must have an EPA ID number and may not offer his/her wastes for treatment, storage, disposal, or transportation to firms not having EPA ID numbers. The GDSCC technically is out of compliance with this requirement as a result of a lack of policy on who shall be responsible as the owner/operator/generator at the GDSCC and Barstow facilities. Inspection of the records shows that the entity NASA/JPL has an EPA ID number as generator for the GDSCC facility (the permit does not mention the Barstow facility). The permits issued by the county to the GDSCC and to the Barstow facility are in the name of the GDSCC on-site contractor as generator. The contractor, however, does not have an EPA ID number, and NASA/JPL does not have a county generator's permit. Both the GDSCC and Barstow facilities use the NASA/JPL EPA ID number. Although this error is administrative in nature, a decision should be made as to who really is the generator at the GDSCC. The problem with names and addresses on permits should be resolved (there are at least six different combinations of names and addresses on GDSCC permits). It is acceptable for the facilities to use the NASA/JPL ID number, but the local permit should bear the name of the the holder of an EPA ID number. Barstow should be included under the EPA ID number if hazardous wastes are generated there.

The generator problem is actually more extensive than this and involves virtually all documents issued by agencies involving permits, fees, external reports, and taxes. Government facilities pay fees, but do not pay taxes. It is unclear, given the diversity of names appearing on documents, whether or not the GDSCC and Barstow are Government facilities. A memo issued by the Commander of Ft. Irwin, dated November 14, 1980, requested submittal of

Form 3510-3 in support of the preparation of a Part A Permit Application to be submitted to EPA by Ft. Irwin. The memo states, "Tenant activity will sign as operator." Form 3510-3 was to be submitted to the Ft. Irwin Commander who would assume responsibility as "owner." No additional documents were found in the file to indicate whatever action was taken by NASA as tenant. It seems that JPL acted independently, however, to obtain the EPA ID number, using NASA/JPL as its name and Pasadena as its address.

On a 1982 Hazardous Waste Tax form, the GDSCC declared itself to be a Government-owned facility and a hazardous waste disposal facility. The former statement is inconsistent with the owner/operator signature used on the form, and the latter statement is incorrect because GDSCC is not a hazardous waste disposal facility.

On a Hazardous Waste Generator Permit Application filed by the GDSCC contractor on April 10, 1984, the contractor is listed as generator, the wrong EPA ID number is recorded, waste generation is reported to be about 5 tons per year, alkaline cleaner is listed as being disposed of on-site by land application or surface impoundment, underground storage of hazardous waste is indicated, and underground storage of hazardous materials is denied. This report substantially is in error.

On a Hazardous Waste Tax Return dated October-December 1985, 20 tons of waste were identified as being recycled, and no waste was reported to be generated or treated. A Tax Return was not filed for the third quarter, and a notice of delinquency (NOD) was received. There was no memo in the file indicating that the GDSCC had acted on the NOD.

Receipts for underground tank permits are confusing. A receipt dated March 18, 1985 shows $1,265 paid to an agency. A receipt dated June 3, 1985 shows a hazardous waste generator permit fee was paid for 27 underground tanks for $265. This fee was based on 306 employees at the GDSCC. This is not consistent with Hazardous Waste Generator fees paid in August of $166 for 20 to 99 employees.

The permit to operate (tanks) issued by SBC/DEHS/HWTCS for the period from May 1984 through May 1985 is $250 for 225 employees. The contractor signed as operator. Attached to this document is a purchase request, dated July 11, 1984, for registration of 21 (should be 27) hazardous substance tanks for $270. Attched to that is a copy of a Fee Renewal Notice for $265 for 225 employees. Also attached is a copy of a completed Hazardous Waste Generator Permit Application/Renewal form dated June 3, 1985. The facility name used was the name of the contractor (not the name of the facility). The owner was designated as NASA, and an incorrect EPA ID number was recorded.

The renewal for the 1985-1986 Hazardous Waste Generator Permit reported 10 tons of waste generated and neglected to identify a disposal method. (As a comparison, 0.1 tons of waste generated was recorded in 1981 and in 1982.0 The only permit fee on file for Barstow was paid November 8, 1985 in an amount of $249, which would indicate that about 200 employees were listed for the facility. The permit expired on July 31, 1986. The GDSCC contractor is listed as the legal owner of the facility. The renewal for the 1986-1987 Hazardous Waste Generator Permit reported 10 tons of hazardous waste generated. The permit fee was $299.

Because of the routine occurrence of misinformation on external reports, it is recommended that all such documents go through internal review by the designated contractor and JPL staff until it is certain that information transmitted is accurate.

e. Manifest Requirements for the Generator (Sections 66475-66484). The GDSCC is required to complete a Hazardous Waste Manifest for each off-site shipment of hazardous waste and recyclable hazardous waste. The primary requirements for manifesting include:

(1) Use of the Hazardous Waste Manifest form specificied by the California State DHS. No other form may substitute for the required form, and the form must be filled in completely and correctly.

(2) The following certification must appear on the manifest:

"This is to certify that the above-named materials are properly classified, described, packaged, marked, and labeled and are in proper condition for transportation according to the applicable regulations of the Department of Transportation and the Department of Health Services." (See also Section V.H, Item 2.)

(3) The GDSCC must send a copy of the manifest to the California State DHS within 30 days of shipment of the waste indicated on the manifest.

(4) The GDSCC must contact either the transporter or waste management facility if a copy of the manifest signed by the waste management facility has not been received by the GDSCC within 35 days of waste shipment.

(5) The GDSCC must submit an Exception Report to the California State DHS if the manifest is not received within 45 days of waste shipment.

The GDSCC has no written procedure for manifesting and deficiency reporting. It is suggested that a procedure be prepared that includes full instructions for manifesting.

A procedure also should be written that describes how GDSCC will meet the commitments of the certification statements that appear on the manifest.

No log is maintained to track manifests, so it is impossible to determine whether the generator copy of the manifest is being sent to the DHS within 30 days or whether the waste management copy is being received within the 35 or 45 day periods discussed above. There is no record of the GDSCC ever having submitted an Exception Report.

Virtually every GDSCC manifest inspected by MBGA has at least one error or omission. In some cases, manifests are signed by unqualified personnel (in one case, the manifest was signed by the security guard at the GDSCC main

gate). It is recommended that one or two individuals be assigned responsibility for signing manifests. These individuals should be trained to complete the manifest properly. Examples of manifests should be included in a manifest procedures document. Recyclable hazardous wastes also must be manifested.

Because the GDSCC repeatedly produces many of the same types of waste, it is recommended that a waste management table be prepared that includes information on the proper DOT shipping name, hazard class, EPA Waste Number, California Waste Number, container specification, labels, markings, vehicle placard requirements, handling precautions, and waste management options (e.g., recycling, landfilling, and treatment). This table can be updated whenever a new waste type is generated. Information from the table can be used to complete manifests. This will help to ensure that information used on manifests is correct. Sending the manifests to a printer to have the EPA ID number and the GDSCC facility information pre-printed will eliminate some errors and speed up the manifest processing time.

The waste management table can be attached to the pre-transportation procedures document that should be prepared by the GDSCC EC. The pre-transportation procedures document should contain a checklist to ensure that all steps required prior to shipping wastes off-site have been executed.

It is imperative that a log be maintained to track waste generation. The GDSCC is not consistent in what it reports on the manifests compared to what it reports to the state and to the county at year end. The solution to this problem is a good recordkeeping system.

f. Recordkeeping Requirements for the Generator (Section 66492). The following records are required under the provisions of this section:

(1) Signed copies of the manifest must be kept on file for at least 3 years.

(2) Copies of the Biennial Report must be kept on file for at least 3 years.

(3) Copies of Manifest Exception Reports must be kept on file for at least 3 years.

(4) Copies of waste analyses, test results, or other hazardous waste determinations must be kept on file for at least 3 years.

Because of incomplete recordkeeping in the past, it is not possible to document whether the GDSCC is in compliance with Items 1, 3, and 4. It is recommended that the appropriate logs and records be maintained as discussed earlier in this audit report. This will allow the GDSCC to have the necessary documentation to show that the facility, indeed, is in compliance. It is recommended that copies of waste analyses be attached to corresponding manifests.

g. Biennial Reporting for the Generator (Section 66493). Waste generators are required to submit a Biennial Report to the California State DHS by March 1 of each even-numbered year. The Report is to be on a form provided by the DHS and is to address hazardous waste activities from the previous calendar year.

Because the DHS sends the generator a form several weeks prior to the required submittal date, it should be relatively simple for the GDSCC to comply with this rule. It is suggested that the EC review the list of requirements for the report (see Section 66493), and develop a waste log that includes this information. The EC only will have to copy this information from the log to the report form and, with little effort, the biennial report will be ready for submittal.

h. Packaging, Labeling, Placarding, and Marking Requirements for the Generator (Section 66504). This section provides the pre-transportation requirements for shipping wastes to off-site waste management facilities. For clarification, the reader is referred to the Federal pre-transport rules found in 40 CFR 262.30.

Prior to shipping, each waste must be properly containerized, and each container and the vehicle in which the waste is transported must be properly labeled, marked, and placarded as applicable. It can only be assumed, but should be verified, that the GDSCC is in compliance with this article, because MBGA has not been present at the GDSCC when wastes have been shipped.

i. Accumulation time for the Generator (Section 66508). This section establishes the criteria for accumulating waste for disposal. Accumulation criteria apply to wastes in any containers, including drums and tanks. In addition to information provided in Article 7, the reader is referred to Articles 19, 20, 24, and 25 for additional criteria applicable to the accumulation and storage of wastes.

Specifically, the rules state that waste must not be stored on-site for more than 90 days without a permit. Furthermore, waste containers must be labeled (see Table 6 for labeling requirements), and the accumulation start date must be posted on the container.

The GDSCC is out of compliance with this section. Accumulation dates are rarely posted on containers. Some containers are not labeled. There should be a manifest generated by the GDSCC at least every 90 days, thus documenting compliance with the 90-day accumulation rule. This assumes that the GDSCC generates waste regularly. A full description of findings from the field audit with respect to storage is presented in Section 3.4 of this report.

7. Article 6.5: Requirements for Transporters of Hazardous Waste (Sections 66530-66564)

This article does not apply to the GDSCC because the facility is not licensed to transport hazardous waste off-site. Again, it is worthwhile to understand the rules for haulers if the GDSCC is to contract haulers to

move its wastes off-site. It is recommended, therefore, that the EC be familiar with this article.

8. Article 7: Additional Requirements for Management of Extremely Hazardous Wastes (Sections 66570-66645)

When characterizing its waste, it is the GDSCC's responsibility to determine whether or not the waste is classified as an extremely hazardous waste. If this is determined, then GDSCC will be responsibile for complying with the provisions of this article. It is recommended that wherever this is applicable, the wastes listed in the Waste Management Table be labeled as Extremely Hazardous or Potentially Extremely Hazardous, based on concentration.

9. Article 8: Fees (Sections 66670-66676)

This Article does not apply directly to the GDSCC because it addresses fees to be paid by owners/operators of off-site and on-site disposal facilities. These facilities pay fees to the state and generally charge the cost of the fee back to the customer in the disposal bill.

10. Article 9: Hazardous Wastes and Hazardous Materials Lists (Section 66680)

This article provides a listing of hazardous materials and wastes, the basis for their inclusion on the list, and a designation as to whether or not they are extremely hazardous. It is necessary that the GDSCC be familiar with this article if it is to identify whether or not a waste that is being produced is hazardous or extremely hazardous.

11. Article 11: Criteria for Identification of Hazardous and Extremely Hazardous Wastes (Sections 66693-66476)

This article establishes criteria and testing procedures for determining whether or not a waste is hazardous, extremely hazardous, or qualifies as a special waste. It is necessary that the GDSCC be familiar with this article if it is to identify whether or not a waste it is producing is hazardous or extremely hazardous. It also is recommended that the EC obtain a copy of EPA Document SW-846 (see Appendix D) and review the sections on sampling and sample management because good test results cannot be obtained from poorly taken samples.

12. Article 12: Recyclable Hazardous Wastes (Sections 66763-66823)

This article states that waste generators may be required to justify that waste, which has been disposed of, could not be recycled. Within 180 days of disposal of a listed recyclable waste (see Article 12, Section 66796), the DHS may request such written justification from the waste

producer. This article does not stipulate action to be taken by the DHS, if the waste producer cannot justify the disposal. A certification statement which appears on the manifest, however, implies that the waste producer certifies that he/she has attempted to minimize waste disposal and recycle where practicable under penalty of perjury.

The GDSCC currently is recycling waste oil, metal containers, and selected solvents. It is recommended that the GDSCC study the types and quantities of chemicals used at the complex as well as its waste generation practices to determine how waste quantities can be reduced further. A Waste Minimization Plan should be developed and procedures written to assist personnel in operating their facilities so as to minimize waste generation and to promote recycling. It then is recommended that the GDSCC produce a status report describing its program for inclusion in its records.

Using the above database for input, it is recommended that the GDSCC initiate a program responsive to the recently passed California Proposition 65 (The California Toxics Initiative). This program should include the following steps:

(1) List all chemicals used at the complex.

(2) Identify which of these chemicals are on the Governor's List of suspected carcinogens.

(3) If they are on the list, determine whether the use of these chemicals can be eliminated or minimized.

(4) Collect necessary toxicological data and determine whether these materials could produce exposures above the designated impact levels. If the answer is no, continue using the product. If the answer is yes, seriously consider discontinuing the use of the product or minimizing its use and placing strict controls on the storage and handling of the product and any wastes that contain it.

Federal Government facilities are not subject to the provisions of Proposition 65. It is necessary, therefore, to determine whether or not the GDSCC is a Government facility. Even if it is determined to be so, it is suggested that NASA and/or JPL implement a Proposition 65-type investigation of its own to ensure that it is not exposing its personnel (or the general population) to dangerous levels of carcinogens.

Section 66822 of Article 12 discusses requirements for management of spent lead-acid storage batteries. In general, the article states that if a waste producer ships batteries for reuse, he/she is only subject to manifesting requirements and not to other requirements of Chapter 30. If, however, the batteries are shipped for disposal, all of the requirements of Chapter 30 are applicable.

It is recommended that the GDSCC be familiar with this section to determine whether batteries should be disposed of or recycled. At the present time, the GDSCC does not label batteries while in storage nor affix accumulation start dates on battery cases.

13. Articles 13, 14, 16, and 17 (Sections 66835-67033)

At present, these articles do not apply to the GDSCC.

14. Article 15: Land Disposal Restrictions (Sections 66900-66935)

California restricts the disposal of specified hazardous wastes into its land disposal facilities. Restricted wastes include:

(1) Liquids containing cyanides.

(2) Liquids containing certain metals.

(3) Liquids having a pH less than 2.0.*

(4) Liquids containing PCBs.

(5) Liquids containing halogenated organics.

(6) Organic sludges and solids containing halogenated organics.

Restrictions hold for specified concentrations of these toxics in liquids as stated in Section 66900. A schedule for implementation of the land disposal restrictions (ban) is provided in Section 66905.

Two exceptions to the ban are provided in Section 66910 (lab packs) and 66935 (emergency variances for disposal of spill cleanup material).

The GDSCC stores acids and liquids containing chlorinated organics. The EC should review the composition of wastes generated to make certain that no restricted mixtures are being generated for disposal. It may be necessary to educate personnel to segregate M-50 and other chlorinated solvents from other wastes. The existing GDSCC solvent-recycling program is effectively minimizing the potential for producing restricted wastes. The GDSCC EC should be familiar not only with the California ban, but should follow regulations under development for the far more restrictive Federal program.

15. Article 18: General Facility Standards for Interim Status and Permitted Facilities (Sections 67100-67108)

Owners/operators of less-than-90-day storage facilities are required to comply with Section 67105, Personnel Training. Either classroom or on-the-job compliance and emergency response training is required. Specific personnel records are required to be maintained. The GDSCC is in

*The chemical symbol pH quantitatively describes the acidity of a liquid. pH values range from 0 to 14. Any liquid with a pH less than 7.0 is acidic. The smaller the pH value, the greater is the acidity.

partial compliance with the requirements. Although some of the training has been provided, the GDSCC has not maintained the proper records for hazardous waste training. It is recommended that the GDSCC review the requirements of Section 67105 and develop a written program and establish a recordkeeping system that is in compliance.

The GDSCC also is required to comply with Section 67106 with respect to storage of hazardous wastes in underground tanks. The GDSCC is not in compliance with this section. It posts no signs in the vicinity of waste tanks. Grounding and bonding are not provided. Documentation of compliance, as required by section 67106(c), is not on record.

Although not a requirement, it is recommended that the GDSCC apply the rules contained in Sections 67104 (Inspections), and 67108(a) (Precipitation Design Features).

16. Article 19: Preparedness and Prevention for Interim Status and Permitted Facilities (Sections 67120-67126)

Provisions in Article 19 applicable to interim status facilities are also applicable to facilities with less-than-90-day storage facilities. These provisions are detailed in Table 6.

Article 19 requires that storage facilities have adequate alarm/communication equipment available in the event that help must be summoned quickly (unless it can be demonstrated that this equipment is not needed). It also requires that fire extinguishers, spill control equipment, decontamination equipment, and an adequate water supply be available. Although alarms and telephones are not installed at collection points, most waste collection points at the GDSCC are for storage of very small quantities of waste and are not remotely located. Assistance is generally within range-of-voice contact. The GDSCC staff reports that work vehicles are equipped with two-way radios, and that waste handlers work at least in pairs. This is probably sufficient to eliminate the requirement for communication devices being installed at each collection point. Fire extinguishers are generally provided or are nearby.

It is recommended, however, that an emergency response box be installed at each storage location. This box should contain rags, a splash mask, disposable chemical-resistant coveralls, gloves, booties, a broom and dust pan, absorbent material, plastic bags, tape, a scissors or knife, a chemical-resistant plastic bucket, hazardous waste labels, and a pen with indelible ink. A small fire extinguisher could be placed in the box, or affixed to the box, as determined to be necessary. The box should be latched, but not locked, and stenciled with the words "EMERGENCY EQUIPMENT" and the GDSCC emergency telephone number.

The GDSCC reports that it has a firm agreement with Ft. Irwin for the latter to respond to emergencies if summoned. Arrangements should include fire support, spill response support, and ambulance and hospital support. If spill response or any other type of emergency support is not available through Ft. Irwin, arrangements should be made with local civilian emergency services. The primary responder should be provided in advance with a list of type categories of materials in storage. Agreements should be in writing.

The GDSCC is planning a new central collection point at the Echo Site. This collection point will be located in Yard 1. Generally, it is prudent to design larger storage facilities using the same design criteria used for permitted facilities. Based on conditions that presently exist at the yard, it is suggested that an impervious base, such as sealed concrete, be constructed for storage of waste containers. Provisions should be made to allow for adequate aisle space, space for processing waste containers, and separate spaces for storage of incompatibles and reactive substances. Consideration also should be given to the design of proper weather protection and for storm water collection and discharge systems. A telephone or alarm should be installed at the site. A portable fire extinguisher, spill control equipment, decontamination equipment, and an adequate water supply are suggested as well. The provisions of Articles 7, 19, 20, and 24 apply.

17. Article 20: Contingency Plan and Emergency Procedures for Interim Status and Permitted Facilities (Sections 67140-67145)

This article requires that owners/operators of hazardous waste management facilities prepare a written emergency/spill contingency plan. The GDSCC has no such plan, and should prepare this plan as rapidly as possible. Refer to Article 19 and Table 6 for details on the contents of the plan.

18. Article 21: Manifest System, Recordkeeping, and Reporting for Interim Status and Permitted Facilities (Sections 67160-67169)

Provisions of this article are not required. It is recommended, however, that the GDSCC read and apply the requirements of Section 67163(a) and (b)(1-6) regarding the use of a written operating record for storage facilities. The concept of the operating record can be broadened to apply to any operation at the GDSCC that requires proper documentation.

19. Articles 22, Monitoring, and 23, Closure/Post-Closure (Sections 67180-67220)

These articles do not apply to the GDSCC as long as they do not operate permitted facilities.

20. Article 24: Use and Management of Containers (Sections 67240-67248)

Provisions of this article also apply to less-than-90-day storage facilities, except for Sections 67245 (containment) and 67248 (closure). Specific container requirements identified in the article are:

(1) Containers must be in good, non-leaking condition. At some storage locations, the GDSCC is in non-compliance with this requirment.

(2) Containers must be compatible with their contents. The GDSCC is in compliance with this requirement.

(3) Containers must be closed during storage, except when they are being filled or emptied. The GDSCC is in partial non-compliance with this requirement. Non-compliance varies on any particular inspection day and for any location. Compliance can be achieved by posting signs at each storage location or by informing staff of the requirement through an SOP or memo.

(4) Weekly inspection of containers for leakage is required. The GDSCC is not in compliance with this requirement. There are no routine, recorded inspections at the complex. It is recommended that an inspection program be developed and implemented. Standard field forms should be prepared for use and should include space for deficiency reporting. Deficiencies should be reported to the EC whose responsibility it should be to ensure that deficiencies are corrected as soon as practicable. The EC should sign off on the field sheets as soon as it has been verified that the correction has been implemented effectively. Field sheets should be filed in the central file for a minimum of 3 years.

(5) Incompatibles should not be stored in the same containers, and incompatibles stored in different containers should be separated by berms, dikes, or other structures. Incompatibles were not being stored in the same location at the time of the MBGA survey. It is recommended that the GDSCC staff be familiar with the provisions of Article 24, and incorporate them in its inspection checklist to ensure compliance in the future.

21. Article 25: Tanks at Interim Status and Permitted Facilities (Sections 67250-67262)

Sections of Article 25 that apply to underground tanks containing hazardous waste, which hold less than 5,000 gal of waste at any one time, include Sections 67257 and 67259. Section 67257(a) has provisions for the proper storage of ignitable, reactive, and incompatible wastes. Section 67257(b) prohibits uses that could damage the tank. Section 67257(d) requires tanks with continuous feed to have a waste feed cutoff or bypass system. Subsections (a) and (b) are of little concern because oil is the only waste stored underground at GDSCC.

With respect to subsection (c), the GDSCC has two waste tanks with continuous feed. These are located at the Echo and Mars Sites. If these tanks are not equipped with a cutoff or bypass system, plans should be made to install such a system when the tanks are replaced.

Section 67259 requires inspection of tanks that have cutoff or bypass systems (daily), determination of liquid levels in tanks (daily), and inspection of visible fixtures and seams and visible containment structures (weekly).

It is recommended that the waste tanks be included in the routine inspection program, and that the items listed above be included on the inspection checklist. Liquid level measurements are being taken under the ongoing underground tank program at the GDSCC. No other requirements under Article 25 are applicable to the GDSCC.

22. Articles 26 through 32 (Sections 67280-67526)

The provisions of these articles do not apply to operations at the GDSCC.

23. Article 33: Hazardous Waste Testing Laboratory Certification (Sections 67600-67606)

Although the provisions of this article do not apply directly to the GDSCC, it is important to be familiar with the requirements for laboratory certification because the GDSCC, on occasion, will need to contract with an outside laboratory for environmental testing. The GDSCC should always request proof of certification. Note that certification is issued for specific tests and not for all tests (see Section 67601, Test Categories).

24. Article 34: Hazardous Waste Property and Border Zone Property (Sections 67650-67651)

This section is not expected to be applied to property at the GDSCC because the GDSCC is located inside a Federal facility. This section technically could apply to the Barstow office, but its application is unlikely.

F. COMPLIANCE WITH CALIFORNIA LAW

The California Health and Safety Code is a compilation of laws related to public health and safety issues. Included in the Health and Safety Code, under Chapter 6.5, are laws regarding hazardous waste management. Compliance with these laws is accomplished through compliance with regulations published in CAC Title 22.

It is useful to read portions of Chapter 6.5 of the Health and Safety Code to facilitate understanding of the regulations. Articles of specific value include:

(1) Article 2: Definitions.

(2) Article 4: Listing of Hazardous Wastes.

(3) Article 5: Standards, Section 25154, Unlawful handling, storage, use of Hazardous Wastes.

(4) Article 5.5: Sections 25159 through 25159.9, Coordination with Federal Acts.

(5) Article 7: Section 25175, Recycling.

(6) Article 8: Sections 25180 through 25196, Enforcement.

Following Chapter 6.5, Hazardous Waste Control, is Chapter 6.7, Underground Storage of Hazardous Substances, Sections 25280 through 25259. Although the scope of this chapter includes materials as well as waste, it is recommended that the GDSCC be familiar with the contents of Chapter 6.7.

G. COMPLIANCE WITH LOCAL RULES

The local agency having hazardous waste authority with respect to the GDSCC facility is the SBC/DEHS/HWTCS. SBC/DEHS/HWTCS conducts seminars on hazardous waste issues and publishes a hazardous waste newsletter periodically, providing an update on local agency activity and policy. SBC/DEHS/HWTCS does not impose waste management requirements in addition to those already imposed by the state. SBC/DEHS/HWTCS, however, does require that local generators obtain a county waste management permit and pay an annual fee. This fee is based on the number of employees at the permittee's facility.

SBC/DEHS/HWTCS inspects the GDSCC on occasion for compliance. Inspectors seldom write NOVs, and no NOVs were on file at the GDSCC for non-compliance with Title 22. It is strongly recommended that this laxity not be taken as the standard. The GDSCC should take responsibility for setting its own higher standard for compliance. Waiting to be cited for violations should not be the basis for taking corrective actions. Informed managers who prescribe a "no action" policy are practicing negligence. Although the GDSCC does not subscribe to a "no action" policy, it sometimes responds to local agency advice to ignore certain requirements because of the small size of an operation or because the facility looks clean. This advice should never be taken without the expressed written consent of the agency and concurrence from the JPL legal staff.

H. COMPLIANCE WITH FEDERAL REGULATIONS

By Executive Order, Federal agencies must comply with provisions of Federal environmental law and regulations as well as state and local requirements. The EPA has developed strategies to ensure that Federal facilities achieve and maintain high levels of compliance. At the present time, EPA is focusing on facilities having serious environmental problems.

EPA encourages Federal facilities to conduct environmental audits. Facilities are reminded, however, that EPA can, through legal means, obtain copies of the audit for their own review. This action generally is reserved for facilities having major non-compliance problems, but could be applied to any facility.

Enforcement actions taken by EPA against Federal facilities are strictly administrative, and civil penalties are not assessed. State agencies are not subject to these limitations and can take actions authorized under state statutes. California statute allows the assessment of severe fines and penalties for violation of environmental laws and regulations.

Non-Federal owners or operators of Federal facilities, however, are subject to all enforcement processes, should actions be taken against them. EPA has made it clear, however, that in this case, both the Federal facility and its non-Federal operator will be involved to force expeditious resolution of the problem. EPA policy is to avoid interference in state actions involving Federal facilities. With respect to hazardous waste compliance, the GDSCC, with some exceptions, is subject to the laws and regulations of the state of California. This is explained below:

All of the regulations promulgated under the RCRA must be enacted by California within a specified time following enactment at the Federal level. The GDSCC should, then, be able to achieve compliance by consulting CAC Title 22. One exception is regulations enacted as a result of the Hazardous and Solid Waste Amendments (HSWA) of 1984 (HSWA, Public Law 98-616). These regulations become effective in California at the same time they are enacted at the Federal level, whether or not California has adopted them.

Sections of HSWA that may affect management of hazardous wastes at the GDSCC include:

(1) Section 201: Prohibitions on disposal of specified wastes in land disposal facilities (corresponds in part to the land disposal ban imposed by CAC Title 22, Article 15). The GDSCC should review all wastes generated to determine whether or not it is generating prohibited wastes. It should also review those materials that are ordered for use at the GDSCC to determine whether these may result in the generation of restricted wastes.

(2) Section 224: Certification to reduce the volume and toxicity of hazardous wastes destined for disposal. This is similar to the California waste minimization requirements, except that EPA is requiring the biennial report to contain information on efforts made by a facility to reduce the volume and toxicity of waste as well as the actual changes in volume and toxicity that have occurred compared to previous years. This will require the GDSCC to keep annual records of all wastes generated, process changes, raw material changes, and other measures taken preliminary and subsequent to waste generation to reduce the quantities and toxicity of the waste stream.

This section also requires that after September 1, 1985 all generators must sign a waste minimization certification statement that is to appear on the manifest. The GDSCC applies this statement to the back of its manifests so that photocopies of manifests placed in the file must be copied on both sides to demonstrate that the certification statement has been signed. The GDSCC has recently ordered new manifests to be preprinted with information that applies specifically to the facility. MBGA has advised the GDSCC to be certain that the manifest carries the required certification statements.

(3) Section 229 requires EPA to conduct an annual inspection of Federal facilities, and authorizes state agencies to conduct annual inspections. The GDSCC, as yet, has not had an EPA or a state inspection. Findings from this compliance audit can be used to prepare for the impending inspections.

(4) Section 244 requires Federal agencies to report to EPA or the state (if appropriate) the following information: An inventory of all storage, treatment, and disposal sites that are permitted or would have been subject to permitting if the rules had been in existence in the past. HSWA specifies the type of information to be provided. The inventory is to be submitted every 2 years beginning January 31, 1986 and shall be available to the public.

This rule is a continuation of a requirement for similar information under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA). Information provided under the CERCLA requirement does not need to be resubmitted, but does need to be updated through the HSWA inventory. The GDSCC does not have any permitted hazardous waste storage, treatment, or disposal facilities. Assuming that the Mojave Base Site dump is a solid waste dump containing no hazardous wastes, the GDSCC is not subject to the provisions of Section 244.

It is recommended that the GDSCC obtain a copy of the HSWAs for its library. For sections that are applicable, the GDSCC should follow the changes in regulations as they develop.

SECTION VI

SOLID WASTE MANAGEMENT

A. INTRODUCTION

About 1975, the state of California passed laws and adopted regulations governing the management and disposal of nonhazardous solid waste. The term solid waste is defined as all putrescible and non-putrescible solid, semi-solid, and liquid wastes, including; demolition and construction wastes; abandoned vehicles and parts thereof; discarded home and industrial appliances, manure, vegetable or animal solid and semi-solid waste; and other discarded solid and semi-solid wastes. Solid-waste management, as referred to in the regulations, means a planned program for effectively controlling the storage, collection, transportation, processing and reuse, conversion, or disposal of solid waste. Disposal must be in a safe, sanitary, esthetically acceptable, environmentally sound, and economical manner. Solid-waste management includes all administrative, financial, environmental, legal and planning functions, as well as the operational aspects of solid-waste handling, disposal, litter control, and resource recovery systems necessary to achieve established objectives.

At the beginning of the state's program, regional planning agencies were designated and charged with the task to prepare Waste Management Plans. The agencies usually were in the counties in which solid-waste facilities or solid-waste related activities existed. In response to this requirement, a County Waste Management Plan was prepared by San Bernardino County, the geographical area in which the solid-waste disposal facilities at the GDSCC are located.

The regulations concerning solid-waste management are administered by the State Solid Waste Management Board (SWMB), with offices located in Sacramento, California. The State SWMB administers the laws and regulations concerning solid-waste management through a local enforcement agency. In the case of the GDSCC, the local enforcement agency is the San Bernardino County Health Department. The state SWMB issues operating permits for solid-waste disposal facilities and the permits are enforced by the SBC/DEHS/HWTCS. The SBC/DEHS/HWTCS conducts periodic inspections of the GDSCC facilities to determine if the facilities are in compliance with permit conditions and state regulations.

The California State Water Resources Control Board (SWRCB), also headquartered in Sacramento, administers the protection of the state's surface and ground waters under the Federal Clean Water Act (CWA). The SWRCB administers the law and regulations pertaining to ground and surface waters through the RWQCB. In the case of the GDSCC, the RWQCB having jurisdiction is the Lahontan Regional Water Quality Control Board (LRWQCB). The LRWQCB issues what are called "Waste Discharge Requirements" for the discharge of solid or liquid wastes onto the land or into surface waters of the state of California. The LRWQCB has issued discharge requirements for three solid-waste disposal sites at the GDSCC.

The LRWQCB also issues ground water and surface water monitoring and reporting requirements for facilities having Waste Discharge Requirements. The LRWQCB conducts periodic inspections to determine if facilities are in compliance with issued discharge requirements, monitoring and reporting requirements, and applicable state regulations.

Prior to a date to be specified by the air and water boards, the GDSCC will be required to prepare SWATs. The SWAT investigations and reports are intended to bring solid-waste facilities into compliance with recently revised portions of CAC, Title 23, Subchapter 15. The SWAT reports (one addressing water quality and one addressing air quality) require extensive testing and evaluation of soils, surface and ground water, and air for the presence of hazardous constituents that might have been released from landfilling activities. The law requires the results of these studies to be reported to the legislature by the SWRCB and the California Air Resources Board (CARB). The SWRCB has recently advised the GDSCC that its SWAT report must be filed prior to 1993.

B. REGULATIONS

The California Health and Safety Code, Title 7.3, contains the law pertaining to the disposal of nonhazardous solid wastes. The CAC Title 14, Natural Resources, Division 7, California Waste Management Board, contains detailed regulations for the management of nonhazardous solid waste. CAC Title 23, Subchapter 15, Chapter 3, contains the SWRCB regulations governing waste disposal to land. The CARB is preparing regulations concerning gaseous emissions from solid-waste disposal sites. These regulations will be implemented as part of the landfill SWAT program. Certain Air Quality Management Districts (AQMD) impose more specific guidelines pertaining to land disposal sites. As these guidelines can readily change, it is recommended that the GDSCC keep in routine contact with the local AQMD to remain current with local requirements. The U.S. Environmental Protection Agency (USEPA) under the RCRA, Subtitle D, specifies certain environmental requirements for land disposal of nonhazardous waste. Under RCRA, states were required to conduct an "Open Dump Inventory" to determine which disposal sites had violated the federal standards. The HSWAs of 1984 require the USEPA to expand and update environmental regulations for nonhazardous, solid-waste land disposal sites. New and revised USEPA regulations are normally incorporated into the CAC, placing California facilities substantially in compliance with Federal regulations when they comply with state regulations.

In addition to the regulations contained in the CAC, permitted landfill facilities must comply with conditions contained in their operating permits. These sometimes are more restrictive than the regulations.

C. GENERAL REQUIREMENTS FOR A NONHAZARDOUS SOLID-WASTE MANAGEMENT PROGRAM

1. Background

A solid-waste management program consists of several elements. These elements, which include planning, collection, disposal, monitoring, reporting, and recordkeeping, are discussed below. The purpose of the discussion which follows is not intended to provide a comprehensive listing of requirements, but to familiarize the reader with the basic requirements of Solid-Waste Management Programs. A facility should prepare a written Solid-Waste Management Plan and standard operating procedures addressing each of these program elements, and should implement an inspection procedure to ensure that the facility is in compliance with the prepared program.

2. Planning (CAC Title 14, Sections 17302 and 17608)

In California, planning is a requirement and responsibility that has been delegated to the counties. In the case of self-supported facilities such as the GDSCC, however, internal planning for future waste management is appropriate. Disposal facilities must be identified in County General Plans and the County Solid-Waste Management Plan. The GDSCC also should have an internal Solid-Waste Management Plan that addresses compliance with regulations and permit requirements. The plan should include written policy for management of wastes at the GDSCC and standard operating procedures for managers, generators, collection activities, and operating facilities. The Solid-Waste Management Plan also should make projections and plans for future solid-waste disposal needs.

3. Collection of Wastes (CAC Title 14, Sections 17311-17341)

State regulations contain requirements governing methods for storage of wastes prior to collection, the length of time that wastes can be stored in containers prior to collection, the frequency of collection, the types of containers and vehicles that can be used, and the labeling and marking of waste containers and vehicles.

4. Facility Engineering, Operation, and Maintenance (CAC Title 14, Sections 17616-17743 and CAC Title 23, Sections 2533-2590

A brief overview of engineering, operational, and maintenance requirements is provided below. More specific information may be obtained by consulting the regulations directly.

Disposal site locations must be mapped and recorded in the office of the County Recorder. Hazardous waste liquids and sludges must not be disposed of in solid-waste landfills, except with agency approval. An operations plan, which is called a Report of Waste Discharge and Report of Disposal Site Information, must be prepared for each disposal facility and submitted to the RWQCB and the State SWMB through their respective local enforcement agencies.

Disposal sites must be professionally engineered. Adequately trained staff must be provided and properly supervised. Disposal sites must be secured to prevent unauthorized access and disposal. Adequate earth cover, drainage, and grading is required at a land disposal-facility. Adequate operating, maintenance, safety, and emergency equipment must be provided. This equipment must be in good condition in accordance with the provisions of the facility operation permit. Provisions for standby equipment must be made.

A Registered Civil Engineer must review site design, implementation, and the facilities operation plan at least every 5 years. The remaining capacity of the facility must be re-estimated for planning purposes at that time.

5. Monitoring, Reporting, and Recordkeeping (CAC Title 14, Sections 17636-17638, 17733)

Site specific monitoring and reporting requirements are included in operating permits issued by the local enforcement agency of the Solid-Waste Management Board and the Regional Water Quality Control Board. Facilities must be in compliance with these conditions. A recordkeeping system must be maintained, not only as required by law, but as an aid to proper management of disposal facilities. Reports required in operating permits must be submitted within the stipulated time frame.

6. Training (CAC Title 14, Section 17647)

A training program must be implemented for personnel involved with solid waste management. Training records must be documented and maintained in a filing system.

7. Compliance Inspections and Monitoring (CAC Title 14, Section 17734 and CAC Title 23, Sections 2551, 2555, 2556, 2557 and 2559)

Routine inspections of collection activities and equipment, closed land disposal-sites, and operating facilities are required to ensure compliance with permit conditions and regulations. The inspections must be documented. A periodic management review and audit of facility monitoring records, agency correspondence, required reports, and training records is necessary to ensure compliance and program effectiveness.

8. Regulatory Liaison

This function is not a requirement of any regulation. Senior program managers should recognize the need, however, to maintain communications with the County Health Department, the RWQCB, and other agencies having responsibilities for regulating solid waste management. The GDSCC should be represented at hearings and meetings where site-waste management is discussed.

D. DESCRIPTION OF FACILITIES

Collection and disposal of waste at the GDSCC is managed by weekly pickup of refuse receptacles of 3 cubic yards or less. A refuse compaction truck is used for this purpose. The collected wastes are transported to a 6-acre, operating land disposal-site near Echo Site, where the waste is discharged from the truck into trenches excavated for the burial of solid waste. A large front end loader is periodically used to compact and cover the waste received. The disposal site, which is the single operating waste-disposal site at the GDSCC, is properly permitted for operation in California as a Class III solid waste landfill. Figure 4 shows the location of the open Echo Site landfill.

At the time of the MBGA survey, the GDSCC had a copy of a proposed state Solid-Waste Facility Permit that stipulated the size of the landfill to be 6 acres. A final copy of the permit was not on file during the MBGA survey. Recently, the GDSCC contacted the LRWQCB regarding the size of the landfill. The LRWQCB concurred that the site was 10 acres and not 6 acres, as stated in the draft permit. Subsequently, the GDSCC has obtained a written statement from the LRWQCB verifying the size of the site to be 10 acres. This is important, because the original 6-acre fill is nearly filled to capacity, and additional capacity is needed if the fill is to continue operating.

Three closed waste-disposal sites are reported at the GDSCC. These include the closed site at the Echo Site, a site at the Mars Site, and a site at the Pioneer Site (no longer managed by NASA). The RWQCB has rescinded the Waste Discharge Requirements for the closed facilities and has not imposed further closure requirements.

In addition to the disposal sites described above, there is one unpermitted solid-waste disposal site at the Mojave Base Site. The disposal trenches at this location have remained open and wastes remain exposed, although the facility is neither permitted nor operated at this time.

E. GENERAL SURVEY FINDINGS

1. Background

A field survey of closed and open solid-waste disposal sites located at the GDSCC was conducted by MBGA staff during May 1986 and February 1987. During the survey, MBGA staff performed an in-depth compliance audit, focusing on the following administrative and management aspects of the GDSCC Solid-Waste Management Program: Recordkeeping and reporting procedures, personnel training, solid-waste collection procedures and policies, facilities engineering, operations, and maintenance, permits, site closure, and monitoring activities. General findings of the audit are provided below.

2. Program Management and Planning

The GDSCC does not have a formal Solid-Waste Management Program. Specifically, there is no written policy statement, planning document, procedural manual, or other administrative/managerial documents that provide

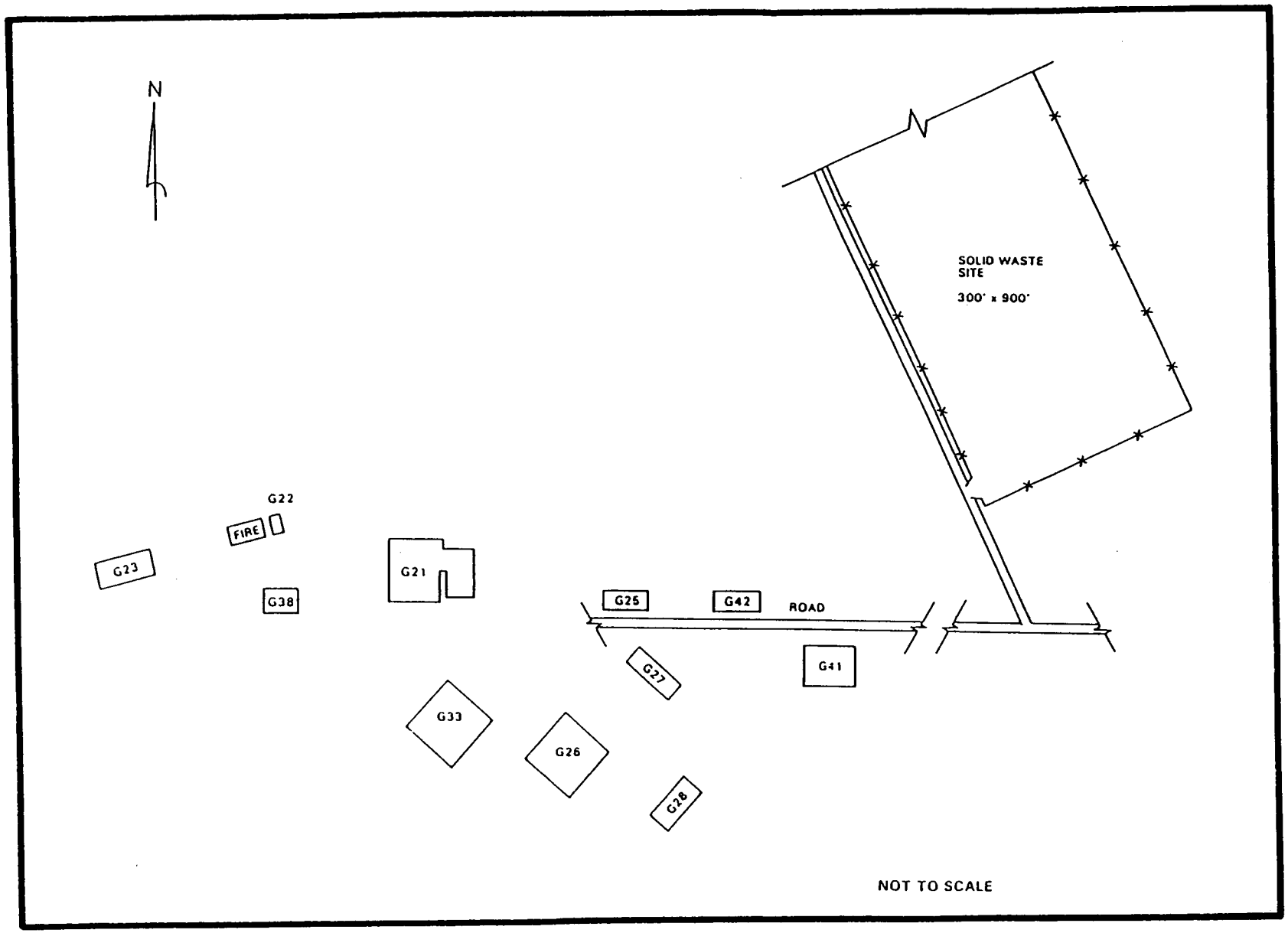


Figure 4. Location of Open Solid Waste Landfill at the Echo Site

guidance for successfully operating a solid-waste management program. The Echo Site landfill, which accepts small quantities of non-putrescible, non-liquid solid wastes, is in reasonable physical compliance with existing requirements. This is due primarily to the characteristics of the waste stream and to the high standards of on-site operations personnel rather than to a plan of action to achieve and maintain compliance. This was evidenced in May 1986 not only by the lack of programmatic documents, but by the lack of an adequate recordkeeping system and the absence of copies of required permits to operate landfill facilities. Since that time, improvements have been made to the recordkeeping system.

Efforts began in February 1987 to obtain copies of permits from the SWMB and LRWQCB, and to map and properly record the landfill with the County Recorder. The GDSCC recently has received verbal confirmation that the LRWQCB has reclassified the landfill from a Class II-2 to a Class III facility. Program documents have not as yet been prepared.

3. Regulatory Liaison and Regulations Update

Periodic changes are made in laws, regulations, and permitting requirements relating to solid-waste management facilities. Local agencies with responsibility for enforcing the state laws and regulations conduct periodic inspections of facilities to determine compliance with regulations and permit conditions. Inspection reports are then filed with the appropriate agency(ies). Prior to permit revision, public hearings are held to ensure that facility permits are reasonable and consistent with regional planning documents. To monitor changes in the regulations, the GDSCC management must maintain a liaison with appropriate agencies and have a detailed knowledge of operating permits. New bills, laws, regulations, and guidelines that affect the GDSCC also should be identified and fully implemented to achieve timely compliance.

The GDSCC presently is working to update and complete its library of applicable laws, codes, regulations, guidelines, and technical journals. At a minimum, to operate a solid-waste management program, the GDSCC must maintain current copies of CAC Titles 14 and 23. NASA/JPL and the contractor's off-site managers provide no regulatory update/interpretation support to the on-site GDSCC contractor. It, therefore, is imperative that the the on-site contractor maintain as complete a library as possible. This reference material should be supplemented with periodic attendance at local regulations seminars and regular contact with cognizant regulatory agencies. MBGA has provided the GDSCC with a list of publications that should be purchased for the library. A copy of the list is included in Appendix D.

4. Recordkeeping and Reporting Procedures

A formal recordkeeping system is not in use at the GDSCC. Reporting requirements have not been delineated and, in some cases, reports have not been submitted. It also was noted during conversations with GDSCC personnel that local agency inspectors seem to operate very informally. Apparently, agency personnel have at times advised GDSCC personnel to be

non-responsive to certain recordkeeping and reporting requirements because the existing landfill is small and well-operated. This advice is of no value and should be ignored. Should the GDSCC have a serious compliance problem in the future, the GDSCC would have no evidence that its facilities have been properly operated.

5. Personnel Training

Adequate training is required by state law so that operating personnel and managers have a working knowledge of the basic requirements of state law and the operating permits governing solid-waste management activities. Although GDSCC contractor personnel are sufficiently knowledgeable of landfill operating requirements and procedures, there is no written documentation of training, proficiency, or refresher training on file.

6. Solid-Waste Collection Procedures and Policies

Written policy and procedures for waste separation, reclamation for reuse, and collection are not on file at the GDSCC.

7. Facilities Engineering, Operations, and Maintenance

At the present time, the GDSCC operates one active, permitted landfill. This landfill is located at the Echo Site. The Echo Site landfill is a well-operated land-disposal facility that is in compliance with respect to litter control, grading, security, and routine operating requirements.

When JPL took over management of the Apollo Site and the Mojave Base Site, it inherited an unpermitted open dump located at the Mojave Base Site. The dump had been left by the previous site manager. Neither JPL nor any JPL on-site contractor has deposited any additional materials into this dumpsite. Although little is known regarding the extent of the dumping activity or the type and quantity of waste deposited, the dump exists in violation of applicable Federal and state laws and regulations.

In addition to the facilities described above, there are three closed solid-waste landfill sites at the GDSCC. These sites are located at the Echo, Mars, and Pioneer Sites and were operated under permit while active. All three sites apparently were properly closed in accordance with requirements in force at the time of closure. State inspection reports also show them to have been operated and closed in compliance with the prevailing regulations. State laws and regulations require that solid-waste management facilities operate under engineering review. The engineering begins with the preparation of a Report of Disposal Site Information and the preparation of operational plans for landfill facilities. Continued engineering also is required. Site surveys, recording of property boundaries, and engineering reports and inspections are required. Construction safety necessitates engineering overview.

MBGA was provided with a copy of an engineering report on the Echo Site landfill prepared in 1980 by Pacific Soils Company. Apparently, the report has been accepted by the LRWQCB and the SWMB as a Report of Waste Discharge and Report of Disposal Site Information. The report, however, does not include all of the required information. The GDSCC has contacted the county regarding submittal of required reports, and the county has expressed no concern regarding the current status of reports and permits. Again, MBGA advises the GDSCC to ignore this lack of concern on the part of agencies and take action to update reports and permits in accordance with regulations.

Files and records for the closed and open landfill sites are incomplete. Permits, correspondence, engineering drawings, and inspection records are not organized and, in many instances, not available. A Disposal Site Operating and Maintenance Log is not kept. This log is required to record activities taking place at the landfill, including quantities of waste placed in the landfill, results of routine inspections, information on maintenance activities, and unusual occurrences such as floods or fires.

8. Permits, Site Closure, and Monitoring Activities

The active GDSCC landfill at the Echo Site is permitted. Copies of final permits for this site were not available during the audits. A revision or clarification to the SWMB permit, however, was recently received. It identifies the size of the Echo Site landfill to be 10 acres. File copies of permits for previously operated landfills were not available. Closure Plans were not on file for the closed facilities, and it is unknown whether or not written plans ever existed, although these were requested by the SWMB in a letter dated May 22, 1979. There is no written Closure Plan on file for the existing Echo Site landfill. There also is no plan prepared as yet for monitoring the landfill to comply with existing CAC Title 23 requirements.

The GDSCC recently contacted the state Water Resources Control Board, the LRWQCB, and the county to determine when it has been scheduled to submit reports to the agencies. The board has scheduled the GDSCC for 1993 for submittal of the required SWAT reports. The 5 year permit review is scheduled for 6 to 18 months from March 1987. The GDSCC may submit required reports earlier than scheduled and should consider the advantages and disadvantages of early submittal.

F. COMPLIANCE STATUS

The audit sheets, which are presented in Tables 7 and 8, provide a detailed listing of state regulatory requirements based on CAC, Title 14. Table 7 is a representation of compliance for the active, permitted Echo Site landfill. Table 8 reflects the compliance status of the unpermitted, open dump at the Mojave Base Site. Table 9 shows GDSCC compliance with Title 23 regulations for the Echo Site landfill. Table 10 shows GDSCC compliance with Title 23 regulations for the open dump at the Mojave Base Site. Table 11 shows compliance with closure requirements for the closed landfills at the Echo and Mars Sites.

Table 7. Compliance Checklist for Solid-Waste Management Facility: Open Dump at Echo Site (From CAC Title 14, Division 7, Chapter 3: Minimum Standards for Solid Waste Handling and Disposal)

Section	Section Description	In Compliance? Yes	No	N/A
ARTICLE 5.	SOLID WASTE STORAGE AND REMOVAL STANDARDS			
17302, 17608	Solid waste storage and removal shall be in conformance with the County Solid Waste Management Plan	X[a]		
17311	The owner, operator, or occupant of any property shall be responsible for safe, sanitary storage of solid wastes	X		
17312	Solid wastes shall be stored in a manner that will not promote attraction, harborage, or propagation of vectors or creation of nuisances	X		
17316	Containers of 1 cubic yard or more shall be identified with the name and telephone number of the agent servicing the container	X		
17331	Refuse shall not be allowed to remain in containers for more than 7 days	X		
17341	Collection equipment shall be maintained in good condition and cleaned to prevent propagation or attraction of flies, rodents or other vectors, and the creation of nuisances	X		
ARTICLE 7.	DISPOSAL SITE STANDARDS			
17616	Each operator must file a "Report of Disposal Site Information" with the enforcement agency	X		

[a]Out-of-date County Solid Waste Management Plan is in the GDSCC file.

Table 7. (Cont'd)

Section	Section Description	In Compliance? Yes	No	N/A
17636	Each site operator shall maintain records of weights or volumes as approved by the enforcement agency. Records shall be adequate for planning and design of the site		X	
17637	Site operators shall maintain records regarding the length and depth of cuts made in natural terrain where fill will be placed	X[b]		
17638	Operators of a site that accepts more than 100 cubic yards per day shall maintain a log of the following information: fires, flooding, earthslides, injury, sudden settlement, discharge of hazardous and other unpermitted wastes			X
17646	The operator shall provide adequate staff	X		
17647	Operating personnel shall be adequately trained	X[c]		
	The site shall have a perimeter barrier to discourage unauthorized entry by persons or vehicles	X		
17660	Roads used by the public shall be identified and kept in a safe condition			X
17666	Adequate sanitary facilities shall be available in the vicinity			X
17667	A safe and adequate supply of drinking water for site staff shall be available			X

[b]Records should be definitive. General Plan was the only record.

[c]Training records not available. Union operators (journeymen) hired. Actual operations indicate that operators were trained.

Table 7.(Cont'd)

Section	Section Description	In Compliance? Yes	No	N/A
17668	Communications facilities shall be immediately available for summoning aid in emergencies. If site is unattended, signs at the entrance should warn users that no communications facilities are available		X	
17669	Lighting shall be provided if there are night operations			X
17676	Adequate control of windblown materials shall be provided. Unloading areas shall be confined to as small an area as possible	X[d]		
17677	Refuse shall be compacted in layers of 2 ft thickness (approximate) as rapidly as practicable	X		
17678	Slopes, depths of excavations, and cuts in earth shall not exceed slopes and dimensions approved by the enforcement agency	X[e]		
17680	Stockpiles of cover material shall not interfere with drainage or disposal operations	X		
17681	A sufficient quantity of cover material to meet standards shall be made available	X		
17682	A minimum thickness of 6 in. of cover shall be used at a frequency approved by the local enforcement agency		X[e]	

[d]There was no evidence of a windblown litter problem at the time of survey.

[e]Final permit not on file at time of survey, but field practice conforms with normal operating practice. For this type of facility, slopes and depth of lots have not been established by the enforcement agency. Vertical cuts would not be approved for safety reasons. Cover was not applied daily. A closure plan has not been prepared as yet.

Table 7. (Cont'd)

Section	Section Description	In Compliance? Yes	No	N/A
17684	A minimum thickness of 12 in. shall be provided where disposal will not occur within 180 days	X		
17685	Final cover shall be a minimum of 2 ft in thickness (or in accordance with the approved closure plan)	X[e]		
17686	Scavenging is prohibited	X		
17690	Salvaged materials shall be placed in a defined, safe area	X		
17701	Nuisances shall not be created	X		
17703	Prompt fire control shall be provided	X		
17704	Leachates shall be controlled			X[f]
17705	Gases shall not be allowed to create a hazard or nuisance. (The enforcement agency will make a determination and notify the operator)	X[g]		
17706	Dust shall be minimized	X		
17708	Adequate drainage shall be provided	X		

[f]No leachate monitoring has been accomplished. The RWQCB has indicated that the SWAT testing report, including leachate monitoring, will not be required for Goldstone until 1993.

[g]No record of any gas generation is available. Compliance, therefore, is unknown. SWAT testing, which will include gas monitoring, will not be required by the RWQCB until 1993.

Table 7. (Cont'd)

Section	Section Description	In Compliance? Yes	No	N/A
17710	Grading shall be provided to promote runoff and prevent ponding	X		
17711	Litter shall be routinely collected	X		
17733	The enforcement agency shall be notified at least 10 days prior to completion or suspension of operations at a disposal site			X
17734	Completed sites shall be inspected and properly maintained.		X[h]	
17735	A site description and map shall be filed with the county recorder and the local agency maintaining the County Solid-Waste Management Plan	X[i]		
17742	A site shall not accept hazardous wastes unless approved for disposal of particular wastes		X[j]	
17743	Liquid wastes and sludges may be accepted only at a site approved by the California RWQCB			X

[h]There are no records on file to indicate that the closed landfills are being inspected and maintained.

[i]This effort was in progress at the time of the February 1987 survey.

[j]Negligent disposal of some paint and oils was observed.

Table 8. Compliance Checklist for Solid-Waste Management Facility: Open Dump at Mojave Base Site (From CAC Title 14, Division 7, Chapter 3: Minimum Standards for Solid Waste Handling and Disposal)

Section	Section Description	In Compliance? Yes	No	N/A
ARTICLE 5.	SOLID WASTE STORAGE AND REMOVAL STANDARDS.			
17302, 17608	Solid waste storage and removal shall be in conformance with the County Solid-Waste Management Plan	X[a]		
17311	The owner, operator, or occupant of any property shall be responsible for safe, sanitary storage of solid wastes			X
17312	Solid wastes shall be stored in a manner that will not promote attraction, harborage, or propagation of vectors or creation of nuisances			X
17316	Containers of 1 cubic yard or more shall be identified with the name and telephone number of the agent servicing the container			X
17331	Refuse shall not be allowed to remain in containers for more than 7 days			X
17341	Collection equipment shall be maintained in good condition and cleaned to prevent propagation or attraction of flies, rodents or other vectors, and the creation of nuisances			X
ARTICLE 7.	DISPOSAL SITE STANDARDS			
17616	Each operator must file a "Report of Disposal Site Information" with the enforcement agency		X[b]	

[a]Out-of-date County Solid-Waste Management Plan is in the file.

[b]No records, plans, or reports for the Mojave disposal site were located. This site was not formally reported to regulatory agencies. No permits exist for the Mojave disposal operation. Monitoring or testing for leachates or gases has not been accomplished.

Table 8. (Cont'd)

Section	Section Description	In Compliance? Yes	No	N/A
17636	Each site operator shall maintain records of weights or volumes as approved by the enforcement agency. Records shall be adequate for planning and design of the site		X[b]	
17637	Site operators shall maintain records regarding the length and depth of cuts made in natural terrain where fill will be placed		X	
17638	Operators of a site that accepts more than 100 cubic yards per day shall maintain a log of the following information: fires, flooring, earthslides, injury, sudden settlement, discharge of hazardous and other unpermitted wastes			X
17646	The operator shall provide adequate staff			X
17647	Operating personnel shall be adequately trained			X
17656	A site open to the public shall have adequate signs			X
	The site shall have a perimeter barrier to discourage unauthorized entry by persons or vehicles		X	
17660	Roads used by the public shall be identified and kept in a safe condition			X
17666	Adequate sanitary facilities shall be available in the vicinity			X

Table 8. (Cont'd)

Section	Section Description	In Compliance? Yes	No	N/A
17667	A safe and adequate supply of drinking water for staff at the site shall be available			X
17668	Communications facilities shall be immediately available for summoning aid in emergencies. If site is unattended, signs at the entrance should warn users that no communications facilities are available		X	
17669	Lighting shall be provided if there are night operations			X
17676	Adequate control of windblown materials shall be provided. Unloading areas shall be confined to as small an area as possible		X	
17677	Refuse shall be compacted in layers of 2 ft thickness (approximate) as rapidly as practicable		X	
17678	Slopes, depths of excavations, and cuts in the earth shall not exceed slopes and dimensions approved by the enforcement agency		X[b]	
17680	Stockpiles of cover material shall not interfere with drainage or disposal operations		X	
17681	A sufficient quantity of cover material to meet standards shall be made available		X	
17682	A minimum thickness of 6 in. of cover shall be used at a frequency approved by the local enforcement agency		X[b]	

Table 8. (Cont'd)

Section	Section Description	In Compliance? Yes	No	N/A
17684	A minimum thickness of 12 in. shall be provided where disposal will not occur within 180 days		X	
17685	Final cover shall be a minimum of 2 ft in thickness (or in accordance with the approved closure plan)		X[c]	
17686	Scavenging is prohibited			X
17690	Salvaged materials shall be placed in a defined, safe area		X	
17701	Nuisances shall not be created		X	
17703	Prompt fire control shall be provided	X		
17704	Leachates shall be controlled			X[b]
17705	Gases shall not be allowed to create a hazard or nuisance. (The enforcement agency will make a determination and notify the operator)		X[b]	
17706	Dust shall be minimized		X	
17708	Adequate drainage shall be provided		X	
17710	Grading shall be provided to promote runoff and prevent ponding		X	
17711	Litter shall be routinely collected		X	

[c]A closure plan has not been prepared.

Table 8. (Cont'd)

Section	Section Description	In Compliance? Yes	No	N/A
17733	The enforcement agency shall be notified at least 10 days prior to completion or suspension of operations at a disposal site		X[b]	
17734	Completed sites shall be inspected and properly maintained		X	
17735	A site description and map shall be filed with the county recorder and the local agency maintaining the County Solid-Waste Management Plan		X[b]	
17742	A site shall not accept hazardous wastes unless approved for disposal of particular wastes		X[d]	
17743	Liquid wastes and sludges may be accepted only only at a site approved by the California RWQCB		X[e]	

[d]A few chemical/oil drums and vehicle batteries were observed in disposal trench.

[e]Drums, which may have contained liquids at the time of disposal, were observed in the open disposal trench.

Table 9. Compliance Checklist for Solid-Waste Management Facility: Open Dump at Echo Site (CAC, Title 23, Subchapter 15)

Section	Section Description	In Compliance? Yes	No	N/A
ARTICLE 2.	WASTE CLASSIFICATION CRITERIA			
2523	Nonhazardous Solid Waste			
(a)	Nonhazardous solid waste means all putrescible and nonputrescible solid, semi-solid, and liquid wastes, including garbage, trash, refuse, paper, rubbish, ashes, industrial wastes, demolition and construction wastes, abandoned vehicles and parts thereof, discarded home and industrial appliances, manure, vegetable or animal solid and semi-solid wastes and other discarded solid or semi-solid wastes. This classification of nonhazardous solid waste is valid provided that such wastes do not contain wastes that must be managed as hazardous			X[a]
(b)	Except as provided in Subsection 2520(d) of this article, nonhazardous solid waste may be discharged at any classified landfill that is authorized to accept such waste	X		
(c)	Dewatered sewage or water treatment sludge may be discharged at a Class III landfill under the following conditions, unless the State DHS determines that the waste must be managed as hazardous			
(1)	The landfill is equipped with a leachate collection and removal system			X
(2)	The sludge contains at least 20% solid if primary sludge, or at least 15% solids if secondary sludge, mixtures of primary and secondary sludges, or water treatment sludges			X

[a]Definition or information only. Not a requirement.

Table 9. (Cont'd)

Section	Section Description	In Compliance? Yes	No	N/A
(3)	A minimum solids-to-liquid ratio of 5:1 by weight shall be maintained to ensure that the co-disposal will not exceed the initial moisture-holding capacity of the nonhazardous solid waste. The actual ratio required by the regional board shall be based on site-specific conditions			X
(d)	Incinerator ash may be discharged at a Class III landfill unless DHS determines that the waste must be managed as hazardous waste			X
2524	INERT WASTE			
(a)	Inert waste does not contain hazardous waste or soluble pollutants in concentrations in excess of applicable water quality objectives, and does not contain significant quantities of decomposable waste			X[a]
(b)	Inert wastes do not need to be discharged at classified waste management units	X		
(c)	Regional boards may prescribe individual or general waste discharge requirements for discharges of inert wastes			X[a]
2524	CLASSIFICATION AND SITING CRITERIA			
(a)	Waste management units shall be classified according to their ability to contain wastes. Containment shall be determined by geology, hydrology, topography, climatology, and other factors relating to the ability of the waste management unit to protect water quality			X[a]

Table 9. (Cont'd)

Section	Section Description	In Compliance? Yes	No	N/A
ARTICLE 3.	WASTE MANAGEMENT UNIT CLASSIFICATION AND SITING			
2531	CLASS I: WASTE MANAGEMENT UNITS FOR HAZARDOUS WASTE			
(a)	Class I disposal units shall be located where natural geologic features provide optimum conditions for isolation of wastes from waters of the state			X
(b)	New and existing Class I units shall be immediately underlain by natural geologic materials that shall have a permeability of not more than 1 X 10^{-6}cm/s			X
(c)	Flooding: New disposal units and existing units in Category I, other than existing land treatment units, shall be located outside of floodplains subject to inundation by floods with a 100-yr return period			X
(d)	Ground Rupture: New units and existing units in Categories I, I′, REC, and EX, other than existing land treatment units, shall have a 200-ft setback from any known Holocene Fault			X
2532	CLASS II: WASTE MANAGEMENT UNITS FOR DESIGNATED WASTES			
(a)	Class II waste management units shall be located where site characteristics and containment structures isolate waste from waters of the state			X

Table 9. (Cont'd)

Section	Section Description	In Compliance? Yes	No	N/A
(1)	New and existing Class II landfills and waste piles shall be immediately underlain by natural geologic materials that have a permeability of not more than 1 X 10^{-6}cm/s. Class II units shall not be located where primary (porous) or secondary (rock opening) permeability greater than 1 X 10^{-6}cm/s could impair the competence of natural geologic materials to act as a barrier to vertical fluid movement			X
(2)	Natural or artificial barriers shall be used to prevent lateral movement of fluid, including waste and leachate			X
(3)	A linear system that conforms to the requirements of Article 4 of this subchapter with a permeability of not more than 1 X 10^{-6}cm/s shall be used for landfills and waste piles when natural geologic materials do not satisfy the requirements in subsection (b)(1) of this section			X
(c)	Flooding: New and existing Class II waste management units shall be designed, constructed, operated, and maintained to prevent inundation or washout caused by floods with a 100-yr return period			X
(e)	Rapid Geologic Change: New and existing Class II waste management units may be located within areas of potential rapid geologic change if containment structures are designed, constructed, and maintained to preclude failure.			X
2533	CLASS III: LANDFILLS FOR NONHAZARDOUS SOLID WASTE			
(a)	Class III landfills shall be located where site characteristics provide adequate separation between nonhazardous solid waste and waters of the state	X		

Table 9. (Cont'd)

Section	Section Description	In Compliance? Yes	No	N/A
(b)	Geologic Setting[b]			
(1)	New Class III and existing Class II-2 landfills shall be sited where soil characteristics, distance from waste to groundwater, and other factors will ensure no impairment of beneficial uses of surface water or of groundwater beneath or adjacent to the landfill. Factors to be evaluated shall include:			X[b]
	(A) Size of the waste management unit			
	(B) Permeability and transmissivity of underlying soils			
	(C) Depth to groundwater and variations in depth to groundwater			
	(E) Current and anticipated use of groundwater			
	(F) Annual precipitation			
(2)	When consideration of factors in subsection (b)(1) of this section indicates site that characteristics alone do not ensure protection of the quality of groundwater or surface water, Class III landfills shall be required to have a single clay liner with permeabilty of 1 X 10^{-6}cm/s or less			X[b]
ARTICLE 4.	CONSTRUCTION STANDARDS			
2543	LEACHATE COLLECTION AND REMOVAL SYSTEMS			
(a)	Leachate collection and removal systems are required for Class I landfills, surface impoundments, and waste piles, for Class II landfills and surface impoundments, and for Class III landfills that have a liner or accept sewage or water treatment sludge			X

[b]SWAT testing will reveal compliance with current geologic and hydrogeologic criteria. N/A indicates that compliance has not as yet been determined.

Table 9. (Cont'd)

Section	Section Description	In Compliance? Yes	No	N/A
2544	INTERIM COVER			
(b)	Interim cover over wastes discharged to a landfill shall be designed and constructed to minimize percolation of precipitation through wastes	X[c]		
2545	SUBSURFACE BARRIERS			
(b)	Cutoff walls are required at Class I waste management units where there is potential for lateral movement of fluid, including waste or leachate. Cutoff walls are required at Class II waste management units where there is potential for lateral movement of fluid, including waste or leachate, and the permeability of natural geologic materials is used for the waste containment in lieu of a liner. Cutoff walls shall be installed at Class III landfills as required by regional boards			X[d]
(c)	Cutoff walls shall have fluid collection systems installed upgradient of the structure. The systems shall be designed, constructed, operated, and maintained to prevent the buildup of hydraulic head against the structure. The collection system shall be inspected regularly, and accumulated fluid shall be removed	X		
2546	PRECIPITATION AND DRAINAGE CONTROLS			
(a)	Waste management units and containment structures shall be designed and constructed to limit, to the greatest extent possible, ponding, infiltration, inundation, erosion, slope failure, washout, and overtopping under the precipitation conditions specified	X[e]		

[c]The RWQCB must make this determination.

[d]Cutoff walls have not been required.

[e]Seems to comply. Design calculations, however, were not available.

Table 9.(Cont'd)

Section	Section Description	In Compliance? Yes	No	N/A
(b)	Precipitation on landfills or waste piles that is not diverted by covers or drainage control systems shall be collected and managed through the leachate collection and removal system	X[f]		
(c)	Diversion and drainage facilities shall be designed and constructed to accommodate the anticipated volume of precipitation and peak flows from surface runoff under the precipitation conditions specified		X[g]	
(d)	Collection and holding facilities associated with precipitation and drainage control systems shall be emptied immediatel following each storm or otherwise managed to maintain the design capacity of the system			X[h]
(e)	Surface and subsurface drainage from outside the waste management unit shall be diverted from the waste management unit		X[i]	
(f)	Cover materials shall be graded to divert precipitation from the waste management unit to prevent ponding of surface water over wastes, and to resist erosion as a result of precipitation with the return frequency specified in Table 4.1 of Section 2541(e) for each class of waste management unit	X[j]		

[f]Precipitation is diverted by covers. No leachate control system has been required.

[g]Does not seem to comply. Design calculations are not available.

[h]None exist.

[i]No visible diversion.

[j]Monitoring is required although arid climate would be expected to prevent leachate and, therefore, prevent groundwater contamination. Either a plan must be prepared under the SWAT program or the GDSCC must apply for a waiver.

Table 9. (Cont'd)

Section	Section Description	In Compliance? Yes	No	N/A
2547	SEISMIC DESIGN			
(a)	Class I and II waste management units shall be designed to withstand the maximum credible earthquake without damage to the foundation or to the structures that control leachate, surface drainage, erosion, or gas. Class III waste management units shall be designed to withstand the maximum probable earthquake without damage to the foundation or the structures that control leachate, surface drainage, erosion, or gas			X
2548	SPECIAL REQUIREMENTS FOR SURFACE IMPOUNDMENTS			
(b)	An operational plan shall be submitted to the regional board that will provide operation levels and waste input quantities permitted each month based on anticipated precipitation and past precipitation conditions for the year			X
ARTICLE 5.	WATER QUALITY MONITORING FOR CLASSIFIED WASTE MANAGEMENT UNITS			
2551	REQUIRED PROGRAMS			
(a) (1)	The discharger shall institute a detection monitoring program. Details of the program shall be approved by the regional board		X[k]	
(2)	If indicator parameters or waste constituents are detected at the compliance points in excess of the water quality protection standards, the discharger shall institute a verification monitoring program			X

[k]The GDSCC has not prepared a Detection Monitoring Program Plan or requested an exemption from this requirement (see Section 2590 (b)(1).

Table 9. (Cont'd)

Section	Section Description	In Compliance? Yes	No	N/A
(3)	If verification monitoring establishes that any water quality protection standard has been exceeded at or downgradient of the points of compliance, the discharger shall institute a corrective action program			X
(4)	Waste discharge requirements shall include one or more of the programs identified in subsection (a) of this section and shall specify the circumstances under which each of the programs shall be required		X[k]	
2555	GENERALGROUND WATER MONITORING REQUIREMENTS			
(b)	The groundwater monitoring system shall be designed and certified by a registered geologist or a registered civil engineer, and shall consist of a sufficient number of wells installed at appropriate locations and depths to yield groundwater samples that represent the background water quality and the quality of groundwater passing the points of compliance		X[1]	
(e)	The groundwater monitoring program shall include consistent and appropriate sampling and analytical procedures that accurately measure indicator parameters and waste constituents to provide a reliable indication of groundwater quality. At a minimum, the program shall include procedures and techniques for sample collection, sample preservation and shipment, analytical procedures, and chain of custody control		X[1]	
(f)	The groundwater monitoring program shall include a determination of the groundwater surface elevation and field parameters (temperature, electrical conductivity, and pH) at each well each time groundwater is sampled		X[1]	

[1]Status in SWAT program will determine when the GDSCC must comply with these monitoring requirements. The GDSCC has been advised by the Regional Board that they will be required to comply by 1993.

Table 9. (Cont'd)

Section	Section Description	In Compliance? Yes	No	N/A
2556	DETECTION MONITORING PROGRAM			
(a)	A discharger required to establish a detection monitoring program under this article shall undertake a program designed to detect the presence of waste constituents in surface water or groundwater outside of waste management units and in the unsaturated zone beneath and adjacent to a waste management unit. The discharger shall install ground-water monitoring systems and unsaturated zone monitoring systems at the compliance points, and monitor ground and surface water for indicator parameters or waste constituents that provide a reliable indication of leakage from a waste management unit		X[1]	
(b)	If the discharger or the regional board finds a statistically significant increase for indicator parameters or waste constituents at any monitoring point, the discharger shall notify the regional board, or acknowledge the regional board's finding, in writing, within 7 days. Notification shall indicate what water quality protection standards have been exceeded. Within 90 days, submit to the regional board an amended report of waste discharge for establishment of a verification monitoring program meeting the requirements of Section 2557 of this article		X[1]	
2557	VERIFICATION MONITORING PROGRAM			
(d)	Dischargers shall determine the velocity and direction(s) of groundwater flow under the waste management unit at least quarterly, including the times of expected highest and lowest elevations of the groundwater surface			X[m]

[m]This program is not implemented until the Detection Monitoring Program is completed.

Table 9. (Cont'd)

Section	Section Description	In Compliance? Yes	No	N/A
2559	UNSATURATED ZONE MONITORING PROGRAM			
(a)	Class I and II waste management units and Class III landfills with liners shall have an unsaturated zone monitoring program whenever feasible. The program shall be designed to detect waste constituents that may escape from waste management units before such constituents reach groundwater. The discharger shall monitor soil and soil-pore liquid at land treatment areas, and monitor soil-pore liquid at other types of waste management units			X
(e)	Dischargers shall use consistent sampling and analysis procedures that are designed to ensure a reliable indication of soil-pore liquid quality and, in the case of land treatment, of the chemical make-up of the soil below the land treatment unit			X
(g)	If a discharger or regional board finds there is a statistically significant increase of waste constituents or indicator parameters, the discharger shall notify the regional board or acknowledge the board's findings, in writing, within 7 days. Notification shall indicate what water quality protection standards have been exceeded. For landfills, the discharger shall, within 90 days, submit to the regional board an amended report of waste discharge for establishment of a verification monitoring program meeting the requirements of Section 2557 of this article			X

Table 9. (Cont'd)

Section	Section Description	In Compliance? Yes	No	N/A
2580	GENERAL CLOSURE REQUIREMENTS			
(a)	Partial or final closure of new and existing classified waste management units shall be in compliance with the provisions of this article. If a unit has been partially closed in accordance with an approved closure plan by the effective date of these regulations, the cover over the closed portion does not need to be modified to conform to these regulations unless monitoring data indicate impairment of beneficial uses of groundwater			X[n]
(b)	Closure shall be under the direct supervision of a registered civil engineer or a registered engineering geologist			X[n]
(c)	Class II waste management units and Class III landfills shall be closed pursuant to Section 2581 of this article			X[n]
(d)	Closed waste management units shall be provided with at least two permanent monuments installed by a licensed land surveyor or a registered civil engineer from which the location and elevation of wastes, containment structures, and monitoring facilities can be determined throughout the post-closure maintenance period			X[n]

[n]Although a closure plan is not required at this time, a plan must be prepared to ensure future compliance. All items under Section 2580 must be addressed in the closure plan.

Table 9. (Cont'd)

Section	Section Description	In Compliance? Yes	No	N/A
ARTICLE 8.	CLOSURE AND POST-CLOSURE MAINTENANCE			
2580	GENERAL CLOSURE REQUIREMENTS			
(e)	Vegetation for closed waste-management units shall be selected to require minimum irrigation and maintenance, and shall not impair the integrity of containment structures including the final cover			X[n]
(f)	The regional board shall require the discharger to establish an irrevocable closure fund or provide other means to ensure closure and post-closure maintenance of each classified waste management unit in accordance with an approved plan			X[o]
2581	LANDFILL CLOSURE REQUIREMENTS[p]			
(a)	Final Cover Requirements			
(1)	Closed landfills shall be provided with not less than 2 ft of appropriate materials as a foundation layer for the final cover. These materials may be soil, contaminated soil, incinerator ash, or other waste materials, provided that such materials have appropriate engineering properties to be used for a foundation layer			X
(2)	Closed landfills shall be provided with not less than 1 ft of soil containing no waste or leachate, placed on top of the foundation layer and compacted to attain permeability of either 1 X 10^{-6}cm/s or less, or equal to the permeability of any bottom linear system or underlying natural geologic materials, whichever is less			X

[o]Not required for Federal facilities.

[p]A closure plan for existing landfills must be submitted at least 180 days before closure of landfill. This item must be addressed in the plan.

Table 9. (Cont'd)

Section	Section Description	In Compliance? Yes	No	N/A
(3)	Closed landfills shall be provided with not less than 1 ft of soil containing no waste or leachate, placed on top of the material described in subsection (a) of this section. The rooting depth of any vegetation planted on the cover shall not exceed the depth to the material described			X
2581	LANDFILL CLOSURE REQUIREMENTS			
(b)	Grading Requirements			
(1)	Closed landfills shall be graded and maintained to prevent ponding and to provide slopes of at least 3%. Lesser slopes may be allowed if an effective system is provided for diverting surface drainage from covered wastes			X[p]
(2)	Areas with slopes greater than 10%, surface drainage courses, and areas subject to erosion by water and wind shall be protected or designed and constructed to prevent such erosion			X[p]
(c)	Throughout the post-closure maintenance periods, the discharger shall maintain the structural integrity and effectiveness of all containment structures, and maintain the final cover as necessary to correct the effects of settlement or other adverse factors. The discharger shall continue to operate the leachate collection and removal system as long as leachate is generated and detected, maintain monitoring systems and monitor the groundwater, surface water, and the unsaturated zone in accordance with the applicable requirements in Article 5 of this subchapter, prevent erosion and related damage of the final cover caused by drainage, and protect and maintain surveyed monuments			X[q]

[q]To be addressed in post-closure maintenance and inspection plan. This requirement is not applicable until the landfill is formally closed and the post-closure period begins.

Table 9. (Cont'd)

Section	Section Description	In Compliance? Yes	No	N/A
ARTICLE 9.	COMPLIANCE PROCEDURES			
2590	REPORTING REQUIREMENTS FOR WASTE DISCHARGE TO LAND			
(a)	Any person discharging or proposing to discharge waste to land where water quality can be affected shall submit to the regional board a "Report of Waste Discharge", unless the report is waived by the regional board.	X		
(1)	The discharger may submit a copy of the application for a hazardous waste facility permit, including the closure and post-closure maintenance plan, under CAC, Title 22, Division 4, Chapter 30 as a report of waste discharge, together with the applicable filing fee, provided that such application includes the information required in this article			X
(2)	For Class II and III waste management units, the closure and post-closure maintenance plan described in Section 2597 of this article shall be submitted with the closure notice required by subsection (c)(5) of this section			X[r]
(4)	The discharger shall notify the regional board of changes in information submitted under this subchapter, including any material change in the types, quantities, or concentrations of wastes discharged, site operations and features, or proposed closure procedures, including changes in cost estimates. The discharger shall notify the regional board a reasonable time before the changes are made or become effective	X		

[r]Will be required 180 days prior to closure.

Table 9. (Cont'd)

Section	Section Description	In Compliance? Yes	No	N/A
(b)	Deadlines for Reporting:			
(1)	Dischargers who own or operate existing waste management units for which waste discharge requirements were issued before the effective date of this chapter shall, within 6 months of the effective date of this section, submit a technical report to the regional board describing the measures necessary to bring their monitoring programs into compliance with Article 5 (Sections 2550-2559) of this subchapter, including a schedule for achieving compliance		X[s]	
(2)	Dischargers who own or operate existing waste management units for which waste discharge requirements were issued before the effective date of this subchapter shall submit, upon request, a report of waste discharge that complies with subsection (a) of this section to the regional board, together with the appropriate filing fee	X[t]		
(3)	Dischargers who own or operate existing waste management units that have not been classified under previous regulations, and for which the discharger has not submitted a report of waste discharge before the effective date of this subchapter, shall submit a report of waste discharge to the appropriate regional board within 60 days of the effective date of this subchapter as required by subsection 2510(d) of this subchapter			X
(c)	Notification			
(1)	The discharger shall notify the regional board in writing of any proposed change of ownership or responsibility for construction, operation, closure, or post-closure maintenance of a waste management unit	X		

[s]Monitoring program plan not submitted as yet.

[t]Revised report of waste discharge not requested by the Regional Board.

Table 9. (Cont'd)

Section	Section Description	In Compliance? Yes	No	N/A
(2)	The regional board shall be notified immediately of any slope failure occurring in a waste management unit	X		
(3)	The regional board shall be notified within 7 days if fluid is detected in a previously dry leachate collection and removal system of unsaturated zone monitoring system, or if a progressive increase is detected in the volume of fluid in a leachate collection and removal system			X[u]
(5)	The owner or operator of a waste management unit shall notify the regional board of units to be closed at least 180 days prior to beginning any partial or final closure activities. The notice shall include a statement that all closure activities will conform to the most recently approved closure plan and that the plan provides for site closure in compliance with all applicable Federal and state regulations.			X[v]
(6)	The owner or operator of a waste management unit shall notify the regional board within 30 days after the completion of any partial or final closure activities. The discharger shall certify under penalty of perjury that all closure activities were in accordance with the most recently approved closure plan and in accordance with all applicable regulations. The discharger shall certify that closed waste management units shall be maintained in accordance with an approved post-closure maintenance plan unless post-closure maintenance has been waived pursuant to subsection (a)(3) of this section			X[w]

[u]This section applies only if the landfill has a required monitoring program.

[v]Closure not expected within 180 days.

[w]Compliance will be required at time of closure.

Table 9. (Cont'd)

Section	Section Description	In Compliance? Yes	No	N/A
(d)	Any report submitted under this section or any amendment or revision thereto that might affect containment features or monitoring systems shall be approved by a registered civil engineer or certified engineering geologist			X[x]
2591	WASTE DISCHARGE REQUIREMENTS			
(a)	The regional board shall adopt waste discharge requirements that implement the applicable provisions of this subchapter			X[y]
2594	WASTE CHARACTERISTICS[z]			
(a)	Dischargers shall provide the following information in the report of waste discharge about the characteristics of wastes to be discharged at the waste management units:			
(1)	A list of the type, quantity, and concentration of wastes proposed to be discharged at each unit	X		
(2)	A description of proposed treatment, storage, and disposal methods	X		
(3)	An analysis of projected waste decomposition processes for each waste management unit indicating intermediate and final decomposition products and the period during which decomposition will continue following discharge		X	

[x]The GDSCC is not subject to this requirement at this time, but could be in the future.

[y]Waste discharge requirements are updated periodically by the Regional Board to incorporate revisions in the regulations.

[z]Report of Waste discharge was filed with and accepted by the RWQCB in 1980 for the GDSCC Echo Site. The report is not current with 1987 regulations. The additional data required in these sections may be requested by RWQCB.

Table 9. (Cont'd)

Section	Section Description	In Compliance? Yes	No	N/A
2595	WASTE MANAGEMENT UNIT CHARACTERISTICS[z]			
(a)	Dischargers shall provide in the report of waste discharge an analysis describing how the ground and surface water may affect the waste management unit and how the unit may affect ground and surface water	X		
(b)	Dischargers shall provide the following data on the physical characteristics of the waste management unit and the surrounding region to demonstrate suitability for the appropriate classification			
(c)	If a report submitted by a discharger refers to another source, the relevant information from that source shall be restated in the report	X		
(d)	Topography			
(1)	A map of the waste management unit and its surrounding region within 1 mile of the unit showing elevation contours, natural ground slopes, drainage patterns, and other topographic features	X		
(2)	Estimated maximum and minimum annual precipitation at the water management unit	X		
(3)	Maximum expected 24-hour precipitation for storm conditions specified as design criteria for the particular class of waste management unit		X	
(4)	Estimated mean, minimum, and maximum evaporation		X	
(5)	Projected volume and pattern of runoff for the proposed waste management unit including peak stream discharges associated with the storm conditions specified as design criteria		X	
(6)	An estimated wind rose		X	

Table 9. (Cont'd)

Section	Section Description	In Compliance? Yes	No	N/A
(f)	Geology			
(1)	A geologic map and geologic cross-sections of the waste management unit showing lithology and structural features		X[aa]	
(2)	A description of natural geologic materials	X		
(3)	A description of the geologic structure of the waste management unit	X		
(4)	The results of a testing program for determination of physical and chemical properties of soils		X[aa]	
(5)	A determination of the expected peak ground acceleration associated with the maximum probable earthquake		X[aa]	
(g)	Hydrology			
(1)	An evaluation of the water-bearing characteristics of the natural geologic materials		X	
(2)	An evaluation of the in-place permeability of soils immediately underlying the waste management unit		X	
(A)	Permeability data, in tabular form, were obtained for selected locations within the unit		X	
(B)	A map of the unit showing test locations where these permeability data were obtained		X	
(C)	An evaluation of the rationale and test procedures		X	

[aa]The following items were not included in the 1980 Report of Waste Discharge: geologic cross-sections, chemical properties of soils, and ground acceleration data.

Table 9. (Cont'd)

Section	Section Description	In Compliance? Yes	No	N/A
(3)	An evaluation of the perennial direction of groundwater movement within the uppermost groundwater zone within 1 mile of the waste facility perimeter		X	
(4)	Estimates of the height to which water rises caused by capillary forces above the uppermost groundwater zone beneath and within 1 mile of the waste management unit perimeter		X	
(5)	A map showing the location of all springs in the waste management facility and within 1 mile of its perimeter			X
(6)	An evaluation, supported by water quality analyses, of the quality of water known to exist within 1 mile of the waste management facility perimeter	X		
(7)	A tabulation of background water quality for all applicable indicator parameters and waste constituents	X[aa]		
(h)	Land use and water use			
(1)	A map showing the location of all springs in the waste management facility and within 1 mile of its perimeter			X
(2)	Name and address of the owner of each well indicated	X		
(3)	Well information where available for each water well indicated	X		
(4)	Current land use within 1 mile of the perimeter of the waste management unit	X		
(5)	Current and future use of groundwater within 1 mile of the perimeter of the waste management unit		X	

Table 9. (Cont'd)

Section	Section Description	In Compliance? Yes	No	N/A
2596	DESIGN REPORT AND OPERATIONS PLAN[aa]			
(a)	Design Report			
(1)	Dischargers who own or operate classified waste management units shall submit preliminary and as-built plans, specifications, and descriptions for all liners, containment structures, leachate collection and removal systems components, precipitation and drainage control facilities, and interim covers that will be installed or used at each unit		X	
(2)	Dischargers shall submit a description of and location data for ancillary facilities including roads, waste handling buildings, and equipment cleaning facilities		X	
(3)	Dischargers shall submit detailed plans and equipment specifications for compliance with the groundwater and unsaturated zone monitoring requirements:		X	
(A)	A map showing the locations of proposed monitoring facilities		X	
(B)	Drawings showing proposed construction details		X	
(C)	Specifications, drawings, and data for location and installation of unsaturated zone monitoring equipment		X	
(b)	Operation Plans			
(1)	Dischargers shall submit operation plans describing the waste management unit operation which shall include:			
(A)	A description of proposed treatment, storage, and disposal methods	X		

Table 9. (Cont'd)

Section	Section Description	In Compliance? Yes	No	N/A
	(B) Contingency plans to the regional board and local governments for the failure or breakdown of waste handling facilities or containment systems, including notice of any such failure or any detection of waste or leachate in monitoring facilities		X	
	(C) Description of inspection and maintenance programs that will be undertaken regularly during disposal operations and the post-closure maintenance period	X		
2597	CLOSURE AND POST-CLOSURE MAINTENANCE PLAN[bb]			
(a)	The following information shall be included in the closure and post-closure maintenance plans:			
(1)	Projected schedule for partial and final closure			X
(2)	Description of proposed final treatment procedures			X
(3)	A topographic map at appropriate scale, contour interval, and detail showing the boundaries of the unit of facility to be closed, and projected final contours and any changes in natural surface drainage patterns			X
(4)	A description of the design and the location of all features and systems that will provide waste containment during the post-closure maintenance period			X
(5)	A description of the precipitation and drainage control features			X

[bb]Closure and post-closure maintenance plans are not required until closure is scheduled.

Table 9. (Cont'd)

Section	Section Description	In Compliance? Yes	No	N/A
(6)	A description of the leachate control features and procedures			X
(7)	A map and discussion of unsaturated zone monitoring programs			X
(8)	An evaluation of anticipated settlement caused by decomposition and compaction of wastes			X
(9)	A description of the nature of the final cover, including its physical characteristics, permeability, thickness, slopes, elasticity, and erosivity, including design details of all proposed landscaping, drainage, and irrigation facilities			X
(10)	The post-closure land use of the disposal site and the surrounding area			X
(11)	Estimates of costs for closure and post-closure maintenance for the anticipated post-closure maintenance period.			X

Table 10. Compliance Checklist for Solid-Waste Management Facilities: Open Dump at Mojave Base Site (CAC, Title 23, Subchapter 15)

Section	Section Description	In Compliance? Yes	No	N/A
ARTICLE 2.	WASTE CLASSIFICATION CRITERIA			
2523	NONHAZARDOUS SOLID WASTE			
(a)	Nonhazardous solid waste means all putrescible and nonputrescible solid, semi-solid, and liquid wastes, including garbage, trash, refuse, paper, rubbish, ashes, industrial wastes, demolition and construction wastes, abandoned vehicles and parts thereof, discarded home and industrial appliances, manure, vegetable or animal solid and semi-solid wastes, and other discarded solid or semi-solid wastes. This definition is valid if such wastes do not contain wastes that must be managed as hazardous			X[a]
(b)	Except as provided in subsection 2520(d) of this article, nonhazardous solid waste may be discharged at any classified landfill that is authorized to accept such waste		X	
(c)	Dewatered sewage or water treatment sludge may be discharged at a Class III landfill under the following conditions, unless the State DHS determines that the waste must be managed as hazardous			X
(1)	The landfill is equipped with a leachate collection and removal system			X
(2)	The sludge contains at least 20% solids if primary sludge, or at least 15% solids if secondary sludge, mixtures of primary and secondary sludges, or water treatment sludges			X

[a]Definition or information only. Not a requirement.

Table 10. (Cont'd)

Section	Section Description	In Compliance? Yes	No	N/A
(3)	A minimum solids-to-liquid ratio of 5:1 by weight shall be maintained to ensure that the co-disposal will not exceed the initial moisture-holding capacity of the nonhazardous solid waste. The actual ratio required by the Regional Board shall be based on site-specific conditions			X
(d)	Incinerator ash may be discharged at a Class III landfill unless the DHS determines that the waste must be managed as hazardous waste			X
2524	INERT WASTE			
(a)	Inert waste does not contain hazardous waste or soluble pollutants in concentrations in excess of applicable water quality objectives, and does not contain significant quantities of decomposable waste			X[a]
(b)	Inert wastes do not need to be discharged at classified waste management units	X		
(c)	Regional boards may prescribe individual or general waste discharge requirements for discharges of inert wastes			X[a]
ARTICLE 3.	WASTE MANAGEMENT UNIT CLASSIFICATION AND SITING			
2530	CLASSIFICATION AND SITING CRITERIA			
(a)	Waste management units shall be classified according to their ability to contain wastes. Containment shall be determined by geology, hydrology, topography, climatology, and other factors relating to the ability of the waste management unit to protect water quality		X[b]	

[b]A permit application has never been filed. The landfill, therefore, has never been presented for classification.

Table 10. (Cont'd)

Section	Section Description	In Compliance? Yes	No	N/A
2531	CLASS I: WASTE MANAGEMENT UNITS FOR HAZARDOUS WASTE			
(a)	Class I disposal units shall be located where natural geologic features provide optimum conditions for isolation of wastes from waters of the state			X
(b)	New and existing Class I units shall be immediately underlain by natural geologic materials that shall have a permeability of not more than 1 X 10^{-6}cm/s			X
(c)	Flooding: New disposal units and existing units in Category I, other than existing land treatment units, shall be located outside of floodplains subject to inundation by floods with a 100-yr return period			X
(d)	Ground Rupture: New units and existing units in Categories I, I', REC, and EX, other than existing land treatment units, shall have a 200-ft setback from any known Holocene Fault			X
2532	CLASS II: WASTE MANAGEMENT UNITS FOR DESIGNATED WASTES			
(a)	Class II waste management units shall be located where site characteristics and containment structures isolate waste from waters of the state			

Table 10. (Cont'd)

Section	Section Description	In Compliance? Yes	No	N/A
(1)	New and existing Class II landfills and waste piles shall be immediately underlain by natural geologic materials that have a permeability of not more than 1 X 10^{-6}cm/s. Class II units shall not be located where primary (porous) or secondary (rock opening) permeability greater than 1 X 10^{-6}cm/s could impair the competence of natural geologic materials to act as a barrier to vertical fluid movement			X
(2)	Natural or artificial barriers shall be used to prevent lateral movement of fluid, including waste and leachate			X
(3)	A linear system that conforms to the requirements of Article 4 of this subchapter, with a permeability of not more than 1 X 10^{-6}cm/s, shall be used for landfills and waste piles when natural geologic materials do not satisfy the requirements in subsection (b)(1) of this section			X
(c)	Flooding: New and existing Class II waste management units shall be designed, constructed, operated, and maintained to prevent inundation or washout caused by floods with a 100-yr return period.			X
(e)	Rapid Geologic Change: New and existing Class II waste management units may be located within areas of potential rapid geologic change if containment structures are designed, constructed, and maintained to preclude failure			X

Table 10. (Cont'd)

Section	Section Description	In Compliance? Yes	No	N/A
2533	CLASS III: LANDFILLS FOR NONHAZARDOUS SOLID WASTE			
(a)	Class III landfills shall be located where site characteristics provide adequate separation between nonhazardous solid waste and waters of the state		X[c]	
(b)	Geologic Setting			
(1)	New Class III and Existing Class II-2 landfills shall be sited where soil characteristics, distance from waste to groundwater, and other factors will ensure no impairment of beneficial uses of surface water or of groundwater beneath or adjacent to the landfill. Factors to be evaluated shall include:		X[c]	
	(A) Size of the waste management unit			
	(B) Permeability and transmissivity of underlying soils			
	(C) Depth to groundwater and variations in depth-to-groundwater			
	(E) Current and anticipated use of groundwater			
	(F) Annual precipitation			
(2)	When consideration of factors in subsection (b)(1) of this section indicates that site characteristics alone do not ensure protection of the quality of groundwater or surface water, Class III landfills shall be required to have a single clay liner with permeabilty of 1 X 10^{-6}cm/s or less			X

[c]The site is not permitted by the Regional Board, and the necessary studies and determinations have not been made.

Table 10. (Cont'd)

Section	Section Description	In Compliance? Yes	No	N/A
ARTICLE 4.	CONSTRUCTION STANDARDS			
2543	LEACHATE COLLECTION AND REMOVAL SYSTEMS			
(a)	Leachate collection and removal systems are required for Class I landfills, surface impoundments, and waste piles; for Class II landfills and surface impoundments; and for Class III landfills which have a liner or accept sewage or water treatment sludge			X
2544	INTERIM COVER			
(b)	Interim cover over wastes discharged to a landfill shall be designed and constructed to minimize percolation of precipitation through wastes		X	
2545	SUBSURFACE BARRIERS			
(b)	Cutoff walls are required at Class I waste management units where there is potential for lateral movement of fluid, including waste or leachate. Cutoff walls are required at Class II waste management units where there is potential for lateral movement of fluid, including waste or leachate, and the permeability of natural geologic materials is used for the waste containment in lieu of a liner. Cutoff walls shall be installed at Class III landfills as required by regional boards		X[d]	

[d]This feature has not been constructed and no determination has been made of its necessity.

Table 10. (Cont'd)

Section	Section Description	In Compliance? Yes	No	N/A
(c)	Cutoff walls shall have fluid collection systems installed upgradient of the structure. The systems shall be designed, constructed, operated, and maintained to prevent the build-up of hydraulic head against the structure. The collection system shall be inspected regularly, and accumulated fluid shall be removed			X[e]
2546	PRECIPITATION AND DRAINAGE CONTROLS			
(a)	Waste management units and containment structures shall be designed and constructed to limit, to the greatest extent possible, ponding, infiltration, inundation, erosion, slope failure, washout, and overtopping under the precipitation conditions specified		X[f]	
(b)	Precipitation on landfills or waste piles that is not diverted by covers or drainage control systems shall be collected and managed through the leachate collection and removal system		X[g]	
(c)	Diversion and drainage facilities shall be designed and constructed to accommodate the anticipated volume of precipitation and peak flows from surface runoff under the precipitation conditions specified		X[f]	
(d)	Collection and holding facilities associated with precipitation and drainage control systems shall be emptied immediately following each storm or otherwise managed to maintain the design capacity of the system			X[e]

[e]This feature is not present at the landfill.

[f]It is unlikely that the facility was designed or constructed to any specifications.

[g]Precipitation is not diverted by covers. No leachate control system exists.

Table 10. (Cont'd)

Section	Section Description	In Compliance? Yes	No	N/A
(e)	Surface and subsurface drainage from outside the waste management unit shall be diverted from the waste management unit		X[h]	
(f)	Cover materials shall be graded to divert precipitation from the waste management unit to prevent ponding of surface water over wastes, and to resist erosion as a result of precipitation with the return frequency specified in Table 4.1 of Section 2541(e) for each class of waste management unit		X[i]	
2547	SEISMIC DESIGN			
(a)	Class I and II waste management units shall be designed to withstand the maximum credible earthquake without damage to the foundation or to the structures that control leachate, surface drainage, erosion, or gas. Class III waste management units shall be designed to withstand the maximum probable earthquake without damage		X[f]	
2548	SPECIAL REQUIREMENTS FOR SURFACE IMPOUNDMENTS			
(B)	An operation plan shall be submitted to the regional board that will provide operation levels and waste input quantities permitted each month based on anticipated precipitation and past precipitation conditions for the year			X

[h]No visible diversion exists.

[i]Grading does not divert the rainfall or runoff from direct contact with wastes in the open trench.

Table 10. (Cont'd)

Section	Section Description	In Compliance? Yes	No	N/A
ARTICLE 5.	WATER QUALITY MONITORING FOR CLASSIFIED WASTE MANAGEMENT UNITS			
2551	REQUIRED PROGRAMS			
(a) (1)	The discharger shall institute a detection monitoring program. Details of the program shall be approved by the Regional Board		X[j]	
(2)	If indicator parameters or waste constituents are detected at the compliance points in excess of the water quality protection standards, the discharger shall institute a verification monitoring program			X
(3)	If verification monitoring establishes that any water quality protection standard has been exceeded at or downgradient of the points of compliance, the discharger shall institute a corrective action program			X
(4)	Waste discharge requirements shall include one or more of the programs identified in subsection (a) of this section and shall specify the circumstances under which each of the programs shall be required		X[j]	
2555	GENERAL GROUNDWATER MONITORING REQUIREMENTS			
(b)	The ground water monitoring system shall be designed and certified by a registered geologist or a registered civil engineer and shall consist of a sufficient number of wells, installed at appropriate locations and depths to yield groundwater samples that represent the background water quality and the quality of groundwater passing the points of compliance		X[f]	

[j]No monitoring program plan exists.

Table 10. (Cont'd)

Section	Section Description	In Compliance? Yes	No	N/A
(e)	The groundwater monitoring program shall include consistent and appropriate sampling and analytical procedures that accurately measure indicator parameters and waste constituents to provide a reliable indication of groundwater quality. At a minimum, the program shall include procedures and techniques for sample collection, sample preservation and shipment, analytical procedures, and chain of custody control		X[j]	
(f)	The groundwater monitoring program shall include a determination of the groundwater surface elevation and field parameters (temperature, electrical conductivity, and pH) at each well each time groundwater is sampled		X[j]	
2556	DETECTION MONITORING PROGRAM			
(a)	A discharger required to establish a detection monitoring program under this article shall undertake a program designed to detect the presence of waste constituents in surface water or groundwater outside of waste management units and in the unsaturated zone beneath and adjacent to a water monitoring system and unsaturated zone monitoring systems at the compliance points, and monitor ground and surface water for indicator parameters or waste constituents that provide a reliable indication of leakage from a waste management unit		X[j]	

Table 10. (Cont'd)

Section	Section Description	In Compliance? Yes	No	N/A
2556	DETECTION MONITORING PROGRAM			
(b)	If the discharger or the regional board finds a statistically significant increase for indicator parameters or waste constituents at any monitoring point, the discharger shall notify the Regional Board, or acknowledge the Regional Board's finding, in writing, within 7 days. Notification shall indicate what water quality protection standards have been exceeded. Within 90 days, an amended report of waste discharge shall be submitted to the regional board for establishment of a verification monitoring program meeting the requirements of Section 2557 of this article		X[j]	
2557	VERIFICATION MONITORING PROGRAM			
(d)	Dischargers shall determine the velocity and direction(s) of groundwater flow under the waste management unit at least quarterly, including the times of expected highest and lowest elevations of the groundwater surface			X[k]
2559	UNSATURATED ZONE MONITORING PROGRAM			
(a)	Class I and II waste management units and Class III landfills with liners shall have an unsaturated zone monitoring program whenever feasible. The program shall be designed to detect waste constituents that may escape from waste management units before such constituents reach groundwater. The discharger shall monitor soil and soil-pore liquid at land treatment areas, and monitor soil-pore liquid at other types of waste management units		X[l]	

[k]Implementation of this program would follow completion of the Detection Monitoring Program.

[l]Because use of landfill is unknown, facility is considered out of compliance.

Table 10. (Cont'd)

Section	Section Description	In Compliance? Yes	No	N/A
(e)	Dischargers shall use consistent sampling and analysis procedures that are designed to ensure a reliable indication of soil-pore liquid quality and, in the case of land treatment, of the chemical make-up of the soil below the land treatment unit		X[j]	
2559	UNSATURATED ZONE MONITORING PROGRAM			
(a)	If a discharger or Regional Board finds there is a statistically significant increase of waste constituents or indicator parameters, the discharger shall notify the Regional Board, or acknowledge the board's findings, in writing, within 7 days. Notification shall indicate what water quality protection standards have been exceeded. For landfills, the discharger shall, within 90 days, submit to the Regional Board an amended report of waste discharge for establishment of a verification monitoring program meeting the requirements of Section 2557 of this article			X[j]
2580	GENERAL CLOSURE REQUIREMENTS			
(a)	Partial or final closure of new and existing classified waste management units shall be in compliance with the provisions of this article. If a unit has been partially closed in accordance with an approved closure plan by the effective date of these regulations, the cover over the closed portion does not need to be modified to conform to these regulations unless monitoring data indicate impairment of beneficial uses of groundwater		X[m]	

[m]A closure plan must be prepared. All items under Section 2580 must be addressed in the closure plan.

Table 10. (Cont'd)

Section	Section Description	In Compliance? Yes	No	N/A
(b)	Closure shall be under the direct supervision of a registered civil engineer or a registered engineering geologist		X[m]	
(c)	Class II waste management units and Class III landfills shall be closed pursuant to Section 2581 of this article		X[m]	
(d)	Closed waste management units shall be provided with at least two permanent monuments installed by a licensed land surveyor or a registered civil engineer, from which the location and elevation of wastes, containment structures, and monitoring facilities can be determined throughout the post-closure maintenance period		X[n]	
ARTICLE 8.	CLOSURE AND POST-CLOSURE MAINTENANCE			
2580	GENERAL CLOSURE REQUIREMENTS			
(e)	Vegetation for closed waste management units shall be selected to require minimum irrigation and maintenance, and shall not impair the integrity of containment structures including the final cover		X[m]	
(f)	The Regional Board shall require the discharger to establish an irrevocable closure fund or provide other means to ensure closure and post-closure maintenance of each classified waste management unit in accordance with an approved plan			X[o]

[n]Monuments have not been provided.

[o]Not required for Federal facilities.

Table 10. (Cont'd)

Section	Section Description	In Compliance? Yes	No	N/A
2581	LANDFILL CLOSURE REQUIREMENTS[P]			
(a)	Final Cover Requirements			
(1)	Closed landfills shall be provided with not less than 2 ft of appropriate materials as a foundation layer for the final cover. These materials may be soil, contaminated soil, incinerator ash, or other waste materials, provided that such materials have appropriate engineering properties to be used for a foundation layer		X	
(2)	Closed landfills shall be provided with not less than 1 ft of soil containing no waste or leachate, placed on top of the foundation layer and compacted to attain permeability of either 1 X 10^{-6}cm/s or less, or equal to the permeability of any bottom liner system or underlying natural geologic materials, whichever is less		X	
(3)	Closed landfills shall be provided with not less than 1 ft of soil containing no waste or leachate, placed on top of the material described in subsection (a) of this section. The rooting depth of any vegetation planted on the cover shall not exceed the depth to the material described		X	

[P]Generally, closure plan for the existing landfill must be submitted at least 180 days before closure of landfill. These items must be provided as approved by the Regional Board.

Table 10. (Cont'd)

Section	Section Description	In Compliance? Yes	No	N/A
2581	LANDFILL CLOSURE REQUIREMENTS			
(b)	Grading Requirements			
(1)	Closed landfills shall be graded and maintained to prevent ponding and to provide slopes of at least 3%. Lesser slopes may be allowed if an effective system is provided for diverting surface drainage from covered wastes		X[p]	
(2)	Areas with slopes greater than 10%, surface drainage courses, and areas subject to erosion by water and wind shall be protected or designed and constructed to prevent such erosion		X[p]	
(c)	Throughout the post-closure maintenance period, the discharger shall maintain the structural integrity and effectiveness of all containment structures, and maintain the final cover as necessary to correct the effects of settlement or other adverse factors. The leachate collection and removal system shall be continued to operate as long as leachate is generated and detected. Maintain monitoring systems to monitor the groundwater, surface water, and the unsaturated zone in accordance with the applicable requirements in Article 5 of this subchapter. Prevent the erosion and related damage of the final cover caused by drainage. Protect and maintain surveyed monuments		X[q]	

[q]Included in post-closure maintenance and inspection plan. This requirement is not applicable until the landfill is formally closed and the post-closure period begins.

Table 10. (Cont'd)

Section	Section Description	In Compliance? Yes	No	N/A
ARTICLE 9.	COMPLIANCE PROCEDURES			
2590	REPORTING REQUIREMENTS FOR WASTE DISCHARGE TO LAND			
(a)	Any person discharging or proposing to discharge waste to land where water quality can be affected shall submit to the Regional Board a "Report of Waste Discharge," unless the report is waived by the regional board		X	
(a) (1)	The discharger may submit a copy of the application for a hazardous waste facility permit, including the closure and post-closure maintenance plan, under CAC, Title 22, Division 4, Chapter 30 as a report of waste discharge, together with the applicable filing fee, provided that such application includes the information required in this article		X[r]	
(2)	For Class II and III waste management units, the closure and post-closure maintenance plan described in Section 2597 of this article shall be submitted with the closure notice required by subsection (c)(5) of this section		X	
(4)	The discharger shall notify the Regional Board of changes in information submitted under this subchapter, including any material change in the types, quantities, or concentrations of wastes discharged, site operations and features, or proposed closure procedures, including changes in cost estimates. The discharger shall notify the Regional Board a reasonable time before the changes are made or become effective.		X	

[r]Application and report have not been filed with the RWQCB.

Table 10. (Cont'd)

Section	Section Description	In Compliance? Yes	No	N/A
(b)	Deadlines for Reporting			
(1)	Dischargers who own or operate existing waste management units for which waste discharge requirements were issued before the effective date of this chapter shall, within 6 months of the effective date of this section, submit a technical report to the Regional Board describing the measures necessary to bring their monitoring programs into compliance with Article 5 (Sections 2550-2559) of this subchapter, including a schedule for achieving compliance		X	
2590	REPORTING REQUIREMENTS FOR WASTE DISCHARGE TO LAND			
(b) (2)	Dischargers who own or operate existing waste management units for which waste discharge requirements were issued before the effective date of this subchapter shall submit to the Regional Board a report of waste discharge that complies with subsection (a) of this section, together with the appropriate filing fee, upon request			X
(3)	Dischargers who own or operate existing waste management units that have not been classified under previous regulations, and for which the discharger has not submitted a report of waste discharge before the effective date of this subchapter, shall submit a report of waste discharge to the appropriate Regional Board within 60 days of the effective date of this subchapter as required by subsection 2510(d) of this subchapter		X	

Table 10. (Cont'd)

Section	Section Description	In Compliance? Yes	No	N/A
(c)	Notification			
(1)	The discharger shall notify the Regional Board in writing of any proposed change of ownership or responsibility for construction, operation, closure, or post-closure maintenance of a waste management unit		X	
(2)	The Regional Board shall be notified immediately of any slope failure occurring in a waste management unit			X
(3)	The Regional Board shall be notified within 7 days if fluid is detected in a previously dry leachate collection and removal system or unsaturated zone monitoring system, or if a progressive increase is detected in the volume of fluid in a leachate collection and removal system			X
2590	REPORTING REQUIREMENTS FOR WASTE DISCHARGE TO LAND			
(a) (5)	The owner or operator of a waste management unit shall notify the Regional Board of units to be closed at least 180 days prior to beginning any partial or final closure activities. The notice shall include a statement that all closure activities will conform to the most recently approved closure plan and that the plan provides for site closure in compliance with all applicable Federal and state regulations		X	

Table 10. (Cont'd)

Section	Section Description	In Compliance? Yes	No	N/A
(6)	The owner or operator of a waste management unit shall notify the Regional Board within 30 days after the completion of any partial or final closure activities. The discharger shall certify under penalty of perjury that all closure activities were in accordance with the most recently approved closure plan and in accordance with all applicable regulations. The discharger shall certify that closed waste management units shall be maintained in accordance with an approved post-closure maintenance plan unless post-closure maintenance has been waived pursuant to subsection (a)(3) of this section			X[s]
(d)	Any report submitted under this section or any amendment or revision thereto that might affect containment features or monitoring systems shall be approved by a registered civil engineer or certified engineering geologist			X[t]
2591	WASTE DISCHARGE REQUIREMENTS			
(a)	The Regional Board shall adopt waste discharge requirements that implement the applicable provisions of this subchapter		X[u]	
2594	WASTE CHARACTERISTICS[v]			
(a)	Dischargers shall provide the following information in the report of waste discharge about the characteristics of wastes to be discharged at the waste management units:			
(1)	A list of the type, quantity, and concentration of wastes proposed to be discharged at each unit		X	

[s]Closure activities have not commenced.

[t]No reports have been submitted to date.

[u]No waste discharge requirements were issued because the required application and reports were not filed with the Regional Board.

[v]No report of waste discharge has been filed with and accepted by the RWQCB.

Table 10. (Cont'd)

Section	Section Description	In Compliance? Yes	No	N/A
(2)	A description of proposed treatment, storage, and disposal methods		X	
(3)	An analysis of projected waste decomposition processes for each waste management unit indicating intermediate and final decomposition products and the period during which decomposition will continue following discharge		X	
2595	WASTE MANAGEMENT UNIT CHARACTERISTICS			
(a)	Dischargers shall provide in the report of waste discharge an analysis describing how the ground and surface water may affect the waste management unit and how the unit may affect ground and surface water		X[V]	
(b)	Dischargers shall provide the following data on the physical characteristics of the waste management unit and the surrounding region to demonstrate suitability for the appropriate classification		X[V]	
(c)	If a report submitted by a discharger refers to another source, the relevant information from that source shall be restated in the report			X
(d)	Topography[V]			
(1)	A map of the waste management unit and its surrounding region within 1 mile of the unit, showing elevation contours, natural ground slopes, drainage patterns, and other topographic features		X	
(2)	Estimated maximum and minimum annual precipitation at the waste management unit		X	

Table 10. (Cont'd)

Section	Section Description	In Compliance? Yes	No	N/A
(3)	Maximum expected 24-hour precipitation for storm conditions specified as design criteria for the particular class of waste management unit		X	
(4)	Estimated mean, minimum, and maximum evaporation		X	
(5)	Projected volume and pattern of runoff for the proposed waste management unit including peak stream discharges associated with the storm conditions specified as design criteria		X	
(6)	An estimated wind rose		X	
(f)	Geology			
(1)	A geologic map and geologic cross-sections of the waste management unit showing lithology and structural features		X	
(2)	A description of natural geologic materials		X	
(3)	A description of the geologic structure of the waste management unit		X	
(4)	The results of a testing program for determination of physical and chemical properties of soils		X	
(5)	A determination of the expected peak ground acceleration associated with the maximum probable earthquake		X	
(g)	Hydrology			
(1)	An evaluation of the water-bearing characteristics of the natural geologic materials		X	
(2)	An evaluation of the in-place permeability of soils immediately underlying the waste management unit:		X	
(A)	Permeability data, in tabular form, for lected locations within the unit, were obtained		X	

Table 10. (Cont'd)

Section		Section Description	In Compliance? Yes	No	N/A
	(B)	A map of the unit showing test locations where these permeability date were obtained		X	
	(C)	An evaluation of the rationale and test procedures		X	
(3)		An evaluation of the perennial direction of groundwater movement within the uppermost ground water zone within 1 mile of the waste facility perimeter		X	
(4)		Estimates of the height to which water rises caused by capillary forces above the uppermost groundwater zone beneath and within 1 mile of the waste management unit perimeter		X	
(5)		A map showing the location of all springs in the waste management facility and within 1 mile of its perimeter		X	
(6)		An evaluation, supported by water quality analyses, of the quality of water known to exist within 1 mile of the waste management facility perimeter		X	
(7)		A tabulation of background water quality for all applicable indicator parameters and waste constituents		X	
(h)		Land Use and Water Use			
(1)		A map showing the location of all springs in the waste management facility and within 1 mile of its perimeter		X	
(2)		Name and address of the owner of each well indicated		X	
(3)		Where available, information for each indicated water well		X	
(4)		Current land use within 1 mile of the perimeter of the waste management unit		X	
(5)		Current and future use of groundwater within 1 mile of the perimeter of the waste management unit		X	

Table 10. (Cont'd)

Section	Section Description	In Compliance? Yes	No	N/A
2596	DESIGN REPORT AND OPERATIONS PLAN[V]			
(a)	Design Report			
(1)	Dischargers who own or operate classified waste management units shall submit preliminary and as-built plans, specifications, and descriptions for all liners, containment structures, leachate collection and removal systems components, precipitation and drainage control facilities, and interim covers that will be installed or used at each unit		X	
(2)	Dischargers shall submit a description of and location data for ancillary facilities including roads, waste handling buildings, and equipment cleaning facilities		X	
(3)	Dischargers shall submit detailed plans and equipment specifications for compliance with the groundwater and unsaturated zone monitoring requirements:		X	
(A)	A map showing the locations of proposed monitoring facilities		X	
(B)	Drawings showing proposed construction details		X	
(C)	Specifications, drawings, and data for location and installation of unsaturated zone monitoring equipment		X	
(b)	Operation Plans			
(1)	Dischargers shall submit operation plans describing the waste management unit operation that shall include:		X	
(A)	A description of proposed treatment, storage, and disposal methods		X	
(B)	Contingency plans for the failure or breakdown of waste handling facilities or containment systems, including notice of any such failure, or any detection of waste or leachate in monitoring facilities, to the Regional Board and local governments		X	

Table 10. (Cont'd)

Section	Section Description	In Compliance? Yes	No	N/A
(C)	Description of inspection and maintenance programs that will be undertaken regularly during disposal operations and the post-closure maintenance period		X	
2597	CLOSURE AND POST-CLOSURE MAINTENANCE PLAN[W]			
(a)	The following information shall be included in the closure and post-closure maintenance plans:			
(1)	Projected schedule for partial and final closure		X	
(2)	Description of proposed final treatment procedures		X	
(3)	A topographic map at appropriate scale, contour interval, and detail showing the boundaries of the unit of the facility to be closed, and projected final contours and any changes in natural surface drainage patterns		X	
(4)	A description of the design and the location of all features and systems that will provide waste containment during the post-closure maintenance period		X	
(5)	A description of the precipitation and drainage control features		X	
(6)	A description of the leachate control features and procedures		X	
(7)	A map and discussion of unsaturated zone monitoring programs		X	
(8)	An evaluation of anticipated settlement caused by decomposition and compaction of wastes		X	

[W]Closure and post-closure maintenance plans are required when the site is closed.

Table 10. (Cont'd)

Section	Section Description	In Compliance? Yes	No	N/A
(9)	A description of the nature of the final cover, including its physical characteristics, permeability, thickness, slopes, elasticity, and erosivity, including design details of all proposed landscaping, drainage and irrigation facilities		X	
(10)	The post-closure land-use of the disposal site and the surrounding area		X	
(11)	Estimates of costs for closure and post-closure maintenance for the anticipated post-closure maintenance period		X	

Table 11. Compliance Checklist for Solid-Waste Management Facilities: Closed Dumps at Echo and Mars Sites (From CAC Title 23, Subchapter 15) (Cont'd)

Section	Section Description	In Compliance? Yes	No	N/A
(a)	Partial or final closure of new and existing classified waste management units shall be in compliance with the provisions of this article. If a unit has been partially closed in accordance with an approved closure plan by the effective date of these regulations, the cover over the closed portion does not need to be modified to conform to these regulations unless monitoring data indicate impairment of beneficial uses of ground water	X[a]		
(b)	Closure shall be under the direct supervision of a registered civil engineer or a registered engineering geologist		X[b]	
(c)	Class II waste management units and Class III landfills shall be closed pursuant to Section 2581 of this article	X[a]		
(d)	Closed waste management units shall be provided with at least two permanent monuments installed by a licensed land surveyor or a registered civil engineer, from which the location and elevation of wastes, containment structures and monitoring facilities can be determined throughout the post-closure maintenance period	X[c]		

[a]Correspondence on file at the GDSCC indicates that the agencies have accepted closure of the Echo, Mars, and Pioneer landfill sites.

[b]There was no information available to indicate that closure was supervised by a registered engineer.

[c]Monuments are available at the GDSCC.

Table 11. (Cont'd)

Section	Section Description	In Compliance? Yes	No	N/A
ARTICLE 8.	CLOSURE AND POST-CLOSURE MAINTENANCE			
2580	GENERAL CLOSURE REQUIREMENTS			
(e)	Vegetation for closed waste management units shall be selected to require minimum irrigation and maintenance, and shall not impair the integrity of containment structures including the final cover	X		
(f)	The Regional Board shall require the discharger to establish an irrevocable closure fund or provide other means to ensure closure and post-closure maintenance of each classified waste management unit in accordance with an approved plan			X[d]
2581	LANDFILL CLOSURE REQUIREMENTS			
(a)	Final Cover Requirements			
(1)	Closed landfills shall be provided with not less than 2 ft of appropriate materials as a foundation layer for the final cover. These materials may be soil, contaminated soil, incinerator ash, or other waste materials, provided that such materials have appropriate engineering properties to be used for a foundation layer			X[e]
(2)	Closed landfills shall be provided with not less than 1 foot of soil containing no waste or leachate, placed on top of the foundation layer and compacted to attain permeability of either 1 X 10^{-6}cm/s or less, or equal to the permeability of any bottom liner system or underlying natural geologic materials, whichever is less			X[e]

[d]Not applicable to Federal facilities.

[e]Compliance status is unknown. The agency, however, seems to have accepted closure of the sites.

Table 11. (Cont'd)

Section	Section Description	In Compliance? Yes	No	N/A
(3)	Closed landfills shall be provided with not less than 1 foot of soil containing no waste or leachate, placed on top of the material described in subsection (a) of this section. The rooting depth of any vegetation planted on the cover shall not exceed the depth to the material described			X[e]
(b)	Grading Requirements			
(1)	Closed landfills shall be graded and maintained to prevent ponding and to provide slopes of at least 3%. Lesser slopes may be allowed if an effective system is provided for diverting surface drainage from covered wastes			X[e]
(2)	Areas with slopes greater than 10%, surface drainage courses, and areas subject to erosion by water and wind shall be protected or designed and constructed to prevent such erosion			X[e]
(c)	Throughout the post-closure maintenance period, the discharger shall: maintain the structural integrity and effectiveness of all containment structures, and maintain the final cover as necessary to correct the effects of settlement or other adverse factors; continue to operate the leachate collection and removal system as long as leachate is generated and detected; maintain monitoring systems and monitor the groundwater, surface water, and the unsaturated zone in accordance with the applicable requirements in Article 5 of this subchapter; prevent erosion and related damage of the final cover because of drainage; and protect and maintain surveyed monuments.			X[f]

[f]Post-closure plans have not been required by the RWQCB.

Table 11. (Cont'd)

Section	Section Description	In Compliance? Yes	No	N/A
ARTICLE 9.	COMPLIANCE PROCEDURES			
2597	CLOSURE AND POST-CLOSURE MAINTENANCE PLAN[g]			
(a)	The following information shall be included in the closure and post-closure maintenance plans:			
(1)	Projected schedule for partial and final closure		X	
(2)	Description of proposed final treatment procedures		X	
(3)	A topographic map at appropriate scale, contour interval, and detail showing the boundaries of the unit of facility to be closed, and projected final contours and any changes in natural surface drainage patterns		X	
(4)	A description of the design and the location of all features and systems that will provide waste containment during the post-closure maintenance period		X	
(5)	A description of the precipitation and drainage control features		X	
(6)	A description of the leachate control features and procedures		X	
(7)	A map and discussion of unsaturated zone monitoring programs		X	
(8)	An evaluation of anticipated settlement caused by decomposition and compaction of wastes		X	

[g]Closure and post-closure plans were never submitted, although correspondence on file at the GDSCC indicates agencies have accepted closure at the now-closed Echo and Mars Sites.

Table 11. (Cont'd)

Section	Section Description	In Compliance? Yes	No	N/A
(9)	A description of the nature of the final cover including its physical characteristics, permeability, thickness, slopes, elasticity, and erosivity, including design details of all proposed landscaping, drainage and irrigation facilities		X	
(10)	The post-closure land use of the disposal site and the surrounding area		X	
(11)	Estimates of costs for closure and post-closure maintenance for the anticipated post-closure maintenance period		X	

The following is an abbreviated description of some of the more relevant audit findings:

1. Program Management and Planning

a. Identification of the Legal Owner and Operator. Identification of the legal owner and operator of the facility must be determined. Documents on file at the GDSCC vary in their designation of owner/operator. Documents on file indicate NASA, NASA/JPL, JPL, the on-site JPL contractor, and various landfill names to be the owner/operator of facilities at Goldstone. Contact names and addresses vary, resulting in the distribution of important regulatory notices to individuals with no direct involvement with day-to-day compliance. It is unlikely that all improperly distributed information is rerouted to the appropriate on-site GDSCC contractor personnel.

b. The JPL/GDSCC Reference Book of Standard Procedures. The JPL/GDSCC reference book of standard procedures was reviewed for content. Policies and procedures for Solid-Waste Management are not included. No other written plans were located during the survey. There was neither a Management Plan (organization structure, program goals and objectives, duties and responsibilities of key personnel, recordkeeping procedures, data-management procedures, inspection schedules, compliance schedules, budget and manpower considerations, equipment needs, training plans and schedules) nor Planning Documents (plans for future disposal capacity).

2. Regulatory Liaison and Regulations Update

The GDSCC has an individual assigned to represent the GDSCC to local regulatory agencies. Recently, this person also was assigned responsibility for tracking the applicable regulations. Tracking regulations is a critical element in any successful compliance program. Regulations are changing so rapidly that regulatory checklists are quickly outdated unless they are reviewed and updated routinely.

The GDSCC currently is updating its regulations library and ordering update services, where available. It is important that personnel involved in the solid-waste program have time allotted to read new materials that are received, and that staff assigned to tracking regulations have sufficient time and resources to do an effective job.

3. Recordkeeping and Reporting Procedures

An adequate recordkeeping system is not in place at the GDSCC. Inspection records are not maintained for either open or closed landfill facilities. Records showing required calculations concerning the rate of waste disposal and remaining capacity of the open Echo Site landfill were not on file.

Required survey records that identified the locations of the closed Pioneer, Mars, and Mojave landfills were not on file. These sites were not shown on the GDSCC facility plans. It is required that disposal-site

locations be recorded on these plans so future structures and development are not planned in the area. Structures constructed on or near landfills are subject to settlement and possible exposure to flammable gases. MBGA understands that the GDSCC is acting on this deficiency.

4. Solid-Waste Collection Procedures and Policies

Written restrictions on what may be placed in dumpsters are not available. This does not imply that personnel are depositing hazardous wastes or recyclable materials in dumpsters. Restrictions, however, should be written in a standard operating procedure that is distributed to all area supervisors.

Dumpsters recently have been marked with the name and phone number of the collecting agent as is required by law. Collection activities seem to be adequate.

5. Facilities Engineering, Operations, and Maintenance

The deficiencies noted below indicate that the GDSCC solid-waste facility does not comply with regulatory requirements.

a. LRWQCB Permit. The open Echo Site landfill facility permit issued by the LRWQCB, dated May 8, 1980, was not available for MBGA review. If not now on file, a copy of the permit should be obtained and placed in the file. The conditions of this permit should be reviewed and included in the GDSCC solid-waste compliance program.

b. SWMB Permit. The State Solid Waste Management Board permit for the open Echo Site landfill on file at the GDSCC during the May 1986 survey (36-SS-084, April 3, 1979) was an unsigned "proposed" version. The board-approved final permit document was not available. The permit provided for 9 years of operation, expiring in 1988. The permit specified 6 acres of operational area, which was nearly filled to capacity at the time of the MBGA survey. Since the May survey, the GDSCC has been notified by the Board that 10 acres and not 6 acres (as proposed) should have been specified in the final permit. It is suggested that the GDSCC obtain the final versions of its solid-waste permits.

c. Response to Notices of Violation. Written responses to NOVs from enforcement agencies were not on file. There is no documentation on file (not even in memo format) indicating that these notices were acted upon. The GDSCC has recently adopted new documentation procedures and is maintaining an NOV file.

d. Engineering Report. A required 5-year calculation prepared by a Professional Engineer has not been generated.

e. Written Operation Plans. Required Written Operations Plans were not on file for landfills at the Echo and Mojave Base Sites. These apparently have never been prepared.

f. Mojave Base Site "Open Dump." The unauthorized dump site at the Mojave Base Site is classified under the Federal RCRA, Subtitle D, as an "open dump." This site is in non-compliance with solid waste regulations.

6. Permits, Site Closure, and Monitoring Activities

a. Permits. Permits for landfills at the GDSCC are not on file.

b. Monitoring. Environmental monitoring for leachate, gas generation, or other environmental effects of solid-waste disposal are not as yet accomplished or planned for any time in the near future.

c. Closure Plans. No closure plans are on file for any landfill facility at the GDSCC. Apparently, these have never been prepared.

G. RECOMMENDATIONS

1. Management and Planning

a. Compliance Schedule. Develop a plan of action and schedule for achieving compliance and for maintaining compliance with those requirements that are applicable.

b. Solid-Waste Management Program. Define the authority and responsibility for the GDSCC solid-waste management program. A policy statement should be prepared. At a minimum, the policy statement should establish program goals and objectives, a program organizational structure, responsibilities of key personnel, and program requirements. Planning for future disposal needs also is recommended.

c. Knowledge of Regulations. Assign specific GDSCC staff the responsibility for remaining current with laws and regulations. This individual(s) should report to management on all changes affecting the GDSCC Solid-Waste Management Program. A procedure such as use of memos or staff meetings should be established for the purpose of disseminating pertinent information to others.

d. Standard Operating Procedures. Written standard operating procedures should be prepared for controlling the distribution of correspondence and documents, filing, recordkeeping, and reporting. Policy

and procedures should be prepared for special programs such as waste segregation and recycling. Operations plans should be prepared for the landfill facilities.

e. Required Documents. The following reports should be updated or prepared, if not already current and on file:

(1) Policy Statement.

(2) GDSCC Solid-Waste Management Plan.

(3) Personnel Training Program Plan.

(4) Standard Operating Procedures.

(5) Land Disposal-Facility Operating Plan (Report of Waste Discharge), including Closure Plan and site design.

(6) Report of Disposal Site Information.

(7) Land Disposal-Facility Operating Log.

(8) Solid Waste Assessment Test Reports (SWATs).

(9) Registered Engineer's 5-Year Report evaluating site design, implementation, and operation plan.

(10) Specific monitoring and reporting requirements included in site operating permits (a Monitoring Plan should be prepared that is responsive to requirements in the facility permits).

(11) Inspection reports for open and closed land disposal-sites.

f. Recordkeeping System. The filing system should organize and contain all permits, fees paid, monitoring activities, inspections, deficiency reports, memos, letters, compliance actions, and other items related to the solid-waste management program. A list of file folder headings should be prepared. At a minimum, this list should include all records required by the regulations. Designate a location for a central file. Originals and original copies of all materials to be filed should go into the central file. As necessary, all secondary filing points should store copies of documents.

g. Use of Computers. Use of the computer should be investigated for its assistance in data management.

h. Standard Forms. Standardized forms should be developed, printed, and used to collect data. These forms should be assigned a reference number (e.g., GDSCC Form 100) and, where appropriate, a sequential (serial) number (e.g., 860001, 860002).

i. Library References. A library should be established that contains pertinent technical information, laws, regulations, and NASA/JPL policy documents. At a minimum, the library should contain copies of the Health and Safety Code Title 7.3, the Water Code, California Administrative Code: Titles 14 and 23, technical information on equipment and procedures currently in use, information on the latest in equipment, improvement in operations, and administrative techniques. Subscription to a solid-waste technical journal is recommended as one means of remaining current on technical advances in the field. Prepare a list of publications/subscription sources and a list of agency contacts.

j. Personnel Training Program. Prepare a Training Program Plan for solid-waste management staff and site personnel. Establish a training schedule and a system for documenting training. The Training Program should also address proficiency and refresher training.

2. Facility Engineering, Operation, and Maintenance

a. Checklists. An engineering requirements checklist should be developed for use in monitoring regulatory compliance and compliance with permit conditions. An inspection checklist also should be prepared and used for scheduled facility inspections (daily, weekly). This second checklist differs from the first in that the first list is a regulatory check list and the second list verifies that operating equipment, safety and security equipment, and facility structures are present and in good condition.

b. Engineering Requirements. Engineering requirements for each of the solid-waste management facilities are provided below:

(1) Echo Site Solid-Waste Landfill

(a) Obtain original copies of all present permits and maintain in the central file. Note permit conditions and add these to Table 7 and Table 9 of this audit report.

(b) Determine monitoring requirements and develop and prepare a monitoring program plan for unsaturated zone and gas monitoring, as directed by the LRWQCB. Submit the monitoring program plan to the LRWQCB for approval and implement plan. Prepare a report on the results of monitoring.

(c) Prepare and submit a revised Report of Waste Discharge and a Report of Disposal Site Information as directed by the Regional Board.

(d) Prepare and submit the required 5-year Review Report addressing the remaining capacity for disposal at the 10-acre site.

(e) Record this site on GDSCC facility plans and also with the San Bernardino County Recorder.

(f) Prepare a study plan in anticipation of the Solid-Waste Assessment Test Reports (SWATs). According to recent information provided by the regional board, SWAT Reports will be required in 1993. This will avoid duplication and overlap with other programs. Guidance documents on SWAT report preparation can be obtained from the air and water Boards. See Appendix E for suggested outlines for SWAT Reports.

(2) Mojave Base Site Open Dump

(a) Conduct a site investigation to determine the extent of waste disposal and types of wastes deposited.

(b) Survey the site for proper recording on GDSCC facility plans. Record this site also with the San Bernardino County Recorder.

(c) Monitor for the presence of gas and leachate.

(d) Prepare a geologic report from available literature.

(e) Formally close the site. Prepare and submit a Closure Plan to the LRWQCB and the State Solid-Waste Management Board. Record the closed site both on facility drawings and plans and with the San Bernardino County Recorder. Closure can be expected to include the following activities: Removal of any waste that is classified as hazardous (batteries, drums containing more than 1 in. of hazardous waste), compaction of wastes with heavy equipment, and covering and grading the site as required by the LRWQCB and the State Solid-Waste Management Board. JPL has submitted a budget proposal to NASA for cleanup of this site in FY 1988-89.

(3) Closed Solid-Waste Landfills at the Echo and Mars Sites

(a) A record of survey should locate and record these disposal sites both on facility plans and with the San Bernardino County Recorder.

(b) Periodically document inspections of the closed sites for drainage, condition of cover and vegetation, in accordance with the regulations.

3. Monitoring, Reporting, and Recordkeeping

a. Monitoring Checklist. Prepare inspection checklists for routine monitoring of facilities and equipment.

b. Routine Inspections. Conduct routine inspections of facilities, operating and safety equipment, signs, structures, and files to determine whether facility structures and equipment are in good operating condition and the GDSCC is in compliance with regulations and permit conditions. File internal deficiency reports and keep track of corrective actions. Conduct semiannual compliance audits of the entire solid-waste management program. Act on noncompliance items as rapidly as is practicable.

c. Response to Agencies. Respond in writing to correspondence issued by regulatory agencies, as required, within as short a time period as possible. Log in all incoming and outgoing correspondence and telephone conversations.

4. Summary and Conclusions

In general terms, the GDSCC is out of compliance with record-keeping, reporting, monitoring, and inspection requirements. Management deficiencies, although not related directly to noncompliance, contribute to the noncompliance situation. A determination should be made as soon as possible to establish whether Ft. Irwin, NASA, JPL, or the GDSCC on-site contractor shall act as owner/operator of the solid-waste management facilities. This responsibility may differ for the open dumps at the Echo and abandoned Mojave Base Sites.

Specific filing and reporting requirements must be met for all land disposal-facilities at the GDSCC, whether they are closed, open, permitted, and non-permitted. A detailed plan of action and schedule for achieving compliance in all aspects must be developed and implemented. Action has been initiated to properly close the Mojave Base Site dump.

Projections for the life of the remaining acreage of the Echo Site land disposal-site should be made. Options for future sites should be identified.

Specific recommendations have been made to develop a single point of responsibility in a structured management system. This will establish a point of contact for regulatory agency interface. It also will allow for monitoring of rule changes and help avoid unknowing noncompliance.

An adequate recordkeeping and reporting system must be developed at once. An aggressive plan of action at this time may preclude problems that evolve from lack of documentation in the event of an agency inspection. Any suggestions made by agencies that requirements listed in CAC Titles 14 or 23 (including submittal of records, reports, and plans) do not have to be met by the GDSCC should be obtained from the agency in writing. Lax or negligent enforcement by a local enforcement agency, however, does not relieve a facility of its responsibility to comply with prevailing laws.

SECTION VII

AIR QUALITY CONTROL

A. BACKGROUND

Section 118 of the Clean Air Act states that Federal facilities "are subject to, and shall comply with, all Federal, state, interstate and local (air pollution) requirements." Congress defined the requirements to include recordkeeping or reporting, permits, and "any other requirement whatsoever."

San Bernardino County Air Pollution Control District (APCD) is the local air pollution control agency having jurisdiction over the NASA-JPL GDSCC.

Rules of the APCD are patterned after those of the South Coast AQMD and use the term "person" for the entity subject to the provisions and mandates of various rules. It is clear from reading the APCD's definition of "person" in conjunction with the Clean Air Act adopted by the U.S. Congress, and Executive proclamations and orders, that Goldstone is required to comply with the applicable rules and regulations of the APCD.

Documents seen and information gathered during a compliance audit made during May 1986, show that Goldstone personnel responsible for air quality compliance are aware of their responsibility. They have procured most, if not all, of the required permits and have demonstrated knowledge of the factors for determining when permits are required. Those sources requiring permits from the APCD will be delineated in this report.

The remainder of this report will: discuss the various air pollution sources at Goldstone (which are, or may be subject to permitting or other APCD rules), estimate emissions for these sources where possible, evaluate compliance status with APCD rules, and offer recommendations for achieving compliance in preparation for an agency compliance audit.

B. APCD RULES APPLICABLE TO GOLDSTONE

A review of the San Bernardino County APCD Rules and Regulations has been made to select those rules, or portions of rules, that are applicable or relevant to the existing air pollution emission sources at Goldstone. Those rules, or portions of those rules, have been paraphrased for this section.

1. Rules 201 and 203: Permits Required

A permit to construct and a permit to operate is required for any equipment that may cause the issuance of air contaminants or that may eliminate, reduce, or control the issuance of air contaminants.

2. Rule 206: Posting of Permit to Operate

The permit to operate or a legible facsimile must be affixed upon the permitted equipment or, if that is not feasible, must be mounted in a clearly visible and accessible place within 26 ft of the permitted equipment.

3. Rule 209: Transfer and Voiding of Permits

A permit is not transferable from one location to another, from one piece of equipment to another, or from one person to another.

4. Rule 219: Equipment Not Requiring a Permit

Various equipment items are exempted from the necessity of obtaining permits. Some of the relevant exemptions are:

(1) Vehicles (but not equipment mounted on the vehicle, if that equipment would otherwise require permits).

(2) Pumps used exclusively for direct fueling of vehicles, mobile equipment, locomotives, or aircraft.

(3) Piston-type internal combustion (IC) engines with a rating of 500 brake horsepower (BHP) or less.

(4) Gas turbine engines with a maximum heat input rate of 5,950,000 Btu/h or less.

(5) Steam generators, water boilers, and heaters with a maximum heat input rate of 20,000,000 Btu/h or less, if they are fired exclusively with natural gas and/or liquefied petroleum gas.

(6) Lab equipment used exclusively for chemical or physical analyses and bench scale or lab test equipment.

(7) Vacuum producing devices used in lab operations or in connection with other exempted equipment.

(8) Natural draft hoods, stacks, or ventilators.

(9) Air conditioning and ventilating systems not used to remove air contaminants.

(10) Refrigeration equipment not used with air pollution control equipment.

(11) Water cooling towers and ponds not used for process water.

(12) Equipment used exclusively for steam cleaning.

(13) Equipment used exclusively for space heating, other than boilers.

(14) Equipment used for buffing, polishing, carving, mechanical cutting, drilling, machining, pressing, routing, sanding, surface grinding or turning of ceramic art work, ceramic precision parts, metals, plastics, rubber, masonry, carbon or graphite and its control equipment.

(15) Equipment used for wood working.

(16) Unheated, non-conveyorized, non-agitated solvent rinsing containers with an open surface area of 10.8 ft^2 or less.

(17) Spray coating equipment operated within control enclosures or using a combined total of 1 gal/day or less of paint and solvent.

(18) Airless spray coating equipment used exclusively for water reducible coatings.

(19) Storage and transfer exclusively of fresh, commercial, or purer grades of sulfuric acid with an acid strength or 99% or less.

(20) Storage exclusively of liquefied gases.

(21) Storage exclusively of unheated organic materials with an initial boiling point of 302°F or higher.

(22) Storage exclusively of 251 gal or less of organic liquids.

(23) Storage of refined lubricating oils.

(24) Storage of 793 gal or less of crankcase oils.

(25) Storage of 250 gal or less of gasoline.

(26) Pumps used exclusively for pipeline transfer of liquids.

(27) Unheated, underground storage of 6077 gal or less of organic liquids with vapor pressure of 25 psia or less.

5. Rule 301: Permit Fees

Values are established for fees associated with the obtaining and renewal of permits.

6. Rule 401: Visible Emissions

Capacities of visible emissions are limited to Ringelmann No. 1 or 20% opacity except for periods aggregating 3 min or less in any 1 hour.

7. Rule 404: Particulate Matter (Concentration)

A table is established for discharge volumes versus particulate matter concentrations in the discharge volumes. This rule does not apply to steam generators or gas turbines.

8. Rule 405: Solid Particulate Matter (Weight)

A table is established for process weights versus particulate matter discharges by weight.

9. Rules 406 and 407: Specific Contaminants and Liquid Gaseous Contaminants

Sulfur dioxide (SO_2) is limited to 500 ppm and carbon monoxide (CO) to 2000 ppm by volume in the discharge gases.

10. Rule 409: Combustion Contaminants

Emission of combustion contaminants from the burning of fuel is limited to 0.1 grain per cubic foot of gas calculated to 12% CO_2 at standard conditions.

11. Rule 431: Sulfur Content of Fuels

The sulfur content of gaseous fuel is limited to 800 ppm of sulfur compounds calculated as hydrogen sulfide (H_2S) at standard conditions, and the sulfur content of liquid or solid fuel is limited to 0.5% by weight.

12. Rule 442: Usage of Solvents

The equipment discharge of organic compounds is limited to:

(1) 14.3 lb/day if the organic compounds have been in contact with a flame, or have been baked, cured, or heat polymerized.

(2) 39.6 lb/day if photochemically reactive.

(3) 600 lb/day if non-photochemically reactive, unless such emissions have been reduced by 85%.

Emissions must be reduced by 85% when photochemically reactive solvents are used for thinning, reducing, or diluting commercial metal surface coatings or for industrial and commercial surface cleaning or degreasing.

No more than 1.3 gal of any photochemically reactive solvent can be disposed of in any 1 day by any means that permit its evaporation into the atmosphere.

The rule does not apply to other equipment subject to other requirements of Rules 461, 462, 463, and 464 or that are exempt from such rules. It also does not apply to equipment subject to specific source rules in Regulation XI or that uses 1,1,1-trichloroethane. This rule should be consulted for exemptions for water reducible materials, high solids materials, and ultra high solids materials.

13. Rule 444: Open Fires

A permit is required for burning combustible refuse in an open fire. Notification of the Air Pollution Control Officer (APCO) is required before a fire is set for fire training, for forest management, or for backfires necessary to save life or valuable property. Adverse meteorological conditions may prevent the issuance of permits for open fires.

14. Rule 461: Gasoline Transfer and Dispensing

Gasoline (a petroleum distillate with a Reid vapor pressure of 4 lb or greater) may not be transferred from a tank truck, trailer, or tank car into a tank of 251 gal or more unless the tank is equipped with: a permanent submerged fill tube, a vapor recovery system certified by the Air Resources Board (ARB) for 95% recovery or processing of displaced vapors, and vapor-tight vapor-return lines that are connected and the vapor recovery device is operating.

Various exceptions from the vapor recovery and vapor return provisions are made for tanks with permanent submerged fill tubes if:

(1) The tank has a capacity of 2000 gal or less and was installed prior to October 13, 1980.

(2) The delivery vessel is exempted.

(3) The tank is equipped with an offset fill pipe.

(4) The tank is at a gasoline dispensing facility installed prior to October, 13, 1980, which has a monthly throughput of 20,000 gal or less.

(5) The tank is located outside of an EPA-designated non-attainment area.

15. Rule 464: Oil Effluent Water Separator

Emissions must be controlled from any separator that recovers 201 gal/day or more of petroleum product from equipment processing, refining, storing, or handling hydrocarbons with a Reid vapor pressure of 0.5 lb or greater.

16. Rule 466: Pumps and Compressors

Pumps or compressors handling organic materials that have a Reid vapor pressure of 1.55 lb or greater must be equipped with a mechanical seal unless the driver has less than 1 HP or the operating temperature exceeds 500°.

17. Rule 467: Safety Pressure Relief Valves

Safety pressure relief valves of 1-in. pipe size or greater shall be vented to vapor recovery or disposal, protected by a rupture disc, or maintained by an inspection system approved by the APCD.

18. Rule 67: Fuel Burning Equipment

A new, non-mobile, fuel-burning equipment unit may not be installed nor an existing unit be expanded unless the discharge will not exceed 200 lb/h of sulfur compounds (calculated as SO_2), 140 lb/h of nitrogen oxides (calculated as NO_x), or 10 lb/h of combustion contaminants as derived from the fuel.

19. Regulation V: Procedure Before the Hearing Board

This regulation sets forth the procedure before the Hearing Board concerning petitions for variances from an APCD rule, or rules, and petitions for appeals from denials of permits by the APCD.

20. Regulation VII: Emergencies

This regulation describes the APCD Emergency Program including actions to be taken at predicted first, second, and third stage episode levels. These include requests to the public to stop all unnecessary driving at each stage and for general public, school, commercial, industrial, and governmental activities to operate as though the day for a predicted third stage episode were a national holiday.

21. Rule 1002: Emission Standards for Asbestos

This rule is essentially the same as in the National Emission Standards for Hazardous Air Pollutants (NESHAPS), 40 CFR, Part 61, Subpart B, for asbestos. Because of the many and lengthy provisions of the rule, it is recommended that the EC review its provisions. The application of the rule is primarily for demolition or removal of asbestos-containing building materials.

22. Rule 1113: Architectural Coatings

This rule applies to the manufacturer and seller of the coatings, and not to the user. It establishes the allowable volatile organic component (VOC) content of each coating in terms of grams VOC per liter of coating. The allowable VOC contents for various coatings are under Rule 1113, III(a): Specific Limits.

23. Regulation 13: New Source Review

This regulation sets forth the requirements for the preconstruction review of new or modified sources of air pollution emissions in areas where the ambient air quality standards are being exceeded. Although information suggests that all contaminants of concern in the area of San Bernardino County encompassing the GDSCC are in compliance (attainment) with all air quality standards except ozone, the APCD does enforce Regulation 13 in that area.

Any increase in emissions for a new source or the sum of the new increase and past increases over the preceding 5 years for a modification to an existing source, which exceeds 250 lb/day of a contaminant (hydrocarbons (HC), NO_x, SO_x, or trisodium phosphate (TSP), or 750 lb/day of CO, requires the application of Best Available Control Technology (BACT) and offsets for the net increase over 250 lb/day (750 lb/day for CO).

C. INVENTORY OF STATIONARY AIR POLLUTION SOURCES AT THE GDSCC

A survey of stationary sources of air pollution emissions was made by a review of the December 1985 Directory of Goldstone Buildings and Facilities (Gold Book), visits to the Goldstone facilities during February and May 1986, and interview sessions with facility personnel. Results of that survey are presented in Table 12 as an inventory of sources. The table also identifies permit status.

D. ESTIMATED AIR POLLUTION EMISSIONS AND COMPLIANCE STATUS

Compliance status for many of the air pollution emission sources at the GDSCC must be determined by comparison of actual emission rates with allowable emission rates specified by APCD rules. In some cases, for example gasoline tanks, the comparison must be between actual equipment specifications and required equipment specifications established by APCD rules.

Calculations of emission rates or levels have been made where data were available. These rates should be considered only as approximate and may indicate the need for testing where the compliance status is uncertain. For many sources, data are lacking or inadequate for determining emission rates or levels by calculations. In those cases, estimates have been made using partial data and/or judgment.

The GDSCC should be commended for preparing the Gold Book, which has been a most useful source in pinpointing most air pollution emission sources and their locations. An additional document with records formatted for

determining emission rates and levels, and compliance with permit requirements, would improve the performance of compliance auditing. This purpose will become more meaningful in light of efforts being made by EPA and by local agencies to raise the quality and quantity of air pollution compliance audits.

The results of emission estimating and compliance checks are presented in Table 13. Item numbers in Table 13 refer to, and correspond with, the columns labeled "Item No." in Table 12. Table 14 provides examples of the calculations.

E. AUDIT FINDINGS

1. Permits

The GDSCC has permits from the APCD to operate almost all of the equipment items that are judged (on the basis of the APCD rules and available GDSCC information) to require APCD permits. In fact, it seems that the GDSCC has an unnecessary permit for Item 53 of the inventory in Table 12 (diesel engine generator Echo G24-6), which would be expected to qualify for exemption from the permit system by Rule 219(b)(1) because it has a 260 BHP rating.

From the records furnished, permit discrepancies or deficiencies were noted for the following items:

(1) Item 11, underground gasoline storage tank "Apollo A1-2G," could not be matched with a specific permit.

(2) Items 29, 30, and 84, oil-water separators at the Mars and Venus Sites, could not be matched to permits.

(3) Item 48, diesel engine generator "Echo G24-1," could not be matched with a specific permit, but application has since been submitted for a permit.

(4) Item 74, sandblaster, could not be matched to a permit.

(5) Item 76, sandblaster, could not be matched to a permit, but application has since been submitted for a permit.

2. Sulfur Content of Fuels

Rule 431 limits the sulfur compound content of liquified petroleum gas (LPG) to less than 800 ppm, as H_2S. According to the GDSCC staff, the supplier states that the sulfur compound content is less than 1000 ppm (1 part per thousand), as H_2S. A more recent communication from supplier states "no sulfur present."

3. Underground Storage Tanks

The underground gasoline storage tanks, Items 6-12 (Table 12), would be exempt from the requirements of Rule 461, if a tank:

(1) Has a capacity of 2000 gal or less and was installed prior to October 13, 1980 (this applies to Item 8);

(2) Is served by a delivery vessel exempted by the APCD pursuant to Rule 462(d)(3). (The delivery vessel is not exempted in writing, although the APCD has acted as if the delivery vessel were exempted. Recently, enforcement personnel of the CARB have been reviewing the practices of the APCD on this category of equipment and have uncovered this deficiency. A change in APCD practice is anticipated that may affect GDSCC underground gasoline tanks unless other exemption is applicable or the delivery vessel is exempted).

(3) Was installed prior to October 13, 1980 and the throughput of the gasoline dispensing facility associated with the tank is 20,000 gal/month or less.

(4) Is located outside a Federal EPA-Designated Nonattainment Area (the area in which the GDSCC is located is still "unclassified" by EPA, but is outside of the "nonattainment" area to the south of the GDSCC that already is designated by the EPA).

If the gasoline tanks do not qualify for an exemption following the CARB-induced shake-out of APCD practices, the GDSCC may, at a minimum, be required to add vapor return-line connections to the three tanks that will remain after the tank-removal program is completed. Consideration should be made for this possibility in establishing specifications for tank replacement under the GDSCC Underground Tank Program.

4. Spray Booth

There is not enough information available to assert positively that the spray booth (Item 34) is in compliance with Rule 442. It is necessary to know the scenario that describes the usage of coatings and solvents that results in the maximum emissions of photochemically reactive organic compounds on any one day. On an averaging basis, the booth seems to be in compliance.

5. Diesel Engine Generators

There were no test reports with data showing compliance or non-compliance on the part of the diesel engine generators with rules limiting concentrations and emissions of various contaminants. Compliance is assumed.

6. Turbine Generators

If the turbine generators were in use, the same conclusion as given for diesel engine generators (see 5, above) would apply to the turbine generators.

7. Sandblaster

The most likely violation from a sandblaster, Items 74 and 76, would be opacity (Rule 401). This would have to be observed. Because the use of the sandblasters is rare (the location of Item 76 was not established), compliance with Rule 401 could not be determined.

8. Solvents

There is not enough information on hand to assert positively that the use of solvents for manual cleaning operations complies with the applicable portions of Rule 442 regarding photochemical reactivity and waste solvent disposal practices.

9. Recordkeeping

In general, necessary records are neither on file nor are filed in one location.

F. RECOMMENDATIONS

1. Knowledge of Regulations

Become familiar with and stay current with the regulations.

2. Program Management

Develop and implement a program for air pollution compliance. This program should include the following elements:

(1) Recordkeeping and reporting

(2) Permits (new and renewals)

(3) Inspections

(4) MSDS Program

(5) Product and equipment labeling

(6) Product control (VOC/hazard reduction)

3. Recordkeeping

Establish one location for information and records relevant to the GDSCC emission sources. Create, maintain, and update the following files:

(1) A list of publications in the GDSCC air pollution library.

(2) Correspondence files organized either by date or by agency/addressee. One file for outgoing and one file for incoming items. Items in each file should be organized either by date for all correspondence, or by date for each addressee.

(3) Internal memo files organized by date for all subjects or by date by each subject.

(4) Agency inspection files. This file should provide a log of the date and results of all agency inspections. File should include GDSCC notes and any photos taken during inspections. File should be organized by agency and by date.

(5) Notice and citation files. This file should contain all notices, citations, or orders received for violations. Attached to each notice should be copies of all items documenting actions taken by the GDSCC to remedy a violation (copies of letters, memos, test results, purchase orders and receipts for new equipment, and internal work orders).

(6) Permit file organized for each category of equipment by year. A sheet at the front of this file should be a table listing each permit and its renewal date. Information in the table should be grouped according to the permit expiration date.

(7) Permit application file. This file holds applications for permits sent to agencies, and should be organized by category of equipment by date.

(8) GDSCC Inspection/deficiency file. This file holds field forms used for routine scheduled inspections of permitted equipment and operations by the GDSCC staff. Documentation showing correction of deficiencies noted on inspection sheets should be attached to each inspection sheet.

(9) Audit file. Findings and documentation of corrections for scheduled and unannounced detailed compliance audits should be maintained in this file. Audits generally are conducted annually by JPL auditors or outside contractors.

(10) Product-files for regulated emission sources. Files containing MSDS, information on product specifications and properties (including VOC content and solvent densities for coatings), and product consumption should be maintained for each permitted emission source. Files should be organized by product type (fuels, gasoline, coatings, and solvents).

(11) Equipment file for regulated emission sources. This file should include a description sheet containing the following information for each piece of regulated equipment:

(a) Type of equipment.

(b) Manufacturer.

(c) Model number.

(d) Serial number.

(e) Rating.

(f) Fuel type used.

(g) Date installed.

(h) Operating schedule.

(i) Location of equipment.

(j) Operating status.

(k) Emissions controls.

(l) Permit number or basis for permit exemption.

(m) Other relevant information such as maintenance and inspection schedule, repairs, log, etc.

(12) Emissions inventory files should include a list of:

(a) VOC sources and estimated emissions.

(b) NO_x sources and estimated emissions.

(c) SO_2 sources and estimated emissions.

(d) CO sources and estimated emissions.

(e) Particulate matter (PM) sources and estimated emissions.

(f) Other known sources and estimated emissions.

(13) Emissions calculation files.

Use a separate data sheet for each item or appropriate groups of items. Include test data, emission factors, operating parameters, method of calculation, and actual calculations for:

(a) VOC sources.

(b) NO_x sources.

(c) SO_2 sources.

(d) CO sources.

(e) PM sources.

(f) Other known sources.

Keep records for at least 2 years. Computerize recordkeeping as much as possible.

4. Permits

The following items should be addressed:

(1) Post facsimiles of all permits on or within 26 ft of item described on permit, and keep an original permit on file at the GDSCC.

(2) Obtain APCD's assistance (either by special visit to APCD office or upon inspector's visit to the GDSCC) to determine permit status of Item 48 from APCD records (see Section VII,E.1).

(3) When annual permits to operate are renewed, suggest to the APCD that equipment be identified with a GDSCC number, serial number, or other designator (as is being done for diesel engine generators) so that permits can be matched to equipment (see Section VII,E.1).

(4) Apply for permits for the oil-water separators, or request a ruling in writing from the APCD on the permit necessity for these items.

5. Vendor Information

(a) Make it a standard practice to require all vendors of coatings and solvents to furnish a MSDS and VOC content of each product sent to the GDSCC. Keep a copy of information on file at the GDSCC.

(b) Make it incumbent upon coating and solvent suppliers to label their products distinctly as to their photochemical or non-photochemical reactivity classification.

(c) Require suppliers of LPG and diesel fuel to provide information on fuel sulfur content in the form expressed in Rule 431.

6. Data Collection

Establish an information base on the use of coatings and solvents. Information to be recorded should include:

(1) Product name.

(2) Quantity used on given date.

(3) Location where product is used.

(4) Method of disposal of unused product.

(5) Quantity of product shipped for disposal on given date.

This recommendation is aimed principally at painting and degreasing operations.

G. SUMMARY AND CONCLUSIONS

Based on the current state of compliance at the GDSCC, efforts for bringing the GDSCC into compliance with air pollution regulations are primarily those associated with the labor required to develop an air pollution compliance program and recordkeeping system, developing background data to support the program, conducting inspections, preparing new permit applications and permit renewal applications, and responding to minor infractions of the regulations such as posting of permits. Another item for consideration is the need to change to a boiler fuel having a sulfur content less than 800 ppm, if the fuel currently in use exceeds this value.

Deficiencies noted during the audit are mainly administrative in nature and do not involve design and installation of control equipment with the following single exception: several tanks in operation at the GDSCC may require vapor control equipment if the supplier does not obtain an exemption from the San Bernardino APCD in writing. These tanks are identified in Section VII. E.3. The GDSCC should determine the exempt status of its supplier and also consider whether or not these tanks are to be replaced under the GDSCC Underground Tank Program before making a decision to install control equipment.

Table 12. Inventory of GDSCC Air Pollution Emission Sources

Item	Location	Equipment Description	Permit Required	Permit Number	Comments
		INVENTORY: STORAGE TANKS			
1	Echo	LPG tank, 7'6" D x 37' L, 12,000 gal, PV @ 250 psig[a]	No	None	
2	MTF	LPG tank, 4' D x 28' L, 3,069 gal, PV @ 250 psig	No	None	
3	Venus 1A (east)	LPG tank, 3'4" D x 17' L, 1,144 gal, PV @ 250 psig	No	None	
4	Venus 1B (west)	LPG tank, 3'4" D x 17' L, 1,144 gal, PV @ 250 psig	No	None	
5	Venus 2	LPG tank, 3'4" D x 18'6" L, 1,030 gal	No	None	
6	Echo G25-1G	UG[a] gasoline tank, 10,000 gal, subm. fill tube	Yes	T0001477	Inst. 1961[b,c]
7	Echo G25-2G	UG gasoline tank, 10,000 gal, subm. fill tube	Yes	T0001478	Inst. 1969[c]
8	Echo G42-1G	UG gasoline tank, 2,000 gal, subm. fill tube	No	T0001476	Inst. 1969[c]

[a]PV means pressure valve; UG means underground.

[b]Inst. means date of installation.

[c]Tank has been emptied, cleaned, inerted and sealed pending removal in accordance with county requirements.

Table 12. (Cont'd)

Item	Location	Equipment Description	Permit Required	Permit Number	Comments
9	Airport	UG gasoline tank	No	None	AVGAS
10	Apollo A1-1G	UG gasoline tank, 4,000 gal	Yes	T0001526	Inst. 1964[c]
11	Apollo A1-2G	UG gasoline tank, 7,500 gal	Yes	None	Inst. 1964[c]
12	Mojave Base	UG gasoline tank, 4,000 gal	Yes	T0001527	Inst. 1960
13	Echo G24-1D	UG Diesel tank, 12,000 gal	No	None	Inst. 1973
14	Echo G24-2D	UG Diesel tank, 12,000 gal	No	None	Inst. 1973
15	Echo G27-1D	UG Diesel tank, 12,000 gal	No	None	Inst. 1961
16	Echo G27-2D	UG Diesel tank, 12,000 gal	No	None	Inst. 1961
17	Echo G27-3D	UG Diesel tank, 12,000 gal	No	None	Inst. 1960[d,e]
18	Echo G42-2D	UG Diesel tank, 2,000 gal	No	None	Inst. 1973
19	Echo TF-3D	UG Diesel tank, 12,000 gal	No	None	Inst. 1974[c,f]
20	Echo TF-4D	UG Diesel tank, 12,000 gal	No	None	Inst. 1974[c,f]
21	Mars G81-1D	UG Diesel tank, 24,000 gal (two tanks manifolded)	No	None	Inst. 1965
22	Mars G81-2D	UG Diesel tank, 12,000 gal	No	None	Inst. 1984[d]

[b]Standby use.

[c]Application submitted to convert to gasoline service with a dispenser.

[d]Two 12,000 gal tanks manifolded together for about 2 years.

Table 12. (Cont'd)

Item	Location	Equipment Description	Permit Required	Permit Number	Comments
23	Mars G81-3D	UG Diesel tank, 12,000 gal	No	None	Inst. 1984[d]
24	Mojave Base M9-1D	UG Diesel tank, 24,000 gal	No	None	Inst. 1964[d]
25	Mojave Base M9-2D	UG Diesel tank, 24,000 gal	No	None	Inst. 1964[c,d]
26	Mojave Base M9-3D	UG Diesel tank, 24,000 gal	No	None	Inst. 1964[c,d]
27	Mojave Base M9-4	UG waste oil tank, 500 gal	No	None	Inst. 1964[c]
28	Mars 14-1 WO	UG waste oil tank, 940 gal	No	None	Inst. 1973
29	Mars 14-2 WT	UG intercepter tank, 1,000 gal	No	None	Inst. 1983[g]
30	Mars 14-3 WT	UG intercepter tank, 1,000 gal	No	None	Inst. 1983[g]
31	Mars 14-1 HO	UG hydraulic oil tank, 10,000 gal	No	None	Inst. 1971[d]
32	Mars 14-2 HO	UG hydraulic oil tank, 10,000 gal	No	None	Inst. 1971[d]
33	Mars G89	Sulfuric acid tank, 400 gal, 4' x 5'4"	No	None	Inst. 1981
		INVENTORY: SPRAY BOOTH, DEGREASERS			
34	Echo G-39	Spray Booth, 25' L x 15' W x 15' H, metal baffle filter, 5 HP Exhaust Fan	Yes	S000283	Air and airless guns used

[g]Emergency use.

Table 12. (Cont'd)

Item	Location	Equipment Description	Permit Required	Permit Number	Comments
35	Echo G-42	Cleanmaster parts washer, Model 70	No	None	
36	Venus	Ultrasonic degreaser	No	None	Not used for about 1 year
37	Echo G-21	Boiler, HW, 0.75 million Btu/h, LPG	No	None	
38	Echo G-23	Boiler, HW, 0.125 million Btu/h, LPG	No	None	
39	Echo G-26A	Boiler, HW, 0.5 million Btu/h (out), LPG	No	None	
40	Echo G-26B	Boiler, HW, 0.5 million Btu/h (out), LPG	No	None	
41	Echo G-26C	Boiler, HW, unknown, LPG	No	None	
42	Echo G-33A	Boiler, HW/Stm, 0.762 million Btu/h, LPG	No	None	
43	Echo G-33B	Boiler, HW/Stm, 0.762 million Btu/h, LPG	No	None	
44	Echo G-33C	Boiler, HW/Stm, 0.762 million Btu/h, LPG	No	None	
45	Echo G-38	Boiler, HW/Stm, 0.45 million Btu/h, LPG	No	None	
46	Venus G-51	Boiler, HW, 0.125 million Btu/h, LPG	No	None	

Table 12. (Cont'd)

Item	Location	Equipment Description	Permit Required	Permit Number	Comments
47	MTF G-72	Boiler, HW, 0.125 million Btu/h, LPG	No	None	
		INVENTORY: DIESEL ENGINE GENERATORS			
48	Echo G24-1	Cat. 398, 875 BHP, S/N 8194, 500 kW	Yes	None[h]	
49	Echo G24-2	Cat. 398, 875 BHP, S/N 8168, 500 kW	Yes	E000266[h]	
50	Echo G24-3	Cat. 398, 875 BHP, S/N 8169, 500 kW	Yes	E000267[h]	
51	Echo G24-4	Cat. 398, 875 BHP, S/N 8170, 500 kW	Yes	E000268[h]	
52	Echo G24-5	Cat. 398, 875 BHP, S/N 8171, 500 kW	Yes	E000269[h]	
53	Echo G24-6	Cat. D-353, 260 BHP, S/N 8087, 150 kW, trailer mounted	No	E001479	Emergency use[g]
54	Venus 1	White Superior Model 40-SX-6, 500 BHP, S/N 8135, 350 kW	Yes	E000270	
55	Venus 2	White Superior Model 40-SX-6, 520 BHP, S/N 8117, 350 kW	Yes	E000271	
56	Mars G81-1A	Cat. 398, 875 BHP, S/N 8113, 500 kW	Yes	E000280	

[h]Application submitted for peaking use.

Table 12. (Cont'd)

Item	Location	Equipment Description	Permit Required	Permit Number	Comments
57	Mars G81-2A	Cat. 398, 875 BHP, S/N 8114, 500 kW	Yes	E000279	
58	Mars G81-3A	Cat. 398, 875 BHP, S/N 8115, 500 kW	Yes	E000281[h]	
59	Mars G81-4A	Cat. 399, unknown, 875 BHP, S/N 8132, 500 kW	Yes	E000278[h]	
60	Mars G81-1B	Cat. 399, 1280 BHP, S/N 8164, 750 kW	Yes	E000275[h]	
61	Mars G81-2B	Cat. 399, 1280 BHP, S/N 8165, 750 kW	Yes	E000274[f]	
62	Mars G81-3B	Cat. 399, 1280 BHP, S/N 8166, 750 kW	Yes	E000276[f]	
63	Mars G81-4B	Cat. 399, 1280 BHP, S/N 8167, 750 kW	Yes	E000277[f]	
64	Mars 5	Cat. 398, 875 BHP, S/N 8134, 500 kW	Yes	E000272	From Pioneer G3-4[h,i]
65	Mars 6	Cat. 398, 875 BHP, S/N 8133, 500 kW	Yes	E000273	From Pioneer G3-3[h,i]
66	Mojave Base M9-1	Cat. 379, 600 BHP, S/N 68B343, 250 kW	Yes	E000260	
67	Mojave Base M9-2	Cat. 379, 600 BHP, S/N 68B342, 250 kW	Yes	E000261	

[i]Not yet operating at Mars.

Table 12. (Cont'd)

Item	Location	Equipment Description	Permit Required	Permit Number	Comments
		INVENTORY: TURBINE GENERATORS			
68	Mojave Base M9-3	Cat. 353, 260 BHP, S/N, unknown, 250 kW	No	None	
69	Mojave Base M9-4	Cat. 353, 260 BHP, S/N, unknown, 250 kW	No	None	
70	Mojave Base M9-1	International Harvester, Solar Model T 10205-22, S/N 400974, 14.5 million Btu/h	Yes	E000263	Operable, but not in use
71	Mojave Base M9-2	International Harvester, Solar Model T 10205-22, S/N 400975, 14.5 million Btu/h	Yes	E000264	Operable, but not in use
72	Mojave Base M9-3	Model number unknown	No	None	Out of service
73	Mojave Base M9-4	Model number unknown	No	None	Out of service
		INVENTORY: MISCELLANEOUS			
74	Echo 3-A (STGE yard)	Kelco Model 125 Sandblaster, portable	Yes	None	Rarely used, 8 h/year Application submitted

Table 12. (Cont'd)

Item	Location	Equipment Description	Permit Required	Permit Number	Comments
75	Echo G-28	Thompson Surface Grinder	No	None	Seldom used
76	Facilities Workyard 4	Sandblaster, portable	Yes	None	Seldom used Application submitted
77	Echo	Gasoline dispensing pumps (to vehicles)	No	None	
78	Mojave Base M-9	Day tank, Diesel, 500 gal	No	None	
79	Echo G-24	Day tank, Diesel, 500 gal	No	None	
80	MTF	Day tank, Diesel, 500 gal	No	None	
81	Mars G-81	Day tank, Diesel, 500 gal	No	None	
82	Venus	Fire training site including LPG burner	Yes[j]		Seldom used
83	Apollo A-6 (outside)	Gasoline engine generator, emergency[k]			Belongs to telephone company
84	Venus	Underground interceptor tank, 1700 gal	No	None	Emergency
85	Echo G-39	Heat lamp bank (infrared and incandescent) for drying	Yes	None	

[j]Permit needed for each event (for that specific event).

[k]Not enough information, but judged to be too small to require permit.

Table 12. (Cont'd)

Item	Location	Equipment Description	Permit Required	Permit Number	Comments
86	Echo G-47	Carpentry shop	No	None	
87	All sites	Use of solvents for cleaning by hand wiping	No	None	

Table 13. Estimated Emission Rates and/or Levels and Compliance Rating

Item (Keyed to Table 12)	Emission Estimates		Rules Relevant to Compliance Rating	Compliance Rating				Comments
				Permits		Other Rules		
	Results	Method		In	Out	In	Out	
1-5	Negligible	Judgment	219(n)(2), 431	X			X	H_2S content may be exceeding Rule 431 limits
6-12	1,916 lb VOC/yr	Calc.[a]	461[b]	X				Because APCD permits do not have enough detail, they cannot be matched with actual tanks. Permit compliance determination assumes permit for 2,000 gal/tank is for tank not being removed. Tanks without permits, but which are being removed, are not considered in determination
13-26	11 lb VOC/yr	Calc.	219(n)(3)(A) 219(n)(3)(C)	X		X		
27-32	Negligible	Judgment	219(n)(3)(C)	X		X		

[a]Calc. means calculated; PM means particular matter.

[b]Tanks would be exempt from the vapor return and vapor control requirements of Rule 461 if supplier had exemption. In fact, supplier does not have written approved exemption because APCD has not issued any written exemptions. Supplier only has "implied" exemption. Tanks also would be exempt if EPA designated area as outside of non-attainment area, but so far EPA has left area as an "unclassified" area.

Table 13. (Cont'd)

Item (Keyed to Table 12)	Emission Estimates		Rules Relevant to Compliance Rating	Compliance Rating				Comments
				Permits		Other Rules		
	Results	Method		In	Out	In	Out	
33	Negligible	Judgment	219(n)(1)(A)	X		X		
34	8.7 lb VOC/day	Calc.	442	X		X		
35	2.7 lb VOC/day	Calc.	219(n)(12), 442	X		X		
36	0 (not in use)		442	X		X		Will need permit if used
37-47	< 1 lb VOC/day	Calc.	219(b)(2), 401, 431[b]	X				
	4 lb NO_x/day			X				
	1 lb SO_2/day			X				
	1 lb CO/day			X				
	< 1 lb PM/day[a]			X				
48-69	66 lb VOC/day	Calc.	219(b)(2), 401, 405, 406, 407, 409, 431[c,d]	X				Item 48 is the only generator needing a permit that does not have one. Item 53 has a permit, but does not seem to need one
	822 lb NO_x/day			X				
	55 lb SO_2/day							
	179 lb CO/day							
	59 lb PM/day							
70-73	--	Judgment	219(b)(1), 401, 404, 405, 406, 409, 431[d]	X				Not in use

[c]Boilers may be violating Rule 431 if sulfur content (as H_2S) exceeds 800 ppm.

[d]No data are available to determine compliance with Rules 404, 405, 406, and 409 when in use.

Table 13. (Cont'd)

Item (Keyed to Table 12)	Emission Estimates		Rules Relevant to Compliance Rating	Compliance Rating				Comments
				Permits		Other Rules		
	Results	Method		In	Out	In	Out	
74	0 (not in use)	Judgment	401[c]		X			Not in use. Needs permit if to be used
75	0 or negligible	Judgment	219(g)(1), 401	X		X		Not in use
76	0 (not in use)	Judgment	401[d]		X			Not in use. Needs permit if to be used
77	8 lb VOC/day	Calc.	219(a)(3)	X		X		
78-81	11 lb VOC/yr	Calc.	219(n)(3)(A), 219(n)(3)(C)	X		X		Same as for Items 13-26.
82	Unknown	--	208, 444[e,f]	X				Permit needed for each event
84	Negligible	Judgment	464		X	X		
85	Include with Item 34	Calc.	442		X	X		Perhaps can be included in permit for spray booth (Item 34)
86	Negligible	Judgment	219(g)(2)	X				Only small hand tools used
87	27.6 lb VOC/day	Calc.	442[g]	X				

[e]No data to the contrary.

[f]No mention made as to exemption from other rules such as Rule 401.

[g]No data are available to determine compliance with Rule 442.

Table 14. Calculation of Emission Rates and/or Levels

Item No. (Keyed to Table 12)	Calculation
1-5	No breathing emission because LPG vapor pressure too high for air to be taken into tank. No filling emission because no air in tank and vapors condense and reabsorb rather than compress to pressure above the release valve (RV) setting
6-12	(7.3 lb VOC/M gal)[a] x (230.8 M gal/yr) = 1,685 lb VOC/yr (filling) (1.0 lb VOC/M gal) x (230.8 M gal/yr) = 231 lb VOC/yr (breathing) (1,685 lb VOC/yr) + (231 lb VOC/yr) = 1,916 lb VOC/yr
13-26	(11.5 lb VOC/M gal) x (483.36 M gal/yr) x (0.011 Diesel vapor pressure (VP) - 6.2 gas VP)[b] = 10 lb VOC/yr (filling) (1 lb VOC/M gal) x (483.36 M gal/yr) x (0.011 Diesel VP - 6.2 gas VP) = 1 lb VOC/yr (breathing) (10 lb VOC/yr) + (1 lb VOC/yr) = 11 lb VOC/yr
27-32	Negligible
33	Negligible
34	(200 gal/yr synthetic enamels) x (4.5 lb VOC/gal) = 900 lb VOC/yr (50 gal/yr top coats) x (5.5 lb VOC/gal) = 275 lb VOC/yr (150 gal/yr thinners) x (6.7 lb VOC/gal) = 1,005 lb VOC/yr (900 lb VOC/yr) + (275 lb VOC/yr) + (1,005 lb VOC/yr) = 2,180 lb VOC/yr or 8.7 lb VOC/day (250 day/yr)
35	(5 gal/mo) x (12 mo/yr) x (11.25 lb exempt VOC/gal) = 675 lb exempt VOC/yr or 2.7 lb/day (250 day/yr)
36	Rarely used
37-47	(74.18 M gal/yr) x (0.26 lb VOC/M gal) = 19.3 lb VOC/yr or 0.1 lb VOC/day (250 days/yr) (74.18 M gal/yr) x (12.8 lb NO_x/M gal) = 949.5 lb NO_x/yr or 3.8 lb NO_x/day (250 days/yr)

[a]M gal means 1000 gallons.

[b]VP means vapor pressure.

Table 14. (Cont'd)

Item No. (Keyed to Table 12)	Calculation
37-47	(74.18 M gal/yr) x (4.6 lb SO_2/M gal) = 341.2 lb SO_2/yr or 1.4 lb SO_2/day (250 days/yr) (74.18 M gal/yr) x (3.2 lb CO/M gal) = 237.4 lb CO/yr or 1.0 lb CO/day (250 days/yr) (74.18 M gal/yr) x (0.28 lb PM/M gal) = 20.8 lb PM/yr or 0.1 lb PM/day (250 days/yr)
48-69	(438.36 M gals/yr) x (37.5 lb VOC/M gal) = 16,438.5 lb VOC/yr or 65.8 lb VOC/day (250 days/yr) (438.36 M gals/yr) x (469 lb NO_x/M gal) = 205,590.8 lb NO_x/yr or 822.3 lb NO_x/day (250 days/yr) (438.36 M gals/yr) x (31.2 lb SO_2/M gal) = 13,676.8 lb SO_2/yr or 54.7 lb SO_2/day (250 days/yr) (438.36 M gals/yr) x (102 lb CO/M gal) = 44,712.7 lb CO/yr or 178.9 lb CO/day (250 days/yr) (438.36 M gals/yr) x (33.5 lb PM/M gal) = 14,685.1 lb PM/yr or 58.7 lb PM/day (250 days/yr)
70-73	0 (not in use)
74	0 (not in use)
75	Not in use and negligible when in use
76	Negligible
77	(9.0 lb VOC/M gal) x (230.8 M gal/yr) = 2077.2 lb VOC/yr or 8.3 lb VOC/day (250 days/yr)
78-81	Same as 15-30, (11 lb VOC/yr)
82	Rarely occurs; emission unknown
84	Negligible
85	Included with Item 37
86	Negligible

Table 14. (Cont'd)

Item No. (Keyed to Table 12)	Calculation
87	Total for all sites using cleaning solvents manually: (500-60) gal/yr) x (11.25 lb VOC/gal) = 4950 lb VOC/yr or 19.8 lb/day (250 days/yr) (300 gal/yr) x (6.5 lb VOC/gal) = 1950 lb VOC/yr or 7.8 lb/day (250 days/yr) 19.8 lb/day + 7.8 lb/day = 27.6 lb/day

SECTION VIII

WASTEWATER MANAGEMENT

A. BACKGROUND

The recently amended Clean Water Act (CWA) provides a Federal mandate to protect the waters of the United States from pollution. Regulations have been promulgated by the EPA to provide detailed requirements of the law. The Federal program provides for a state to administer its own program for surface and groundwater. The State of California has enacted the Porter-Cologne Water Quality Control Act to enforce the Federal CWA.

State regulations for management of wastewater are administered by the State Water Resources Control Board through nine Regional Water Quality Control Boards. The Regional Board, with jurisdiction over the GDSCC, is the Lahontan Regional Water Quality Control Board (LRWQCB).

It is the responsibility of the regional water quality control boards to issue Waste Discharge Requirements specifying operating conditions and reporting requirements for wastewater management facilities.

B. REGULATIONS

Regulations promulgated in support of Division 7 of the State Water Code, which relate to operation of the GDSCC sewage treatment plants and oxidation ponds, are found in CAC Title 23. Domestic sewage treatment plants are regulated under subchapter 9 of Title 23. General requirements are discussed below.

1. Requirements for a Report of Waste Discharge (CAC Title 23, Subchapter 9, Sections 2205-2207)

A report of Waste Discharge and an application form must be filed with the RWQCB for discharges from domestic sewage treatment plants. The RWQCB will consider the application and report. If water quality guidelines will be achieved, the Board will issue waste discharge requirements referred to as a permit for plant operations. Waste discharges must have the required permit to operate.

2. Definition of a Material Change (CAC Title 23, Subchapter 9, Section 2210)

Material changes in the character, location, and volume of the waste discharge must be reported to the Regional Board. This also includes a change in process, treatment, or disposal method or a substantial increase in flow above the permitted quantity. Closure of a facility or discontinuance of a discharge must be reported.

3. Monitoring Program Reports (CAC Title 23, Subchapter 9, Section 2230)

Regional boards specify requirements for periodic laboratory analysis, inspections, recordkeeping, and reporting as part of a facility's waste discharge requirements. A facility must submit the results of any monitoring program to its regional board at least once per year. Analyses must be conducted by a laboratory certified for such analyses by the State DHS.

4. Periodic Review of Waste Discharge Requirements (CAC Title 23, Subchapter 9, Section 2232.2)

The Regional Board is required to review the GDSCC's waste discharge requirements every 5 years. Modifications to discharge requirements may be made at this time.

5. Inspections (CAC Title 23, Subchapter 9, Section 2234)

The Regional Board is required to inspect the GDSCC ponds at least once every 5 years.

C. DESCRIPTION OF FACILITIES

1. General

This section describes active wastewater management facilities at the Echo and Mars Sites and an inactive facility at the Mojave Base Site. The Pioneer Site, which is still included on the NASA/JPL permit, is now managed by the U.S. Army, Ft. Irwin, and will not be included in this discussion.

2. Wastewater Facilities at the Echo and Mars Sites

Wastewater facilities at the Echo and Mars Sites are similar. Facilities at each of these sites include several septic tanks, leach lines, and two wastewater ponds. The general location of facilities at the Echo and Mars sites are shown in Figures 5 and 6, respectively.

a. Oxidation Ponds. Figure 7 is a sketch of the oxidation/percolation ponds at the Mars Site. The ponds at the Echo Site are larger, but the construction is similar. The ponds are lined with 2 ft of clay material. This lining has eroded to some extent on the inside slopes of all the ponds at both sites. According to the design, the ponds are used to retain and evaporate flows not manageable by the septic tank and/or leach field for each system.

b. Septic Tank Systems. The septic tanks are standard multi-compartment concrete basins that were constructed in 1967. The tanks are accessible through 24-in. diameter manholes. All wastes discharged to the

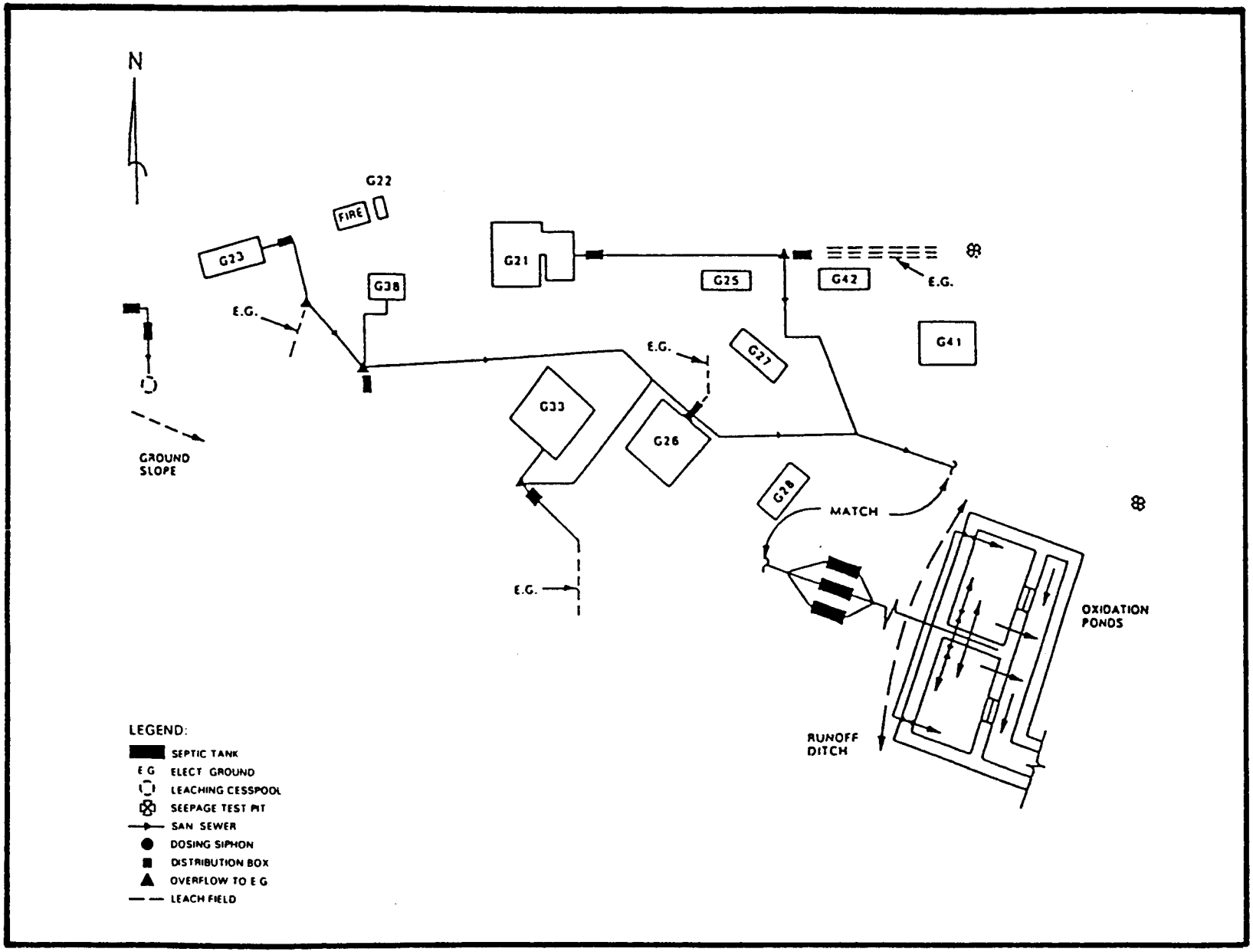


Figure 5. Location of Septic Tank System and Oxidation Ponds at Echo Site

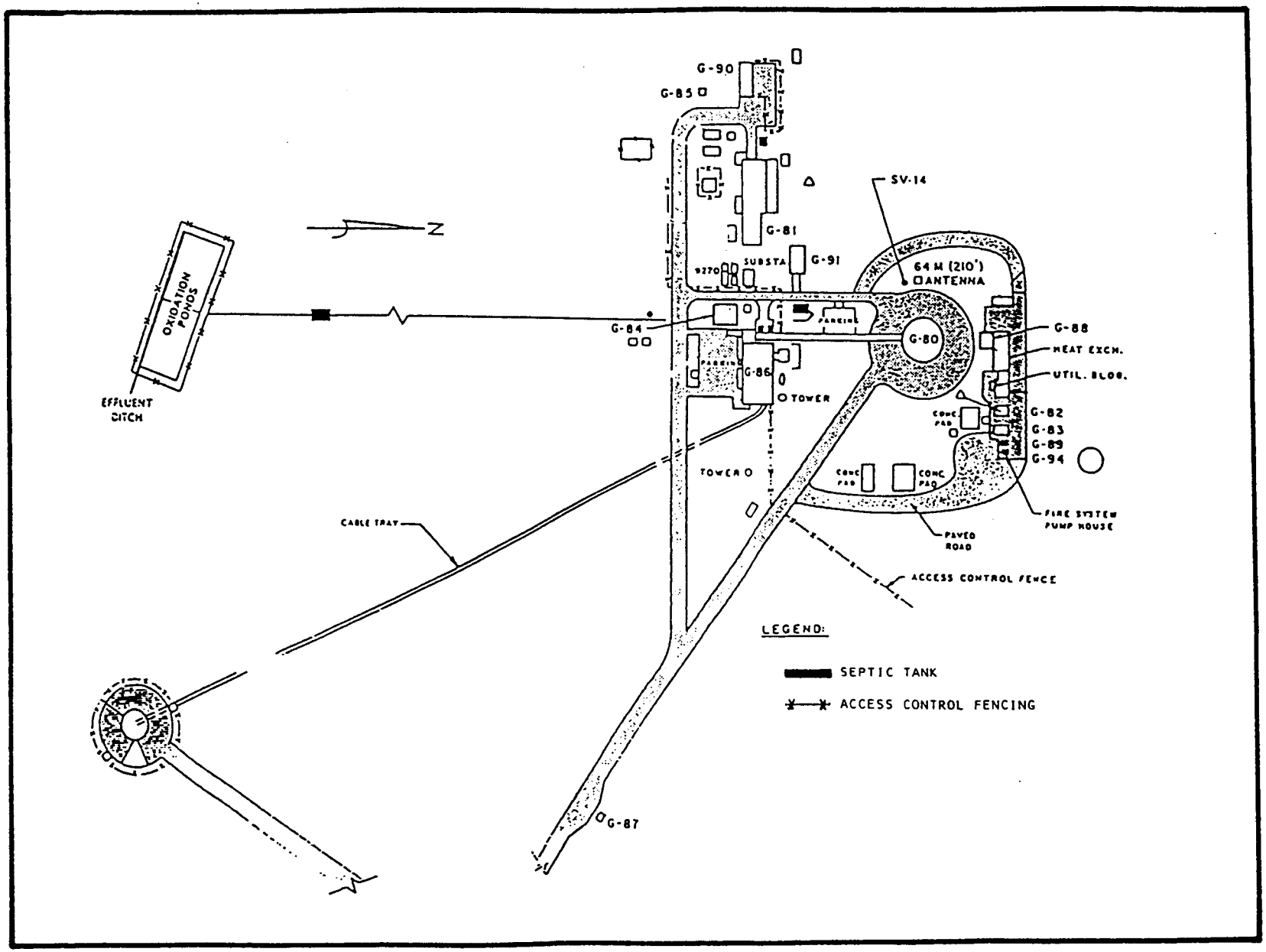


Figure 6. Location of Septic Tank System and Oxidation Ponds at Mars Site

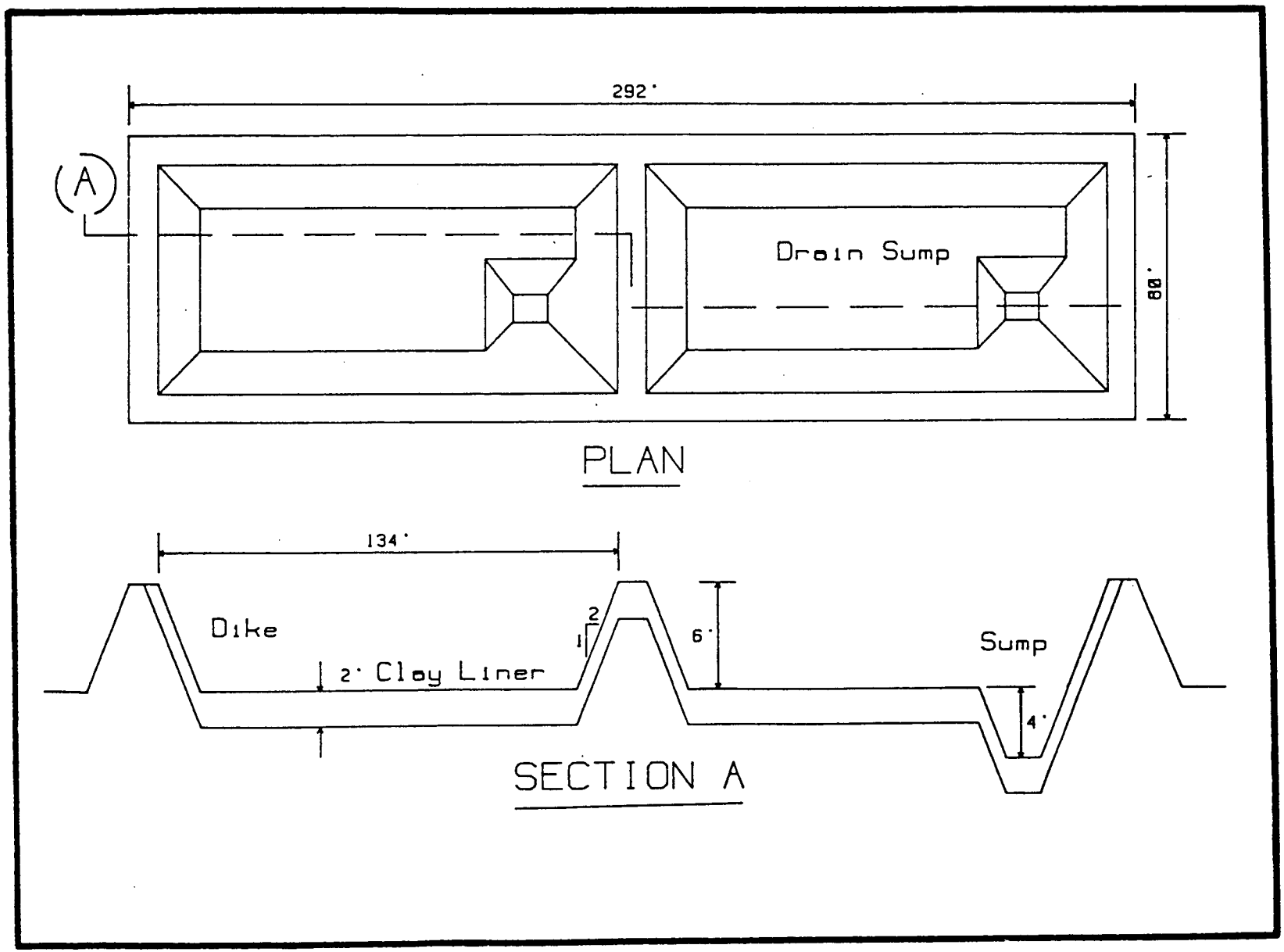


Figure 7. Drawing of Oxidation/Percolation Ponds at Mars Site (Typical)

septic tank systems are domestic-type wastewater. There are no known industrial wastewaters containing hazardous constituents being discharged into a septic tank system. The normal mode of wastewater flow is as follows:

(1) All wastewaters flow from the buildings through pipelines to the septic tanks.

(2) Effluent from the septic tanks is split so that some flow is to the leach lines, with the remainder of the flow discharged to the oxidation ponds.

(3) All flow directed from a septic tank system to the ponds is exclusively to one oxidation pond for a period of about 1 year. Flow is then directed from the septic tank system to the second pond. The pond not in use is allowed to evaporate until it is dry.

(4) Septic tanks are pumped as necessary by a contractor and the removed material is transported off-site for disposal.

(5) Design capacity at the Echo Site, as indicated in the permit, is 18,000 gal. The average daily flow to the ponds is about 1,200 gal per day. The average number of persons working at the Echo Site is 110 persons per day.

(6) Design capacity at the Mars Site, as indicated in the permit, is 5,000 gal. The average flow to the ponds is about 420 gal per day. The average number of persons working at the Mars Site is 48 persons per day.

3. Wastewater Facilities at the Mojave Base Site

The wastewater system at the Mojave Site includes septic tanks, leach fields, an above-ground package treatment plant, and one oxidation pond. Personnel at the GDSCC who were working on-site when the system was built indicate that the package treatment plant and pond system performed poorly, and were abandoned after a short testing period of operation.

D. SURVEY FINDINGS

1. Background

With the exception of the treatment system installed at the Mojave Base Site, the GDSCC wastewater systems have operated very well since they were put in service in the mid-1960s. No serious problems have been experienced. Some erosion occurs with time on the inside slopes of the oxidation ponds. This will require routine corrective maintenance. There is a reoccurring problem with weeds that grow in the ponds. The removal of weed growth is a permit requirement. The conditions observed do not seem to be serious problems that endanger the integrity or function of the ponds.

The abandoned pond at the Mojave Base Site was inspected and seems to be in good condition. The base and sides of the pond did not have any accumulation of sludge and were not discolored. There is nothing in the appearance of the pond to suggest that it has been used over an extended time period.

The GDSCC does not plan to use the package treatment plant and oxidation pond at the Mojave Site. The current plan is to drill boreholes in the pond, collect samples, and perform soil tests to verify that there is no contamination of the soils underlying the pond. If this is found to be the case, the pond will be formally closed with the concurrence of the LRWQCB. Table 15 identifies the compliance status of the GDSCC with respect to CAC, Title 23, Subchapter 9. A copy of the Waste Discharge Requirements (Board Order No. 6-85-7) are included in Appendix A.

2. Program Management

Until recently, copies of the state regulations pertaining to the operation of wastewater treatment facilities and waste discharges to land were not available at the GDSCC. Persons responsible for operation of the permitted facilities simply responded to RWQCB staff advice and correspondence concerning wastewater discharges, rather than managing a compliance program around the requirements of the regulations and permit conditions.

3. Recordkeeping and Reporting

The GDSCC has not received comments from the LRWQCB regarding its recordkeeping and reporting practices. The current lack of attention by Regional Board inspectors and staff does not, however, relieve the GDSCC from its responsibility. Recordkeeping was found to be minimal, and should be improved to document the O&M of the facilities as specified in the regulations. O&M logs, formal inspection records, and the information necessary to prepare annual reports should be maintained in a file that is kept current. There is no record in the file that shows monthly measurements of freeboard for each of the ponds. This measurement is a requirement of the permit.

Annual reports have been submitted to the Regional Board in conformance with Board Order No. 6-85-7. Copies of the 1985 and 1986 annual reports are included in Appendix B. Each report states a change in the size of the work force from the previous year, but the number of people reported working at each site does not reflect this change.

4. Operating Procedures

There are no written operating procedures for the wastewater facilities. There are no recordkeeping and reporting instructions for operating personnel.

Table 15. Compliance Checklist for Wastewater Ponds (From CAC, Title 23, Subchapter 9 - Waste Discharge Reports and Requirements)

Section	Section Description	In Compliance? Yes	No	N/A
ARTICLE 2	WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES OTHER THAN FROM POINT SOURCES TO NAVIGABLE WATERS			
2205	PRELIMINARY PROCEDURES			
	Each waste discharge report, together with the required filing fee, shall be submitted to the appropriate Regional Board on forms supplied by the board. Relevant supplemental information as required by the Board shall also be provided.	X		
2205	EFFECTIVE FILING DATE			
	When the discharger has submitted all the information required by the Board and the full fee that is due, the report will be deemed filed. The discharger will be notified to that effect.	X		
2207	CRITERIA FOR FILING REPORTS			
	Separate reports shall be filed for discharge to different disposal areas. One report may include two or more discharges by the same person to the same disposal area unless, in the judgment of the Regional Board, separate reports should be filed.	X		

Table 15. (Cont'd)

Section	Section Description	In Compliance? Yes	No	N/A
2210	DEFINITION OF A MATERIAL CHANGE			
	A material change in the character, location, or volume of the discharge requiring a waste discharge report includes, but is not limited to, the following:			
	(a) Addition of a major industrial waste discharge to a discharge of essentially domestic sewage, or the addition of a new process or product by an industrial facility resulting in a change in the character of the waste.			X[a]
	(b) Significant change in disposal method, including a change from land disposal to a direct discharge to water, or change in the method of treatment that would significantly alter the characteristics of the waste.			X[a]
	(c) Significant change in the disposal area, including moving the discharge to another drainage area, to a different water body, or to a disposal area significantly removed from the original area potentially causing different water quality of nuisance problems.			X[a]
	(d) Increase in flow beyond that specified in the waste discharge requirements.			X[a]
	(e) Increase in area or depth to be used for solid waste disposal beyond that specified in waste discharge requirements.			X
2230	MONITORING PROGRAM REPORTS			
	(a) The result of any monitoring shall be reported to the Regional Board as specified in the waste discharge requirements, but in no case less than once per year.	X		

[a]This change has not occurred.

Table 15. (Cont'd)

Section	Section Description	In Compliance? Yes	No	N/A
2210	DEFINITION OF A MATERIAL CHANGE			
	(b) The Regional Board may require the discharger to submit an annual report summarizing the monitoring data for the previous year.	X		
	(c) Unless otherwise permitted by the Regional Board Executive Officer, all analyses shall be required to be conducted at a laboratory certified for such analyses by the State DHS.			X[b]
2231	TIME SCHEDULES			
	(a) Time schedules should be included in requirements for existing discharges when it appears that the discharger cannot immediately meet the requirements.			X
2232.2	PERIODIC REVIEW OF WASTE DISCHARGE REQUIREMENTS			
	The Regional Board Executive Officer shall review all waste discharge requirements at least once every 5 years.			X[c]
2233	OTHER TERMS AND CONDITIONS TO BE INCLUDED IN WASTE DISCHARGE REQUIREMENTS			
	(d) Conditions shall be included in waste discharge requirements for all publicly-owned wastewater treatment plants requiring the following:			
	(d)[a] That supervisors and operator of plants shall possess a certificate of appropriate grade in accordance with CAC, Title 23, Section 3680.			X

[b]The GDSCC has not as yet been required to conduct chemical tests of pond effluents.

[c]This is a responsibility of the Regional Board and requires no action by the GDSCC.

Table 15. (Cont'd)

Section	Section Description	In Compliance? Yes	No	N/A
2234	INSPECTIONS			
	Each Regional Board shall develop a schedule for inspection of all waste dischargers within the region to determine compliance with waste discharge requirements. Each discharge shall be inspected for compliance with discharge requirements at least once every 5 years.			X[c]
ARTICLE 3	LEVELS OF COMPETENCE FOR OPERATION OF WASTEWATER TREATMENT PLANTS			
3680	LEVELS OF COMPETENCE			
	Persons classified as supervisors shall possess the same grade certificate as the class of plant operated. Assistant supervisors and foremen shall possess a grade certificate no more than one grade lower than the class of a plant operated except in Class V plants, a foreman shall possess at least a Grade III certificate. All operators shall possess at least a Grade I certificate or an operator-in-training certificate.			X

The Regional Board has not given notice that the oxidation ponds are regulated by the Toxic Pits Cleanup Act of 1984. Because they have not been used to store or dispose of hazardous wastes, the ponds are not at present subject to the act. The GDSCC must continue to control the quality of wastewater entering the ponds or these ponds could become subject to the provisions of the Toxic Pits Cleanup Act, and could be reclassified as hazardous waste impoundments.

E. RECOMMENDATIONS

1. Program Management

The wastewater facilities have operated very well with no documented major problems. The following recommendations are offered as suggestions to improve the O&M of the wastewater systems and the inspection, recordkeeping, and reporting procedures.

The wastewater treatment systems are not complex. Proper management in conformance with the Regional Water Quality Control Board order, however, would be facilitated if the GDSCC would prepare a written policy and standard operating procedures providing guidance for operating staff.

The policy should establish the objectives of the wastewater management program and should identify prohibitions and restrictions on the use of the system. The policy statement should also state the responsibilities of persons in charge of operations that discharge to the system.

SOPs should be written that include procedures for the O&M of the wastewater system, O&M and inspection schedules, and recordkeeping and reporting guidelines. Examples of an O&M log sheet, inspection form, and other forms to be used in performing program activities should be included in the SOPs.

2. Recordkeeping and Reporting

a. Listing of Required Reports and Records. A table listing required reports and records should be compiled by the environmental coordinator. The GDSCC wastewater filing system can be set up using this list as a guide. Sources for determining which records and reports must be maintained or generated are found in CAC, Title 23, Chapter 9 (see Table 15) and in the facility permit. For example, the LRWQCB Order No. 6-85-7 requires that the following records be maintained and compiled into a report:

(1) The average number of people working at the Echo and Mars Sites each day.

(2) A determination, on a monthly basis, of the distance from the top of the dike to the wastewater surface in each oxidation pond.

(3) Date of septic tank pumping, including:

(a) Date of pumping.

(b) Location of tank.

(c) Volume of waste pumped.

(d) Name of contractor doing the work.

(e) Point of disposal by the contractor.

(4) Description of any system modifications.

(5) Description of any maintenance activities.

(6) Description of any major problems.

The full text of the Board Order listing these requirements is included in Appendix A of this report. Revised requirements to the permit are scheduled to be adopted by the Regional Board in March 1987. Revisions will exclude the pond at the Pioneer Site, which is no longer managed by NASA/JPL

since the Army (Ft. Irwin) took over management of the site in late 1986. The GDSCC should carefully review the new permit to ensure that there are no substantive changes which could affect its recordkeeping, monitoring, reporting, or operational procedures.

3. Correction of Deficiencies

A procedure should be developed for tracking the progress of actions taken to correct deficiencies found during inspections. Deficiencies should be reported in writing to the EC. He/She, in turn, assigns staff to work on the problem in accordance with a given schedule. When the deficiency is corrected, the EC should sign off on the deficiency form. The inspection/ deficiency form should be kept on file along with any paperwork documenting that action has been taken (purchase order records, internal work orders).

4. Training

All personnel should be provided with awareness training. This training should address information on how the wastewater system works, the GDSCC policy regarding the use of the system, an explanation of restrictions placed on discharges to the system, and a contact number should users have questions or concerns regarding discharges to the system. O&M personnel also should be trained in proper equipment use and maintenance, safety procedures, and the reasons for certain operational procedures (why the ponds must be kept free from weeds).

Training records should be maintained for applicable employees, documenting all classroom and on-the-job training received.

5. Studies and Closure Projects

The planned soil investigation of the abandoned pond at the Mojave Base Site should be carried out to verify there is no contaminated soil beneath the oxidation pond. The site should be officially closed with LRWQCB approval. Proper closure will likely involve removal of contaminated soil (if soil is found to be contaminated), and backfilling of the pond to grade with clean fill.

F. SUMMARY AND CONCLUSIONS

The wastewater facilities at the Echo and Mars Sites are simple systems that have operated well with no major problems since their construction in the early 1960s. The facilities are operated in near conformance with requirements established by the LRWQCB.

Maintenance deficiencies were noted in each of the active ponds. Specifically, the inside slopes of the oxidation ponds at the Echo and Mars Sites require routine repair to correct the erosion that occurs and to prevent development of a more serious condition. Weed growth in the oxidation ponds require regular removal to maintain the volume and function of the ponds.

The ponds at Mars and Echo Sites should continue to provide an effective means for managing domestic wastewater at the GDSCC. The abandoned pond at the Mojave Base Site must, however, be properly closed in accordance with regulations.

It is extremely important that the GDSCC carefully monitor wastewater sources to ensure that no hazardous wastes enter the ponds or septic tank systems. This can be accomplished through implementation of a routine source surveillance program. It is recommended that the results of these inspections be recorded and maintained in the GDSCC files. Documentation of no industrial discharge is just as important as documenting the occurrence of a hazardous waste discharge to the system. An ongoing record of inspections will document the GDSCC efforts to operate its system properly.

SECTION IX

PESTICIDE MANAGEMENT

A. BACKGROUND

This section provides an assessment of the GDSCC compliance requirements with respect to pesticide regulation enacted under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). FIFRA regulations are included in 40 CFR Parts 160-180, Subchapter E: Pesticide Programs. Specific parts of Subchapter E that affect criteria for contracting with an outside firm and usage of pesticides at the GDSCC are:

(1) 40 CFR Part 162, "Regulations for the Enforcement of FIFRA." Under Definitions in Subpart 162.3(ff), examples of classes of pesticides are described and include insecticides and rodenticides, which are the only classes of pesticides used at GDSCC.

(2) 40 CFR Part 165, "Regulations for the Acceptance of Certain Pesticides and Recommended Procedures for the Disposal and Storage of Pesticides and Pesticide Containers." This part of the FIFRA Regulation addresses procedures for safe storage and disposal of pesticides, pesticide containers, and residues.

(3) 40 CFR Part 171, "Certification of Pesticide Applicators." This part of the FIFRA Regulations describes standards for certification of pesticide applicators, standards for supervision of non-certified applicators, submission and approval of state plans for certification of pesticide applicators, and maintenance of state plans.

B. REGULATORY COMPLIANCE REQUIREMENTS

1. Pesticides in Use at the GDSCC: 40 CFR Part 162

The GDSCC contracts with an outside firm that is responsible for applying pesticides at the GDSCC. Pesticides must have EPA registration numbers as required by FIFRA regulations. It is the GDSCC's responsibility to ensure that the pesticide contractor is using only those pesticides having EPA registration. It is recommended that the GDSCC Safety Officer obtain MSDSs and a list of EPA registration numbers for each pesticide used by the contractor at the GDSCC. The GDSCC should review all pesticide MSDSs and come to an agreement with the pesticide firm as to which pesticides may be used at the GDSCC. Any change in pesticide type or formulations should be approved by the GDSCC Safety Officer before use. Pesticide container labels must be checked to ensure that only general-use pesticides are used at the GDSCC.

2. Pesticide Wastes and Pesticide Storage: 40 CFR Part 165

The contractor should not bring large containers of pesticide concentrate onto the facility. The best approach is for the contractor to bring spray canisters ready for use. This minimizes the probability of a release or other accident during container transfer operations.

Only those areas designated by the GDSCC Safety Officer should be sprayed. Overuse of pesticides should be avoided, especially in worker spaces. The Safety Officer should log in the frequency and quantity of pesticide application at each building sprayed as a means of tracking the frequency of pesticide usage. A sign-off sheet, such as the one shown in Figure 8, is useful for this purpose.

No pesticide wastes of any type are generated at the GDSCC that are not removed by the contractor. This practice should be continued. It is recommended that should the pesticide contractor need to transfer pesticides between containers, he/she should be carefully supervised to ensure that a spill would not result in an impact to health or the environment. Special attention should be placed on avoiding the release of pesticides into drains discharging into the septic tank system or into oxidation ponds.

3. Certification of Pesticides Applicators and Application Standards: 40 CFR 171

Pesticide application must be performed by a Certified Pesticide Application Firm. It is recommended that copies of the applicator's certification should be on file at the GDSCC along with MSDSs for all of the products used at the GDSCC.

Overuse of pesticides is a common problem. This only can be controlled by a management program that does not permit personal application procedures or individual contractor request procedures. The detailed application "Sign-Off Sheets" should be reviewed by the GDSCC Safety Officer at least quarterly to determine application patterns and overall quantities applied. The effectiveness of the program can be gauged accordingly.

C. RECOMMENDATIONS

1. FIFRA Requirements

The GDSCC compliance with applicable requirements of FIFRA regulations requires the following:

(1) The GDSCC must ensure that its contract pesticide applicator uses only registered pesticides.

(2) The GDSCC must contract only with certified pesticide applicators.

(3) The GDSCC must not generate pesticide wastes or store pesticides on-site.

PESTICIDE APPLICATION SIGN-OFF SHEET

Date of treatment: _____

_____

Location treated: _____

_____

_____

_____

_____

_____

Total units treated: _____

Pest or pests controlled: _____

_____

_____

Equipment used: _____

_____

Employee Signature: _____

This form will be filled out at the end of each pesticide application.

Figure 8. Example of Pesticide Application Sign-off Sheet

2. Preparation of Pesticide Management Plan

It is recommended that a pesticide management plan or standard operating procedure be prepared that addresses authorized use, frequency of use, spill prevention, safety, inspections, recordkeeping, and application procedures.

SECTION X

COMPREHENSIVE ENVIRONMENTAL RESPONSE COMPENSATION AND LIABILITY ACT

A. BACKGROUND

This chapter provides an assessment of compliance with the statutory requirements set forth in the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA or Superfund), Title 42, Chapter 103. CERCLA authorizes the Federal Government (the EPA) to clean up both toxic chemical spills and abandoned or uncontrolled hazardous waste sites. The Act also assigns responsibility for cleanup and liability for cleanup costs and damages to those directly or indirectly culpable for releases of hazardous substances.

Congress has recently amended and reauthorized CERCLA. The amended version is referred to as the Superfund Amendments and Reauthorization Act of 1986 (SARA). The full text of SARA has not as yet been issued, therefore, the information provided in this report has been based on the August 25, 1986 Legislative Galley. Sections of SARA that have or could have impact on the GDSCC are discussed below.

Section 120 of SARA defines the applicability of the act to Federal facilities. The amendment reaffirms that, except for requirements relating to bonding, insurance, or financial responsibility, all provisions of the act that apply to private facilities also apply to Federal facilities in the same manner and to the same extent.

The primary areas of applicability of SARA to Federal facilities involve: (1) responsibilities for assessment and cleanup of contaminated hazardous waste sites, and (2) reporting of new releases to the environment of specified quantities of designated hazardous substances.

Private and Federal facilities are required under Section 3016 of the Solid Waste Disposal Act (SWDA) to notify EPA of the existence of any past or present site where hazardous wastes are known to have been deposited. Federal facilities having made such notification, and which have contaminated property posing a serious threat to health and the environment, may be placed on the National Priorities List. In this case, Federal laws apply and EPA will take the lead in directing preliminary assessments and cleanup activities. State laws apply to response actions at Federal Government facilities that are not on the National Priorities List.

Under Section 103 of CERCLA, private and Federal facilities are required to notify EPA or the cognizant state agency within 24 hours or less, whenever a release of a hazardous substance to the environment has occurred in quantities exceeding a specified "reportable quantity" for that substance. A reportable release is one that poses an actual or potential threat to the environment. CERCLA defines a "release" to include virtually all ways that substances may enter the environment (spilling, leaching, leaking, and

dumping). If a substance eventually enters a storm drain or surface water body, seeps into the ground, or volatilizes into the atmosphere, it is considered a "release."

RQs are listed, defined, and interpreted in CERCLA. For the majority of the 692 hazardous substances listed, an RQ of 1 lb per 24 hours is stipulated. Section 102 of the Act establishes a reportable quantity of 1 lb for all unlisted hazardous substances, except where the substance has a different RQ established under Section 311 of the CWA (see also 40 CFR 116). SARA requires EPA to promulgate final regulations establishing RQs for substances appearing on the list. EPA was to publish proposed regulations establishing RQs by December 31, 1986, and promulgate final regulations by April 30, 1988.

B. SURVEY FINDINGS

Neither JPL nor its on-site contractor are aware of any past activity at the GDSCC that would require reporting under the SWDA or CERCLA. At this time, the Mojave Base Site dump is not considered to be a reportable candidate. From all appearances, the site was used to dispose of trash and not (with small exception) hazardous wastes.

At the time of the survey, the GDSCC personnel were unaware of their specific reporting responsibilities under CERCLA or SWDA. It is recommended that the GDSCC EC become completely familiar with the SWDA and CERCLA reporting requirements.

The on-site EC must have a thorough understanding of requirements involving RQs, primarily because this is an area of CERCLA compliance with more immediate applicability to the GDSCC. The EC should understand when and how to make reports for hazardous substances releases, and be trained to make the calculations for determining whether or not a "release" actually exceeds CERCLA limits. For example, spilling the contents of a 55-gal drum containing 400 lb of waste (water mixed with 10 lb of a substance having an RQ of 100 lb) does not constitute a reportable release. The ability to make these calculations correctly will minimize unnecessary reporting of releases. Written protocol and procedures for RQ reporting should be prepared in draft and agreed upon by both JPL and contractor personnel. A final document should be prepared and signed by appropriate JPL and contractor staff.

CERCLA requires entities of the Federal Government to clean up accidental or unlawful discharges to the environment for which they are directly or indirectly responsible. It also stipulates that entities of the Federal Government are fiscally responsible for their portion of costs incurred for cleanup and for damages. It is recommended that qualified individuals, representing all parties associated with the ownership and operation of the GDSCC, develop agreements defining who, under what conditions, and to what extent the parties, either jointly or separately, shall assume administrative and fiscal responsibility in the event of a discharge of hazardous substance. In the event of a release, a file containing detailed notes on the course of events should be maintained. Photographs, sampling methods, test results, and other pertinent documentation should be placed in the file as well.

C. RECOMMENDATIONS

The GDSCC should prepare a file folder for CERCLA reporting. A standard form should be printed that lists each month for a 1 year period, and provides space for comments on whether or not a reportable release has occurred each month. This type of recordkeeping should commence at once. The draft protocol and procedures document, which defines conditions for what type of report is required, should also be prepared for upper management review.

SECTION XI

CERTIFICATION

I hereby certify that all work performed by M. B. Gilbert Associates, Long Beach, California, in its environmental audit of both operations and records at the Goldstone Complex of the Ft. Irwin Military Reservation, San Bernardino County, California, as described in this report, was performed in compliance with Federal, state, and local regulations, and in accordance with good engineering and investigative practice.

Leonard H. Kushner
Registered Professional Engineer

Signature Leonard H Kushner

Date Signed: Sep 15, 1987

Registration No. E9003, Electrical
SF1086, Safety

State: California
California

Stamp/Seal:

APPENDIX A

WASTE DISCHARGE REQUIREMENTS FOR WASTEWATER PONDS

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LAHONTAN REGION

BOARD ORDER NO. 6-85-7

REVISED WASTE DISCHARGE REQUIREMENTS

FOR

GOLDSTONE TRACKING STATION
ECHO, MARS AND PIONEER SITES
San Bernardino County

The California Regional Water Quality Control Board, Lahontan Region finds:

1. The Board previously established waste discharge requirements for Goldstone Tracking Station - Echo, Mars and Pioneer sites under Board Order Nos. 6-72-74, 6-72-76 and 6-72-75, respectively, which were adopted on October 26, 1972. For the purposes of this order, the National Aeronautics and Space Administration - Jet Propulsion Laboratory is hereinafter referred to as the "discharger".

2. The Board is revising waste discharge requirements at this time to update them.

3. The Goldstone Tracking Station is located approximately 35 miles (56 km) north of the City of Barstow.

4. The Echo Site collects, treats and disposes of an average of 1,200 gpd (4,500 l/d) of domestic wastewater. The treatment and disposal facilities are located in the Bicycle Hydrologic Unit within the NE/4 Section 19, T14N, R2E, SBB&M as shown on Attachment "A", which is made a part of this order.

5. The Mars Site collects, treats and disposes of an average of 420 gpd (1,590 l/d) of domestic wastewater. The treatment and disposal facilities are located in the Robbers Subunit of the Panamint Hydrologic Unit within the NW/4 Section 9, T15N, R1E, SBB&M as shown on Attachment "B", which is made a part of this order.

6. The Pioneer Site collects, treats and disposes of an average of 210 gpd (800 l/d) of domestic wastewater. The treatment and disposal facilities are located in the Nelson Subunit of the Nelson Hydrologic Unit within the SW/4, Section 14, T15N, R1E, SBB&M as shown on Attachment "B", which is made a part of this order.

7. Each site consists of a tracking station for the National Aeronautics and Space Administration - Jet Propulsion Laboratory (NASA - JPL) Deep Space Network. Approximately 60, 12 and 14 people currently work each day at the Echo, Mars and Pioneer Sites, respectively.

8. Wastewater at the Echo Site is discharged to 12 septic tanks with a total capacity of 18,000 gallons (68,000 liters). Septic tank efffluent is discharged to two 0.4-acre (0.16 hectare) percolation/ oxidation ponds and a small leachfield.

9. Wastewater at the Mars Site is discharged to 4 septic tanks with a total capacity of 5,000 gallons (18,900 liters). Septic tank effluent is discharged to two 0.16-acre (0.07 hectare) percolation/ oxidation ponds and a small leachfield.

10. Wastewater at the Pioneer Site is discharged to 6 septic tanks with a total capacity of 6,000 gallons (22,700 liters). Septic tank effluent is discharged to two 0.11-acre (0.04 hectare) percolation/ oxidation ponds and a small leachfield.

11. The percolation/oxidation ponds and the leachfields are the only designated disposal sites.

12. The disposal sites are underlain by unconsolidated Quarternary alluvial deposits. A well located 3.0 miles (4.8 km) east of the Echo Site was dry when drilled to a depth of 335 feet (102 m). The top of this well is 350 feet (107 m) lower in elevation than the disposal area. Depth to groundwater in the nearest water well [3.5 miles (5.6 km) southwest] to the Mars site is greater than 140 feet (43 m). Total filtrable residue content of the groundwater exceeds 1,000 mg/l. Depth to groundwater in a well 5 miles (8 km) southwest of the Pioneer Site is greater than 150 feet (45 m). The total filtrable residue concentration of the groundwater is greater than 2,000 mg/l.

13. The designated disposal sites are located on land owned by the U.S. Government and controlled by the NASA - JPL.

14. The Board adopted the Water Quality Control Plan for the South Lahontan Basin on May 8, 1975, and this order implements that plan.

15. The beneficial uses of the groundwaters of the Bicycle Hydrologic Unit (Echo Site) as set forth and defined in the plan are:

    a. municipal and domestic supply
    b. industrial service
    c. freshwater replenishment

16. The beneficial uses of the groundwaters of the Robbers Subunit of the Panamint Hydrologic Unit (Mars Site) as set forth and defined in the plan are:

    a. municipal and domestic supply
    b. industrial service

17. The beneficial uses of the groundwaters of the Nelson Subunit of the Nelson Hydrologic Unit (Pioneer Site) as set forth and defined in the plan are:

    a. municipal and domestic supply

18. The Board has notified the discharger and interested agencies and persons of its intent to revise waste discharge requirements for these discharges.

19. These waste discharge requirements govern existing facilities which the discharger is currently operating. The project consists only of the continued operation of the existing facilities governed by these waste discharge requirements and is therefore exempt from the provisions of the California Environmental Quality Act (Public Resources Code Section 21000 et seq.) in accordance with Section 15301, Chapter 3, Title 14, California Administrative Code.

20 The Board in a public meeting heard and considered all comments pertaining to the discharges.

IT IS HEREBY ORDERED, that the discharger shall comply with the following:

I. DISCHARGE SPECIFICATIONS

A. EFFLUENT LIMITATIONS

1. The total flow of wastewater to the treatment and disposal facilities during a 24-hour period shall not exceed 22,500 gallons (85,200 liters), 5,200 gallons (19,700 liters), or 6,500 gallons (24,600 liters) at the Echo, Mars or Pioneer Sites, respectively.

2. The discharge of wastewater except to the designated disposal sites is prohibited.

3. The discharge to waters of the State shall contain no trace elements, pollutants or contaminants, or combinations thereof, in concentrations which are toxic or harmful to humans or to aquatic or terrestrial plant or animal life.

B. RECEIVING WATER LIMITATIONS

1. The waste discharge shall not result in any perceptible color, odor, taste or foaming in surface or groundwaters of the Bicycle Hydrologic Unit, the Robbers Subunit of the Panamint Hydrologic Unit, or the Nelson Subunit of the Nelson Hydrologic Unit.

2. The discharge shall not result in coliform organisms attributable to human wastes to be present in the surface or groundwaters of the Bicycle, Panamint or Nelson Hydrologic Units.

3. The discharge shall not cause there to be in any surface or groundwaters of the Bicycle, Panamint or Nelson Hydrologic Units toxic substances that individually, collectively or cumulatively cause detrimental physiological responses in human, plant, animal, or aquatic life.

C. GENERAL REQUIREMENTS

1. There shall be no discharge, bypass or diversion of raw or partially treated sewage, sewage sludge, grease or oils from the collection, transport, treatment or disposal facilities to adjacent land areas or surface waters.

2. Surface flow or visible discharge of sewage or sewage effluent from the designated disposal sites to adjacent land areas or surface water is prohibited.

3. All facilities used for collection, transport, treatment or disposal of wastes shall be adequately protected against either structural damage or a significant reduction in efficiency resulting from a storm or flood having a recurrence interval of once in 100 years.

4. The vertical distance between the water surface elevation and the lowest point of a pond dike or the invert of an overflow structure shall not be less than 1.5 feet (0.46 m).

5. The discharge shall not cause a pollution.

6. Neither the treatment nor the discharge shall cause a nuisance.

II. PROVISIONS

1. Board Orders No. 6-72-74, 6-72-76 and 6-72-75 are hereby rescinded.

2. The discharger shall comply with Monitoring and Reporting Program No. 85-7 as specified by the Executive Officer.

3. The discharger shall immediately notify the Regional Board by telephone whenever an adverse condition occurs as a result of this discharge; written confirmation shall follow.

4. Any proposed material change in the character of the waste, manner or method of treatment or disposal, increase of discharge, or location of discharge shall be reported to this Regional Board at least ninety (90) days in advance of implementation of any such proposal.

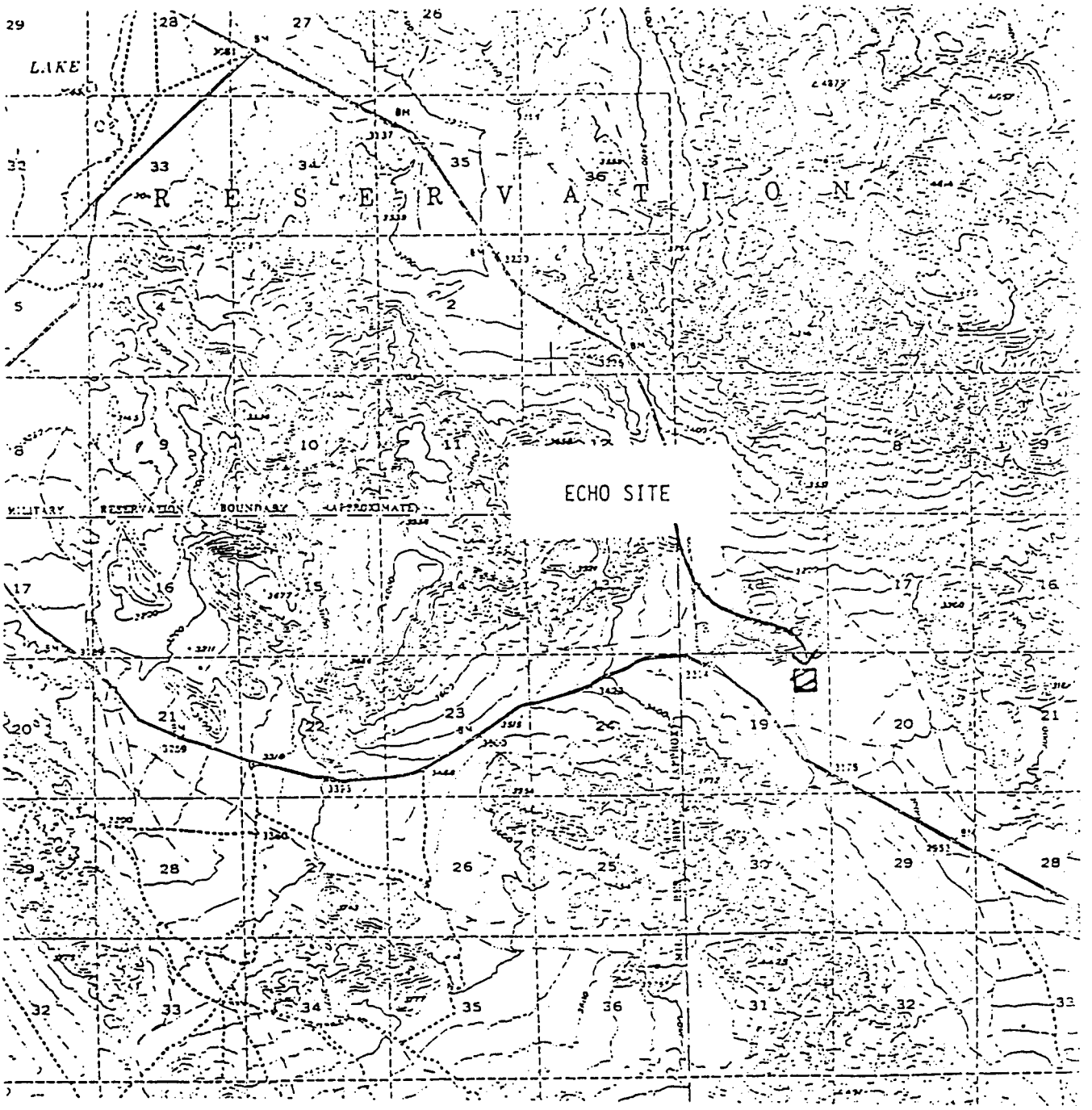
5. The California Regional Water Quality Control Board, Lahontan Region hereby reserves the privilege of changing all or any portion of this order upon legal notice to and after opportunity to be heard is given to all concerned parties.

6. Surface waters, as used in this order, include, but are not limited to, live streams, either perennial or ephemeral, which flow in natural or artificial watercourses and natural lakes and artificial impoundments of waters within the State of California.

7. The owner of property subject to waste discharge requirements shall be considered to have a continuing responsibility for ensuring compliance with applicable waste discharge requirements in the operation or use of the owned property. Any change in the ownership and/or operation of property subject to waste discharge requirements shall be reported to this Regional Board. Notification of applicable waste discharge requirements shall be furnished the new owner(s) and/or operator(s). A copy of such notification shall be sent to this Regional Board.

I, Roy C. Hampson, Executive Officer, do hereby certify that the foregoing is a full, true and correct copy of an order adopted by the California Regional Water Quality Control Board, Lahontan Region on February 8, 1985.

ROY C. HAMPSON
EXECUTIVE OFFICER



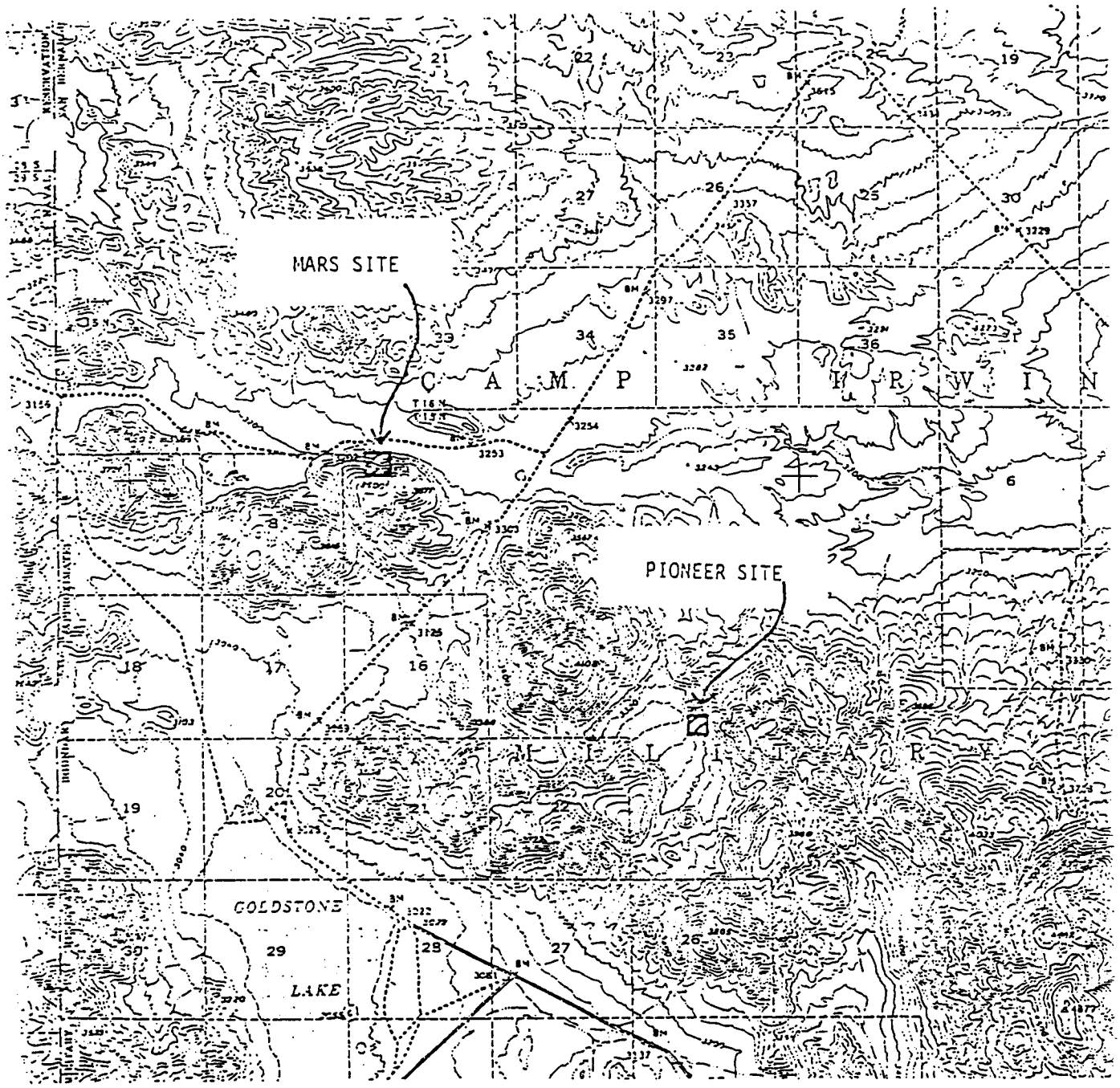
ATTACHMENT "A"

GOLDSTONE TRACKING STATION - ECHO SITE

North of Barstow - San Bernardino County

Portion of the NE/4 Section 19, T14N, R2E, SBB&M

USGS Goldstone Lake 15 Minute Quadrangle



ATTACHMENT "B"

GOLDTONE TRACKING STATION - MARS & PIONEER SITES

North of Barstow - San Bernardino County

Mars - Portion of the NW/4 Section 9, T15N, R1E, SBB&M

Pioneer - Portion of the SW/4 Section 14, T15N, R1E, SBB&M

USGS Goldstone Lake 15 Minute Quadrangle

CALIFORNIA REGIONAL WATER QUALITY CONROL BOARD
LAHONTAN REGION

MONITORING AND REPORTING PROGRAM NO. 85-7

FOR

GOLDSTONE TRACKING STATION
ECHO, MARS AND PIONEER SITES
San Bernardino County

FLOW MONITORING

The following shall be recorded:

1. The average daily number of people working at each facility for each month.

2. The freeboard (distance from the top of the dike to the wastewater surface in a pond) measured each month in each pond. If a pond does not contain wastewater indicate that it is empty.

OPERATION AND MAINTENANCE

A brief summary of any operational problems and maintenance activities shall be submitted to the Regional Board with each monitoring report.

This summary shall discuss:

1. Any modifications or additions to the wastewater conveyance system, treatment facilities, or disposal facilities.

2. Any major maintenance conducted on the wastewater conveyance system, treatment facilities, or disposal facilities

3. Any major problems occurring in the wastewater conveyance system, treatment facilities, or disposal facilities.

4. The date and location of any septic tank and/or subsurface disposal system that is pumped. The volume of waste pumped, the point of disposal, and the person or company doing the work should also be recorded.

REPORTING

Annual monitoring reports including the preceding information shall be submitted to the Regional Board by the 15th day of the following annual period. The first report is due January 15, 1986.

Ordered by: Roy C. Hampson Dated: Feb. 25, 1985

ROY C. HAMPSON
EXECUTIVE OFFICER

APPENDIX B

ANNUAL REPORTS FOR WASTEWATER PONDS

Reply: Goldstone Space Communications Stations
P.O. Box 997, Barstow, California 92311

JET PROPULSION LABORATORY California Institute of Technology • 4800 Oak Grove Drive, Pasadena, California 91109

January 24, 1986

Mr. Robert S. Dodds
California Regional Water
Quality Control Board
LaHontan Region
15371 Bonanza Road
Victorville, CA 92392-2494

Dear Mr. Dodds:

As per your request, the following information is submitted in compliance with the Monitoring & Reporting Program No. 85-7, Board Order No. 6-85-7 for the Goldstone Deep Space Communications Complex.

Location	Average Daily Number Of People Working	Pond Freeboard
Echo	Approximately 100	One pond dry/4 ft.
Mars	Approximately 50	One pond dry/3 ft.
Pioneer	Approximately 4	Both ponds dry

No modifications or additions have been made to the Waste Water Conveyance System, Treatment Facilities or Disposal Facilities.

No major maintenance has been conducted of the Facilities.

No major problems have occurred with the Facilities.

At the Mars site a small sewer holding tank (400 gallons) was pumped on February 7, May 8, and August 8, 1985, by "Burns Septie & Rotary Rooter Co." located in Hinkley, CA.

The average daily number of people working at each site has changed, but this has made very little impact on the ponds.

Sincerely,

L. E. Butcher

L. E. Butcher
Goldstone Operations Manager

cc: H. R. Alderson
File

Telephone (213) 354-4321 Twx 910-588-3269 Telex 910-588-3294

Jet Propulsion Laboratory
California Institute of Technology
4800 Oak Grove Drive
Pasadena, California 91109
(818) 354-4321

JPL

Reply: Goldstone Deep Space Communications Complex
P.O. Box 489, Barstow, California 92311
(619) 386-3222

January 13, 1987

Ms. Cindi Mitton
California Regional Water
Quality Control Board
LaHontan Region
15371 Bonanza Road
Victorville, CA 92392-2494

Dear Ms. Mitton:

The following information is submitted in compliance with the Monitoring & Reporting Program No. 85-7, Board Order No. 6-85-7 for the Goldstone Deep Space Communications Complex.

Location	Average Daily Number Of People Working	Pond Freeboard
Echo	Approximately 100	One pond dry/4 ft.
Mars	Approximately 50	One pond dry/3 ft.
Pioneer	Approximately 4	Both ponds dry

*No modifications or additions have been made to the Waste Water Conveyance System, Treatment Facilities or Disposal Facilities.

No major maintenance has been conducted of the Facilities.

No major problems have occurred with the Facilities.

At the Mars site a small sewer holding tank (400 gallons) was pumped on April 1, 1986. At the Echo site two septic tanks were pumped on April 29, and on May 8, 1986, one more was pumped for a total of 4,000 gallons. All work was performed by "Burns Septie & Rotary Rooter Co." located in Hinkley, CA.

The average daily number of people working at each site has changed, but this has made very little impact on the ponds.

*Due to a change in ownership at the Pioneer site we have submitted a Form 200 (dated 12-16-86) for a revised report of Waste Discharge with Tracie Billington at your office.

Sincerely,

L. E. Butcher

L. E. Butcher
Goldstone Operations Manager

cc: H. R. Alderson
File

APPENDIX C

EXAMPLES OF ENVIRONMENTAL FORMS

The following are examples of forms that may be modified for use at the GDSCC by the Environmental Coordinator. They contain information that is useful in implementing an Environmental Management Program. They are not intended to be used as presented, rather, they should be adapted to the unique requirements of the GDSCC.

List of Emergency and Safety Equipment
(Example Only)

Item	Location	Quantity
Boots, MIL-B-3825B	Bldg. 4826	
Coveralls, MIL-C-4306D	Bldg. 4826	
Gloves, MIL-B-43196B and MIL-G-82253C	Bldg. 4826	
Radios	ERV*	
Shovels, round	ERV	4
Shovels, square	ERV	4
Rakes	ERV	2
Rubber squeegee, steel	ERV	4
Push brooms	ERV	4
Plastic bags, 22 x 14 x 60 in.	ERV	100
Recovery drum, 85 gal	ERV	1
Barricade tape	ERV	2 rolls
Oil/water absorbent material, 7930-00-269-1222	ERV	6 bags
Safestep absorbent material, NISG-4979 400 each	ERV	6 bags
3M LSM, 12 x 12 in.	ERV	
Polypropylene felt	ERV	1 roll
Sandbags	ERV	24
Warning signs	ERV	
Safety goggles, Fed. Spec. GGG531	ERV	6
Face shield, 4240-01-110-9486	ERV	6
Hard hats	ERV	12
Hood, paper disposable	ERV	1 box
Hood, Gra Lite	ERV	4
Rubber gloves, acid/alkali resistant,		
8415-00-266-8679	ERV	6 pair
8415-00-846-5519	ERV	6 pair
8415-00-266-8675	ERV	6 pair
Gloves, canvas work, 8415-00634-4658	ERV	12 pair
Gloves, Pylox rubber disposable,		
6515-00-394-9567 and 9568	ERV	2 boxes
6515-00-394-9569 and 9670	ERV	2 boxes
Gloves, plastic disposable	ERV	1 box
Shoe cover, plastic disposable	ERV	1 box
Apron, bib-type, 8415-00-FRC3298	ERV	6
Apron, plastic disposable	ERV	1 box
Coverall, Polyolefin fabric disposable	ERV	12
Fuel coveralls, MIL-C-43063B	ERV	6
Handlers gloves, MIL-B-43196B	ERV	6 pair
Boots, rubber, MIL-B-3825D	ERV	6 pair
Respirators, masks	ERV	
Self-contained breathing apparatus	ERV	
Scott air packs	ERV	3
Air cylinder, 2,000 psi	ERV	1

*ERV means Emergency Response Vehicle.

CHEMICAL DATA SHEET

ISOPROPYL ALCOHOL, IPA (CH3)2CHOH

Properties:

Physical -	State (r.t.):	Liquid
	Appearance:	Clear, water-white, volatile liquid, slight odor.
	Boiling Point:	180°F (82.5°C)
	Freezing Point:	-129°F (-89.4°C)
	Liquid Density:	6.6 lb/gal @ 68°F (6.785 g/cc @ 20°C)
	Sp. Gr. Vapor (STP-Air):	2.07
	Vapor Pressure:	0.6 psia @ 68°F 4.0 psia @ 104°F
	Flash Point (Closed Cup):	53°F (11.7°C)
	Auto-ignition Temperature:	750°F (399°C)
	Flammability Range:	LEL = 2.0 UEL = 11.8 percent by volume @ 68°F
Chemical -	Description:	Alcohol
	Molecular Weight:	60.11
	Solubility:	IPA is miscible with water in all proportions. It is soluble in most of the common organic solvents such as acetone, ether, carbon tetrachloride, benzene, kerosene, and gasoline.
	Stability:	Good stability.

Hazards:

Hazard Category: Flammable, toxic.

Incompatibility: IPA is an excellent solvent. It reacts vigorously with strong mineral acids or strong organic acids, aluminum and oxidants. It is nonhypergolic with nonfluorinated oxidizers.

Fire: IPA is flammable. Combustion of alcohols produces flames which are difficult to see in daylight. For this reason, care must be taken when fighting fires involving alcohols, since fire back-flashes may occur and be unperceived by fire-fighting personnel. Alcohol fires are supported by air, strong oxidizers such as nitric acid, and strong, unstable oxidizers such as hydrogen peroxide.

Explosion: IPA vapors readily form explosive mixtures with air. Alcohols form mixtures with liquid oxygen which react explosively immediately upon ignition.

Health: IPA is an irritant to the eyes and mucous membranes, is a defatting agent to skin. When absorbed into the body, it depresses the central nervous system. Ingestion of 10 ml or more, or inhalation of large quantities of the vapor, may progressively cause flushing, headache, dizziness, mental depression, nausea, vomiting, narcosis, anesthesia, coma, and death. Because of the low volatility of IPA, its CAL OSHA limit value of 400 ppm is unlikely to be achieved during ordinary handling operations.

First Aid:

1. Wearing full protective equipment, remove inhalation victims from further exposure. Seek medical aid immediately.

2. For skin contact, wash area with copious amounts of water. Remove contaminated clothing as soon as practicable. Seek medical aid.

3. For splashes of the eye, flood the eyes copiously with water.

Safety Considerations: Avoid prolonged inhalation of vapors, exposure to skin, and splashing into the eyes. For exposure to large amounts of liquid, protective equipment for hand, foot, and face areas must be used. Neoprene or PVC are suitable hand and foot protective equipment materials. For exposures to large concentrations of IPA vapors in poorly ventilated areas, confined spaces or oxygen deficient atmospheres, respirators (supplied-air or SCBA) are required.

Transfer and Storage:

Materials - Allowable Metals: Stainless steel, high tensile steel, monel, aluminum and some aluminum alloys. Steels authorized for use with IPA include: mild, low carbon, open-hearth, and electric.

Allowable Non-metals:
- Tetrafluoroethylene (Teflon TFE);
- Halon TFE, or equivalent;
- Chlorotrifluoroethylene (Kel-F), Halon CTF, or equivalent;
- Polyethylene;
- Polyvinylchloride;
- Neoprene and rubber.

Allowable Lubricants: Because IPA is an excellent solvent, specialized lubricants such as fluorinated hydrocarbons, molybdenum disulfide, and graphite-based lubricants must be used whenever IPA can come in contact with the lubricant. Petroleum lubricants must not be used. Thread lubricants and sealants such as Permatex No. 2, Litharge, glycerin, and Perfluoroethylene tape can be used.

Storage Containers: DOT specifications 17E, 17X, Specification 34.

Storage Precautions: Store away from oxidizers and ignition sources. IPA is not to be used in open containers. Proper grounding and bonding should be provided and used. Care must be taken to avoid placing anhydrous IPA into any container that is contaminated by rust. Twenty percent solutions of alcohol in water are not flammable.

Waste Management:

Reuse: Possibility for resale or reclamation of waste IPA should be considered prior to offering waste for disposal.

Disposal: As of the present time, drummed isopropyl alcohol is being accepted for processing at Kettleman Hills. It is recommended that this material be reclaimed rather than placed in a landfill.

SPILL RESPONSE DATA SHEET

ISOPROPYL ALCOHOL

I. Definition of Spill Size/Reportable Quantity

Small spills or leaks of less than fifty-five (55) gallons will be handled by the emergency response team. Spills exceeding fifty-five (55) gallons or smaller spills that cannot be contained within small areas, should be deemed to exceed the emergency response team capability and require mobilization of additional resources.

Technical data for isopropyl alcohol are available through the DOSC, the MSDS file, and the Chemical Data Sheets in Section 5.2 of this document.

The reportable quantity (RQ) of these materials which requires notification of the National Response Center (NRC) is 1.0 pounds (CERCLA). Spills exceeding the reportable quantity will be referred to as "RQ Spills." Host facility policy requires that the host EC be notified if a spill of reportable quantity occurs. Immediate notification of the host EC is the responsibility of the tenant EC. Notification will be verbal, followed up by a written message which advises the host EC that tenant EC will contact the NRC if the Air Force fails to contact the NRC within 24-hours. The tenant EC will obtain written documentation from the host EC that the NRC has been notified.

II. Check list (See Sections III through VI for details)

A. Discovery

1. Notify extension 444 (alternate extension 3584).

B. Evaluation and initiation of action

1. DOSC response.
2. Assess hazards.
3. Evacuation, as needed.
4. Establish control zone.
5. Mobilize spill response resources.

C. Containment and countermeasures

1. Personal protective equipment: full protective suit, boots, and gloves of PVC or neoprene; SCBA.

2. If material is on fire or is involved in a fire:

   a. Do not extinguish fire unless flow can be stopped.
   b. Use water in flooding quantities as fog for fire-fighting and cooling containers.
   c. Solid streams of water may be ineffective.
   d. Cool all affected containers with flooding quantities of water.
   e. Apply water from as far a distance as possible.
   f. Use "alcohol" foam, carbon dioxide or dry chemical.
   g. Contain runoff.

3. Entry minimum: two (2) persons.

4. Determine spill size/scope - more or less than fifty-five (55) gallons.

5. Spills exceeding fifty-five (55) gallons:

   a. Notify host facility; and, contact the on-call spill response contractor.
   b. Notify the host EC if an RQ Spill has occurred.
   c. Contain spill (e.g., use existing containments, reposition container(s), plug container(s), set up berms).
   d. Do not wash down.

6. Spills less than fifty-five (55) gallons:

   a. Contain spill (e.g., use existing containments, reposition container(s), plug container(s), set up berms).

   b. Neutralize liquids and residues with mild alkaline material and solidify with vermiculite.

   c. Work from perimeter inward.

   d. DOSC declares end of emergency.

D. Packaging and disposal

1. Solids - DOT Specification 17H drums with polyliner.

2. Label/mark as per tenant Hazardous Waste Turn-in Procedures.

III. Discovery/Notification

A. Any individual discovering a spill will immediately contact extension XXX (alternate extension XXXX) and provide the following information:

1. Type of incident and response needed.

2. Location.

3. Time.

4. Source/cause of spill.

5. Type and quantity of material spilled.

6. Spill related injuries.

7. Your name and phone number or location.

B. Assist with removal of personnel from immediate area of spill, if this can be done safely. No one should enter the affected area without proper respiratory protection.

C. Await the arrival of spill response personnel at a safe distance from the spill.

IV. Evaluation and Initiation of Action

A. Following notification that a spill has occurred, the DOSC shall:

1. Respond to the spill scene.

2. Assess potential hazards to people, property, and environment.

3. Perform appropriate rescue.

4. Determine notification requirements, and make necessary contacts per the Spill Contingency Plan.

5. Order necessary evacuation.

6. Establish a control zone as appropriate. Post signs prohibiting unauthorized personnel from entering the control zone.

7. Mobilize appropriate resources.

V. Containment and Countermeasures

A. Personal protective equipment for response personnel shall include:

1. Full protective suit, boots, and gloves made of PVC or neoprene.

2. NIOSH/OSHA approved SCBA. Respiratory protection may be downgraded based on concentration per guidelines provided by industrial hygienist.

3. Firefighting should be performed by fully suited hazardous materials-trained firefighters. Do not extinguish fire unless flow can be stopped. Use water in flooding quantities as fog. Cool affected containers with water; apply water from as far a distance as possible. Use "alcohol" foam, carbon dioxide, or dry chemical. Flames may be nearly invisible. Straw brooms can be used to verify the presence of flames.

4. Keep ignition sources away.

5. Entry minimum: two (2) persons, with one (1) person as a safety backup.

B. Spills exceeding fifty-five (55) gallons

1. Notify host facility; and, contact the on-call spill response contractor.

2. Notify the host EC if an RQ Spill has occurred.

3. Provide as much containment as can safely be accomplished using existing containment systems (e.g., close valve, reposition container(s), plug with ducting compounds).

4. Contain runoff with inert sorbents like vermiculite or sand.

5. Use water sprays to disperse vapors or dilute standing pools of liquid, but contain all liquid.

6. Control of the spill scene shall be maintained until the DOSC has determined that all potential hazards have been properly mitigated, and cleanup is complete.

C. Spills less than fifty-five (55) gallons.

1. Provide containment using existing containment systems, (e.g., close valve, reposition container(s), plug with ducting materials) and with inert solvents such as vermiculite.

2. Liquids should be solidified with inert sorbents, swept-up, and packaged.

3. Contaminated areas should be water washed, and liquids solidified as described above.

4. Control of scene should be maintained until the DOSC has determined that all potential hazards have been properly mitigated, and cleanup is complete.

VI. Packaging and Disposal

A. Solidified wastes should be packaged in DOT Specification 17H drums with polyliner. This packaging is suitable for transportation.

B. All drums must be properly labelled. Consult DFRF Hazardous Waste Turn-in Procedures.

C. Disposal: See Chemical Data Sheet in Section 5.2 of this document.

INSPECTION/DEFICIENCY REPORT

Inspector's Name: _____
Date of Inspection: _____ Time of Inspection: _____.

Item No.	Item	Description of Problem	Correction date/ Comments
	SAFETY/EMERGENCY EQUIPMENT:		
1.	Absorbant		
2.	Empty drums		
3.	Splash masks		
4.	Respirators		
5.	Scott Air Pack		
6.	Aspirator pump		
7.	Emergency lights		
8.	Fire hydrants, hose, and nozzels		
9.	Fire alarms		
10.	Telephones		
11.	Public address system		
12.	First aid supplies		
13.	Vapor detection units		
14.	Explosive Concentration unit		
15.	Emergency eyewash and showers		
	SECURITY DEVICES:		
16.	Fuel Farm fence		
17.	East gate		
18.	West gate		
19.	Warning signs		
20.	Non-potable H2O		
	CONTAINERS:		
21.	Container placement		
22.	Container seals		
23.	Container labels		
24.	Container condition		
25.	Incompatibles		
26.	Debris on pad/sump		
	STRUCTURAL EQUIPMENT:		
27.	Berms/curbs		
28.	Bases/foundation		
29.	Ramps		
30.	Sump areas		
31.	Shelter/roof		
	OPERATIONAL EQUIPMENT:		
32.	Scrubbers		
33.	Static grounds		
34.	Bonding		
35.	Lights		
36.	RPPVs		
37.	Freeze-proof valves		

I certify that all entries represent conditions at the facility on the date of inspection, and that all deficiencies have been corrected as indicated.

Signed: _____ Date: _____

EXAMPLE INSPECTION DEFICIENCY REPORT FORM

SPILL REPORT Incident No._____

Dispatcher:_____ Date/Time of Notification:_____

NOTIFICATION

Name of notifying person:_____

Phone No./Other I.D. of notifier:_____

_____ Method of Notification:_____

SITUATION

Suspected source:_____

Address/Phone No. of spiller:_____

_____ Date/time of spill:_____

Location of spill:_____

Pollutant:_____ Amount:_____

Cause:_____

Health/Environmental impact:_____

Weather/predicted weather:_____

Predicted movement of spill:_____

ACTION

Is spill response team activated:_____ Who:_____

Remarks:_____

Date/Time dispatched:_____ Time O/S:_____

Actions taken:_____

_____

_____

External agency contacts/reports (Name, date, description):

Host Facility _____

DHS:_____

RWQCB:_____

Other:_____

Investigation: Open ___ Closed ___ Date case closed:_____

EXAMPLE SPILL RESPONSE FORM

PERMISSIBLE CONTAINERS AND LABEL REQUIREMENTS FOR HAZARDOUS WASTES STORED AT THE FACILITY.
(Reference 49 CFR 172)

Hazardous Waste Type	DOT Proper Shipping Name (DOT Hazard Class)	Container Requirements	49 CFR Reference	Label/Marking Requirements
Anhydrous hydrazine (N_2H_4)	Waste, Hydrazine anhydrous, UN 2029 (Flammable liquid)	5-304 or 347	178.80	Poison
		5A-304 or 347	178.81	Hazardous waste
		5C-304 or 347	178.83	
		17E-304 or 347	178.116	
Anhydrous monomethyl-hydrazine (MMH)	Waste, Methylhydrazine, UN 1244 (Flammable liquid)		173.276	Flammable liquid
		5-304 or 347	178.80	Poison
		5A-304 or 347	178.81	Hazardous waste
		5C-304 or 347	178.83	
		17E-304 or 347	178.116	
Anhydrous nitrogen tetroxide (N_2O_4)	Waste, Nitrogen tetroxide, liquid, NA 1067 (RQ) (Poison B)		173.328	Poison gas
			173.336	Oxidizer
		3A480	178.36	Hazardous waste
		3AA480	178.37	
Water with hydrazine	Waste, Corrosive liquid, poisonous, n.o.s., UN 2922 (Corrosive material)		173.276	Corrosive
		5-304 or 347	178.80	Poison
		5A-304 or 347	178.81	Hazardous waste
		5C-304 or 347	178.83	
		17E-304 or 347	178.116	
Citric acid with MMH or N_2H_4	Waste, Corrosive liquid, poisonous, n.o.s., UN 2922 (Corrosive material)		173.244	Corrosive
			173.245	Poison
		5A-304 or 347	178.81	Hazardous waste
		5B-304 or 347	178.82	
		5C-304 or 347	178.83	
		17E-304 or 347	178.116	
		2D (with 2S or 2SL liner)	178.102	
Citric acid (14%)	Waste, Acid, liquid, n.o.s, NA 1769 (Corrosive material)		173.244	Corrosive
			173.245	Hazardous waste
			173.245a	
		5A	178.81	
		5B	178.82	
		5C	178.83	
		17E	178.116	
		6D (with 2S or 2SL liner)	178.102	

EXAMPLE CHECK LIST OF DOCUMENTS AND RECORDS WHICH MUST BE ON FILE AT FACILITY

Description of Document or Record	Update Frequency	Length of Time File Must be Maintained	File Location*	File Name
1. Hazardous Waste Facility Operations Plan (FOP) certified August 15, 1983, including all amendments, revisions and modifications.	Once a year at a minimum, or whenever conditions, operations, equipment, or personnel are changed.	Until facility closure is completed.	EC(1)	PERMITS -- HW FACILITY
2. Hazardous Waste Facility Permit No. CAD dated February 15, 1984 and all ammendments, revisions and modifications.	Whenever permit is changed. Note: Permit expires Feb. 1, 1989. New permit must be applied for by July 2, 1988. Changes to the Operations Plan may require changes in the Permit.	Until facility closure is completed.	EC	PERMITS -- HW FACILITY
3. Hazardous Waste Spill Contingency Plan for the hazardous waste storage facility and area sumps, including all updated revisions (See Section X, page 166 of the Facility Operations Plan).	Once every three years at a minimum, or whenever conditions, operations, equipment, or personnel are changed.	Until facility closure is completed.	EC	SPILL CONTINGENCY PLAN
4. Copy of all correspondence, reports, notifications, etc. sent to, and received from regulatory agencies including: • California Department of Health Services • Regional Water Quality Control Board • Regional Air Quality Management District • U.S. EPA Region IX Office	Respond to actions stipulated in correspondence as indicated.	Until facility closure is completed. 3 years.	EC	CORRESPONDENCE MAILED, YEAR; CORRESPONDENCE RECEIVED, YEAR
5. Annual reports to the California Department of Health Services, including changes in facility closure cost estimates.	Yearly, on or before March 1.	Until facility closure is completed.	EC	DHS ANNUAL REPORT, YEAR

(1) EC means environmental coordinator.

APPENDIX D

PUBLICATIONS LIST

Publications List[a]

Name/Description	Source
FEDERAL LAWS National Environmental Policy Act of 1975 (NEPA) Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) Toxic Substance Control Act of 1976 (TSCA) Resource Conservation and Recovery Act of 1976 (RCRA) Federal Insecticide, Fungicide, and Rodenticide Act of 1972 (FIFRA) Hazardous and Solid Waste Amendment of 1984 Clean Air Act of 1977 Clean Water Act of 1972 Safe Drinking Water Act of 1977	GPO BOOKSTORE ARCO Plaza Level C 505 S. Flower St. Los Angeles, CA 90071 213-894-5841
FEDERAL REGULATIONS Code of Federal Regulations (CFR) Title 40, Parts 1-799 CFR Title 49 - Parts 100-199 Federal Register[b]	GPO BOOKSTORE Same as above
Environment Reporter[b]	BUREAU OF NATIONAL AFFAIRS 2140 W. Olympic Blvd. Suite 229 Los Angeles, CA 90006 213-385-1741

[a]Request most recent amended version.

[b]Environment Reporter is preferred compared to the Federal Register.

Publications List (Cont'd)

Name/Description	Source
STATE STATUTES[c] Annotated Water Code, Sections 7000-19999 Annotated Health and Safety Code, Sections 18200-25699	WEST PUBLISHERS 417 S. Hill St. Room 1024 Los Angeles, CA 90013 213-626-0593
STATE REGULATIONS[c] California Administrative Code (CAC) Title 8: Industrial Relations CAC Title 14: Natural Resources CAC Title 19: Public Safety CAC Title 23: Waters CAC Title 26: Toxics	DEPT. OF GENERAL SERVICES Central Stores Publications Unit P.O. Box 1015 North Highlands, CA 95660 916-924-4800
STATE BILLS	
TOXIC News	Capitol Reports 1121 "L" St. Suite 204 Sacramento, CA 95814 916-441-4427
Waste Stream Journal	M. B. Gilbert Associates 2525 Cherry Ave. Suite 380 Long Beach, CA 90806 213-426-0700
OTHER RELEVANT PUBLICATIONS	
National Technical Information Service	NTIS 5285 Port Royal Rd. Springfield, VA 22161 703-487-4600

[c]Request update service.

Publications List (Cont'd)

Name/Description	Source
OTHER RELEVANT PUBLICATIONS (Cont'd)	
Sax, N. Irving, DANGEROUS PROPERTIES OF INDUSTRIAL MATERIALS (6th ed, Van Nostrand Reinhold Co.)	LOU'S BOOKS 5647 Atlantic Blvd. Long Beach, CA 90805 213-423-1403
Clayton and Clayton, PATTY'S INDUSTRIAL HYGIENE AND TOXICOLOGY, Vols. 1, 2a, 2b, and 2c.	LOU'S BOOKS Same as above
NIOSH Pocket Guide to Chemical Hazards	GPO BOOKSTORE Same as on page D-3
Compilation of Air Pollutant Emission Factors, Vol. 1	GPO BOOKSTORE Same as on page D-3
Herbicide Manual, U.S. Dept. of Interior	GPO BOOKSTORE Same as on pageD-3
EPA RCRA Orientation Manual	GPO BOOKSTORE Same as on page D-3
Pocket Guide to Pesticide Management	GPO BOOKSTORE Same as on page D-3
Transportation of Hazardous Materials, Office of Technical Assessment	GPO BOOKSTORE Same as on page D-3
RCRA Groundwater Monitoring Technical Enforcement Guidance Document	GPO BOOKSTORE Same as on page D-3
Permit Applicants' Guidance Manual for Hazardous Waste Land Treatment Storage, and Disposal Facilities	GPO BOOKSTORE Same as on page D-3
NIOSH/OSHA/USCG/EPA Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities	GPO BOOKSTORE Same as on page D-3
EPA Test Methods for Evaluating Solid Wastes	GPO BOOKSTORE Same as on page D-3