U.S. DEPARTMENT OF ENERGY

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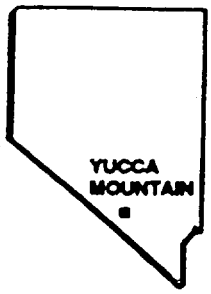

YUCCA MOUNTAIN PROJECT

ENVIRONMENTAL PROTECTION IMPLEMENTATION PLAN FOR THE YUCCA MOUNTAIN PROJECT

NOVEMBER 1989

UNITED STATES DEPARTMENT OF ENERGY
NEVADA OPERATIONS OFFICE/YUCCA MOUNTAIN PROJECT OFFICE

ENVIRONMENTAL PROTECTION IMPLEMENTATION PLAN

FOR THE

YUCCA MOUNTAIN PROJECT

November 9, 1989 to November 8, 1990

Prepared by

Yucca Mountain Project
Yucca Mountain Project Office
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1.0 YUCCA MOUNTAIN PROJECT ENVIRONMENTAL PROTECTION PROGRAM

1.1 PURPOSE

The purpose of this Environmental Protection Implementation Plan (EPIP) is to describe the Yucca Mountain Project (Project) environmental protection program. This EPIP satisfies the requirements of Chapter III of DOE Order 5400.1, which calls for each U.S. Department of Energy (DOE) field organization to prepare an implementation plan to ensure that facilities are operated and managed in a manner that will protect, maintain, and restore environmental quality; minimize potential threats to the environment and the public health; and comply with environmental regulations and DOE polices.

1.2 SCOPE

The Project is committed to performing its activities in an environmentally safe and sound manner that complies with applicable environmental statutes and regulations. An environmental program has been established for the Yucca Mountain site that includes the plans and activities necessary to satisfy applicable environmental regulatory and programmatic requirements as documented in this EPIP and the Environmental Program Overview for the Yucca Mountain Site (DOE, 1988a). The Project has also established a health and safety program which is described in the Environment, Safety and Health Protection Implementation Plan (ESHPIP) (DOE, 1989a).

It is important to note that the Project is not an operating DOE facility in the traditional sense. Currently, the Project is in the early stages of characterizing the Yucca Mountain site to determine its potential suitability as a repository for high-level civilian nuclear waste. With the exception of the following: operation of a sample management facility; small-scale, low-impact geological, ecological and archaeological studies; and ongoing meteorological, radiological, and air quality monitoring; the

Project is not conducting any operations that could cause any adverse environmental impacts. Additionally, all field activity proposals must be submitted to the Yucca Mountain Project Office (Project Office), which conducts reviews to ensure that the activities would comply with all environmental laws and regulations, as well as with any commitments made by the Project in its environmental planning documents. As part of this review process, pre-activity surveys for biological and archaeological resources are conducted by contractors to identify potential impacts and mitigation measures.

This EPIP addresses environmental protection only during site characterization of the Yucca Mountain site. The Project site characterization program is described in the Site Characterization Plan (DOE, 1988b). If Congress selects Yucca Mountain as the location for the high-level nuclear waste repository, then a new EPIP would have to be prepared.

1.3 APPLICABILITY

The environmental protection program applies to all Project activities, including management, administration, planning, design, construction, and operation, as described in the various plans and procedures used to manage the Project. The EPIP applies to all Project staff, including the Project Office and the various Project participants involved in performing parts of the environmental protection program.

1.4 RESPONSIBILITIES AND AUTHORITY

The Nevada Operations Office (DOE/NV) is responsible for the management of all activities on the Nevada Test Site (NTS). The Project Manager of the Yucca Mountain Project Office is the authorized official responsible for managing all Project activities at Yucca Mountain, including the environmental protection program, and reports administratively to DOE/NV and programmatically to the Office of Civilian Radioactive Waste Management (OCRWM) in Washington, D.C.

The Project environmental program organization is shown in Figure 1-1. OCRWM is not shown in the figure since it provides general policy guidance and is not directly responsible for site activities. Within the Project Office, the Operations Control Branch (OCB) of the Project and Operations Control Division (POCD) is responsible for day-to-day environmental protection activities. The Project's environmental program is managed by the Branch Chief of the OCB with support from two physical scientists. Environmental responsibilities are divided between regulatory compliance and field-related activities. Regulatory activities include acquisition of permits, regulatory compliance, and preparation of environmental regulatory planning documents. Field activities include preparation of field planning/monitoring plans, implementation of environmental monitoring activities, field activity compliance, and data collecting activities. The Project Office Quality Control Division is responsible for the overall Project quality assurance program described in Chapter 7 of this EPIP.

Figure 1-1 also shows the DOE/NV organizations that support the Project Office environmental activities. Coordination and integration of support activities are depicted by the dashed lines in the figure. The Project interfaces primarily with the Environmental Protection Division (EPD) and the Health Physics and Defense Waste Division (HPDWD). The EPD mainly supports the Project in the acquisition of State and local permits. The HPDWD provides support to the Project in the areas of radiological safety and hazardous waste management.

The Project environmental program organization directed by the OCB is shown in Figure 1-2. Each organizational entity is led by a manager supported by the appropriate technical staff. Figure 1-3 illustrates the Project environmental program functional responsibilities directed by the OCB for the Project Office. In addition to the environmental program, OCB has management responsibility for Project socioeconomic, land access, grants, and transportation programs. Environmental responsibilities include satisfying the special environmental requirements of the Nuclear Waste Policy Act, as amended; compliance with environmental laws, regulations, and orders; compliance with environmental conditions of approval contained in right-of-way grants issued by other agencies; and performance of

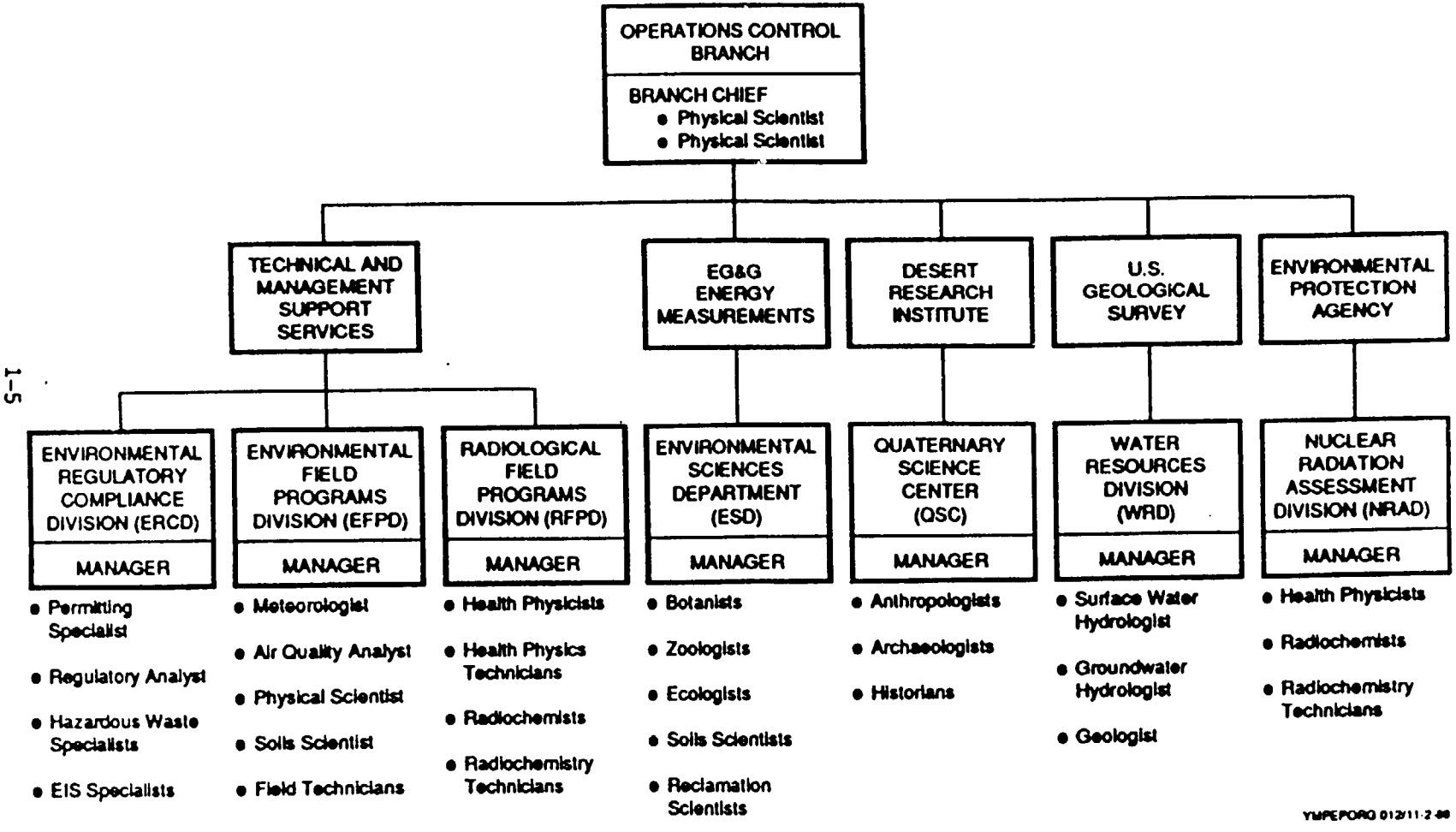

Figure 1-2. Yucca Mountain Project Operations Control Branch, Environmental Program Organization.

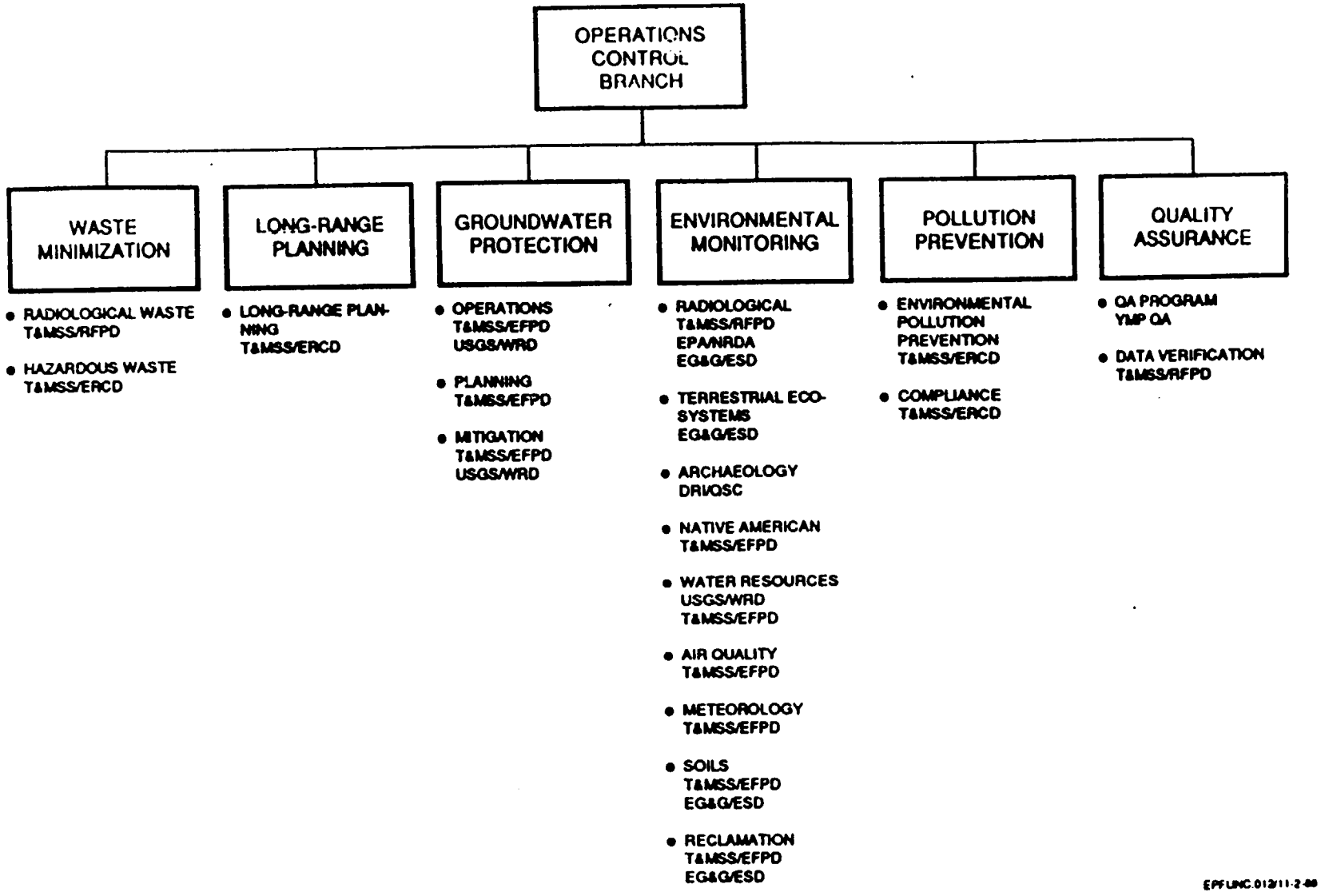

Figure 1-3. Environmental Progam Functional Responsibilities.

environmental field compliance and data collection. The OCB is supported by the various Project participants listed in Figure 1-3. The participants are listed by area of responsibility and categorized according to the program functions required by DOE Order 5400.1.

The Technical and Management Support Services (T&MSS) contractor, comprised of Science Applications International Corporation (SAIC), Westinghouse, and Harza Engineering, provides technical and management support services to the Project. T&MSS is responsible for assisting the Project Office with long-range planning and coordination of the entire Project including the environmental program. The T&MSS Environmental Regulatory Compliance Division (ERCD) provides support in the areas of environmental regulatory compliance and permitting, and hazardous waste management. The T&MSS Environmental Field Programs Division (EFPD) conducts the meteorological and air quality monitoring program, and supports the water resources monitoring program, and soils and reclamation studies. The T&MSS Radiological Field Programs Division (RFPD) conducts the radiological monitoring program and supports the radioactive waste management program. T&MSS coordinates consultations with Native Americans and is the primary participant responsible for socioeconomic and transportation studies.

EG&G Energy Measurements Environmental Science Department (ESD) provides biologists, ecologists, botanists, and soil scientists to conduct terrestrial ecology, soils, and reclamation studies. Desert Research Institute (DRI) of the University of Nevada provides archaeologists, anthropologists, and historians to conduct archaeological and historical preservation studies. The United States Geological Survey (USGS) Water Resources Division provides surface and ground water hydrologists and geologists to perform water resources planning and groundwater monitoring activities. The U.S. Environmental Protection Agency (EPA) Nuclear Radiation Assessment Division (NRAD) provides radiological health scientists to perform radiological sample analysis for the Project radiological monitoring program. The principal NTS contractors that support the Project include Reynolds Electrical and

Engineering Company (REECo), the NTS prime contractor for site operations and maintenance; Holmes & Narver, Inc. (H&N); and Fenix & Scisson of Nevada, Inc. (FSN), the primary architectural and engineering contractors.

2.0 ENVIRONMENTAL PROTECTION STANDARDS

The Project environmental program is structured to satisfy the statutory requirements of the Nuclear Waste Policy Act, as amended; the National Environmental Policy Act; the Atomic Energy Act; other applicable environmental statutes, regulations, standards, and DOE Orders. The Federal and State statutes, regulations, requirements, and DOE Orders that apply to the Project, and a brief description of each, are listed in the Environmental Program Overview. An Environmental Regulatory Compliance Plan for the Yucca Mountain Site (DOE, 1988c) was written to describe how the Project would satisfy the environmental regulatory requirements for site characterization. The Project Office has begun implementing the plan.

3.0 NOTIFICATION AND REPORTS

3.1 NOTIFICATION OF ENVIRONMENTAL OCCURRENCES

DOE Order 5000.3, "Unusual Occurrence Reporting System," and NV Order 5000.3-2 on the same subject are the orders with which the Project must comply. The definition in DOE Order 5000.3 for unusual occurrence is "[a]ny unusual or unplanned event having programmatic significance such that it adversely affects or potentially affects the performance, reliability, or safety of a facility."

The authorities and responsibilities for reporting unusual occurrences related to health and safety for the Project are described in the ESHPIP. The ESHPIP has been developed to satisfy the following criteria:

1. Ensure that organizations under the Project purview expeditiously report unusual occurrences to the appropriate Project Division Director, or designee.

2. Support the commitments of NV Order 5000.3-2 to avert potential adverse conditions or events, and prevent their recurrence.

3. Review all Unusual Occurrence Reports generated in the Project for programmatic significance and lessons-to-be-learned.

3.2 OMB CIRCULAR A-106 5-YEAR PLAN REPORTS

Environmental compliance is factored into all ongoing and planned activities and has resulted in no non-compliances being identified that would require submittal of A-106 Pollution Abatement Plans. Environmental monitoring and auditing programs are being implemented as Project features mature and compliance needs are identified. In the event that non-compliances are discovered through the internal auditing process, the OCB Branch Chief will initiate the A-106 process.

3.3 ANNUAL SITE ENVIRONMENTAL REPORTS

The annual site environmental report requirement of DOE Order 5400.1 will be satisfied by two reports that are already commitments included in the Project environmental program. The Project will issue EMMP Semiannual Progress Reports to describe monitoring and mitigation results and an Annual Environmental Monitoring Program Summary Report to describe data collection results and environmental compliance activities. These reports will be submitted to the appropriate organizations and agencies as required by DOE Order 5400.1. The OCB Branch Chief is responsible for issuing these reports which are prepared by the T&MSS Environmental Regulatory Compliance Division and Radiological Field Programs Division.

4.0 ENVIRONMENTAL PROTECTION PROGRAM PLANS

The Yucca Mountain Project uses a systematic approach to planning, whereby the overall environmental program, as presented in the Environmental Program Overview (EPO), is subdivided and described in detailed management plans. These management plans have been developed to address the environmental program requirements that have been identified beginning with the Yucca Mountain Project Environmental Assessment (EA), which was completed in May 1986 (DOE, 1986). These management plans provide a breakdown of requirements and activities to be performed, including the reports necessary to accomplish the environmental program. A brief discussion of the individual planning documents is presented below. The Project environmental planning documents are listed in Table 4-1 and are included as Appendices to this EPIP. The documents in preparation will be appended as they are completed.

4.1 ENVIRONMENTAL ASSESSMENT (EA) FOR SITE CHARACTERIZATION

The EA addressed the DOE's proposed site characterization activities and their potential impacts. The EA found that no significant adverse environmental impacts were expected from site characterization activities.

4.2 ENVIRONMENTAL MONITORING AND MITIGATION PLAN (EMMP)

The Project has written an EMMP (DOE, 1988d) in order to confirm the EA finding described above, and to satisfy Section 113(a) of the Nuclear Waste Policy Act (NWPA), which requires the DOE to conduct its site characterization activities in a manner that minimizes any significant adverse environmental impacts to the maximum extent practicable. The plan describes the Project's monitoring and mitigation programs for site characterization, and focuses on monitoring those activities with a potential for causing significant adverse environmental impacts. Semiannual progress reports are prepared to describe progress. The OCB Branch Chief is responsible for

Table 4-1. List of Yucca Mountain Project Environmental Planning Documents

Document	Appendix
Environmental Program Overview	A
Environmental Monitoring and Mitigation Plan	B
Environmental Regulatory Compliance Plan	C
Environmental Field Activity Plan (EFAP) for Cultural Resources: Archaeological Component	D
EFAP for Cultural Resources: Native American Component	E
EFAP for Air Quality	F
EFAP for Terrestrial Ecosystems	G
EFAP for Radiological Studies	H
Reclamation Program Plan	I
Environment, Safety and Health Protection Implementation Plan	In Prep.
Reclamation Implementation Plan	In Prep.
Hazardous Materials Management and Handling Plan	In Prep.
EFAP for Water Resources	In Prep.
EFAP for Soils	In Prep.

issuing the progress reports and any changes to the EMMP. The T&MSS Environmental Regulatory Compliance Division (ERCD) coordinates compilation of the monitoring data and preparation of the progress reports.

4.3 ENVIRONMENTAL REGULATORY COMPLIANCE PLAN (ERCP)

The ERCP identifies the environmental statutes and regulations applicable to site characterization and describes the plan by which the DOE will comply with them. The ERCP also addresses, as a matter of comity, State and local environmental statutes and regulations for which Congress has not waived Federal sovereign immunity. Permit applications and supporting documentation are prepared by the T&MSS ERCD, and submitted to the DOE/NV Environmental Protection Division through the OCB Branch Chief for submittal to the appropriate permitting agency.

4.4 RECLAMATION PROGRAM PLAN (RPP) AND RECLAMATION IMPLEMENTATION PLAN (RIP)

Section 113(b)(1)(A) of the Nuclear Waste Policy Act and the Right-of-Way Agreement for use of Bureau of Land Management lands require the DOE to prepare decontamination and decommissioning plans and plans for reclamation of areas disturbed by site characterization activities. A Reclamation Program Plan (DOE, 1989b) has been developed to establish an overall reclamation policy for the Project. The Reclamation Implementation Plan (DOE, 1989c) describes how disturbed areas will be stabilized and revegetated when an activity warranting reclamation is completed. The OCB Branch Chief is responsible for reclamation planning and surveillance activities necessary to ensure that reclamation policies are being implemented. The T&MSS ERCD is responsible for preparing reclamation documents and EG&G is responsible for reclamation feasibility studies.

4.5 ENVIRONMENT, SAFETY, AND HEALTH PROTECTION IMPLEMENTATION PLAN (ESHPIP)

The ESHPIP, Annex 3 of the Project Management Plan (PMP), was prepared according to the specifications of DOE Order 4700.1. The ESHPIP addresses the methods used to implement the applicable DOE Orders and regulations, appropriate sections of the Nuclear Waste Policy Act, and other State and Federal regulations applicable to protection of the health and safety of workers and the public and the quality of the environment. The T&MSS RFPD is responsible for preparing the ESHPIP with assistance from the ERCD. The Project Manager of the Yucca Mountain Project has overall responsibility for environment, safety, and health protection.

4.6 HAZARDOUS MATERIALS MANAGEMENT AND HANDLING PLAN (HMMHP)

The HMMHP (DOE, 1989d) outlines Project requirements for the use and handling of hazardous materials, including emergency preparedness planning, contingency planning, safety, waste minimization, waste management, and training. The HMMHP describes requirements for hazardous materials handling as directed by statute and/or regulation, including the Resource Conservation and Recovery Act (RCRA) and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) as amended by the Superfund Amendments and Reauthorization Act (SARA), and the Occupational Safety and Health Act. Regulations implementing these statutes have been promulgated by the EPA, and the U.S. Department of Transportation. The HMMHP requires Project participants to monitor their Project activities for regulated hazardous substances and materials, and to obtain Project Office authorization prior to use of those materials. Authorization is obtained by submitting both an Authorization for Use of Regulated Hazardous Substance Request and a Materials Reporting and Handling Plan (MRHP). The MRHP outlines the steps to be taken by the participant to comply with applicable hazardous material regulations and the Project HMMHP. The OCB Branch Chief is responsible for ensuring that hazardous substances are managed properly; however, the final decision-making authority, with respect to all hazardous waste management issues, rests with the Project Manager. The T&MSS ERCD

Hazardous Waste Coordination Group is responsible for preparing the HMMHP and tracking the participant MRHPs.

4.7 LONG-RANGE ENVIRONMENTAL PROTECTION PLAN

DOE Order 5400.1 requires that a long-range environmental protection plan be developed. The Project's long-range plan has been developed and is summarized in the Environmental Program Overview and subordinate plans. The Project's long-range plan is simply an extension of the Project's comprehensive program already being implemented. The OCB Branch Chief is responsible for development and implementation of this long-range environmental program. The T&MSS ERCD and EFPD assist the OCB with coordinating planning activities, as well as preparation of planning documents.

4.8 ENVIRONMENTAL FIELD ACTIVITY PLANS (EFAPs)

EFAPs describe the environmental field activities that will be conducted to collect the environmental data required for the ERCP, EMMP, Environmental Impact Statement, and other documents. To ensure that the environmental field program addresses all environmental requirements, EFAPs have either been prepared or are scheduled to be prepared for the following environmental categories (additional EFAPs will be prepared if appropriate):

- Aesthetics
- Air Quality
- Cultural Resources:
  - —Archaeological Component
  - —Native American Component
- Noise
- Radiological Studies
- Soils
- Terrestrial Ecosystems
- Water Resources

Each EFAP describes specific environmental field studies to be conducted during the site characterization phase, as well as subsequent phases. The EFAPs will initially concentrate on requirements driven by commitments made in the EMMP, other requirements identified in the ERCP, or both. At intervals throughout the site characterization phase and potential future

repository development, the EFAPs will be updated to respond to new requirements or modifications of existing requirements that drive the environmental program.

The EFAPs are written to implement the environmental data collection programs. They provide (1) a description of the field work to take place, concentrating on the near-term; (2) a rationale for proposed studies; (3) field techniques and methods; (4) equipment and materials required; and (5) quality assurance requirements. Technical procedures are prepared for the specific data collection techniques to be used in the field and for the subsequent analysis of the data.

An important aspect of the EFAPs is that they provide a common integration place for environmental program data requirements. This integration provides for common data requirements to be satisfied without duplication of efforts and minimizes the potential that some data requirements might be omitted. Common EFAPs also allow present data collection to change in a structured timely fashion to satisfy future requirements.

The OCB Branch Chief is responsible for preparation of EFAPs and supervision of environmental field activities. The T&MSS EFPD coordinates the preparation of each EFAP with the technical discipline principal investigator responsible for a specific functional area of investigation as shown in Figure 1-3.

5.0 SPECIAL PROGRAM PLANNING

5.1 GROUNDWATER PROTECTION MANAGEMENT PROGRAM

A groundwater protection management program is being developed as described in the EFAP for Water Resources (DOE, 1989e). The purpose of the initial phase of the monitoring program is to determine current water quality conditions at the site and the quantity of currently available water resources, prior to the commencement of site characterization. The monitoring program will support water resource management and compliance with applicable environmental laws and regulations, including the Safe Drinking Water Act, the Resource Conservation and Recovery Act, and the Comprehensive Environmental Response, Compensation, and Liability Act. As the program proceeds, monitoring of water quality and quantity will be maintained to determine any potentially adverse impacts to water resources resulting from site characterization activities. Monitoring will serve as an early warning system that will alert the Project to potential adverse impacts to groundwater supplies and to trigger appropriate mitigation measures or remedial actions. The OCB Branch Chief is responsible for development of the groundwater protection program. The EFAP for Water Resources is being prepared by the U.S. Geological Survey, Ground Water Resources Branch and the T&MSS EFPD. DOE Order 5400.1 requires that a Groundwater Protection Management Plan be completed no later than May 9, 1990. The EFAP for Water Resources will be finalized and submitted by that time.

5.2 WASTE MINIMIZATION PROGRAM

DOE Order 5400.1 requires that all field organizations establish and implement a waste minimization program with the goal of minimizing the volume and toxicity of all wastes that are generated. Annual reduction goals in waste generation are also required if allowed within the programmatic requirements of the facility. The DOE Order requires that a waste minimization plan and documented program (including any plans required by

legislation) be developed by May 9, 1990, reviewed annually and updated every three years. The DOE waste minimization policy is currently evolving and specific guidance is forthcoming from the Office of Environment, Health and Safety (EH). When the DOE-wide policy statement and specific EH guidance is issued, the Project will submit the required plans and programs required by those instructions. When the program has been approved by EH it will then be incorporated into the facility Pollution Prevention Awareness Program. In the interim, the Project has developed programs for waste minimization for ongoing and planned activities which meet the existing regulatory requirements and those established in the DOE Orders. Since the Project is in the design phase, the DOE has adopted the philosophy that pollution prevention and waste minimization can best be accomplished through careful facility design, implementation of environmental awareness programs, and self auditing to identify all potential environmental protection concerns. The Project goal is to prevent environmental pollution to the extent that mitigation or remediation is never required.

Hazardous waste management and minimization strategies are addressed in the Hazardous Materials Management and Handling Plan (HMMHP), and the radiological waste management and minimization strategies are addressed in the Radiological Monitoring Plan (RMP) (DOE, 1988c). These plans include provisions and requirements to ensure that the facility operations meet the waste management and minimization requirements and guidelines set forth in the State and Federal regulations, Executive Order 12088, OMB Circular A-106 and DOE Orders 4300.1B, 4700.1, 5400.1, 5400.2, 5481.1B, 5820.2A, 5000.3, and the 5400 series dealing with radiation protection. In addition, all activities related to the generation and disposal of radioactive wastes at the Yucca Mountain site must be consistent with NVO-185 "Operational Radioactive Waste Management Plan for the Nevada Test Site."

In general, the ERCP outlines environmental regulatory requirements, permits and consultations required for Project activities. Compliance with these requirements, via Project design and waste stream monitoring to ensure compliance with the permitted discharge limits, is the first level in the waste minimization strategy. Project facilities are designed to ensure that waste stream criteria set by the various permits can be met. Discharges

of wastes below permitted discharge limits become either State or Federally "permitted releases". These releases do not constitute a waste management problem as long as the effluents do not exceed permitted levels. Response and reporting plans are also required to address any releases over the permitted levels. As permits are issued for the Project, internal field audits will be developed to ensure compliance with the permit requirements. T&MSS ERCD, at the direction of the OCB, prepares permit applications for approval by the Project program manager and submittal to the various agencies through the DOE/NV. Field monitoring programs and records, which are required by those permits and regulations, are developed and maintained by the T&MSS EFPD.

The HMMHP outlines the Project waste management program which includes both hazardous and nonhazardous waste handling and disposal. Included in the plan are requirements for emergency preparedness, contingency planning, worker safety training, waste minimization, reporting and record keeping. Project wastes which are not "hazardous wastes" will be disposed of in the Yucca Mountain Project landfill, which is to be designed and operated as authorized by the State of Nevada. Hazardous wastes will be accumulated at "satellite accumulation areas" operated by the Project participants as outlined in the HMMHP. Hazardous waste transport to the project hazardous waste accumulation area will be manifested and transported under Hazardous Material Transportation Report (HMTR) regulations on-site as required under the NTS hazardous materials transportation guidelines. The accumulation area is located in Area 25 of the Nevada Test Site (NTS) at the Sample Management Facility. The T&MSS ERCD Hazardous Waste Coordination Group will manage the accumulation area and final transportation and disposal of hazardous wastes as required by the HMMHP.

The Radiological Monitoring Plan (RMP) (DOE, 1988c) requires procedures for radioactive waste minimization in compliance with DOE/NV directives. Participants are required to have a program that addresses the radiological hazards associated with their general work area. The program must satisfy the DOE/NV requirements for the management and disposal of radioactive wastes including a waste minimization program. These procedures are currently being developed and approved to satisfy RMP requirements.

5.3 POLLUTION PREVENTION AWARENESS PROGRAM

DOE Order 5400.1 establishes the requirement for integrating pollution prevention awareness into all field organization programs. The Project has adopted the philosophy that environmental awareness and prevention is the foundation of an environmental compliance program. The ERCP is the first step in identifying compliance areas that may be applicable to the Project. In the ERCP, compliance strategies are developed to obtain the appropriate permits and authorizations and then to monitor activities to ensure continued compliance. Orientation for all Project employees includes an environmental awareness training segment. Specific training has been developed for those individuals involved in compliance monitoring activities.

A Yucca Mountain Project pollution prevention awareness program is currently being developed. A program has been developed which includes measures for promoting employee awareness and training. Special awareness campaigns, and incentive and award programs will also be developed. The Project HMMHP also requires worker training for facility waste minimization, handling and disposal of hazardous materials, and actions and reporting in the event of hazardous material spills or emergencies. The OCB will review the awareness program annually for required updates and revisions. The program will be updated at least every three years. The T&MSS ERCD is responsible for development of the pollution prevention awareness program.

6.0 ENVIRONMENTAL MONITORING PROGRAMS

6.1 PREOPERATIONAL MONITORING

DOE Order 5400.1 requires that an environmental study be conducted prior to start up of a new site, facility, or process which has the potential for significant adverse environmental impact. The Environmental Assessment (EA) (DOE, 1986), which addressed proposed Yucca Mountain site characterization activities and their potential impacts, concluded that no significant adverse environmental impacts were expected. To confirm this finding, a monitoring program is being implemented that includes preoperational monitoring as described in Section 6.2.

6.2 ENVIRONMENTAL MONITORING PLANS

The Project's environmental monitoring plans are described in the EMMP and summarized below. For each monitoring program, a brief description of the proposed data collection program is presented, including the parameters to be monitored, types of measurements needed, and general analysis methodologies to be employed. The objective of the studies identified in the EMMP is to ensure that site characterization activities are conducted in a way that minimizes, to the maximum extent practicable, significant adverse environmental impacts even though such impacts are not expected. The EMMP program incorporates mitigation measures designed to prevent significant adverse impacts by mitigating them before they become significant. Details of each program can be found in the corresponding EFAP for that program.

6.2.1 Air Quality/Meteorology

The air pollutant of principal concern during site characterization is particulate matter generated or released from a variety of activities (e.g.,

exploratory shaft excavation and site preparation). Therefore, a monitoring program has been implemented in the vicinity of Yucca Mountain to monitor total suspended particulates and ambient particulate matter less than 10 microns (PM_{10}) in aerodynamic diameter. Ambient particulate monitoring may also be required to satisfy regulatory compliance in different locations. Any such changes in the monitoring program will be reflected in the EFAP for Air Quality (DOE, 1988f). The T&MSS EFPD is responsible for preparing the EFAP for Air Quality and conducting the data collection program.

6.2.2 Archaeological, Historic, and Cultural Resources

In 1988, DOE signed a Programmatic Agreement (PA) (DOE, 1988g) with the Advisory Council on Historic Preservation stipulating that the DOE will conduct pre-activity surveys to identify any archaeological resources and historic sites that may be affected by the conduct of site characterization activities. The details of the pre-activity surveys are described in the EFAP for Cultural Resources-Archaeological Component (DOE, 1988h). If an archaeological or historic site is located, the planned site characterization activity will be relocated or altered whenever possible so that the site will not be disturbed. Where this is not possible, the site data will be recovered by controlled excavation, depending on the significance of the cultural resource(s) located. Impacts to sites may occur through direct and indirect means, and all sites that have the potential to be impacted will be monitored as part of the EMMP process. Worker education programs are stipulated in the PA and will serve to minimize any significant adverse impacts that might occur. The location, extent, and timing of these surveys are dependent upon the scheduling of the proposed site characterization activities. The Desert Research Institute is responsible for preparing the EFAP and conducting the pre-activity surveys and data collection program.

Consultations with Native American groups regarding cultural and religious values and resources are stipulated in the PA and are part of the environmental regulatory compliance process. Consultations have been collected separately from the archaeological program.

6.2.3 Radiological Studies

Environmental radiological monitoring activities in support of the EMMP, described in the EFAP for Radiological Studies (DOE, 1988i), have been started prior to the initiation of significant surface-disturbing activities and will continue through the site characterization phase into the post-characterization period. The T&MSS Radiological Field Programs Division is responsible for preparing the EFAP and conducting the data collection program. The data gathered as a result of these monitoring activities will be used to formulate background conditions existing at the site prior to the initiation of significant site characterization activities. As site characterization progresses, the data taken will reflect whether site characterization activities are contributing to an elevation of that background measurement.

The design of the monitoring program includes field activities for the evaluation of potential sources of radioactivity from soil and sediment samples, groundwater samples, airborne particulate and radioiodine samples, biota sampling, radon emanation monitoring, and ambient radiation levels. The overall study area for these sampling programs is described by a circle with a radius of 84 km (52 mi) whose center is located at the proposed Yucca Mountain site.

Soil and sediment samples will be obtained from all air sampling locations, from areas selected for indicator species (biota) sampling, and from future areas of intense construction activity. The water sampling program includes the collection of well-water, surface-water, and ephemeral-water sources. Surface-water samples will be collected at those limited locations where surface water occurs. A survey of catch basins will be conducted and those serving as water sources for wildlife will be included in the sampling program. The air sampling program will include (1) continuous collection of airborne particulate and iodine samples, (2) intermittent airborne particulate collection, (3) airborne tritium and noble gas sampling, and (4) radon and daughter products monitoring. The biota sampling program will include monitoring of locally collected plants of importance to the human food chain exposure pathway, or plants that may be indicative of

localized conditions. In addition, distribution of local graze, local produce, and local meat and poultry production will be evaluated for inclusion in the sampling program. A milk sampling program already exists and will not be duplicated.

6.2.4 Terrestrial Ecosystems

Pre- and post-activity surveys are being conducted to monitor the impacts of site characterization activities on the terrestrial ecosystems (DOE, 1988j). These surveys are a current standard DOE regional operating procedure for surveying all sites to be disturbed prior to the start of an activity. However, to monitor the actual impact of activities, it is important to also visit sites during construction and after construction is completed. These surveys would document any changes to the original plans, determine actual areal extent of disturbed habitat, and determine if recommendations made for conserving biological resources based on pre-activity surveys were followed. Most importantly, these surveys would help keep a record of the amount of habitat disturbed during site characterization and would document the approximate date that disturbance took place. EG&G Energy Measurements, Environmental Sciences Department is responsible for the EFAP for Terrestrial Ecosystems and conducting the pre-activity surveys and data collection program.

Aerial photography will also be used to monitor impacts to the environment. Given the amount of habitat to be disturbed, baseline photographs will be acquired before the onset of major site characterization activities, so that any impacts are adequately addressed. Some minor ground-disturbing activities have already begun and aerial photography will be a means for monitoring impacts to those areas not previously disturbed.

The desert tortoise is a recently listed endangered species in the State of Nevada. A Biological Assessment (BA) (DOE, 1989f) pursuant to Section 7(c) of the Endangered Species Act was prepared to determine if site characterization activities would adversely affect the tortoise population and distribution. The Project has had an on-going survey program in place to

minimize direct impacts to the desert tortoise. As a result of the recent "listing," field activities which could impact the species have been restricted pending the final review of the BA by the U.S. Fish and Wildlife Service and their resulting recommendations.

The presence of any other sensitive species will be monitored during pre- and post-activity surveys. Among the State-protected furbearers, special attention will be paid to the kit fox during the surveys. Kit fox dens are conspicuous and are good indicators of the animal's presence in the immediate vicinity.

6.2.5 Water Resources

Some of the ancillary facilities that will be constructed in support of site characterization at Yucca Mountain, as well as some of the site characterization activities to be conducted, have the potential to adversely impact water resources in the area. Site characterization activities that could potentially impact water resources include construction of sewage treatment ponds, drilling of boreholes to the water table, use of chemical tracers, and increased water use. Monitoring requirements will be added to the EFAP for Water Resources as the requirements are identified through coordination with Federal and State permitting agencies. The monitoring activities described in the EFAP for Water Resources (DOE, 1989e) focus on early detection of degradation that could result from the introduction of contaminants, and the depletion of water supplies.

The water resources monitoring program will demonstrate whether measured changes in water chemistry are a result of site characterization activities or are naturally occurring variations. Monitoring of the ground-water chemistry of springs that provide habitat for sensitive species and of water supply wells in the area will be performed to evaluate if no significant adverse impacts are resulting from site characterization. The program also includes the development of mitigating measures to be implemented in the event that measurable changes in the water quality are detected by the monitoring program.

Upon the initiation of site characterization, any field activities that have the potential for significant ground-water degradation or depletion will be evaluated and monitored. These activities include waste disposal operations, tracer injection tests, or large-scale ground-water withdrawals. Analytical and numerical simulation techniques will be used to predict the likely impacts resulting from these activities.

6.3 EFFLUENT MONITORING

Effluent monitoring programs will be developed and added to the EFAP for Water Resources as permits are obtained, permit monitoring conditions are defined, and effluent systems are more fully designed. The T&MSS ERCD is responsible for identifying the effluent monitoring requirements and the T&MSS EFPD is responsible for incorporating these requirements into the EFAP. These programs will satisfy the following objectives:

(a) Verify compliance with applicable Federal, State, and local effluent regulations and DOE Orders.

(b) Determine compliance with commitments made in the Environmental Assessment and other official Project documents.

(c) Evaluate the effectiveness of effluent treatment and control.

(d) Identify potential environmental problems and evaluate the need for remedial actions or mitigation measures.

(e) Support permit revision and/or reissuance.

(f) Detect, characterize, and report unplanned releases.

The monitoring programs are expected to provide data on liquid and airborne discharges, and solid wastes. Auditable records will be maintained.

6.4 ENVIRONMENTAL SURVEILLANCE

The Environmental Regulatory Compliance Plan (ERCP) states that a compliance audit program will be developed and implemented to provide assurances that environmental regulatory requirements are being properly satisfied. The T&MSS ERCD is responsible for developing and implementing the program. The program will be designed to satisfy the following objectives:

(a) Verify compliance with applicable environmental laws and regulations.

(b) Verify compliance with environmental commitments made in the Environmental Assessment and other official Project documents.

(c) Characterize and define trends in the physical, chemical, and biological condition of the environment at Yucca Mountain by studying the results of the EMMP program.

(d) Provide a continuing assessment of pollution abatement programs.

(e) Identify and quantify new or existing environmental quality problems.

6.5 METEOROLOGICAL MONITORING PLAN

Meteorological monitoring is being conducted by the T&MSS EFPD for the Yucca Mountain site as described in the Meteorological Monitoring Plan (MMP) (DOE, 1989g). Five towers have been installed to characterize the existing conditions for both synoptic and terrain-induced air flow patterns. Four of the monitoring towers are 10 meters high, remotely located, and instrumented to continuously measure and record wind speed, wind direction, sigma theta (for determination of atmospheric stability), relative humidity, and temperature. The fifth tower, which is also referred to as the Main Site, is

60 meters high, instrumented at both the 10-meter and 60-meter levels, and measures and records wind speed, wind direction, sigma phi, sigma theta, temperature, temperature differential (between levels), net radiation (solar and terrestrial), relative humidity, and precipitation. Data are monitored by a data logger, averaged internally, and output to magnetic tape (cassette) on an hourly basis. Continuously recording strip charts provide hard-copy backup data in the event of digital system malfunctions. The meteorological sensors for both tower types are discussed in more detail in the MMP.

6.6 RADIOLOGICAL MONITORING

The radiological monitoring program, described previously in Section 6.2.3, has been developed to satisfy the requirements of the DOE Orders dealing with radiation protection of the public and the environment. This program is closely coordinated with the DOE/NV worker protection program.

6.7 NON-RADIOLOGICAL MONITORING

The non-radiological monitoring being performed is discussed in Section 6.2. As site characterization permitting and planning further define monitoring requirements, these monitoring programs will be expanded and the EFAPs revised to accommodate these changes.

6.8 GROUNDWATER MONITORING PROGRAM

The groundwater monitoring program being developed to protect regional groundwater resources is described in the EFAP for Water Resources as discussed in Section 6.2.

7.0 QUALITY ASSURANCE

7.1 QUALITY ASSURANCE PROGRAM

The Project Quality Assurance (QA) program is committed to ensuring that the structures, systems, and components important to safety and the barriers important to waste isolation are subjected to appropriate QA methods and procedures during the siting, design, licensing, construction, and operation of waste-management facilities. The QA program consists of systematic actions that provide demonstrable evidence that the environment and public health and safety are protected. A detailed description of the Project QA program is documented in the Project Office Quality Assurance Program Plan (DOE, 1988k).

Quality assurance requirements for the program have their origin in, and comply with, DOE directives, Nuclear Regulatory Commission (NRC) licensing regulations, and national standards. The QA program is consistent with the applicable QA criteria of DOE Order 5700.6A (Quality Assurance); the NRC's 10 CFR Part 50, Appendix B (Quality Assurance for Nuclear Power/Fuel Reprocessing Plants); and the national consensus standard ANSI/ASME NQA-1 (Quality Assurance Program Requirements for Nuclear Facilities), developed by the American National Standards Institute and the American Society of Mechanical Engineers. The QA criteria cover the following program elements:

1. Organization.
2. Quality assurance program.
3. Design control.
4. Procurement-document control.
5. Instructions, procedures, and drawings.
6. Document control.
7. Control of purchased material, equipment, and services.
8. Identification of materials, parts, and components.
9. Control of special processes.
10. Inspection.

11. Test control.
12. Control of measuring and test equipment.
13. Handling, storage, and shipping.
14. Inspection, test, and operating status.
15. Nonconforming materials, parts, or components.
16. Corrective action.
17. Quality assurance records.
18. Audits.

The Yucca Mountain Project Systems Engineering Management Plan (SEMP) (DOE, 19881) incorporates by reference the QA requirements. These requirements include provisions for the control of program planning, scientific investigations, design input, review and approval of design documents, change control, and design interface control.

7.2 LABORATORY CERTIFICATIONS

Laboratories supporting the various monitoring programs are required to maintain current certification for performing the required analyses. Required laboratory analyses are described in the appropriate EFAP. The OCB is responsible for ensuring that laboratories conducting analyses are properly certified.

7.3 INDEPENDENT DATA VERIFICATION

Independent data verification programs will be developed as required by the Quality Assurance program described above. Data verification will be included in the technical procedures that are written to implement the data collection programs. The OCB is responsible for ensuring that technical data verifications are performed.

8.0 REFERENCES

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DOE (U.S. Department of Energy), 1989g. Meteorological Monitoring Plan, Yucca Mountain Project Office, Las Vegas, Nevada.

APPENDIX

Department of Energy
Nevada Operations Office
P. O. Box 98518
Las Vegas, NV 89193-8518

WBS 1.2.5.3.3
QA

NOV 7 1989

Peter N. Brush, Acting Assistant Secretary, Environment, Safety and Health, HQ (EH-1) FORS
Samuel Rousso, Acting Director, Civilian Radioactive Waste Management, HQ (RW-1) FORS

YUCCA MOUNTAIN PROJECT ENVIRONMENTAL PROTECTION IMPLEMENTATION PLAN (EPIP)

The Yucca Mountain Project EPIP is enclosed in accordance with U.S. Department of Energy (DOE) Order 5400.1. This EPIP satisfies the requirement to prepare an implementation plan to ensure that facilities are operated and managed in a manner that will protect, maintain, and restore environmental quality; minimize potential threats to the environment and the public health; and comply with environmental regulations and DOE policies.

It is important to note that the project is not an operating DOE facility in the traditional sense. Currently, the project is in the early stages of characterizing the Yucca Mountain site. An environmental program for the project has been established, as described in detailed management plans. These plans have been used as the basis for the EPIP.

The enclosed project EPIP addresses only the project component of the DOE/Nevada Operations Office (DOE/NV) and is separate from the EPIP which covers the DOE/NV Weapons Program. An EPIP addressing the DOE/NV Weapons Program Environmental Protection activities is being submitted under separate cover.

If you have any questions concerning this information or our environmental program, please contact Bob Kaiser at (702) 794-7954 or FTS 544-7954.

Nick C. Aquilina
Manager

YMP:RDK-681

Enclosure:
EPIP

cc w/encl:
G. J. Parker, HQ (RW-333) FORS
E. W. McCann, SAIC, Las Vegas, NV

ENCLOSURE 2

WBS 1.2.5.3.3
QA

NOV 6 1989

Nick C. Aquilina, Manager, NV

TRANSMITTAL OF THE YUCCA MOUNTAIN PROJECT ENVIRONMENTAL PROTECTION IMPLEMENTATION PLAN (EPIP)

Enclosed is the subject report and accompanying transmittal letter addressed to the appropriate individuals identified in U.S. Department of Energy (DOE) Order 5400.1. This EPIP satisfies the requirement to prepare an implementation plan to ensure that facilities are operated and managed in a manner that will protect, maintain, and restore environmental quality; minimize potential threats to the environment and the public health; and comply with environmental regulations and DOE policies.

If you have any questions, please contact Glenn M. Doyle at 794-7595 or Bob Kaiser at 794-7954.

ORIGINAL SIGNED BY

Carl P. Gertz, Project Manager
Yucca Mountain Project Office

YMP:GMD-680

Enclosures:
1. EPIP
2. Ltr Aquilina to Distribution w/encl (dtd 11/7/89)

cc w/encls:
G. J. Parker, HQ (RW-333) FORS
M. I. Foley, SAIC, Las Vegas, NV
E. W. McCann, SAIC, Las Vegas, NV

CONCURRENCE	
RTG. SYMBOL	YMP
INITIALS/SI	Doyle jr
DATE	11/6/89
RTG. SYMBOL	YMP
INITIALS/SI	Kaiser
DATE	11/6/89
RTG. SYMBOL	YMP
INITIALS/SI	Dixon
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