DOE/EH-0428

Routine Environmental Audit

of the Y-12 Plant

Oak Ridge, Tennessee

U.S. Department of Energy
Office of Environmental Audit
Washington, DC 20585

September 1994

PREFACE

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U.S. Department of Energy
Routine Environmental Audit
Conducted at
The Y-12 Plant
Oak Ridge, Tennessee

The Secretary of Energy's July 20, 1993, Environment, Safety, and Health Policy establishes daily excellence in the protection of the worker, the public, and the environment as the hallmark and highest priority of all DOE activities. That policy also calls for a proactive program of continuous improvement to move the Department beyond minimal compliance with standards. In furtherance of that policy, the Office of Environment, Safety and Health (EH) has established, as part of the internal oversight responsibilities within DOE, a program within the Office of Environmental Audit (EH-24) to conduct environmental assessments of DOE programs and operating facilities. The ultimate goal of this program is enhancement of environmental protection and minimization of risk to public health and the environment through systematic and periodic evaluations of the Department's environmental programs within line organizations.

Through its environmental evaluation program, which provides measurable goals with milestones, EH-24 is committed to helping establish the DOE as a model of responsible environmental stewardship. In addition, this program will serve to reinforce the Secretary's goal of building on the efforts currently ongoing to attain and maintain compliance in cooperation with the regulatory authorities and other affected stakeholders.

This document contains the findings identified during the routine environmental audit of the Y-12 Plant, Oak Ridge, Tennessee, conducted August 22–September 2, 1994. The audit included a review of all Y-12 operations and facilities supporting DOE-sponsored activities. The audit's objective is to advise the Secretary of Energy, through the Assistant Secretary for Environment, Safety and Health, as to the adequacy of the environmental protection programs established at the Y-12 Plant to ensure the protection of the environment, and compliance with Federal, state, and DOE requirements.

September 1994
Washington, DC

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CONTENTS

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ROUTINE ENVIRONMENTAL AUDIT
OF THE Y-12 PLANT

CONTENTS

CONTENTS (continued)

FIGURES

TABLE

APPENDICES

EXECUTIVE SUMMARY

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EXECUTIVE SUMMARY

This report documents the results of the routine environmental audit of the Oak Ridge Y-12 Plant (Y-12 Plant), Anderson County, Tennessee. During this audit, the activities conducted by the audit team included reviews of internal documents and reports from previous audits and assessments; interviews with U.S. Department of Energy (DOE), State of Tennessee regulatory, and contractor personnel; and inspections and observations of selected facilities and operations. The onsite portion of the audit was conducted August 22—September 2, 1994, by the DOE Office of Environmental Audit (EH-24), located within the Office of Environment, Safety and Health (EH).

DOE 5482.1B, "Environment, Safety, and Health Appraisal Program," establishes the mission of EH-24 to provide comprehensive, independent oversight of DOE environmental programs on behalf of the Secretary of Energy. The ultimate goal of EH-24 is enhancement of environmental protection and minimization of risk to public health and the environment. EH-24 accomplishes its mission by conducting systematic and periodic evaluations of DOE's environmental programs within line organizations, and by using supplemental activities that strengthen self-assessment and oversight functions within program, field, and contractor organizations.

The audit evaluated the status of programs to ensure compliance with Federal, state, and local environmental laws and regulations; compliance with DOE Orders, guidance, and directives; and conformance with accepted industry practices and standards of performance. The audit also evaluated the status and adequacy of the management systems developed to address environmental requirements.

The audit's functional scope was comprehensive and included all areas of environmental management and a programmatic evaluation of the air, surface water, and environmental radiation programs. Although the audit was designed to be thorough and to consider a representative sample of Y-12's environmental activities and programs, it was not intended to be exhaustive in scope. Instead, it was meant to provide DOE organizations, including the Secretary, with an indication of the status of Y-12 management's effectiveness in achieving its mission in an environmentally responsible manner.

In a precedent-setting move, EH-24 conducted its audit effort jointly with a health and safety management appraisal by the Oak Ridge Operations Office. The team leaders from each audit met daily to share information to improve the overall quality of the reports as well as to ease the burden of the audit process on senior management at the Y-12 Plant. The joint effort culminated in a combined closeout briefing on September 1, 1994.

The audit team identified seven findings. An evaluation of these findings resulted in the identification of one "key finding":

- Environmental Commitment. The environmental compliance emphasis at the Y-12 Plant has resulted in significant progress. As the goal of total compliance moves closer to becoming reality, management must refocus its sights on environmental excellence. Given its progress, Y-12 now is in position to reach such a goal. In addition, Y-12 has made inroads made toward environmental excellence, particularly in the area of pollution prevention/waste minimization. The high environmental standards alluded to

in the Y-12 Mission Statement, however, have not yet been defined and translated into implementing policies, programs, and procedures. This should include reference to, and elevation of the priority of, the relevant non-regulatory aspects of the DOE Orders that currently do not receive the attention devoted to regulatory compliance.

While this issue presents a great challenge, it also provides a unique opportunity to excel. This issue is addressed in greater detail in Section 3.

The audit team identified the following strengths in the Y-12 environmental program:

- Quality of Personnel. The quality and dedication exhibited by many people, both line and support, are important factors in the improvement in environmental operations at the Y-12 Plant. The compliance focus, dedication, perseverance, and ownership demonstrated by environmental and operations personnel are exemplary.

- Integration with Operations. A key—perhaps, *the* key—to a successful environmental program is that it be integrated into the day-to-day operations of the facility. Such integration was very much evident at the Y-12 Plant. Line personnel are informed of environmental responsibilities and resources available to them. The relationship between operations and environmental support is generally strong. Environmental awareness is good and proper authority and management support exists to effect necessary changes. Line organizations recognize that environmental compliance is their responsibility, not that of the ES&H organization. Roles and responsibilities are usually well-defined.

- Organizational Relationships. The audit team noted good working relationships between the various entities that affect the environmental program. Positive relationships and well-defined responsibilities exist among the Martin Marietta Energy Systems, Inc. (MMES) Environmental Management Department, line organizations, and the MMES environmental restoration and waste management organizations. Communication between the MK-Ferguson Environmental Services Group and MMES has improved in recent months.

- Commitment to Compliance. In this area, the audit team noted that management sets a strong example. While some issues concerning commitment to environmental excellence were noted (see Section 3.2), commitment to environmental compliance was found to be strong. Senior management is involved, particularly through monthly meetings with environmental personnel, and is accessible whenever the need arises. Senior management also ensures that funding of environmental compliance projects receives a high priority.

- Task Teams/Environmental Officers. Task teams are responsible for developing an MMES-wide program for implementing environmental requirements. They effectively develop consistent policy while accommodating Y-12 input and ensuring that a Y-12 advocate exists. As a

group, they also serve as an effective forum for DOE/contractor discussion of reservation-wide environmental issues, and as a means for keeping the players in contact. The environmental officer position also provides a valuable liaison function between the line divisions and the ES&H organization.

- Environmental Program Progress. A number of persons contacted by the audit team, including Tennessee Department of Environment and Conservation personnel, lauded the progress made by the Y-12 environmental program. Some indicators of this progress were:

  — There have been no RCRA compliance findings by regulators in the past 3 years.

  — A "swap shop" has been established to encourage recycling of materials. This is one of a number of initiatives in pollution prevention/waste minimization.

  — Y-12 has developed extensive waste management programs that have resulted in a decision by DOE Headquarters to lift the moratorium on the off-site shipment of certain hazardous wastes.

  — National Pollutant Discharge Elimination System (NPDES) exceedences have been reduced from 246 in 1989 to 14 in 1993 and 10 this year.

  — A program has been implemented to trace drains to their destinations and reroute those that pose a problem.

  - The Risk-Based Prioritization System (RBPS) funds virtually all environmental compliance projects.

  - A major stack and effluent monitoring system upgrade has been accomplished for National Emission Standards for Hazardous Air Pollutants (NESHAP) regulations.

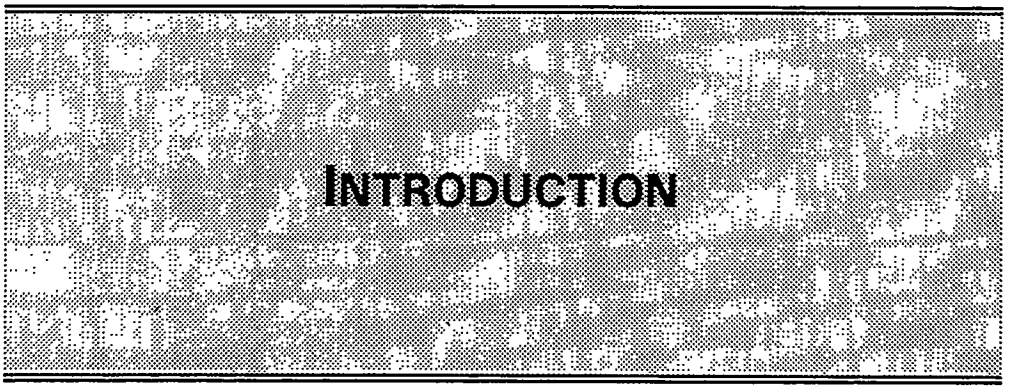
- Risk-Based Prioritization System. The RBPS is quite comprehensive, giving highest priority to compliance and other high-risk ES&H items. The Y-12 and Environmental Restoration systems are similar and compatible, and their proponents interact. The environmental restoration system goes the further step of involving the stakeholders (regulators) in the process, and includes them in the scoring.

- Emergency Management. The emergency response function is quite mature. Occurrence reports are reviewed by the Emergency Management Department for determination of further action, and occurrence reports are tracked and trended. The Y-12 response capability has also supported the local community with off-site assistance.

Y-12 has been effective in addressing the myriad environmental issues and responsibilities it faces. This is a challenging period for Y-12, because it is transitioning from a defense

program mission to one of technology transfer and environmental restoration. Although some deficiencies in environmental management were observed by the audit team, the general consensus was that top management in the Oak Ridge Operations Office, the Y-12 Site Office, MMES, MK-Ferguson Company of Oak Ridge, and Johnson Controls World Services, Inc. have committed themselves and their organizations to resolving the organizational, management, and resource issues affecting the program.

SECTION 1.0



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1.0 INTRODUCTION

This report documents the results of the Routine Environmental Audit of the Y-12 Plant, located in Anderson County, Tennessee. The onsite portion of the audit was conducted August 22—September 2, 1994, by the Department of Energy (DOE) Office of Environmental Audit (EH-24).

DOE 5482.1B, "Environment, Safety and Health Appraisal Program," establishes the mission of EH-24, which is to provide comprehensive, independent oversight of DOE complex-wide environmental programs on behalf of the Secretary of Energy. The ultimate goal of EH-24 is to enhance environmental protection and minimize risk to public health and the environment. EH-24 accomplishes its mission using systematic and periodic evaluations of the DOE's environmental programs within line organizations, and through use of supplemental activities that serve to strengthen self-assessment and oversight functions within program, field, and contractor organizations.

These evaluations function as a vehicle to apprise the Secretary and Program Managers of the current status and vulnerabilities of DOE's environmental activities and environmental management systems. Several types of evaluations are conducted, including:

- environmental management assessments;
- comprehensive baseline environmental audits;
- routine environmental audits; and
- special issue reviews.

The purpose, scope, and approach of the audit is described below.

1.1 PURPOSE

The purpose of the audit is to provide the Secretary of Energy, through the Assistant Secretary for Environment, Safety and Health (EH-1), with concise information pertaining to the following areas:

- adequacy of environmental management programs and organizations;
- DOE vulnerabilities and liabilities associated with environmental management practices;
- compliance with environmental laws and regulations, DOE Orders, and DOE environmental policies (as identified in Appendix F), which address environmental management programs;
- adherence to best management (and accepted industry) practices pertaining to environmental management programs;

- progress and effectiveness of environmental corrective actions resulting from the 1990 Tiger Team assessment and the 1992 Environment, Safety and Health Progress Assessment Report; and

- noteworthy environmental management practices, and program strengths.

The information gathered during this audit and embodied in this report will assist DOE in determining patterns and trends in environmental deficiencies and strengths. Results of this audit will be given to DOE's Office of Defense Programs (DP), Office of Environmental Management (EM), Office of Energy Research (ER), Oak Ridge Operations Office (ORO), Y-12 Site Office (YSO), and the Y-12 Plant management and operating contractors, Martin Marietta Energy Systems, Inc. (MMES), MK-Ferguson Company of Oak Ridge (MK-F), and Johnson Controls World Services, Inc. (JCWS). They are expected to fully utilize this information to develop corrective actions, make appropriate modifications to specific programs to prevent recurrence, and implement lessons learned programs to ensure broad applications to other operations, programs, and facilities.

1.2 SCOPE

The scope of this audit included all eight disciplines of environmental management, described in Protocols for Conducting Environmental Management Assessments (DOE/EH-0326, June 1993), and three functional environmental disciplines (in surface water, air quality, and environmental radiation protection programs) on a sampling basis. The management disciplines were organizational structure (OS); environmental commitment (EC); environmental protection programs (EP); formality of environmental programs (FP); internal and external communication (IC); staff resources, training, and development (SR); program evaluation, reporting, and corrective action (PE); and environmental planning and risk management (RM). The three functional environmental disciplines were evaluated as part of the environmental protection programs management assessment.

Environmental management was evaluated within and between ORO, YSO, MMES, MK-F, and JCWS. Additional consideration was given to reporting and oversight relationships with DP, the responsible DOE Headquarters program office. Further attention was given to EM, because some of the Y-12 Plant facilities are scheduled to transfer from DP to EM for decontamination and decommissioning.

Because the scope of this audit included three functional environmental disciplines, site inspections of ongoing operations and operating facilities were conducted where appropriate. The purpose of this was to evaluate compliance with air quality, surface water, and environmental radiation protection requirements.

1.3 APPROACH

The audit followed accepted auditing techniques and was guided by implementation of procedures and programs cited in the DOE Environmental Audit Program Guidance (DOE/EH-0232, January 1992), the Protocols for Conducting Environmental Management Assessments (DOE/EH-0326, June 1993), and Performance Objectives and Criteria for Conducting DOE Environmental Audits (DOE/EH-0229, January 1994). The audit was conducted by a team of professionals managed by a DOE Headquarters audit team leader and deputy team leader from EH-24, a team coordinator, and six management systems

specialists from Arthur D. Little, Inc. (ADL). The names, areas of responsibility, affiliations, and biographical sketches of the team members are provided in Appendix A.

This audit was scheduled concurrently with the ORO Safety, Health, and Quality Assurance Management Appraisal (Management Appraisal) of the Y-12 Plant to prevent unnecessary duplication of effort, and reduce the auditing burden on Y-12. The EH-24 audit team leader and deputy team leader attended the Management Appraisal's training and planning sessions June 27—28, 1994, at ORO to discuss and coordinate the audit/appraisal scoping, issues, interview scheduling, information exchange, and logistic arrangements.

During the audit planning phase, a memorandum dated July 14, 1994, was sent to ORO announcing the audit and requesting information about Y-12 Plant facilities and its environmental programs in general. A pre-audit site visit was conducted July 28, 1994, by the DOE team leader and deputy team leader, and the team coordinator from ADL. Y-12's response to the information request memorandum, combined with the pre-audit site visit, formed the basis for the Audit Plan (see Appendix B). This was transmitted on August 16, 1994, and included a preliminary onsite agenda. Once onsite, the audit team modified the preliminary agenda as more information was obtained and additional areas of interest were identified. Appendix C provides the final schedule of onsite activities. The daily meetings between the EH-24 audit team leader and the Management Appraisal team leader, however, were not listed in the final schedule.

Certain DOE Headquarters offices impact the effectiveness of environmental management systems associated with Y-12 environmental operations and programs. Because of this, interviews with personnel from relevant DOE Headquarters offices were conducted prior to the onsite portion of the audit. Specifically, interviews within DP, EM, and ER were held August 10, 1994.

Onsite audit activities were conducted August 22—September 2, 1994, and included interviews in Oak Ridge, Tennessee, with the staff and management of ORO, YSO, MMES, MK-F, and JCWS; State of Tennessee regulators; and community representatives. Document reviews including previous audit and self-assessment reports; and field inspections to address the three functional environmental disciplines mentioned above.

The audit team conducted daily debriefs that were open to ORO, YSO, MMES, MK-F, JCWS, and Tennessee State personnel, and to representatives of DP and EM. Lists of site documents reviewed and interviews conducted are provided in Appendices D and E, respectively. Using these sources of information, in addition to information developed from site inspections, the audit team developed overviews and findings, which are discussed in Sections 2.0 and 3.0 of this report.

During the audit, the environmental management specialists, except for the three management specialists in the environmental protection programs discipline, broadly reviewed the environmental activities applicable to their disciplines horizontally across management lines instead of focusing only on certain environmental program(s).

The management specialists auditing the environmental protection programs management discipline evaluated the activities of a representative number of environmental programs in a more technical manner. This required these three specialists to look at the environmental

activities of each selected environmental program vertically, from upper management down to the operator level. This resulted in a more intense set of document reviews and interviews within specific environmental programs than was performed by the other management specialists on the team. This approach provided sufficient specific technical evidence supporting the degree of effectiveness of the environmental management systems.

Findings identified in this report are conditions that, in the judgment of the audit team, might not satisfy DOE Orders, agreements with regulatory agencies, environmental regulations and permit conditions, internal DOE or contractor environmental policies and procedures (including Performance Objectives and Criteria for Conducting DOE Environmental Audits), regulatory agency or DOE guidance, and accepted industry practice or technical standards.

The findings and overviews detailed in Section 3.0 are organized into the eight environmental management disciplines, as mentioned in Section 1.2. Each finding is organized into three sections: the performance objective, the finding statement, and a discussion of the facts and observations supporting the finding. The performance objectives specify the particular standards against which the finding is being evaluated. The findings are not arranged in order of relative significance.

1.4 BACKGROUND AND PROJECT DESCRIPTION

The Oak Ridge Reservation (ORR) is located in eastern Tennessee, about 20 miles west of Knoxville. The Y-12 Plant is one of the three major facilities located on the 37,000-acre ORR. The other two facilities are the K-25 Site and the Oak Ridge National Laboratory (ORNL). The Y-12 Plant is situated at the eastern end of ORR in Bear Creek Valley, located in Anderson County (see Figure 1-1). The plant occupies an area about 0.67 miles wide and 3.2 miles long.

The Y-12 Plant was originally constructed in 1943 as part of the Manhattan Project. Its initial mission was the separation of fissionable isotopes of uranium (U^{235}) by the electromagnetic process. U^{235} was the fissionable material used in the world's first atomic bomb. The magnetic separators were decommissioned at the end of 1946, when gaseous diffusion became the accepted process for enriching uranium. In the ensuing years, Y-12 has become a highly sophisticated nuclear-weapons-component manufacturing and development engineering organization. Missions have evolved and changed, however, with the easing of international tensions and resulting conclusion of Y-12's weapon component production mission. The Y-12 Plant map is displayed as Figure 1-2.

The Y-12 Plant is operated by MMES. Part of the draft mission statement of the Y-12 Plant is stated as follows:

> "The Y-12 Plant serves as a key manufacturing technology center for the development and demonstration of unique materials, components, and services of importance to the Department of Energy (DOE) and the nation. . . . We are recognized by our people, the community, and our customers as innovative, responsive, and responsible. We are a leader in worker health and safety, environmental protection, and stewardship of our national resources."

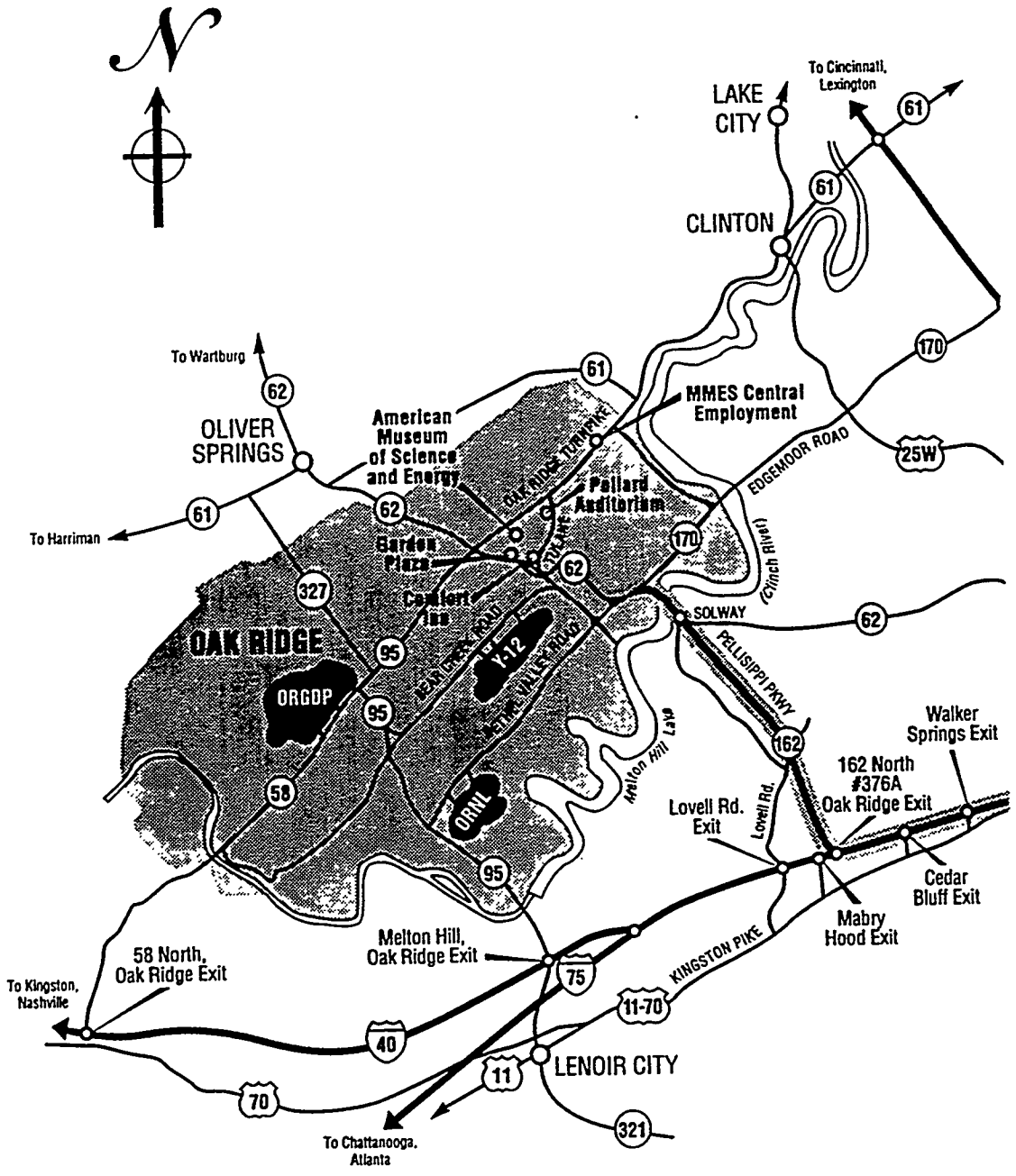

Figure 1-1: Regional Setting of the Y-12 Plant

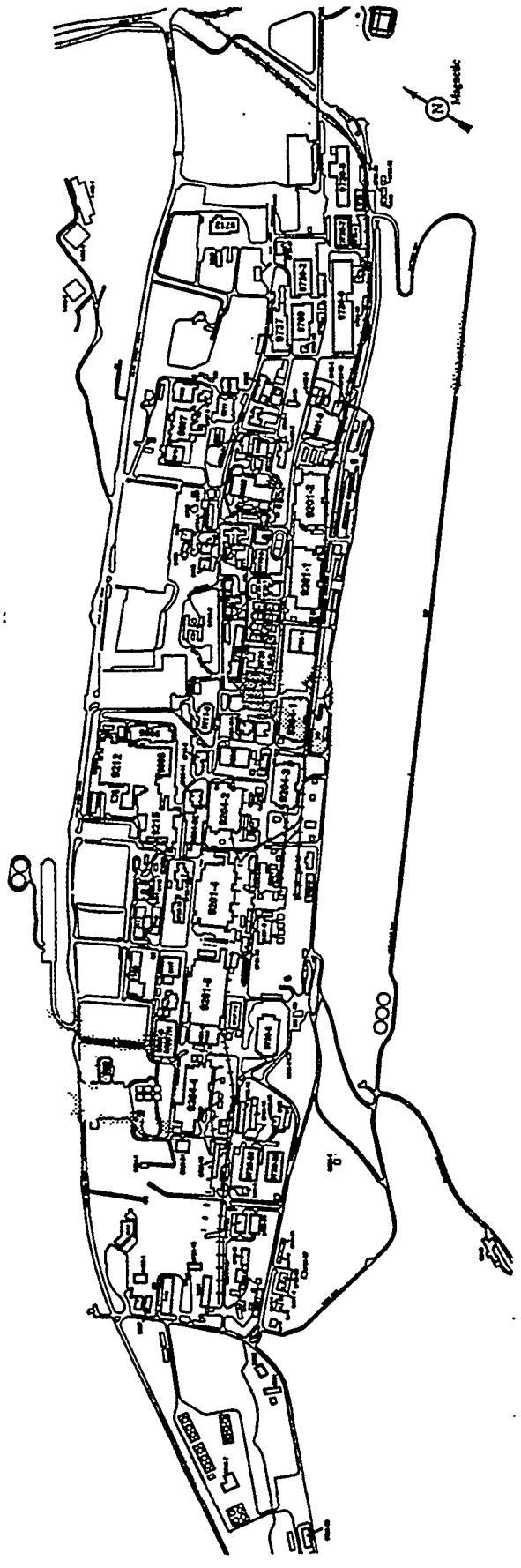

Figure 1-2: Y-12 Plant Map

Currently, Y-12 has two principal DP missions:

- Y-12 Plant Defense Program assignments include the dismantling of nuclear weapon components returned from the national arsenal, maintaining nuclear production capability and stockpile support, serving as the nation's storehouse of special nuclear materials, and providing special production support to DOE programs.

- The technology transfer mission has as its goal to apply unique expertise, initially developed for highly specialized military purposes, to a wide range of manufacturing problems to support the capabilities of the U.S. industry base.

In addition to the above-stated missions, EM is working at ORR to remediate inactive sites and facilities, as well as offsite locations contaminated as a result of operations at those sites. All sites are to be remediated to levels consistent with risk-based evaluations; in compliance with applicable laws, regulations, and regulatory agreements; and as economically as feasible.

1.5 ENVIRONMENTAL PROGRAMS AND ORGANIZATIONS

DP is Y-12's landlord; ER and EM also have operations at the plant. DP formulates and directs DOE's defense programs associated with the production of nuclear weaponry and related activities retained by DOE. The Office of Weapons Facilities (DP-24), through Y-12 Facilities Management Division (DP-243), provides DOE Headquarters policy, guidance, and oversight of the environmental management programs at the Y-12 Plant.

ER's operations are limited to a large biology laboratory and other ORNL activities; EM conducts all plant environmental restoration and waste management operations. Therefore, each of the three Cognizant Secretarial Offices (CSOs) has some responsibility for environmental performance at the plant, but DP retains ultimate responsibility.

The CSOs delegate to ORO the overall responsibility for all environmental monitoring, compliance, and protection activities at the Y-12 Plant. ORO has assigned these responsibilities to four organizations: YSO, the ORO Environmental Restoration Division (ORO-ERD), the ORO Waste Management and Technology Development Division (ORO-WMD), and the ORO Engineering Services Division (ORO-ESD). ORO's environmental matrix support organization, the ORO Environmental Protection Division (ORO-ENVPD), lends environmental technical and administrative support to each of the four organizations. The ORO organization chart is displayed as Figure 1-3.

YSO performs for DP the functions of site landlord, and is responsible for all environmental activities at the site, except those conducted under the ORO Assistant Manager for Environmental Restoration and Waste Management (AMERWM) and Assistant Manager for Construction and Engineering (AMCE). ORO-ESD is responsible for the contractual relationship, oversight and interface with MK-F and JCWS. Each of these four organizations has a Contracting Officer's Representative (COR) who is responsible for managing the contractual relationships with the prime contractors on the site (i.e., MMES, MK-F, and JCWS) and for providing direction and supervision to the contractors. The YSO organization chart is displayed as Figure 1-4.

DOE Oak Ridge Operations

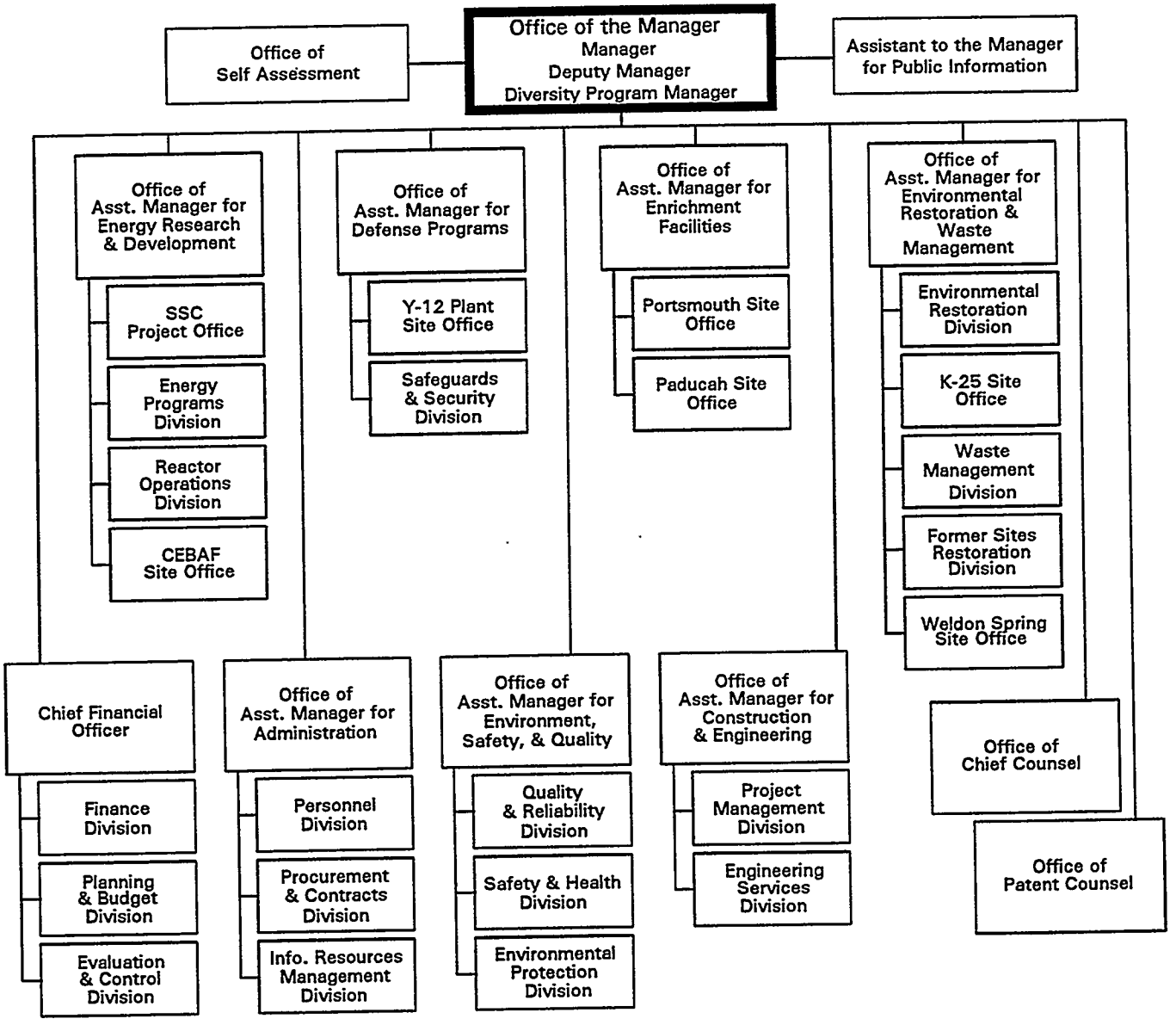

Figure 1-3: Oak Ridge Operations Organization Chart

DOE Y-12 Site Office

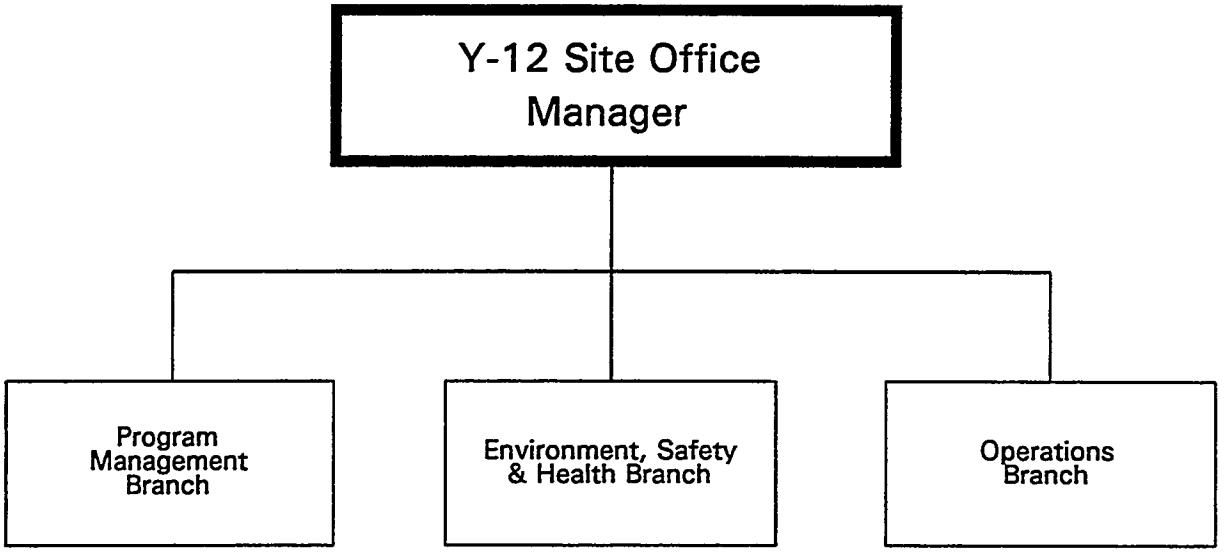

Figure 1-4: Y-12 Site Office Organization Chart

As primary contractor for Y-12, MMES has direct responsibility for managing, implementing and conducting environmental program activities at the plant. The MMES Y-12 Plant Manager has delegated these responsibilities to both line and support organizations. Linedivision managers and their employees are responsible for operating in a manner that maintains environmental protection and compliance. They are supported by the MMES Y-12 Environmental Management Department (MMES-EMD) under the Y-12 Health, Safety, Environment and Accountability (HSE&A) Division. MMES-EMD helps to identify and provide guidance on regulatory requirements and DOE Orders, develops plant-specific policies and procedures, assists in obtaining environmental permits, and performs oversight. The Y-12 organization chart is displayed as Figure 1-5, and the organizational chart of MMES-EMD is displayed as Figure 1-6.

Each division manager has one or more environmental officers (EOs) who coordinate the division environmental program activities, act as liaisons to MMES-EMD, provide division personnel with supplementary guidance, and implement the division's environmental surveillance program. EOs report directly to their division managers and also have a matrix reporting relationship with the MMES-EMD Manager.

Three other MMES organizations at the Y-12 Plant—the MMES Environmental Restoration Division (MMES-ERD), the MMES Waste Management Division (MMES-WMD), and the MMES Environmental Compliance Division (MMES-ECD)—report to MMES Central rather than to the MMES Y-12 Plant Manager. MMES-ERD and MMES-WMD have "dotted-line" reporting relationships through the HSE&A Manager.

MMES-ERD manages the environmental cleanup process, from identification of remediation sites to final closure of the five ORO sites operated by MMES (i.e., Y-12, K-25, X-10, Paducah, and Portsmouth). MMES-WMD performs two primary functions for Y-12: management of the treatment, storage, and disposal of all wastes generated at the plant; and administration of Y-12's Waste Minimization Pollution Prevention Program. MMES-ECD develops environmental policies and procedures for the five ORO sites operated by MMES, reviews ongoing and proposed environmental programs at the plant, and performs independent oversight. MMES-ECD's relationship with MMES-EMD is formalized by assigning the MMES-EMD Manager two direct line reporting relationships, one to the HSE&A Manager and another to the MMES-ECD Director.

MK-F manages the planning, performance, and review of all construction activities at the five MMES-operated sites in ORO, based on specifications and designs from MMES. As such, it is responsible for maintaining environmental protection programs for all of its activities and those of its subcontractors.

JCWS performs four functions: operation and maintenance of the DOE potable water plant for ORNL, Y-12, and the City of Oak Ridge; maintenance of government-owned vehicles; facilities maintenance of roads, shoulders and ditches within ORR but outside the boundaries of the three reservation sites; and building maintenance for DOE's Office of Scientific and Technical Information. As a prime contractor to DOE, JCWS is responsible for maintaining compliance with all environmental requirements that apply to its activities.

MMES Y-12 Plant Organization

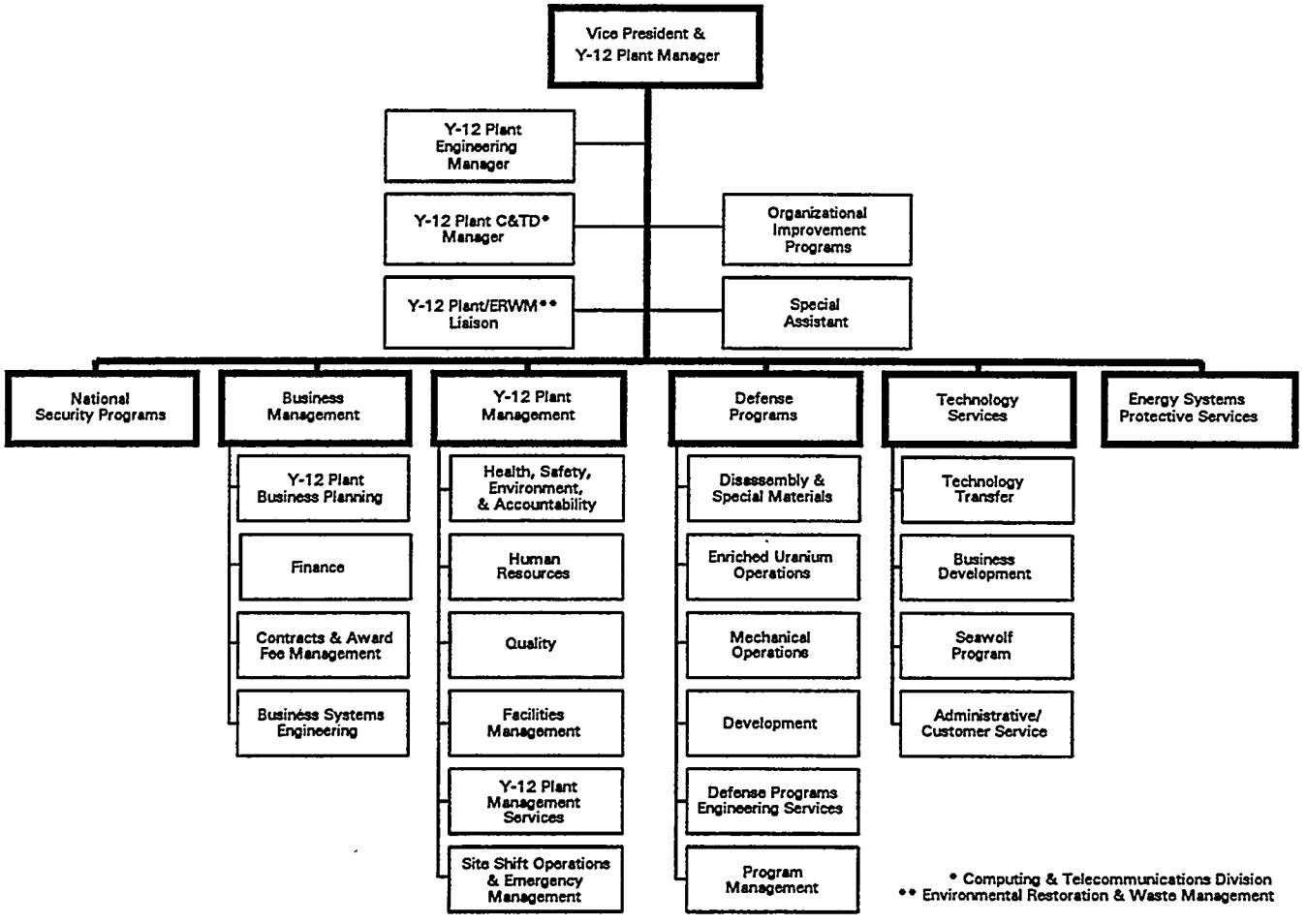

Figure 1-5: MMES Y-12 Plant Organization Chart

MMES Y-12 Plant
Environmental Management Department

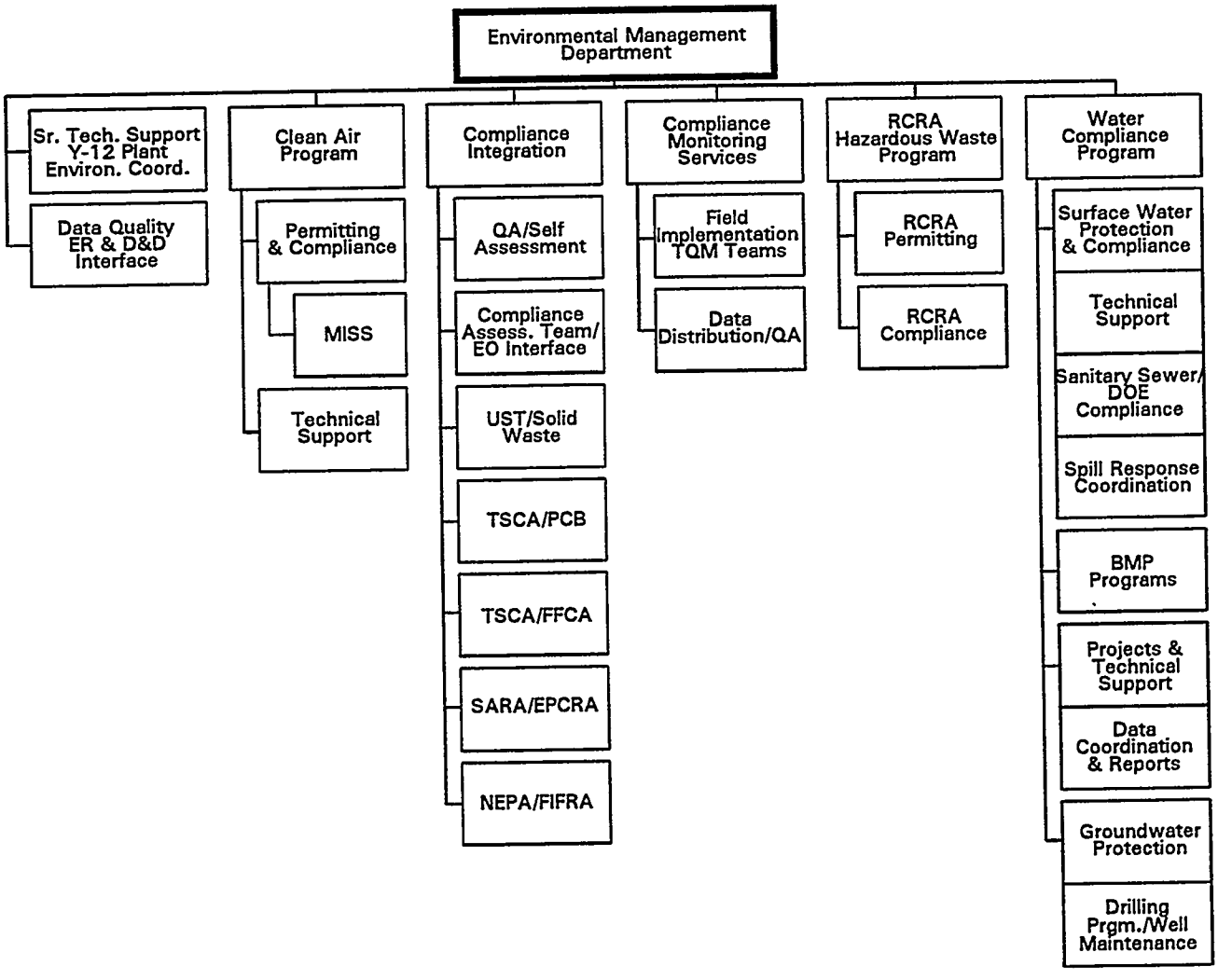

Figure 1-6: MMES Environmental Management Division Organization Chart

SECTION 2.0

SUMMARY OF ROUTINE ENVIRONMENTAL AUDIT RESULTS

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2.0 SUMMARY OF ENVIRONMENTAL AUDIT RESULTS

The following summarizes the results and conclusions of the Routine Environmental Audit of the Y-12 Plant conducted August 22—September 2, 1994. The conclusion of the audit team is that Y-12 has made progress in the management of its environmental programs since the 1990 Tiger Team assessment. This progress has occurred, in large measure, due to Y-12 management's conscious effort to integrate environmental activities into the facility's day-to-day activities.

2.1 Y-12 STRENGTHS

The audit team identified the following strengths in the Y-12 environmental program:

- Quality of Personnel. The quality and dedication exhibited by many people, both line and support, are important factors in the improvement in environmental operations at the Y-12 Plant. The compliance focus, dedication, perseverance, and ownership demonstrated by environmental and operations personnel are exemplary.

- Integration with Operations. A key—perhaps, *the* key—to a successful environmental program is that it be integrated into the day-to-day operations of the facility. Such integration was very much evident at the Y-12 Plant. Line personnel are informed of environmental responsibilities and resources available to them. The relationship between operations and environmental support is generally strong. Environmental awareness is good and proper authority and management support exists to effect necessary changes. Line organizations recognize that environmental compliance is their responsibility, not that of the ES&H organization. Roles and responsibilities are usually well-defined.

- Organizational Relationships. The audit team noted good working relationships between the various entities that affect the environmental program. Positive relationships and well-defined responsibilities exist among the MMES Environmental Management Department, line organizations, and the MMES environmental restoration and waste management organizations. Communication between the MK-F Environmental Services Group and MMES has improved in recent months.

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- Task Teams/Environmental Officers. Task teams are responsible for developing an MMES-wide program for implementing environmental requirements. They effectively develop consistent policy while

accommodating Y-12 input and ensuring that a Y-12 advocate exists. As a group, they also serve as an effective forum for DOE/contractor discussion of reservation-wide environmental issues, and as a means for keeping the players in contact. The environmental officer position also provides a valuable liaison function between the line divisions and the ES&H organization.

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  — There have been no RCRA compliance findings by regulators in the past 3 years.

  — A "swap shop" has been established to encourage recycling of materials. This is one of a number of initiatives in pollution prevention/waste minimization.

  — Y-12 has developed extensive waste management programs that have resulted in a decision by DOE Headquarters to lift the moratorium on the off-site shipment of certain hazardous wastes.

  — National Pollutant Discharge Elimination System (NPDES) exceedences have been reduced from 246 in 1989 to 14 in 1993 and 10 this year.

  — A program has been implemented to trace drains to their destinations and reroute those that pose a problem.

  - The Risk-Based Prioritization System (RBPS) funds virtually all environmental compliance projects.

  - A major stack and effluent monitoring system upgrade has been accomplished for National Emission Standards for Hazardous Air Pollutants (NESHAP) regulations.

- Risk-Based Prioritization System. The RBPS is quite comprehensive, giving highest priority to compliance and other high-risk, ES&H items. The Y-12 and Environmental Restoration systems are similar and compatible, and their proponents interact. The environmental restoration system goes the further step of involving the stakeholders (regulators) in the process, and includes them in the scoring.

- Emergency Management. The emergency response function is quite mature. Occurrence reports are reviewed by the Emergency Management Department for determination of further action, and occurrence reports are tracked and trended. The Y-12 response capability has also supported the local community with off-site assistance.

2.2 KEY FINDING

The key finding presented below, in the judgment of the audit team, is integral to understanding the nature and scope of the environmental issues existing at Y-12.

Environmental Commitment. The environmental compliance emphasis at the Y-12 Plant has resulted in significant progress. As the goal of total compliance moves closer to becoming reality, management must refocus its sights on environmental excellence. Given its progress, Y-12 now is in position to reach such a goal. In addition, Y-12 has made inroads made toward environmental excellence, particularly in the area of pollution prevention/waste minimization. The high environmental standards alluded to in the Y-12 Mission Statement, however, have not yet been defined and translated into implementing policies, programs, and procedures. This should include reference to, and elevation of the priority of, the relevant non-regulatory aspects of the DOE Orders that currently do not receive the attention devoted to regulatory compliance.

2.3 FINDINGS SUMMARY

During the audit, seven findings were identified; six were in the environmental management systems area, and one related to specific technical disciplines. Table 2-1 presents the finding numbers and titles.

Organizational Structure (OS): There were no findings in this portion of the audit. The roles, responsibilities, and authorities within line organizations and between line organizations and the ES&H support organizations are generally clearly defined and communicated. The overview for the OS section notes opportunities for improvement, but none of such significance to constitute a finding. An overview of this discipline is found in Section 3.1.1.

Environmental Commitment (EC): There was one finding in this portion of the audit. This related to a need for management commitment and associated systems to go beyond compliance to Y-12's stated goal of environmental excellence. Management commitment to environmental compliance has produced laudable results. What remains is to apply this same level of emphasis to excellence. An overview of this discipline is found in Section 3.2.1.

Environmental Protection Programs (EP): There was one finding in this portion of the audit. This finding related to inadequate incorporation of the non-regulatory aspects of DOE 5400.1 and 5400.5 into MMES's environmental protection programs. The emphasis is primarily on air monitoring and environmental ALARA (as low as reasonably achievable) programs. An overview of this discipline is found in Section 3.3.1.

Formality of Environmental Programs (FP): There was one finding in this portion of the audit. This related to procedures that were found to be either inadequate or missing in the areas of environmental monitoring and surveillance. An overview of this discipline is found in Section 3.4.1.

TABLE 2-1

ROUTINE ENVIRONMENTAL AUDIT TEAM FINDINGS

Finding Number	Title of Finding	Page No.
Organizational Structure (OS)		
	No findings identified	
Environmental Commitment (EC)		
EC-1	Y-12's Environmental Commitment	3-10
Environmental Protection Programs (EP)		
EP-1	Environmental Protection Programs	3-18
Formality of Environmental Programs (FP)		
FP-1	Y-12 Procedures for Environmental Program Activities	3-24
Internal and External Communication (IC)		
	No findings identified	
Staff Resources, Training, and Development (SR)		
SR-1	Environmental Officer Training	3-38
SR-2	Environmental Performance Evaluations	3-40
Program Evaluation, Reporting, and Corrective Action (PE)		
PE-1	Implementation of Corrective Action Plans	3-44
PE-2	ORO Oversight of JCWS	3-46
Environmental Planning and Risk Management (RM)		
	No findings identified	

Internal and External Communication (IC): There were no findings in this portion of the audit. Internal communications within the organization structure worked well, both formally and informally. Communication with the affected public, regulators, and other stakeholders is frequent and open. An overview of this discipline is found in Section 3.5.1.

Staff Resources, Training, and Development (SR) There were two findings in this portion of the audit. The first related to the lack of a formal training program for Environmental Officers; the second related to a lack of guidance to managers on evaluating employees' environmental performance. An overview of this discipline is found in Section 3.6.1.

Program Evaluation, Reporting and Corrective Action (PE): There were two findings in this portion of the audit. The first relates to an insufficiently broad and technical approach to developing and closing corrective action plans. The other concerns inadequate oversight by ORO of the environmental performance of Johnson Control World Services (JCWS). An overview of this discipline is found in Section 3.7.1.

Environmental Planning and Risk Management (RM): There were no findings in this portion of the audit. The Y-12 Risk-Based Prioritization System is a strength in the program. An overview of this discipline is found in Section 3.8.1.

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SECTION 3.0

ROUTINE ENVIRONMENTAL AUDIT OVERVIEWS AND FINDINGS

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3.0 ROUTINE ENVIRONMENTAL AUDIT OVERVIEWS AND FINDINGS

The audit findings in the following pages are not necessarily presented in order of importance. Rather, they are grouped by area of investigation, as listed in the Protocols for Conducting Environmental Management Assessments of DOE Organizations. The protocols are a primary resource used by the Office of Environmental Audit (EH-24) to conduct this type of audit. In addition to the protocols, the audit team consulted the DOE Environmental Audit Program Guidance and Performance Objectives and Criteria for Conducting DOE Environmental Audits.

Findings identified during the 1990 Tiger Team assessment that have not yet been corrected were not specifically included in this report, although some Tiger Team findings with overdue corrective actions were evaluated. Although the scope of this audit was comprehensive, the observations developed as supporting evidence for findings were based on sampling a limited selection of environmental disciplines.

Each area of investigation is introduced by an overview that describes: (1) the approach taken by the management or technical specialist in conducting the audit of that area; (2) Y-12 programs and activities related to the area of investigation; (3) characterization of the strengths and weaknesses of Y-12 activities; and (4) a brief summary of the auditor's findings. Each finding is organized into three sections: the performance objectives, the finding statement, and a discussion of the details of the finding. The performance objective specifies the particular practices or standards against which the finding is evaluated. In many cases, where the phrase "best management practice" appears in the performance objective, there are no specific regulatory or DOE references cited. Where this occurs, the best management practice is often based on the protocols described above.

The finding statement concisely describes the issue that requires resolution. The discussion section sets out in detail the facts and observations that support the finding in the technical disciplines (i.e., air, surface water, groundwater, waste management, toxic and chemical materials, environmental radiation, and inactive waste sites).

Within each finding or overview, references to findings, interviews, and documents are made parenthetically. For example, in the reference "(see Finding OS-1)," "OS" stands for "Organizational Structure," and "1" is the finding number. Abbreviations include the following:

OS	Organizational Structure
EC	Environmental Commitment
EP	Environmental Protection Programs
FP	Formality of Environmental Programs
IC	Internal and External Communication
SR	Staff Resources, Training, and Development

PE	Program Evaluation, Reporting, and Corrective Action
RM	Environmental Planning and Risk Management

These abbreviations are used rather than the more conventional designations for environmental management findings to enable the reader to determine more easily the specific area of investigation to which the finding relates. Findings in the technical disciplines are in the section of this report entitled "Environmental Protection Programs" and will be preceded by "EP."

Several specialists on the audit team covered more than one area listed above. In those cases, specialists conducted interviews and document reviews with multiple areas of responsibility in mind. To reduce duplication in referencing interviews and documents, they are identified as follows: in the reference "(I-A-1)," "I" signifies an interview, "A" an individual team member, and "1" the sequential interview number. Documents referenced for this audit are designated first by the letter "D" for document, followed by the letter designating each specialist (as listed below), followed by a sequential number (e.g., D-A-1). The lists of documents reviewed and interviews conducted are presented in Appendices D and E, respectively.

Designator Letter	Team Member
A	Mark Pine
B	Ray F. Machacek
C	David J. Allard
D	Karen L. Jones
E	Paul E. Flaherty
F	Joseph Lischinsky

3.1 ORGANIZATIONAL STRUCTURE

3.1.1 Overview

The purpose of the organizational structure portion of the Y-12 Plant routine environmental audit was to evaluate whether Y-12's organization is structured to promote environmental management that is effective and consistent with environmental regulations and DOE policy. Specifically, with respect to the environmental management function, the objectives of this portion of the audit were to determine whether:

- The organizational structure is characterized by clear lines of authority and responsibility;
- Environmental roles, responsibilities, and reporting relationships are well defined, clearly communicated, understood, and effectively integrated into the overall organizational structure;
- Environmental managers have sufficient organizational stature, independence, and authority to effectively implement environmental programs;
- Environmental staff and line management are accountable for environmental performance; and
- A group independent of line management is responsible for policy and standards development, oversight, and technical support.

The general approach to the audit included a review of documents provided by Y-12 and DOE as well as onsite interviews with key personnel. Documents reviewed included organization charts, mission statements, policy manuals, job descriptions, performance appraisal forms, and other relevant documents that describe the organizational structure, environmental management function, and environmental roles and responsibilities of Y-12, DOE's offices of Defense Programs (DP), Environmental Management (EM), and Energy Research (ER); ORO; YSO; MMES; MK-F; and JCWS. Interviews were conducted with selected MMES, MK-F, and JCWS managers and staff. DOE personnel from DP, EM, ER, ORO, and YSO also were interviewed to better understand the chain of command and determine their roles in overseeing environmental management activities at the Y-12 Plant. A list of regulations, requirements, and guidelines used in this audit is provided in Appendix F.

Environmental Management Structure

DP is Y-12's landlord, and ER and EM also have operations at the plant (ER's operations are limited to a large biology laboratory and other ORNL activities, and EM conducts environmental restoration and waste management operations). Therefore, each of the three Cognizant Secretarial Offices (CSOs) has some responsibility for environmental performance at the Y-12 Plant.

These three CSOs delegate to ORO the overall responsibility for all environmental monitoring, compliance, and protection activities at the Y-12 Plant. ORO has assigned

these responsibilities to four organizations: YSO, the ORO Environmental Restoration Division (ORO-ERD), the ORO Waste Management and Technology Development Division (ORO-WMD), and the ORO Engineering Services Division (ORO-ESD). ORO's environmental matrix support organization, the ORO Environmental Protection Division (ORO-ENVPD), lends environmental technical and administrative support to each of the four organizations.

YSO performs the functions of site landlord for DP, and is responsible for all environmental activities at the site except those conducted under the ORO Assistant Manager for Environmental Restoration and Waste Management (AMERWM) and Assistant Manager for Construction and Engineering (AMCE). Both ORO-ERD and ORO-WMD report to AMERWM. ORO-ESD reports to AMCE. ORO-ERD has responsibility for the oversight of all environmental restoration activities at the Y-12 Plant. ORO-WMD is responsible for overseeing the management of all wastes generated at Y-12. ORO-ESD is responsible for the contractual relationship, oversight, and interface with MK-F and JCWS. YSO, ORO-ERD, ORO-WMD, and ORO-ESD each has a contracting officer's representative (COR) who is responsible for managing the contractual relationships with the prime contractors on the site (i.e., MMES, MK-F, and JCWS) and for providing direction and supervision to the contractors.

MMES, the primary contractor for Y-12, has direct responsibility for managing, implementing, and conducting environmental program activities at the Y-12 Plant. The MMES Y-12 Plant Manager has delegated these responsibilities to line and support organizations. Line division managers and their employees are responsible for operating in a manner that maintains environmental protection and compliance. They are supported by the MMES Y-12 Environmental Management Department (MMES-EMD), which helps identify and provide guidance on regulatory requirements and DOE Orders, develops plant-specific policies and procedures, assists in obtaining environmental permits, and performs oversight. Each division manager has one or more environmental officers (EOs) who coordinate the division environmental program activities, act as a liaison to MMES-EMD, provide division personnel with supplementary guidance, and implement the division's environmental surveillance program. The EOs report directly to their respective division managers and also have a matrix reporting relationship with the MMES-EMD Manager.

Three other MMES organizations with environmental responsibilities at the plant report to MMES Central, which manages activities at all three ORR sites (i.e., Y-12, K-25, X-10) and environmental restoration activities at the Paducah and Portsmouth Gaseous Diffusion Plants, rather than to the MMES Y-12 Plant Manager; however, two of the organizations have "dotted-line" reporting relationships through the Y-12 Manager of Health, Safety, Environment and Accountability (HSE&A). The two organizations with dotted-line reporting relationships are the MMES Environmental Restoration Division (MMES-ERD), and the MMES Waste Management Division (MMES-WMD). The third MMES Central organization is the MMES Environmental Compliance Division (MMES-ECD). MMES-ERD manages the environmental cleanup process, from identification of remediation sites to final closure. MMES-WMD performs two primary functions: management of the treatment, storage, and disposal of all wastes generated at the plant; and administration of Y-12's waste minimization pollution prevention program. MMES-ECD develops environmental policies and procedures for the five ORO sites operated by MMES, reviews ongoing and proposed environmental programs at the plant, and performs independent oversight. MMES-ECD's relationship with MMES-EMD is formalized by assigning to the MMES-EMD Manager two

direct-line reporting relationships, one to the HSE&A Manager and another to the MMES-ECD Director.

Overall, MMES's organizational structure at the Y-12 Plant is designed to match DOE's, with the following counterpart relationships:

- the YSO Site Manager and the MMES Y-12 Plant Manager;
- the YSO ES&H Branch Chief and the MMES HSE&A Manager;
- the ORO-ERD representative for Y-12 and the MMES-ERD Y-12 Program Manager; and
- the ORO-WMD representative for Y-12 and the MMES-WMD Y-12 Program Manager

MK-F manages the planning, performance, and review of all construction activities at the five MMES-operated ORO sites based on specifications and designs from MMES. As such, it is responsible for maintaining environmental protection programs for all of its activities and those of its subcontractors. The MK-F General Manager delegates this responsibility to both line and staff organizations. The MK-F Site Manager for Y-12, his employees, and subcontractors are responsible for maintaining compliance with environmental requirements. The MK-F Environmental Services Department supports each of the five Site Managers by providing guidance about compliance requirements and technical review of construction plans and projects. All wastes are segregated and transferred by MK-F to MMES-WMD for treatment and disposal. MMES-EMD and MMES-ECD also provide standards and permit conditions, and perform oversight of MK-F's onsite activities.

JCWS performs four functions: operation and maintenance of the DOE potable water plant for ORNL, Y-12, and the City of Oak Ridge; maintenance of government-owned vehicles; facilities maintenance of roads, shoulders and ditches within ORR but outside the boundaries of the three ORR sites; and limited building maintenance for DOE's Office of Scientific and Technical Information. As a prime contractor to DOE, JCWS is responsible for maintaining compliance with all environmental requirements that apply to its activities. The Project Manager for JCWS has delegated responsibility for compliance to the Operations Manager, who in turn has delegated it to the Superintendents for Water Treatment, and Vehicle and Heavy Equipment, and Building Maintenance. The two-person JCWS ES&H group provides some compliance support and oversight — primarily for waste management; additional support and oversight is coordinated on an as-requested basis by the DOE COR, who obtains it from ORO-ENVPD.

Effectiveness of Environmental Management Structure

The organizational structures of YSO, ORO, MMES, MK-F, and JCWS are generally characterized by clear lines of authority and responsibility that are well communicated to and understood by the members of these organizations. Interviews revealed a consistent perception of responsibilities and authority for environmental management at the site. This perception matched the organization charts and other formal organizational descriptions obtained for YSO; ORO-ENVPD, ORO-ERD, ORO-WMD, and ORO-ESD; MMES; MK-F; and JCWS.

One exception to the general clarity of these roles is a lack of certainty about the future of the MMES-EMD Manager's dual reporting relationships (i.e., for the past year, he has reported to both the HSE&A Manager and the MMES-ECD Director). Personnel within HSE&A were uncertain whether these two relationships should be expected to remain unchanged for the foreseeable future, or should be seen as a brief stage in a transition toward centralized environmental management support. The audit team concluded that centralization of this function could weaken the strong working relationships that MMES-EMD personnel have with Y-12 senior management and line personnel. The audit team went on to note, however, that HSE&A senior personnel had perceived no discrepancy to date in the expectations of MMES-EMD's two direct superiors, nor had line personnel seen any change in the way MMES-EMD provided its support services.

Line accountability for environmental protection within MMES is reinforced by individual performance reviews. These reviews call for supervisors to evaluate personnel on their support of ES&H policies, although there is a need to further define the criteria for this evaluation (see Finding SR-2). In addition, MMES's personnel discipline policy, which ranges from counseling to termination depending on severity of the issue, is initiated when an employee has caused a compliance violation. The audit team did not review the job descriptions or performance standards of MK-F or JCWS.

The individuals best informed about overall environmental conditions at Y-12 have adequate access to top management.

- At YSO, the ES&H Branch Chief assimilates the information from his three-person environmental staff, and is then two reporting steps removed from the primary decision-maker about Y-12 funds, the ORO Assistant Manager for Defense Programs.

- At MMES, the best-informed individual is the Plant Environmental Coordinator. On organization charts, this individual is four reporting steps removed from the Y-12 Plant Manager. In practice, however, the audit team found that this gap is bridged during monthly environmental status meetings; these meetings are attended by the Y-12 Plant Environmental Coordinator, the Plant Manager, and each of the three individuals between them on the organization chart.

- At MK-F, the managers of Environmental Compliance and of Environmental Technical Services both report to the Environmental Services Director, who reports directly to the Deputy General Manager.

- At JCWS, the safety technician reports to the ES&H Manager, who reports to the Project Manager.

The organizations responsible for policy development, technical support and oversight at each of the organizations at the Y-12 Plant have been provided adequate independence from line management.

- Within ORO, the Directors of ORO-ERD and ORO-WMD report to the AMERWM, while the Director of ORO-ENVPD reports to the Assistant

Manager for Environment, Safety and Quality; both of these assistant managers report directly to the ORO Manager.

- Within YSO, the ES&H Branch Chief reports directly to the YSO Site Manager.

- Within MMES, the QA/Self Assessment Manager reports to the Compliance Integration Manager, who reports to the Manager of MMES-EMD, who reports to the of HSE&A Manager, who reports to the Y-12 Site Manager, who reports to the Y-12 Plant Manager. The audit team noted not only the length of this chain, but that one individual before the plant manager—i.e., the site manager—is responsible for a line organization, the Facilities Management Department, whose operations have the potential to impact the environment. The Quality Division also performs independent oversight, and its Manager has only a two-step reporting chain to the Y-12 Plant Manager. The Quality Manager's direct superior, however, is again the Y-12 Site Manager. It should be noted that the audit team did not identify any problems attributable to the length of these chains or the reporting relationships with the Y-12 Site Manager, and as such did not develop a finding on the subject.

- Within MK-F, the Director of Environmental Services reports to the Deputy General Manager of Support Services, who reports to the General Manager.

- Finally, within JCWS, the Safety Technician reports to the ES&H Manager, who reports directly to the overall Project Manager.

In summary, the organizational structure portion of the audit revealed that DOE and contractor environmental management structures generally have clear and widely understood lines of authority, although the future reporting relationship of the MMES-EMD Manager to MMES Y-12 and MMES Central is unclear. The individuals best informed about environmental conditions at the plant have adequate access to top management. The organizations responsible for policy development, technical support, and oversight at each of the organizations at Y-12 have been provided adequate independence from line management, although the reporting distance between the oversight function and top management is long and includes an office with responsibility for operations that could potentially impact the environment.

Based on the above observations, no findings were identified in the organizational structure portion of the audit.

3.2 ENVIRONMENTAL COMMITMENT

3.2.1 Overview

The purpose of the environmental commitment portion of the Y-12 Plant routine environmental audit was to evaluate Y-12, YSO, and ORO personnel's overall awareness of relevant environmental issues and commitment to attaining environmental excellence. More specifically, the review included an assessment of senior management's support of and involvement in environmental issues and environmental policies; the distribution and understanding of these policies; and the extent to which all employees take personal responsibility for potential environmental impacts of their activities and decisions.

The general approach used in this portion of the audit included a review of documents provided by DOE and MMES, and interviews with selected Y-12 personnel. Documents reviewed included mission statements, environmental policy statements, implementation plans, and long-range plans. Interviews were conducted with ORO, YSO, and MMES staff in the environment, safety, and health (ES&H) and line organizations. A list of regulations, requirements, and guidelines used in this audit is provided in Appendix F.

DOE commitment is focused on working with MMES to meet a goal of total compliance. The YSO Mission Statement states the office's commitment to achieving excellence in several areas, including environmental quality. The Mission Statement further states that its goals will be "accomplished through teaming with . . . the operating contractor by establishment and implementation of the highest standards for: the protection of the environment . . . " The audit team noted that staff at the division director level and below indicated an awareness of environmental protection, and that it takes priority over operational issues (I-F-8, I-F-12, and I-F-22). YSO ES&H Branch environmental engineers and scientists assigned to the various media-specific programs meet with their respective section heads, the MMES Environmental Department Manager, and the Environmental Compliance Coordinator on a monthly basis to communicate environmental performance goals and review the status of programs (I-F-24).

MMES senior management has clearly committed itself to the pursuit of environmental compliance. The audit team noted measures to communicate environmental performance as a consideration in all operations. Examples include environmental compliance tracking, an Environmental Excellence Award program at the division level, and environmental performance charts and graphs posted in numerous locations throughout the site. The audit team concluded that senior management conveys environmental compliance as a priority to the various divisions, reinforced by a "positive discipline" program that responds to noncompliance using various disciplinary methods, including short-term compensated leave (I-F-1). MMES has a recognition and incentive system for good environmental performance as part of its Significant Awards program. Y-12 sponsors an Annual Award of Environmental Excellence for those groups that exhibit their commitment to environmental protection through actions and programs. The Enriched Uranium Division has won this award in the 2 years it has been offered.

Line personnel generally demonstrate a high level of responsibility and ownership for environmental compliance; interviews revealed significant knowledge of environmental programs (I-F-12 and I-F-22). Line management has demonstrated personal involvement and has emphasized its commitment to giving priority to environmental compliance.

The audit team observed that Y-12 has a high degree of environmental commitment related to programs driven by regulatory compliance, and that this commitment is supported by the line organization. However, the level of commitment was notably lower for programs with environmental risks but few regulatory drivers. Where there are measurable drivers, such as Federal and state regulations or permit conditions, a high degree of management attention was provided. Where compliance drivers are not as strong as in some DOE Orders, environmental management systems and measurement programs were not as well structured (see Findings EP-1 and EC-1).

Based on the documents reviewed and interviews conducted, Y-12 appears to demonstrate environmental commitment and an overall goal of environmental excellence through environmental regulatory compliance. Top management at YSO and MMES have demonstrated environmental commitment through a level of personal involvement which is visible to Y-12 Plant personnel and community stakeholders (I-F-18). Y-12, however, has not demonstrated a systematic approach for the implementation of the Secretary's guidance, the YSO Mission Statement, and the Y-12 Plant Health and Safety Policy for Environmental Protection to achieve the highest standards for the protection of the environment.

There is one finding in the environmental commitment portion of the audit, relating to a need for Y-12 to shift its goal from environmental compliance to environmental excellence.

3.2.2 Finding

EC-1: Y-12's Environmental Commitment

Performance Objective: The Secretary's Environment, Safety and Health (ES&H) Policy dated July 20, 1993, establishes daily excellence for protection of the worker, the public, and the environment as the hallmark and highest priority of all DOE activities. This policy also calls for a proactive program of continuous improvement to move DOE beyond minimum compliance with laws and regulations.

The YSO Mission Statement establishes the office's commitment to the achievement of excellence in several areas, including environmental quality. The YSO Mission Statement states that its goals will be "accomplished through teaming with . . . the operating contractor by establishment and implementation of the highest standards for: the protection of the environment . . . "

The MMES Y-12 Plant Health and Safety Policy for Environmental Protection states "The management of the Y-12 Plant is committed to strive for excellence in conduct of its operations in order to ensure protection of the environment. Work activities will be managed in order to reduce impact to the environment to levels as low as reasonably achievable (ALARA)." This policy further states that "A systematic evaluation process will be maintained to ensure compliance and to serve as a basis to identify actions to reduce risk of damage to the environment."

The Performance Objectives and Criteria for Conducting DOE Environmental Audits, Performance Objective EM.2, states that there should be a clear set of goals regarding environmental performance, and that these goals should be supported by all aspects of an environmental program. This policy should also consider compliance with environmental requirements, and provisions for environmental excellence that go beyond regulatory requirements.

Finding: Although Y-12 has demonstrated a strong commitment toward environmental regulatory compliance, YSO and MMES have not developed a systematic approach for the implementation of the Secretary's guidance, the YSO Mission Statement, and the Y-12 Plant Health and Safety Policy for Environmental Protection to achieve the highest standards for the protection of the environment.

Discussion: DOE environmental commitment at the YSO level is focused on working with MMES to meet a goal of total compliance. The audit team observed that Y-12 has a high degree of environmental commitment related to regulatory compliance-driven programs and that this commitment is supported by the line organizations. However, an inconsistency was noted between compliance-driven programs and programs which have environmental risks, but few regulatory drivers. Where there are measurable drivers, such as Federal and state regulations or permit conditions, a high degree of management attention is provided. Where compliance drivers are not so explicit, as in some of the DOE Orders, a lower degree of management attention is provided (see Finding EP-1).

The audit team concluded that YSO and MMES senior management demonstrate an understanding of environmental protection and regulatory compliance, but have not differentiated environmental excellence from a culture of compliance. Although individuals

interviewed by the audit team demonstrated a strong commitment toward environmental regulatory compliance, they consistently considered environmental excellence to be the meeting of compliance requirements (I-E-1, 2, 3, 5, 9, and 25, I-F-1, 2, 12, and 24). Despite the YSO mission and MMES policy statements, Y-12 has not developed any systematic approach for the " . . . implementation of the highest standards for: the protection of the environment . . .." In addition, MMES has not developed any systematic approach to achieve the goals of its policy specifically to reduce impact to the environment to levels as low as reasonably achievable and identify actions to reduce risk of damage to the environment.

The audit team observed the following specific examples that, taken together, indicate that environmental regulatory compliance, rather than environmental excellence, is the primary focus of environmental programs at the Y-12 Plant:

- In the MMES Risk Matrix used in the Risk-Based Prioritization Methodology for funding ES&H projects, compliance with DOE Orders is assigned a weighting factor half of that for compliance with laws or regulations (D-F-4). To date, this weighting factor has not caused compliance with DOE Orders to fall below the budget appropriation for a given fiscal year. This potential exists, however, and further indicates inconsistency between regulatory compliance-driven programs and programs with environmental risks, but few regulatory drivers. It should be noted that DOE considers its Orders to be equivalent to regulations.

- Y-12 fiscal budgets have decreased during the past several years, and the consensus across the site is that this trend will continue. Interviews with YSO and MMES personnel indicate that these budget constraints will cause best management practices (BMPs), which Y-12 often equates with exceeding compliance, to fall below the funding line. In addition, BMPs may not even be submitted for consideration unless they can be tied to a compliance issue (I-F-1, I-F-2, and I-F-7). The MMES Environmental Restoration and Waste Management organizations have implemented BMPs when funds in those budgets have been available, or return-on-investment (ROI) analyses support funding pollution prevention initiatives. Additional BMPs have been implemented for some programs under the direction of YSO when funding has been available.

- Y-12 has not tracked facility air emission changes as they may relate to potential onsite impacts. The resumption of firing coal as the primary fuel at the steam plant was not reviewed for its potential impact on onsite locations. The audit team concluded that a review should have been performed to assess potential sulfur dioxide impacts at onsite locations and determine if the site's monitoring program was sufficient to provide information as required by DOE 5400.1. This assessment was not performed because resumption of coal-firing was not considered by the Y-12 staff to be a significant operational change. Factored into this consideration was the fact that the resumption of coal-firing is allowed by the Tennessee Department of Environment and Conservation (TDEC) air permit, and therefore a regulatory requirement for the evaluation did not exist (see Finding EP-1).

- The major contributor to the site's air emissions of nitrogen, sulfur dioxide, carbon monoxide, and particulates is the Y-12 steam plant. This facility meets all permit conditions, but has not been evaluated to determine the feasibility of using low-sulfur coal to further reduce air emissions (see Finding EP-1).

- The Y-12 Plant environmental ALARA program does not meet all the requirements of DOE 5400.5, but the Y-12 Plant Policy for Environmental Protection ensures that activities will be managed in order to reduce impact to the environment to levels as low as reasonably achievable (see Finding EP-1).

3.3 ENVIRONMENTAL PROTECTION PROGRAMS

3.3.1 Overview

The purpose of the environmental protection programs portion of the Y-12 Plant routine environmental audit was to evaluate the extent to which Y-12 has developed and implemented specific environmental protection programs and plans as embodied in Federal, state, and local regulations; DOE Orders; and best management practices. Environmental programs were reviewed to determine their existence and effectiveness.

Specific environmental protection programs evaluated during this audit included air; surface water and groundwater protection; industrial wastewater discharges; potable water supply protection; environmental restoration; waste management; waste minimization and pollution prevention; toxic and chemical materials management; preventive maintenance activities; quality assurance; and environmental radiation. The focus of the review was on pollution control and abatement programs rather than National Environmental Policy Act (NEPA) or natural resource management programs. Formal environmental protection programs and/or plans required by DOE Orders or regulatory statutes that were evaluated included Environmental Protection Program Implementation Plan; Long Range Environmental Protection Plan; Waste Management Plan; Waste Minimization and Pollution Prevention Awareness Program Plan; Storm Water Pollution Prevention Plan; Environmental Monitoring and Surveillance Plan; groundwater protection management program; environmental restoration program; quality assurance program; and preventive maintenance program for pollution control equipment.

The general approach to the audit was to review DOE Orders and regulatory requirements, and background documents provided by Y-12 prior to the onsite portion of the audit. The onsite portion of the audit involved additional document review and extensive interviews with Y-12 staff from ORO, YSO, MMES, and MK-F. MMES and MK-F are the two main prime contractors at the Y-12 Plant. Members of the Tennessee Department of Environmental Conservation (TDEC) oversight group were also interviewed during the assessment. In addition, field verification activities were performed at a sample of the Y-12 Plant facilities. The main field verification activities involved the enriched uranium operations, the depleted uranium operations, the steam plant and associated coal storage areas, and the steam plant wastewater treatment plant. A list of regulations, requirements, and guidelines used in this audit is provided in Appendix F.

A major emphasis in this audit was the review of the Environmental Monitoring Plan (EMP) (D-E-1) and its implementation into the environmental protection programs. The audit team found that the current EMP, completed in September 1992, needs improvement in several areas. Among those areas are aspects of radiological effluent monitoring and surveillance. Improvement also is called for with respect to the design basis for monitoring non-radiological air pollutants. This is consistent with concerns raised by TDEC, as well as some issues partially identified in the ORO Functional Appraisal (D-E-18). The EMP is currently under revision.

The Y-12 Plant has many point source emission points with the greatest mass of air emissions attributable to the mostly coal-fired steam plant, which is a major source of sulfur dioxide, nitrogen oxides, carbon monoxide, and particulate air emissions. Y-12's uranium processing operations are the primary sources that are subject to the National

Emission Standards for Hazardous Air Pollutants (NESHAP) for the control of radioactive air emissions. The Y-12 Plant will also be subject to many of the new air regulations under development in response to the Clean Air Act Amendments of 1990. Perhaps the greatest impact to Y-12 will be to the Federal operating permit requirements that will likely dramatically increase the burden of demonstrating compliance with air pollution control requirements.

The National Pollutant Discharge Elimination System (NPDES) permit has been a major focus in the water programs at the Y-12 Plant. Y-12 has made progress in improving its NPDES compliance record in the past several years and is awaiting approval of a new NPDES permit from TDEC and EPA. A key aspect of the new permit will be the limits for mercury and biotoxicity. Discharge limits for these parameters will likely be difficult to attain and will present new challenges in NPDES compliance for Y-12 (I-E-4). It is also worth noting that Y-12's achievements in reducing chlorine in wastewater discharges has allowed renewed biological development in the East Fork Poplar Creek; the chlorine is related to the potable water supplied to the site, not to Y-12 process operations.

Another challenge for Y-12 is management of mixed and low-level radioactive wastes. Currently, the K-25 TSCA/RCRA Incinerator is capable of treating some of the Y-12 Plant's liquid wastes but not solid wastes. Y-12 is performing extensive self-monitoring activities related to its Resource Conservation Recovery Act (RCRA) compliance programs. These activities appear to be very successful in ensuring compliance, particularly in the storage areas (I-E-4). The Y-12 Plant hosts a number of treatment and storage facilities for hazardous and mixed wastes. Several of these facilities treat wastewater and are considered "permit by rule" under Federal and state hazardous waste regulations. Y-12 also treats and stores liquid radioactive mixed wastes, with units designed to remove metals from spent plating solutions and uranium-contaminated wastes. There are seven onsite facilities for treatment or storage of solid, low-level radioactive waste. In addition to the above facilities for radioactive and hazardous wastes, Y-12 hosts landfills that accept nonhazardous solid waste from ORR.

In 1989, Y-12 established a waste minimization and pollution prevention program. They developed a program plan and initiated an employee-awareness campaign to comply with Federal and state laws and DOE Orders. The framework of the program includes evaluation of processes for waste minimization opportunities; implementation of a waste minimization promotional campaign; development of a comprehensive waste-tracking network; and establishment of an information exchange network. The Y-12 program is consistent with DOE's established waste management hierarchy of source reduction, recycling, safe waste treatment, and, when necessary, disposal in an environmentally sound manner. The Y-12 Plant has made progress in the areas of process modification, substitution and/or decreased use of hazardous materials, and improvements in housekeeping, maintenance, and inventory control. The MMES Waste Management Division (MMES-WMD) has overall program responsibility, and tracks and reports on approximately 1,400 waste streams. Recycling of paper and aluminum cans has been implemented at the Y-12 Plant. One weakness noted by the audit team was in the area of low-level radioactive waste minimization. At this time, new packing materials (i.e., cardboard boxes on pallets) are entering radiologically contaminated areas. Y-12 has received DOE Headquarters approval for a "return-on-investment" (ROI) proposal to install a "clean" unloading dock to mitigate this concern, and funding is expected shortly.

Uranium is the major radiological contaminant of concern at the Y-12 Plant. Both enriched (i.e., greater than 0.7 percent U^{235} by weight) and depleted (i.e., typically less than 0.2 percent U^{235} by weight) are processed in various facilities at the Y-12 Plant. Both the air and liquid effluent pathways have the greatest potential for release to the environment. Air effluents are regulated under EPA's NESHAP regulations. Radiologically contaminated liquid effluents are not specifically regulated by EPA and state NPDES regulations; however, Y-12 was required to develop a radiological monitoring plan for liquid effluents. During the past several years, Y-12 has made improvements in reducing both air and liquid effluent discharges of uranium. With the upgrade of stacks and radiological monitoring and control equipment (i.e., High Efficiency Particulate Air filters), as well as implementation of a program quality assurance plan, Y-12 has achieved compliance with the NESHAP radionuclide regulations. Additionally, all radionuclides discharged to surface or sanitary waste streams are within DOE's derived concentration guidelines.

The environmental as low as reasonably achievable (ALARA) program at the Y-12 Plant does not fully meet DOE guidance at the present. MMES has incorporated the environmental ALARA function into the plant-wide ALARA Steering Board, which also addresses occupational radiation protection, industrial hygiene, and safety. A separate Environmental ALARA Committee was formed in 1991, and a draft ALARA Program Plan was developed in 1993. ALARA goals were set for the Y-12 Plant in 1991, but the committee did not function under a program plan required by DOE Headquarters guidance. In order to improve effectiveness of the committee, MMES recently reorganized the Y-12 Pollution Prevention Committee to fulfill the function previously served by the Environmental ALARA Committee. Despite the fact that this issue is a portion of Finding EP-1, it is noteworthy that Y-12 has attempted to integrate this program into its operations since 1991. They are further ahead than many other DOE sites and therefore will be more likely to be compliant with the DOE's final 10 CFR 834 once published (expected Autumn 1994).

The environmental restoration program at the Y-12 Plant has a number of environmental cleanup issues, including a groundwater plume leaving the eastern portion of ORR and two other contaminated groundwater plumes. The full extent of the groundwater plume leaving the eastern portion of ORR has not been determined; a more extensive groundwater sampling program is underway. The environmental restoration program includes the cleanup of former burial grounds and disposal lagoons located near the Y-12 Plant.

The underground storage tank (UST) program at the Y-12 Plant is in excellent condition; all tanks installed before 1986 have been removed. There are seven underground petroleum tanks in operation that were installed between 1986 and 1988, and these tanks have been upgraded and tested in accordance with UST regulations. USTs have been installed at the new fuel station at the east end of the Y-12 Plant. According to Y-12, the new tanks meet all of the current requirements for USTs.

There are several concerns pertaining to the Spill Prevention, Control, and Countermeasures Program. In 1986, MMES developed a design standard for the secondary containment of storage tanks constructed after 1986; however, MMES decided to exclude the existing storage tanks. There are tanks at the Y-12 Plant which do not meet the Energy Systems standard written for newly constructed tank systems. In addition, an incident occurred in December 1993 at the lithium processing area that

probably allowed hazardous waste to reach the East Fork Poplar Creek from storage tanks with secondary containment.

Y-12 has developed a Comprehensive Groundwater Monitoring Plan to comply with DOE 5400.1. The monitoring plan addresses assessment of groundwater plumes resulting from solid waste management units and underground storage tanks, and attempts to identify contamination exit pathways in the vicinity of the Y-12 Plant. The complicated structure of the geological formation beneath the Y-12 Plant (i.e., the presence of Maynardville limestone) makes assessment of the groundwater flow direction and contamination exit pathways difficult. This may have delayed the identification of contamination in the Union Valley Industrial Park as possibly originating from the Y-12 Plant.

The Y-12 Plant has a DOE-owned water treatment facility that is managed by JCWS and supplies potable water to Y-12, Oak Ridge National Laboratory, and the City of Oak Ridge. It is classified by the TDEC Division of Water Supply as a "non-transient, non-community" water distribution system. Water is drawn from the Clinch River, treated, and chlorinated prior to distribution. Recent changes to the Safe Drinking Water Act have required compliance monitoring for lead and copper. Compliance was demonstrated through testing over two consecutive 6-month sampling periods, and TDEC has approved a reduced monitoring requirement. Y-12 has also implemented a backflow prevention program to prevent cross-connections with contamination sources.

During the last several years, Y-12 has significantly upgraded its Emergency Response Program for compliance with DOE Orders. It has identified through self-assessment several tasks that still require action. Nonetheless, the program appears to be well documented and organized. Building hazard assessments have been completed on a risk-prioritization basis. The audit team concluded that the Emergency Response Program would be capable of responding to an onsite or offsite release of hazardous materials or radionuclides to the environment. However, there appears to be a lack of formal documentation in the Emergency Response Procedures, as noted in Finding FP-1.

Both air and liquid pollution control and monitoring equipment are on routine maintenance schedules. A sample of the pollution control and maintenance activities at the steam plant was reviewed, including the preventive maintenance procedures for baghouses that control particulate emissions from the coal-fired boilers. The audit team concluded that procedures are in place for preventive maintenance per manufacturer's recommended practices, and that these procedures are implemented at the steam plant (I-E-15). A review of data from the continuous opacity monitors (D-E-4) reinforced this conclusion. The high degree of cleanliness observed at the steam plant, including the boilers, also was noteworthy. This degree of cleanliness is not easily achieved in coal-fired plants. There were no findings in this program area.

The environmental compliance responsibilities for the Y-12 Plant have been placed with the line organizations. It is evident from the interviews and field verification results of the audit that this responsibility is acknowledged and accepted. Line organizations and support and oversight groups seem to work very well together, recognize their mutual responsibilities, and consequently appear to have a very strong environmental regulatory compliance program. Evidence of commitment to ensuring that Y-12 operations are conducted in compliance with environmental regulatory compliance requirements was strongly visible from the implementation levels up through senior management. Weekly

reports on the status of potential regulatory non-compliance issues are generated by the MMES Compliance Integration Section and discussed with MMES senior management. Monthly meetings with senior management are also held to discuss and review progress on these potential non-compliance issues.

Y-12 is overseen by the TDEC DOE Oversight group (TDEC/DOE-O) as part of the Tennessee Oversight Agreement. Interviews with TDEC/DOE-O indicated that YSO and contractors were doing an excellent job in performing environmental protection duties and in communicating with the agency.

In summary, the audit team found that Y-12 has made substantial progress in the development and implementation of its environmental protection programs, particularly with respect to regulatory compliance issues. This statement was supported by TDEC's oversight personnel, as well as by many Y-12 managers interviewed by the audit team. Numerous problems were noted, however, with elements of DOE 5400.1 relating to the EMP's design criteria, rationale, and performance of critical pathway analysis. In addition, Y-12 has attempted to implement an environmental ALARA program, but this program does not satisfy the requirements of DOE 5400.5. These issues are presented in greater detail in one overall finding for the environmental protection programs portion of the audit, relating to implementation of non-regulatory aspects of DOE 5400.1 and 5400.5.

3.3.2 Finding

EP-1 Environmental Protection Programs

Performance Objective: DOE 5400.1, "General Environmental Protection Program," establishes environmental protection program requirements, authorities, and responsibilities for assuring compliance with applicable laws and regulations, Executive Orders, and internal DOE policies. The Order states "It is DOE's Policy to conduct its operations in an environmentally safe and sound manner . . . and to anticipate and address potential environmental problems before they pose a threat to the quality of the environment or the public welfare . . . "

DOE 5400.5, "Radiation Protection of the Public and Environment," states "It is DOE's objective to operate its facilities and conduct its activities so that radiation exposures to members of the public are maintained within the limits established in this Order and to control radioactive contamination through the management of real and personal property. It is also a DOE objective that potential exposures to members of the public be as far below the limits as is reasonably achievable (ALARA) and that DOE facilities have the capabilities, consistent with the types of operation conducted, to monitor routine and non-routine releases and to assess doses to members of the public. In addition to providing protection to members of the public, it is DOE's objective to protect the environment from radioactive contamination to the extent practical."

Finding: MMES's environmental protection programs do not adequately incorporate the non-regulatory aspects of DOE 5400.1 and DOE 5400.5.

Discussion: The audit team reviewed key components of the environmental protection programs that are required by DOE 5400.1 and DOE 5400.5. The results of this review indicated that environmental protection programs at Y-12 comply with applicable Federal and state regulations; however, they do not always meet the intent of the non-regulatory aspects of DOE Orders, although Y-12 has recently developed a formal assessment program that includes compliance with DOE Orders.

The following deficiencies were identified in the implementation and development of the Environmental Monitoring and Surveillance Program, the Environmental Monitoring Plan (EMP), and the environmental ALARA Program:

Non-Radiological Effluents

- A comprehensive, technically rigorous evaluation of ambient air monitoring requirements has not been conducted. This statement is supported by the following information:

  — The EMP ambient surveillance sections do not specifically address DOE 5400.1's requirement for addressing onsite, as well as offsite, impacts (D-E-1).

  — Y-12 has not tracked facility air emission changes as they may relate to potential onsite impacts. For example, resumption of significant coal-firing at the steam plant in January 1994 has resulted in a large

increase in actual sulfur dioxide (SO_2) emissions since 1990 (in 1990, the Y-12 ambient SO_2 monitoring system was discontinued). During the 1980s, the power plant was predominantly coal-fired. The resumption of coal-firing as the primary source of fuel at the coal plant was not reviewed for its potential impact on onsite locations. In addition to possible environmental impacts related to SO_2, synergistic effects on vegetation have been known to occur due to the interaction between nitrogen oxides and SO_2. This assessment was not performed, partially because the resumption of coal-firing is allowed in the TDEC air permit; thus a regulatory requirement for the evaluation did not exist (D-E-3).

- Y-12 has not evaluated the need for modifications to the ambient air monitoring network related to actual or projected non-radiological air emission changes. Thus, the Y-12 Plant monitoring network may not be providing sufficient information to ensure that Y-12 is anticipating and addressing potential environmental impacts before they pose a threat to environmental quality or welfare, as required by DOE 5400.1.

- Locational criteria for the ambient air monitoring network defined in the EMP (Section 4.1.2.3) do not include an evaluation of locations where elevations are higher than stack-top elevations. Given the close proximity of such elevations to the emission points at the Y-12 Plant, this element may have a critical impact on locational criteria for siting monitors as well as the identification of the magnitude of potential impacts.

- Apparently, some evaluations of steam plant operations related to ambient air impacts in high terrain were performed, but they are not referenced in the EMP. In addition, one of these evaluations focused on the plant's SO_2 impacts at locations above stack-top. The modeling for this evaluation was based on maximum permitted conditions, however, even though maximum impacts at elevated receptors could occur with lower loads due to the reduced plume rise associated with these operations. Thus, the EMP does not include a complete basis for siting and design of the Y-12 Plant ambient air monitoring network.

- The EMP description of site operations and air emissions (Section 2.3.4.1) identifies air emissions from the Y-12 Plant as almost exclusively related to plant uranium operations. This is an incorrect statement; greater than 95 percent of the Y-12 Plant's air emissions are pollutants from the steam plant, which is defined by Federal regulations as a "major source" for nitrogen oxide, SO_2, carbon monoxide, and particulates.

- The report (D-E-6) prepared to justify discontinuing the Y-12 Plant ambient air monitoring network did not adequately address the decision-making process according to the requirements of DOE 5400.1 (see Finding PE-1).

- Under the requirements of DOE 5400.1, Y-12 did not characterize the leading edge of the groundwater plume of heavier-than-water volatile organic compounds until after it apparently had left the eastern edge of ORR

(D-B-18). This apparently was related to the complex hydrogeological formations that mask the probably extent of the plume.

Radiological Environmental Monitoring and Surveillance

- MMES has not conducted an evaluation to establish various aspects of the radiological environmental/surveillance program required for the EMP (D-C-37). The need for radiological environmental sampling and analysis has not been evaluated in relation to an exposure pathway analysis specific to the Y-12 Plant's liquid and gaseous radionuclide effluents. Such an evaluation, coupled with relevant data, site-specific criteria and assumptions, and references, provides a basis for the selection of sampling locations and frequency, analytical parameters, equipment, and instrumentation. Further, the critical pathway of radionuclide transfer from one environmental medium to another, which can cause the largest portion of the applicable dose limit to a population sector, has not been assessed (I-C-4 and I-C-5) and documented in the 1992 or draft 1993 Annual Site Environmental Reports (D-C-38 and D-C-67) as per DOE/EH-0173T. The need for such an exposure pathway analysis was recognized by MMES environmental managers in 1992 and documented in the EMP.

- The older and more established radiological environmental monitoring and surveillance activities across Y-12 (i.e., surface water, groundwater, and airborne) appear to be adequately documented in the EMP with respect to design criteria and rationale. Other activities (e.g., soil and vegetation sampling, and direct radiation) are not adequately documented in the EMP, however, perhaps due to the lack of the above-noted evaluation and critical pathway analysis. For example, direct radiation monitoring at the Y-12 Plant is currently performed with pressurized ionization chambers (D-C-67; I-C-4). While such devices are quite accurate in most measurement scenarios, they have a reduced sensitivity for low-energy gamma-emitting uranium decay products deposited in the environment. Further, due to the relatively high cost versus thermoluminescent dosimeters, fewer monitoring stations may be employed; this has the potential for limiting the ability to ascertain background variability.

- Y-12 has recently completed a major capital project to upgrade stacks and radionuclide air effluent monitors in the uranium processing building(s) to comply with the National Emissions Standards for Hazardous Air Pollutants (NESHAP). With the completion of the Quality Assurance Project Plan (QAPP) (D-C-71) in 1992, all Federal Facilities Compliance Agreement milestones have been met; the Y-12 Plant is considered to be in compliance with the NESHAP regulations pertaining to radiological emissions (D-C-67). However, as a requirement of QAPP, Y-12 must characterize radionuclide emissions. At this time, Y-12 has assumed that stack air effluents for enriched or depleted uranium (EU or DU) are in equilibrium with respective radioactive decay products (D-C-71). For this reason, and measurement interference due to background radon^{222} decay products, radiometric filter sample analysis was discontinued (I-C-2). At this time, all stack air filter samples are analyzed for uranium via a chemical technique. This approach is

valid for EU and DU processing areas, except metal melting operations (e.g., foundry), where unsupported thorium^{234} and thorium^{231} decay products separate from the uranium^{238} and uranium^{235}, respectively. This effect is known to both building operations and the occupational health physics staff (I-C-11 and I-C-32).

Environmental ALARA Program

- The Y-12 Plant does not have an ALARA program that fully meets the functional environmental ALARA program requirements of DOE 5400.5 and DOE Policy signed by the Secretary of Energy on June 8, 1993, and published in the Federal Register (Vol. 58, No. 117, 33804).

- In 1991, the ALARA Steering Board included representatives from occupational radiation protection, industrial hygiene, safety, and environmental protection (D-C-72). This group drafted a Y-12 Plant ALARA Policy in late 1992 (D-C-74), which was issued in April 1993 (D-C-68). ALARA goals were established for 1992 and 1993 (D-C-7 and D-C-72), but it was not until January 1994 that an Environmental ALARA Program Plan was issued (D-C-75). The Environmental ALARA Committee was disbanded in June 1994, with the intent of using the Y-12 Pollution Prevention Council to implement the ALARA Program (D-C-24). At this time, the program plan is again under revision. No implementing procedures have been developed as yet for ALARA review methods (e.g., dose assessments, alternate process evaluations, etc.) (I-C-3 and I-C-13).

- During several Y-12 Plant building and area inspections, a number of practices were noted that appear contrary to the environmental ALARA philosophy and need to be evaluated, including:

  — outside storage of contaminated scrap metal;

  — outside storage of contaminated used drums;

  — outside storage of low-level radioactive waste containers;

  — outside contamination control areas unprotected from rain; and

  — manual radiological surveys of ORR solid waste by health physics technicians, per a statistical sampling of dumpsters, prior to disposal at the sanitary landfill, which may result in contaminated material above acceptance criteria entering the landfill (I-C-14).

The above observations were based on a comprehensive review of DOE 5400.1 and DOE 5400.5 requirements. Based on this review, the audit team questions the degree of compliance with the non-regulatory aspects of other DOE Orders. Some of these findings may have been noted by ORO during recent self-assessment.

3.4 FORMALITY OF ENVIRONMENTAL PROGRAMS

3.4.1 Overview

The purpose of the formality of environmental programs portion of the Y-12 Plant routine environmental audit was to determine whether environmental protection activities at the Y-12 Plant are being conducted in accordance with formal programs supported by documentation, inspections, and procedures. DOE 5480.19, "Conduct of Operations Requirements for DOE Facilities," provides requirements and guidelines for the development of directives, plans, and procedures relating to the conduct of operations. This Order states that it is DOE policy that facilities have procedures in place to control the conduct of their operations, and that these operations be managed with a consistent and auditable set of requirements.

This portion of the audit focused on evaluating the systems to track and translate regulatory requirements; to prepare and manage procedures for implementation of polices and programs; to use routine inspections to ensure compliance; and to maintain systems used for recordkeeping and reporting. The general approach included reviewing DOE Orders and background documents provided by MMES and DOE and interviews with managers at ORO, YSO, and MMES, and with staff at MMES who are directly responsible for these systems. A list of regulations, requirements, and guidelines used in this audit is provided in Appendix F.

MMES has several effective systems in place to track and translate environmental regulations. Regulatory tracking is conducted at MMES Central by task teams with participation from relevant Y-12 personnel, and it provides the Environmental Management Department (MMES-EMD) with timely information on both proposed and promulgated regulations. The specific requirements in the regulations are translated by MMES-EMD into procedures, and formally communicated to all divisions. Within MMES-EMD there are individuals responsible for each major Federal or state regulation, such as the Toxic Substances Control Act (TSCA), the Resource Conservation and Recovery Act (RCRA), and the National Pollutant Discharge Elimination System (NPDES). These individuals work with the appropriate line divisions to ensure proper implementation of the regulatory requirements in their areas.

The audit team found that the regulatory tracking was generally sound, even though in an isolated instance the task team for the Clean Air Act did not identify the requirements for purchasing gasoline with reduced vapor pressures until 3 years after the effective date. The Y-12 practice of designating an Environmental Officer (EO) for each line division should help facilitate regulatory management, especially after each EO receives a more formal training program. This audit found the regulatory tracking and integration provided by the task teams to be generally sound.

General guidance for environmental management at the Y-12 Plant comes from DOE Orders, and implementation plans and procedures within MMES. Requirements under DOE 5400.1 are discussed in the Y-12 Plant Environmental Protection Program Implementation Plan (EPPIP). In addition, there are four levels of procedures at MMES: Level One, or MMES procedures, apply to several sites; Level Two, or Y-12 sitewide Standard Practice Procedures apply to all divisions at the Y-12 Plant; and Level Three and Four procedures,

or Standard Operating Procedures, operate within a division or a department such as MMES-EMD.

While MMES has generally created and updated its procedures according to a formalized system, the system does not ensure creation of procedures that are comprehensive throughout all environmental program areas. The audit team noted that environmental monitoring and surveillance procedures are not completely developed at various levels and organizations (see FP-1).

The self-assessment groups in the MMES-EMD do an excellent job of formally conducting a variety of inspections for compliance and routine surveillance on a regular basis. For example, the satellite accumulation areas and 90-day accumulation areas for hazardous wastes are inspected weekly. Another example of inspection is the daily use of a "creek walker" to visually inspect the discharge from more than 100 outfalls for oil sheens or foam and to observe the general condition of the East Fork Poplar Creek. A final noteworthy example is the annual inspections of all buildings and grounds at the Y-12 Plant for environmental compliance.

The audit team did not examine the system for maintaining pollution control equipment nor did it examine how Y-12 prioritizes preventive maintenance, corrective maintenance or emergency maintenance.

The recordkeeping and reporting systems are generally good. There are computerized systems for the Y-12 Plant Manager and MMES-EMD that track commitments by date, action required, and responsible person. In addition, MMES-EMD holds weekly meetings to review the status of all open items to assure a timely response.

Overall, the formality of Y-12's environmental programs is adequate. However, there was one finding in the formality of enviuronmental programs portion of the audit, relating to the failure to develop certain environmental procedures (FP-1).

3.4.2 Finding

FP-1: Y-12 Procedures for Environmental Program Activities

Performance Objective: DOE 5480.19, "Conduct of Operations Requirements for DOE Facilities," states its purpose "To provide requirements and guidelines for Departmental elements to use in developing directives, plans, and/or procedures relating to the conduct of operations at DOE facilities. The implementation of these requirements and guidelines should result in improved quality and uniformity of operations." DOE 5480.19 also requires that facilities have procedures in place to control the conduct of their operations.

Performance Objectives and Criteria for Conducting Environmental Audits suggests that formal procedures be in place to implement environmental program activities on a day-to-day basis.

Finding: Y-12 does not have a complete and comprehensive set of formal procedures (upper- and lower-level) for managing and implementing its environmental programs.

Discussion: The Y-12 management system for development and review of new or revised MMES standards and procedures begins with a Procedures Configuration Control Board (PCCB) for Level One documents (D-C-79). This group provides direction for establishing and maintaining Level One procedures that are consistent with policy. The Central Policy Manager serves as chairperson of the PCCB, which reviews requests to develop new Level One procedures, and provides recommendations for procedure development and improvement. Within the 10-Series Administrative Procedures Manual, several procedures provide guidance on operating procedure development, revision, and control; writing operating procedures; and command media development. In order to develop a procedure, the command media development procedure requires concurrence by the Plant Procedures Coordinator (PPC). The PPC submits the request for intent to change or develop a procedure to the PCCB.

The procedures for various environmental activities at the Y-12 Plant are MMES Central environmental surveillance procedures (i.e., ES/ESH/INT-14) and those contained in several 40-, 50-, or 70-Series procedure manuals (D-C-60, 61, 81, and 82). Recently, it has been recognized that both upper- and lower-level procedure manuals need to be reassessed with respect to the transition in mission of the Y-12 Plant, and need to be fully compliant with DOE 5480.19 on conduct of operations (I-C-13 and I-C-37). On March 1, 1993, the Y-12 Plant Manager provided ORO with an implementation status and schedule (D-C-80). In addition to the above-noted initiative for adopting a single approach for procedures within MMES and the 10 organizations at the Y-12 Plant (D-C-80), the Environmental Management Department (MMES-EMD) has an ongoing effort to reevaluate procedures on an annual basis (I-C-2 and I-C-12).

Nevertheless, current procedures for activities that directly impact various environmental programs are not yet developed, or are missing relevant elements. Specific examples of environmental procedures noted by the audit team to be incomplete or lacking are noted below.

- The Environmental Surveillance Procedures Quality Control Program Manual (ES/ESH/INT-14) is not a quality control program manual; it is the MMES

Central Environmental Compliance Organization's environmental monitoring and surveillance manual (D-C-60). A major portion of the manual on field quality control is yet "to be issued" (TBI). Seventeen procedures are noted in the field quality control manual as TBI. Additionally, 18 procedures relating to various activities are noted in other manual sections as TBI. Below are several important examples:

— Sampling Potable Water Supplies;

— Sampling of Biological Materials;

— Sampling Multiphase Waste;

— Smear and Wipe Sampling for Radioactivity;

— Measurement of External Gamma Radiation;

— Sampling of Vegetation, Food Crops, and Milk;

— Sample Identification;

— Field Logbooks and Forms; and

— Sample Archive and Disposition.

In addition, many of the procedures for environmental monitoring and surveillance have not been revised since August 1988, and do not implement DOE Headquarters guidance on radiological effluent monitoring and environmental surveillance (DOE/EH-0173T).

- The conduct of operations implementation status report states that, for the area of emergency preparedness, Y-12 performance objectives would be clearly defined and documented regarding organizational structure in the functional areas of radiological environmental surveys, radiological accident assessment, technical support, etc. (D-C-80). These functional areas are not documented in the 40-Series Procedures (D-C-82) on emergencies, with respect to roles and responsibilities of Y-12 Plant personnel. This is especially relevant and notably lacking in the following procedures:

  — Response of Plant Emergency Personnel (Y40-003);

  — Reporting of and Responding to On-Site Hazardous Materials Releases (Y40-007);

  — Response of Off-Site Hazardous Material Spill (Y40-008); and

  — Organization Emergency Management Program (Y40-027).

  After discussions with Y-12 staff, the audit team concluded that an emergency would be handled appropriately. In fact, some of these functions

are addressed in the Emergency Operations Center (EOC) Reference Guide and in various individual job and task analysis summaries for each emergency response team. There is a concern, however, that the needed response is not formally documented in higher-level procedures, and the coordination with state and local emergency response organizations has not been documented (I-C-26, I-C-27, and I-C-28).

- There are in the Y-12 Plant 70-Series Health and Safety Procedures Manual, procedures regarding radiation, environmental affairs, and waste management, among others. A review of a sample of these procedures noted several concerns, as follows:

  — Criteria for Placing Continuous Samplers on Breakthrough Monitors on Point Sources (Y70-924) provides methods for estimating source term, dose-to-source term ratio, and criteria for sampling and monitoring. There is no guidance provided in this or other procedures on required EPA sampling methods, sample analysis (i.e., chemical versus radiometric), or need for periodic confirmatory measurements for 40 CFR 61, Subpart H requirements. This issue is addressed, however, in the NESHAP QA Program Plan.

  — Radiologically Contaminated Scrap Metal Management (Y70-309) establishes requirements for the management of radiologically contaminated scrap metal at the Y-12 Plant. The scope of this procedure notes management is to be performed in an environmentally sound manner. However, no criteria is provided for surface contamination that, if exceeded, would require appropriate containment and storage.

- Within the Y-12 Plant 50-Series Environmental Management Department Operating Procedures (D-C-61), there are 13 procedures covering various program aspects. However, there is no cross-reference to other applicable procedures at various levels up or down at the Y-12 Plant, or to the Central Compliance Organization's Environmental Surveillance Procedures. Thus, it appears that there are gaps in procedures for environmental effluent monitoring and surveillance. For example, there is a procedure noted for collection of samples from continuous samplers and breakthrough monitors, but no procedure for calibration is referenced.

- Lastly, it appears there is not a logical hierarchy regarding programmatic and operational procedures in the Y-12 Plant procedures series (i.e., 10-, 40-, 50-, and 70-series). For example, there are 10-Series Administrative Procedures Manual procedures for a Nuclear Materials Control and Accounting System, Identification and Control of Sensitive and Classified Information, mixed with procedures for Wood Pallet Control and Printer Toner Cartridges for Recycle. This is the most illustrative example, however, a similar concern relates to procedure organization within the various manuals used for environmental monitoring and surveillance activities. The issue is that of an appropriate flow-down of policy and procedures. MMES has recognized this problem and is planning to remedy this situation through

a major procedures manual(s) revision across all of its ORR sites (I-C-13 and I-C-37).

3.5 INTERNAL AND EXTERNAL COMMUNICATION

3.5.1 Overview

The purpose of the internal and external communication portion of the Y-12 Plant routine environmental audit was to determine whether there are formal and informal channels of communication to emphasize management's commitment to environmental protection and to engender a sense of environmental awareness and commitment throughout the organization. The following areas were evaluated by the audit team:

- Extent and effectiveness of routine management reporting of environmental performance and issues;
- Communication of environmental management activities among staff and line personnel and laterally across divisions; and
- Communication of information to external organizations such as regulatory agencies, environmental groups, and the community.

The emphasis of the internal communication portion of the audit was to determine if formal and/or informal channels have been established and are effective for top-down, bottom-up, and lateral communication of environmental information and lessons learned. External communication was reviewed to determine if Y-12 has proactive and positive relationships with external regulatory agencies, community groups, and other relevant external parties.

The general approach to this portion of the audit included a review of background documents provided by DOE and MMES, as well as onsite interviews with key personnel. Documents reviewed included DOE and MMES policies, procedures, guidance memoranda, newsletters, and other documents pertaining to environmental information exchange. Interviews were conducted with contractor personnel from MMES, MK-F, and JCWS; personnel from DOE's offices of Defense Programs (DP), Environmental Management (EM), and Energy Research (ER); ORO; and YSO. Officials from the Tennessee Department of Environment and Conservation (TDEC) who interact regularly with Y-12 were contacted. Interviews were also conducted with environmental groups and representatives of the local community. A list of regulations, requirements, and guidelines used in this audit is provided in Apopendix F.

Internal Communication

Formal channels for environmental communication exist through a series of reports and meetings at various levels across each of the Y-12 organizations. Some exampled from within DOE, and between DOE and the prime contractors, are:

- Monthly meetings on environmental program status between the YSO Environment, Safety and Health (ES&H) Branch and MMES Environmental Management Department (MMES-EMD) staff.
- Monthly meetings between the YSO Performance Evaluation Committees and top management of each of the three prime contractors (i.e., MMES, MK-F,

and JCWS). Environmental performance is on the agenda, and the YSO ES&H Branch Chief or members of his staff participate.

- A monthly "roll-up" report based on the weekly environmental performance reports of each of MMES's five ORO sites, delivered to YSO and the DOE site offices of the other four ORO sites managed by MMES. ORO's environmental matrix support organization, the Environmental Protection Division (ORO-ENVPD), also receives a copy.

- Bi-monthly meetings between staff members of the YSO ES&H Branch and the ORO Environmental Restoration (ORO-ERD) and Waste Management divisions (ORO-WMD).

- Monthly meetings of the DOE Contracting Officers' Representatives for the prime contractors at Y-12, with environmental issues on the agenda.

This exchange is reinforced by informal lines of communication. For example, the YSO ES&H Branch Chief and the MMES Site Manager find it convenient to meet several times per week because their offices are on the same floor. Similarly, frequent contact between the staffs of the ES&H Branch and the MMES-EMD is facilitated by their locations in nearly adjacent buildings. In fact, strong informal relationships between ORO, YSO, and MMES were generally observed in audit team interviews.

Within MMES, a number of formal channels of environmental communication were observed. For example:

- The MMES Environmental Compliance Division (MMES-ECD) chairs quarterly, program-specific task team meetings of environmental personnel from across the five MMES-managed ORO sites, with the intent of developing consistent program plans, policies, and procedures. Y-12 is represented by appropriate staff members of MMES-EMD; some teams also include observers, such as the division Environmental Officers (EOs) and environmental support specialists of YSO, ORO, MK-F, and JCWS. Examples of team subjects include MMES's programs for Clean Air, Clean Water, the Resource Conservation and Recovery Act (RCRA), and the Toxic Substances Control Act. The RCRA Task Team, the most active of these groups, frequently has several dozen attendees at its meetings.

- The MMES Y-12 Plant Manager holds a monthly meeting with the MMES Y-12 Site Manager, the HSE&A Manager, the MMES-EMD Manager, the Plant Environmental Coordinator, and the Compliance Integration Manager in order to discuss environmental performance status.

- MMES-EMD holds a monthly meeting with all division EOs to discuss their questions and concerns as well as new and proposed regulatory requirements, DOE Orders, and MMES policies and procedures.

- The Y-12 Pollution Prevention Council holds monthly meetings with the division Pollution Prevention Advocates to review initiatives, prioritize activities, and identify goals.

- The MMES Environmental Restoration Division (MMES-ERD) Y-12 Project Manager holds a weekly lunch discussion of restoration issues, which is open to all personnel.

- The MMES-ECD Director has a monthly meeting attended by the MMES-EMD Manager and his counterparts at the other MMES-managed ORO sites to discuss environmental performance.

- Formal communication of environmental requirements to line personnel occurs through "required readings" about new procedures. The subjects of these readings are generally selected by MMES-EMD and must be approved by the Y-12 Plant Manager. Other occasional modes of formal communication include memoranda from division directors or above, and division-wide or shift-wide meetings with senior management.

- Environmental awareness throughout the plant is reinforced by such mechanisms as a bimonthly newsletter on pollution prevention called *Awareness News*; periodic discussion forums organized by each of MMES-EMD's programs (the RCRA program is the most active, with bimonthly forums); and occasional messages via the plant newsletter, the plant's morning loudspeaker announcements, and displays in the plant cafeteria.

The primary mode of informal communication to line personnel is through division EOs. During the course of their daily activities—which include signing generators' waste characterization forms, performing environmental surveillances, investigating occurrences, and collecting information on waste streams, air emissions, water discharges, etc.—EOs also inform division personnel of environmental requirements and provide guidance on how to comply.

The EO function is supplemented in certain locations by a new Building Manager function. MMES has established Building Managers for six nuclear facilities with multiple-occupant organizations and hazard ratings that are among the plant's highest. The Building Managers act to further distribute information about environmental requirements and to identify ownership of environmental issues when disagreements occur. EOs and Building Managers also serve as some of the primary mechanisms for bottom-up communication of environmental questions and concerns, because line personnel have more frequent contact with their EOs than with MMES-EMD.

Despite these formal and informal methods for communicating environmental requirements within MMES, the audit team found a potentially significant breakdown in understanding of these requirements. In this instance, a line manager described scenarios in which he would not feel required to report process changes, when in fact each of these hypothetical process changes would necessitate such reporting. The audit team did not develop a finding on this isolated case of a purely hypothetical problem, but concluded that MMES could better communicate process change reporting instructions to line personnel.

Employees can use the MMES Ethics Hotline to anonymously communicate environmental concerns, according to senior management. Line personnel generally acknowledged the

hotline as an outlet for anonymous communication, but were frequently uncertain about whether it was an appropriate forum for environmental concerns.

Information exchange between MMES and the other prime contractors is accomplished in several forums, for example:

- The Director of MK-F's Environmental Services Department (MK-F-ESD) attends the MMES-ECD Director's monthly meetings.

- Personnel from MK-F-ESD and the JCWS Environmental Management group are "observer members" of particularly relevant monthly task teams. YSO and/or ORO personnel are also observer members on all teams.

- MK-F-ESD attends the monthly meetings between MMES-EMD and the EOs.

Despite these meetings, the audit team determined that communication between MMES and MK-F on the environmental aspects of construction projects can be improved. According to the "Interface Agreement" (formally titled Requirements for the Accomplishment of Construction Projects Utilizing a Construction Management Contractor) between the ORO Assistant Manager for Construction and Engineering, MMES, and MK-F, MMES is responsible for providing relevant permits and related technical guidance to MK-F. The agreement goes on to specify that "Direct contact between (MMES and MK-F) is recommended for the administration of programs (e.g., health, safety, environmental . . ." Although the audit team found that MMES is adequately providing permits, its technical guidance on permit conditions suffers from insufficiently frequent communication about ongoing projects with MK-F project managers and MK-F-ESD staff. The audit team noted that the Y-12 Health, Safety, Environment, and Accountability (HSE&A) organization has recently canceled its biweekly meetings to discuss such issues.

For its internal communication of environmental information, MK-F-ESD uses more limited, less formal channels. For example:

- At weekly meetings of Operations Department managers, the Director of MK-F-ESD is given time on the agenda to explain environmental requirements, which the managers are then expected to pass down through their organizations.

- A daily surveillance tour will be initiated in September 1994, with rotating responsibility among MK-F-ESD.

The audit team did not investigate anonymous communication mechanisms at MK-F, nor any internal communication mechanisms at JCWS.

External Communication

External communication related to environmental programs is performed primarily through the Tennessee Oversight Agreement (TOA) and the DOE Public Information Office. The TOA, effective May 13, 1991 (D-D-1), requires that DOE provide financial and technical support to TDEC for oversight of DOE activities at ORR. A DOE Oversight Division (TDEC/DOE-O) has been established in Oak Ridge. HSE&A is responsible for coordination

of TOA activities at the Y-12 Plant; a YSO environmental representative maintains oversight. Based on interviews with TDEC/DOE-O and MMES-EMD (I-D-6, 7, 17, 29, 30, and 33), it appears that Y-12 has maintained excellent communications with TDEC staff. Under the terms of the TOA, TDEC/DOE-O performs joint sampling operations at the Y-12 Plant and has been present for sampling activities and environmental assessments. TDEC/DOE-O stated that Y-12 has routinely communicated schedules for environmental sampling and assessments in a timely manner (I-D-29 and I-D-30). Y-12 has succeeded in "streamlining" the document declassification process to allow TDEC more prompt access to documents. Moreover, Y-12 has set aside a classified document review room to review classified documents.

As part of TOA and the Federal Facility Compliance Agreement (FFCA), DOE is required to develop a "quality-assured, consolidated data base of monitoring information that shall be shared on a near real-time basis with the State by way of electronic data processing". This system, known as the Oak Ridge Environmental Information System (OREIS), is rather new to TDEC. TDEC staff is beginning to receive training from MMES. The system will eventually include all monitoring data, but currently includes mostly environmental restoration and compliance monitoring information. Data are uploaded weekly into the system after undergoing a quality assurance check by MMES. The OREIS system has been reported to be user-friendly (I-D-7 and I-D-29).

In general, Y-12 has established an open relationship with the community. General public relations and community relations activities associated with environmental restoration activities under the FFCA and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) are primarily conducted through the DOE Public Information Office. The MMES Y-12 Public Affairs Manager attends public meetings, obtains answers to technical questions from the public, and directs all media materials concerning the Y-12 Plant.

Y-12 maintains a list of "stakeholders" who are notified of meetings, public relations events, emergency situations, and occurrences. Y-12 also periodically issues press releases and advertises in local newspapers (i.e., *The Oak Ridger* and the *Knoxville News Sentinel*). Based on interviews with key stakeholders including the Oak Ridge Chamber of Commerce and the Environmental Quality Advisory Board (EQAB), it appears that ORR has held many public meetings to discuss environmental issues. MMES Public Relations at the K-25 site manages community relations and public information for environmental restoration and waste management activities at ORR. Some members of the local community have complained that there is too much information and too many meetings. The frequent meetings and prolific environmental information has overwhelmed and confused the public. Some of these meetings, however, are required by the National Environmental Policy Act (NEPA), the Comprehensive Environmental Response, Compensation, and Liabilities Act (CERCLA), and other laws (I-D-26 and I-D-32).

Despite national attention on DOE environmental issues, local interest in Y-12 predominantly relates to economic matters. The most widely attended meetings were those in which significant local economic impacts, such as planned staff downsizing, were discussed. The meetings which address environmental issues generally are not well attended. (I-D-8 and I-D-26).

Several local organizations focus on Y-12 Plant environmental issues. These include the Local Oversight Committee, EQAB, and the Oak Ridge Environmental Peace Alliance. According to the EQAB chairperson, there is some concern that a newly proposed committee, to be chartered in accordance with the Federal Advisory Committee Act, will be superfluous because other grass roots organizations and committees already exist (I-D-32).

To keep apprised of local concerns and issues, DOE has assigned individuals to attend various public meetings and act as the primary points of contact for fielding questions. A staff person from ORO-ERD, for example, attends most EQAB meetings (I-D-32).

Formal and informal internal communication within and between ORO, YSO, and MMES was generally found to be adequately frequent and effective for reporting environmental expectations, performance, and concerns. An anonymous communication mechanism within MMES was found to be available and widely known, though somewhat poorly understood. Communication between MMES, MK-F, and JCWS was found to be accomplished through inclusion of MK-F and JCWS in various MMES meetings about environmental issues; however, MMES/MK-F communication was found to suffer from infrequent discussion of specific environmental requirements and concerns for construction projects. Internal communication within MK-F was found to be improving, although more limited than within MMES.

Overall, Y-12 has maintained excellent external communication with regulatory officials. TDEC/DOE-O raised no major concerns during the audit interviews and appears pleased with Y-12's ability to provide on a timely basis schedules of Y-12 activities; monitoring information; sampling data; and occurrence reports. Y-12 has also made arrangements to allow TDEC/DOE-O convenient access to knowledgeable technical personnel, documents, and environmental site activities such as internal audits and sampling. Although Y-12 lacks a history of public participation, it has rather quickly opened its doors and responds well to public requests for information, and regulatory requirements for public participation. Challenges now lie ahead for ORR and Y-12 to provide information in a focussed and coordinated manner because the public does not always recognize the distinctions between environmental issues at the Y-12 Plant and the entire ORR.

There were no findings identified in the internal and external communication portion of the audit.

3.6 STAFF RESOURCES, TRAINING, AND DEVELOPMENT

3.6.1 Overview

The purpose of the staff resources, training, and development portion of the Y-12 Plant routine environmental audit was to ensure that staff resources are sufficient to develop and implement the organization's environmental protection programs; that a formal program is in place to make certain that all personnel have received environmental protection training appropriate to their job responsibilities; that Y-12 has an effective strategy for restructuring the workforce to adapt to workforce reduction initiatives; and that the organization provides staff development and career advancement opportunities for environmental staff.

The general approach to this portion of the audit was to review documents from DOE and MMES pertaining to staff resources, training, and developmentthis included course descriptions and training bulletins, training records (computer data base files and hard-copy files), course evaluation forms, job descriptions, employee performance evaluation forms, staffing plans, and relevant procedures. The approach also included interviews with Y-12 staff who represent relevant administrative departments (e.g., human resources and training), MMES and MK-F environmental and line organization staff, and YSO personnel. A list of regulations, requirements, and guidelines used in this audit is provided in Appendix F.

Staffing

In general, environmental staffing levels appear sufficient to achieve environmental goals at the Y-12 Plant. Y-12 has experienced voluntary and involuntary staff reductions; however, reorganization, efficiency gains, and matrixing of staff have mitigated the impact of a reduced workforce, with the possible exception of the Quality Division. On May 12, 1994, DOE announced that approximately 1,100 to 1,400 jobs at ORR would be eliminated as a result of "declining budgets, shifts in programmatic emphasis, and improved management efficiencies." In the 2 months following this announcement, MMES completed a special retirement program which resulted in 1,382 MMES employees opting for the early retirement incentive program. Because voluntary departures exceeded original expectations, MMES issued only 101 layoff notices (I-D-11). MMES is already assessing job openings and will give first consideration to personnel already working at ORR facilities. During these staff reductions, the Y-12 workforce was reduced by 850 employees, mostly due to early retirement. In response to staff reductions, MMES managers (I-D-14, I-D-17, and I-D-33) have turned to frequent matrixing of staff, which has provided staff with broader professional experiences. Within the DOE organization, YSO provides oversight to ensure implementation of DOE Orders, policies, and objectives. YSO comprises 28 people, including 8 professional staff in the ES&H branch. Turnover has been low within YSO. No overall shortage of staff was noted because YSO has been able to matrix staff from outside the group. A job opening for a health physicist, however, has been open since March 1994.

In contrast to the significant staff reductions at the Y-12 Plant, the MMES Environmental Management Department (MMES-EMD) staff has been reduced by only five people. Several interviews with the Y-12 Health, Safety, Environment, and Accountability organization (HSE&A) indicated that staff resources are sufficient at this time (I-D-14, I-D-16, and I-D-17). The Quality Division, however, has undergone significant downsizing

as part of the MMES program to centralize certain functions among the three ORR sites. The Quality Systems Department has experienced actual staff reductions of 54 people during the past year (excluding those employees who have been matrixed to other divisions); the remaining 26 people have focused on more project-specific quality assurance (QA) at the expense of programmatic QA, which could affect Y-12's ability to improve overall environmental performance. In addition, staff reductions in the Quality Division may contribute to deficiencies in the Y-12 corrective action program (see Finding PE-1).

The technical experience and managerial backgrounds of key environmental staff appear to be appropriate for their responsibilities. The staff interviewed by the audit team were very knowledgeable on both technical and management issues. All of the 41 environmental professionals within MMES-EMD have Bachelor of Science degrees. The 17 environmental technicians in MMES-EMD have more than 100 years of combined experience. Because the size of the staff within MMES-EMD has remained stable and little turnover has occurred, the staff has continued to enhance experience and training.

MMES has a recognition and incentive system for good environmental performance as part of its Significant Awards program. Also, Y-12 sponsors the annual Award of Excellence for organizations that demonstrate performance excellence, as well as a specific Environmental Award of Excellence for those groups that exhibit their commitment to environmental protection through actions and programs. The Enriched Uranium Division (EU) has won the award for the 2 years the award has been given.

Although Y-12 has incentive systems in place for good environmental performance at the division level, few incentives exist for individual environmental performance. Specifically, MMES line organizations do not adequately assess the environmental performance of staff during the annual review process (see Finding SR-2).

Long-term staffing requirements are identified within MMES by the division directors and are verified by senior management. MMES-EMD currently has no immediate plans to increase staff. Outside subcontractor personnel are currently used for short-term, project-specific needs rather than long-term job assignments (I-D-11).

Training

The audit focused primarily on the MMES training organization. As a general observation, both MMES and ORO are undergoing transition to centralized and formalized training. Training-needs evaluations are also becoming more formalized within the MMES and ORO training organizations. ORO's Training and Development Division (ORR-TDD) oversees training of DOE employees at the Y-12 Plant; it also and develops and manages a central program for training, education, and human resource development to ensure that ORO personnel are technically competent and proficient. As an example, ORO-TDD will begin preparing baseline position standards for jobs. ORO-TDD is currently conducting interviews with ORO staff to develop "draft position standards" and will subsequently identify specific training and development needs through an "Individual Development Plan." YSO has completed position standards. Individual development plans, based upon the YSO position standards, are being finalized.

During the audit, the MMES Y-12 training organization was being reorganized in order to centralize training, eliminate redundancy, and standardize training among the three ORR sites (I-D-13). As part of this centralization, MMES founded the Center of Continuing Education to house four institutes: the Health and Safety Institute, the Environmental Management Institute, the Leadership and Organizational Effectiveness Institute, and the Basic Skills and Training Institute.

Y-12 uses a combination of classroom training, on-the-job training (OJT), computer-based training (CBT), and video training. Division training managers are responsible for ensuring that line organization staff receives adequate OJT as required. Y-12 has made significant progress in formalizing OJT. Y-12 documents OJT by using Performance Documentation Checklists (PDCs) (D-D-8). Although consistency does not exist throughout Y-12, PDCs are used and updated regularly across the line divisions. As new procedures are identified, PDCs are eventually developed.

In addition to classroom training, MMES has developed a noteworthy CBT system for environmental officers (EOs) at the Y-12 Plant. The EO CBT Series, which received the 1993 Award of Excellence from the DOE Advisory Group, currently includes Toxic Substances Control Act/PCB; National Environmental Policy Act (NEPA); and Hazardous Waste Generator. More CBT training modules, including a four-module Clean Water CBT, are being developed (D-D-25; I-D-28).

Y-12's occupational health and safety training strongly outweighs environmental training, even for EOs. Training histories from a sample of six EO training records reflects a strong emphasis on safety and administrative skills and significantly less emphasis on environmental issues. Training records show that six MMES EOs trained for an average of 79 hours between August 1993 and August 1994. An average of 16 hours per employee, or 20 percent of total employee training, pertained to environmental subjects. The level of environmental training also varied considerably among these six EOs, from less than one hour of training to 78 hours of training. Additionally, the MK-F EO attended a total of ten courses last year (MK-F training records do not list hours); of these, only one pertained to environmental issues. Among MMES staff interviewed, EO training is a recognized weakness in the overall training program. The CBT courses provide EO training, but there is currently no established and formal training program for EOs as required by MMES Oak Ridge Y-12 Plant Procedure 70-921 (see Finding SR-1).

The 1990 Tiger Team identified that "not all workers at the Y-12 Plant were given comprehensive OJT training and a rigorous system for documentation of the training is not in place in all areas". The site closed out the finding after developing a centralized training management system (TMS), performing job and task analysis, and developing performance documentation checklists and performance-based curricula. The audit team concluded that TMS appeared to be user-friendly, reliable, and responsive. During the audit, TMS was consolidating and downloading training records from the X-10 and K-25 sites as part of a larger effort to centralize and standardize training records. TMS does not currently account for OJT, but Y-12 is working to rectify this issue (I-D-18).

Although TMS has proven to be an adequate system for Y-12, it contains only courses offered through MMES with assigned course numbers, rather than maintaining all training information. Corresponding hard-copy files in MMES training, however, usually contain a more comprehensive training history. The TMS system is designed to report training files

chronologically or by job requirements. Since not all job assignments have included required training in TMS, it is not always possible to access a list of required courses for each job assignment. These two weaknesses in TMS should be reduced as the system matures and more job-required training and outside-offered courses are entered into the system.

There are three levels of oversight to monitor the effectiveness of training programs: participant evaluation; instructor evaluation; and course and instructor certification. DOE has developed a training evaluation form which is completed by an employee at the end of a course. The employee's supervisor must also sign the form to ensure that the employee achieved the training objectives and to verify that the employee successfully completed the course. The evaluation form is returned to the central training organization for review. Monitoring the quality of the training courses and instructor certification will be the responsibility of the recently established Center of Continuing Education and its four institutes (I-D-13).

Y-12 has experienced significant progress in formalizing training programs. Moreover, Y-12's ability to enhance efficiency and matrix existing staff has resulted in no overall staff resource shortages despite the departure of more than 850 employees during the past year at Y-12.

Two findings were identified in the staff resources, training, and development portion of the audit. The first related to the lack of a formal and established training program for EOs and the lack of adequate guidance for the review of staff environmental performance.

3.6.2 Findings

SR-1: Environmental Officer Training

Performance Objective: DOE Order 5700.6c, "Quality Assurance," states "personnel shall be trained and qualified to ensure they are capable of performing their assigned work. Personnel shall be provided continuing training to ensure that job proficiency is maintained."

MMES Oak Ridge Y-12 Plant Procedure 70-921, "Environmental Officer Program," requires that the Environmental Officer Coordinator (EO Coordinator) coordinates the Environmental Officer (EO) program through, among other things, "the establishment of a training curriculum".

Performance Objectives and Criteria for Conducting DOE Environmental Audits suggests that individuals responsible for regulatory compliance and oversight have adequate training to accomplish their mission.

Finding: MMES has not established a formal training program for environmental officers (EOs) and has not ensured that EOs receive adequate environmental training.

Discussion: The Environmental Officer program was developed approximately 8 years ago to establish the EO positions and to define responsibilities to "maintain environmental regulatory compliance at the Y-12 facility". EOs are named by each division manager to coordinate and facilitate environmental compliance for all divisional activities and facilities. The EO Coordinator in the Environmental Management Department (MMES-EMD) is responsible for serving as the primary interface between MMES-EMD and divisional EOs. The EO Coordinator is also responsible for "the establishment of a training curriculum" for the EOs.

There are currently 32 EOs, including two from MK-F and five from Oak Ridge National Laboratory divisions, operating at the Y-12 Plant. Daily EO responsibilities vary considerably between divisions. For example, the EOs in the Enriched Uranium Operations and Disassembly and Special Materials divisions contend with mixed, radioactive, and hazardous wastes. By contrast, the EOs in Human Resources and in Information Management Services contend mainly with nonhazardous commercial waste streams. Given the wide-ranging scope of operations among the various divisions, it is important to provide a comprehensive training program that will address the environmental concerns across all divisions, as well as more advanced training for EOs in divisions involved with complex environmental issues.

MMES has not established a formal comprehensive training program for EOs (I-D-21, I-D-23, and I-D-28). The audit team noted the following deficiencies:

- There is no formal program plan that defines the EO training curriculum and implementation of an EO training program.
- The EO Coordinator schedules monthly EO meetings, in which subject-matter experts within MMES-EMD provide regulatory updates on environmental compliance. These meetings have served as an informal means of providing

some degree of regulatory and compliance training for EOs. All EOs interviewed said they believe that these meetings are important (I-D-21, 23, 25, and 27). Although attendance is recorded at these meetings, no mechanism is in place to ensure or require routine participation at these EO meetings.

- Although some EOs have used computer-based training (CBT), there is no system in place to ensure completion of these CBT modules and ensure proficiency.

The EO Coordinator and all EOs interviewed by the audit team said they are aware that the EO program lacks a formal, comprehensive training program. The EO Coordinator stated that, eventually, classroom training to accompany the CBT training will be provided (I-D-25 and I-D-28).

SR-2: Environmental Performance Evaluations

Performance Objective: Performance Objectives and Criteria for Conducting DOE Environmental Audits (Objective EM.6, Criterion II) states that performance standards in the performance appraisal process should include the environmental aspects of individual job responsibilities, including line management responsibilities for environmental performance. In addition, periodic staff performance reviews should include explicit measures of environmental performance.

Finding: MMES does not provide adequate guidance to managers for the review of staff environmental performance.

Discussion: MMES's annual performance evaluation forms, known as Performance Planning Review (PPR) forms, are inadequate for a proper assessment of staff's environmental performance. The PPR form includes a standardized list of 11 performance factors, including "environment, safety and health" (ES&H). The explanation next to this performance factor states "actively practices and promotes safe work practices in support of company ES&H policies". This explanation statement neglects to reference environmental responsibilities. As a result, the form does not guide the manager to consider the employee's environmental performance. Instead, the emphasis remains on health and safety (D-D-3; I-D-37).

Instructions for completing the PPR form, which are included in the PPR booklet, also do not provide specific guidelines for consideration of environmental performance or standards (D-D-2). The PPR instructions only provide insight into the stages of the PPR process, from the initial completion of the form to a final meeting with the supervisor.

Environmental performance receives inadequate emphasis because of this lack of emphasis, in the opinion of the audit team. A review of three completed performance evaluation forms submitted by employee supervisors indicates the supervisors did not supply any additional written statements to offer further insight into employee environmental performances.

3.7 PROGRAM EVALUATION, REPORTING, AND CORRECTIVE ACTION

3.7.1 Overview

The purpose of the program evaluation, reporting, and corrective action portion of the Y-12 Plant routine environmental audit was to evaluate whether ORO, YSO, MMES, and MK-F have in place effective oversight and self-assessment programs. More specifically, the audit team evaluated the types of self-assessment and oversight programs, reporting of identified concerns to appropriate managers, and implementation and tracking of corrective actions that address root causes. A main focus in this audit was to evaluate the self-assessment and corrective action programs at the operational level of Y-12.

The general approach to this portion of the audit was to review documents provided by DOE and MMES and to conduct interviews with key personnel. Interviews were conducted with ORO, YSO, MMES, and MK-F personnel in the Environment, Safety, and Health (ES&H) and line organizations. In addition, interviews were held with the Tennessee Department of Environment and Conservation (TDEC), which performs oversight of Y-12. Interviews with TDEC were used to determine if the self-assessment and corrective action programs were providing the early warning and response functions intended. In order to understand the implementation of the corrective action program at Y-12, the Tiger Team Action Plan for Finding A/BMP-3 (to correct deficiencies in the ambient air monitoring program) was investigated in detail to evaluate the closure. This review was also used to provide information on how Y-12 integrates the implementation of actions that affect more than one finding or program at the Y-12 Plant. A list of regulations, requirements, and guidelines used in this audit is provided in Appendix F.

The assessment and action plan activities at the Y-12 Plant are extensive for the MMES operations. Line operations often receive four or more different assessments per year from a combination of their own organization, the local Y-12 support groups, the MMES Central environmental compliance and quality groups, and Martin Marietta Corporation. In addition to these assessments, there are other, outside assessment activities from TDEC, EPA, and DOE Headquarters, and ORO has conducted functional appraisals of the Y-12 Plant (D-E-17). The Y-12 Plant also has a well-structured assessment program for evaluating DOE Order compliance.

The level of assessment activities at the Y-12 Plant may actually be more than necessary. The audit team concluded that less effort in performing and tracking assessment activities could result in a broader, more integrated approach to developing and implementing corrective action plans. This would likely have a positive effect on the quality of the corrective action plans. This concern is described in greater detail in Finding PE-1, regarding the implementation of corrective action plans.

MMES senior management receives assessment information on a weekly and monthly basis to ensure that the site corrects problems that might result in non-compliant situations. A weekly summary report (D-E-7) on open potential non-compliance issues is developed by the MMES Y-12 Compliance Integration Section. This report identifies the issues, corrective actions, and status of the corrective actions so that senior management at MMES can follow the progress. These weekly summaries are then summarized and presented to the MMES Y-12 Plant Manager. YSO receives notifications of all non-compliances when they occur, as well as monthly reports. The implementation of this

procedure is evidence of the strong level of commitment and support for environmental performance from top levels of management.

In recognition of the extensive self-assessment and appraisal activities, the recent ES&H Progress Assessment of the Y-12 Plant (D-E-20) identified the Y-12 Plant Self-Assessment Program as a strength. A key basis for this determination was the procedure and implementation of the Lessons Learned and Alert System. The program continues to be effective because it is a simple process that personnel will use rather than avoid. The audit team observed that the procedure was implemented, although in some cases it appeared that Lessons Learned could have received more attention.

On the other hand, MK-F has only recently (within the last 9 months) developed and implemented specific environmental self-assessment programs. Recently, ORO performed an assessment of the MK-F 90-day hazardous waste accumulation area and identified several concerns. MK-F appears to have reacted promptly and effectively to this oversight assessment and is in the process of developing and staffing a complete Environmental Support Division for ORO operations (I-E-18).

MMES uses the Energy Systems Action Management System (ESAMS) computer data base to track the status of all corrective action plans for findings identified from assessments above the division level. In addition, ESAMS is used to track action plans for findings that are regulatory in nature and that are identified at the division level or lower. For findings developed at the division level or lower that are not regulatory issues, some divisions use ESAMS and others do not. Given the high frequency of auditing activities at Y-12, this does not appear to be a significant problem except that it may affect the ability to perform analyses of non-regulatory findings.

ESAMS incorporates root cause analyses and Lessons Learned and Alert System procedures (D-E-8), and feeds information directly into the MMES Occurrence Reporting Program. The root cause and Lessons Learned elements are not necessarily included in the action plan development if the action plan is not tracked in ESAMS. Essentially, the MMES Y-12 Quality Division allows flexibility in division tracking of corrective action plans, provided they follow the procedures for the program established by MMES Central and MMES Y-12.

The ES&H Progress Assessment also concluded that self-assessment programs lacked consistency and formality; this is still an issue at the Y-12 Plant and is partially noted in the corrective action finding (see Finding PE-1). Improvement in this area was noted, however, and the audit team concurs with the Progress Assessment Team that this is not a significant program weakness. It may cause problems, however, such as finding redundancy, inaccurate prioritization of lower-level findings, and inaccurate trending.

It is worthy of note that the MMES Environmental Restoration Division Y-12 organization has independently developed a formal program plan for self-assessment that represents an excellent and effective approach for self-assessment programs. This approach uses a cross-referencing system for Y-12 environmental restoration programs and the ES&H Performance Objectives and Criteria to ensure proper focus in their self-assessment program (D-E-24).

The MMES Quality Division has determined in the last 6 months the proportion of late action plan closures has decreased from 40 to 13.5 percent. In addition, the award fee for MMES for the next fiscal year will include an incentive to achieve a goal of less than 5 percent for late action plan closures. This goal, although a good incentive for MMES, also places greater importance on the closure verification process. Because the Y-12 MMES Quality Division is responsible for verification of action plan implementation and they have recently been restructured with fewer personnel, there is a concern that appropriate review of the action plans may be impacted.

The success of the MMES self-assessment program is displayed in a positive regulatory compliance record. The findings indicate that Y-12 is identifying its own potential problems and correcting them before they become issues with TDEC (D-E-6 and D-E-7). The success of the DOE program was also observed in the audit, as their oversight activities were mentioned by Y-12 contractors as forcing mechanisms for better implementation of corrective action programs and environmental performance. For example, improvements in MK-F 90-day hazardous waste accumulation area management activities are directly attributable to an ORO assessment (I-E-18). Similarly, MMES noted its improved record for completing action plans on time as being directly related to another YSO assessment (D-E-21; I-E-24).

The Y-12 action plan program is based on formal procedures for self-assessment, oversight activities, action plan validation, and corrective action plan verification. The ES&H Progress Assessment noted that the application of the program was inconsistent and less than fully effective. Although improvements in the application of the system have been made, problems with the implementation of the corrective action program were again noted in this audit (see Finding PE-1). Consistent with the ES&H Progress Assessment, the audit identified problems with a Tiger Team Action Plan that did not fully address the finding and did not correct deficiencies such that the problem would not recur.

DOE oversight of JCWS is the responsibility of the ORO Assistant Manager for Construction and Engineering (AMCE), as implemented by the Contracting Officer Representative in the AMCE Engineering Services Division. The audit team concluded that DOE oversight of JCWS was limited to the biennial ORO appraisals and could be improved (see Finding PE-2).

In summary, Y-12 program evaluation activities are being implemented through very aggressive assessment programs. These programs are designed to identify potential regulatory issues and correct them before they become non-compliant issues. Assessment and corrective action programs appear effective, an opinion that was supported by interviews with TDEC's oversight personnel for the Y-12 Plant. However, a lack of a broad and sufficiently technical approach to some corrective actions was noted in this audit, as well as a need by ORO to improve oversight of JCWS. These concerns are specifically identified in Findings PE-1 and PE-2, respectively.

3.7.2 Findings

PE-1: Implementation of Corrective Action Plans

Performance Objective: Performance Indicators and Criteria for Conducting DOE Environmental Audits performance objective QA.2 states "A program should be in place to provide verification of the effectiveness of the environmental protection activities and adherence to the Quality Assurance Program."

Finding: Although procedures are in place to provide for review and closure of corrective action plans, Y-12 lacks a sufficiently broad and technical approach in their development and closure of action plans.

Discussion: Although procedures are in place to provide for review and closure of action plans, Y-12 lacks a sufficiently broad and technical approach for reviewing these plans. Specific deficiencies in the corrective action process identified by the audit team include:

- The primary tracking mechanism for corrective actions is based on planned milestone completion dates. Independent quality control reviews are not currently performed at the completion of each milestone within an action plan. Whereas many milestones do not require a thorough quality review, some are critical to the successful completion of later milestones. These key milestones are not currently identified for a greater level of review due to their importance, which can result in problems in implementing subsequent milestones and separate but related corrective action plans.

- The MMES Y-12 Quality Division has the responsibility for verification. In the last 2 years, its staff has decreased from 110 to approximately 30 people. Included in these staff reductions were high-quality engineers who are now part of MMES Central. Some of this group left MMES when the auditing function was moved to the central group, and their experience is difficult to replace in this oversight function. It is worth noting that the stress and pressure on the Y-12 Quality Division is likely to increase with connection of the award fee program to the corrective action plan completion dates. The plan is for the Y-12 award fee program to be tied to a goal of less than 5 percent late completion dates for corrective actions (I-E-24).

- As part of this audit, the Corrective Action Plan for Tiger Team Finding A/BMP-3 was investigated from development through the ultimate closure of the action plan. The following deficiencies were identified which call into question the design and implementation of the corrective action program:

  — The action plan developed to correct Tiger Team Finding A/BMP-3 was modified to allow closure of the finding by eliminating the Y-12 ambient air monitoring program. Cross-referencing to other corrective action plans and elements did not exist in the reference file. At least two other assessment programs resulted in related action plans to A/BMP-3, including the ORO Functional Appraisal of July and August of 1993, which included a recommendation for possible augmentation of the Y-12 monitoring system for non-radiological pollutants.

- Modification of action plans for Tiger Team findings requires formal request and receipt of YSO approval. The evidence file maintained in the Y-12 Quality Division did not contain this information (I-E-24).

- The entire action plan for the Tiger Team Finding A/BMP-3 was indicated as closed in the Energy Systems Action Management System (ESAMS) tracking system (D-E-9), based on a verification review performed by the Y-12 Quality Division (I-E-4 and I-E-24) represented by a memorandum to the file from the verifier indicating a verbal confirmation with YSO.

- The action item implemented to close the finding (i.e., termination of the ambient air sampling) was found by the audit team to be inconsistent with DOE 5400.1 criteria (see Finding EP-1). TDEC has also requested additional technical information before it will reconsider this request.

In addition to the problems identified above, Y-12 divisions are not all consistent in how they track, report, prioritize, utilize lessons learned, or develop action plans based on assessment findings (I-E-1, 4, 5, 17, and 24). As a result, trending information developed by ESAMS may be affected depending on the information supplied to the system by each division.

PE-2: **ORO Oversight of JCWS**

Performance Objective: DOE 5482.1B, "Environment, Safety and Health Appraisal Program," states that it is DOE policy to "Assure the protection of the environment," and that this assurance is "provided, in part, by the ES&H (Environment, Safety & Heath) appraisal program." Further, this Order states that among the ES&H appraisal program's objectives are to "evaluate the effectiveness of ES&H policies, requirements, and standards and their implementation," and "provide management with objective, timely, and reliable information on ES&H performance, including significant achievements and deficiencies."

The Oak Ridge Implementation Guidance that correlates to DOE Order 5482.1B states that Contracting Officers (COs) and Contracting Officers' Representatives (CORs) are responsible to "Ensure that ORO and ORO contractors' ESH&A activities are consistent with sound practices and in compliance with DOE requirements [and] implement a comprehensive self-assessment program consistent with reference 4b and DOE 5482.1B to cover facilities, buildings, sites, activities, etc., under their control. In order to carry out this responsibility COs and CORs may be supported by the ORO matrix organizations."

Finding: DOE ORO does not perform adequate oversight of the environmental performance of JCWS.

Discussion: DOE does not have a comprehensive program for the assessment of the environmental programs and performance of JCWS. Environmental oversight of JCWS is limited to the biennial evaluation performed by ORO. As a result, DOE is inadequately informed of the status of environmental programs at JCWS during the periods between these biennial appraisals.

The COR charged with overseeing JCWS is responsible for a wide variety of technical and administrative areas. He reports through the Director of the Engineering Services Division to the Assistant Manager for Construction and Engineering. Currently, there is no formal training program for the JCWS COR that would facilitate better oversight of the environmental programs at JCWS. In the opinion of the audit team, the COR did not have adequate knowledge of the programs in place at JCWS to minimize waste or maintain pollution control equipment (I-G-1 and I-G-2). In particular, the audit team noted that Appendix B of the JCWS's Pollution Prevention Program Plan identifies a waste minimization schedule through June 1995 (D-A-1), but found that the DOE COR is uninformed of whether or not JCWS is meeting the schedule's milestones.

3.8 ENVIRONMENTAL PLANNING AND RISK MANAGEMENT

3.8.1 Overview

The purpose of the environmental planning and risk management portion of the Y-12 Plant routine environmental audit was to assess the extent and effectiveness of technical and financial planning related to environmental management; this included short- and long-term environmental planning, integration of technical and financial planning, resource allocation, and prioritization of projects. Additionally, the audit addressed the site's systems for identifying, assessing, and addressing potential environmental risks including risk management program design and approach, and Risk-Based Prioritization Systems (RBPSs).

The approach for this audit included a review of documents provided by DOE and MMES, as well as interviews with ORO, YSO, and MMES personnel responsible for project and program planning, risk management, environmental review of projects, and RBPSs. Planning and risk-management systems that may exist for MK-F and JCWS were not evaluated by the audit team. A list of regulations, requirements, and guidelines used in this audit is provided in Appendix F.

Planning for Y-12 environmental programs implemented by MMES is conducted through several mechanisms. The planning process requires participation from MMES organizations based at the Y-12 Plant that support DP activities; and environmental restoration and waste management organizations both at the Y-12 Plant and across ORR.

The MMES Environment, Safety, and Health (ES&H) Strategic Plan and the Y-12 ES&H Five Year Plan serve to identify activities and resources required during the planning period to ensure protection of the environment and bring the site into and maintain compliance with ES&H regulations and standards. The MMES Environmental Management Five Year Plan is the planning vehicle for both the Environmental Restoration Division (MMES-ERD) and the Waste Management Division (MMES-WMD). Another planning document is the Environmental Protection Program Implementation Plan (EPPIP), which is intended to provide sitewide environmental protection goals and objectives. The site has satisfied the requirements of Chapter III of DOE 5400.1 for development of a Long Range Environmental Protection Plan through the MMES Environmental Management and ES&H five year plans.

MMES's DOE Office of Defense Programs (DP)- and Office of Environmental Management (EM)-funded programs have mechanisms in place for coordination with the MMES Environmental Management Department (MMES-EMD) for review of environmental compliance and environmental protection issues. This coordination is typically specified in program- and project-level planning documents, and is accomplished through matrix support and oversight from MMES-EMD. Additional mechanisms in place include coordination with MMES-EMD in the National Environmental Policy Act (NEPA) review process.

Y-12 conducts a risk determination of issues and projects through the Risk-Based Prioritization Methodology (RBPM) using the MMES corporate-wide risk matrix. This method prioritizes projects by determining the risk that would exist if the issue is not resolved or the project is not completed. The input for this system comes from programmatic and project-related activities in support of the DP mission and work for

others which are divided into functionally related groupings called Decision Package Data Sheets. The results of this risk-based prioritization are used in the allocation of resources for projects through the Integrated Resource Management System. This system is used for risk evaluation, issue and project prioritization, resource allocation, and funding requests. MMES-WMD and Y-12 utilize the same RBPM.

A modified RBPM system has been developed by MMES-ERD for the Y-12 environmental restoration programs; Activity Data Sheets (ADSs) are the fundamental budget formulation documents. ADSs identify proposed projects, priority and funding levels, and budget reporting codes; they also provide a narrative description. These ADSs, once funded, are included in the Y-12 planning process, although they do not affect DP funding decisions.

Technical and financial input for the Decision Package Data Sheets and ADSs are provided by the individual Y-12 divisions for input into the prioritization process. The risk matrix defines the relative probability factors for such categories as public health and safety, environmental protection, site personnel safety, regulatory compliance, external confidence, mission and operational performance, and business efficiency. The greatest weight is given to consequences in public health and safety. The second greatest weight is assigned to consequences in site personnel safety, followed closely by environmental protection. The remaining categories are lesser in weight by approximately one order of magnitude, and compliance with DOE Orders is provided a weighting factor half of that for compliance with laws or regulations (see Finding EC-1).

The Integrated Resource Management System, in which the RBPM resides, specifies the establishment of environmental issues evaluation teams and health and safety issues evaluation teams. A Project Evaluation Group (PEG) has been established to systematically review and evaluate the risks and/or benefits of programs, issues, activities, and projects. The PEG for the Y-12 Plant is composed of a cross-section of senior managers from the different program organizations. Y-12 senior management provides review and concurrence for the budgeting process.

The risk management matrix used by MMES-ERD, the Environmental Risk-Based Benefit Assessment Matrix, differs from the RBPM in that environmental protection and compliance are listed as a single category and a weighting factor has been incorporated for "stakeholder" interest (D-F-14; I-F-16). For both the waste management and environmental restoration programs, the PEG is composed of representatives from the three sites and the five ORO sites managed by MMES, respectively.

Following MMES review, budget requests are consolidated into program budgets defined as Core Decision Packages. These packages are reviewed by the appropriate DOE program organization, modified if necessary, and submitted to ORO. The technical scope, assumptions, and budgets for individual activities included in the Work Breakdown Structure of the Decision Package Data Sheets and ADSs form the basis of the Current Year Work Plans. DP and EM budget requests are submitted to DOE Headquarters by ORO on an annual fiscal year basis, along with technical scope summaries and schedules. Funding may be revised by DOE Headquarters program management during the budget approval process (D-F-10; I-F-10 and I-F-17).

DP-funded budgets for environmental support and EM-funded budgets for direct environmental programs have been growing steadily during the last several years. The

overall budget, however, has been reduced each of the last 2 fiscal years. Funding of environmental-compliance-related items have been maintained (I-F-1, I-F-12, and I-F-17). DP, the primary source of Y-12 direct program funds, is experiencing budget decreases and because the indirect environmental budgets are a function of the direct funding Y-12 receives, these budgets face increasing constraints as well. Expenditures planned using Decision Work Packages and ADSs are tracked monthly by appropriate-level managers and their respective resource managers using cost-account reporting. In addition, many onsite projects, such as those funded through ORO-ERD, require additional project cost planning, tracking, and reporting. To accomplish this, project management systems are available that provide planned versus actual expenditures. The systems of planning, funding, budgeting, and tracking at the Y-12 Plant reflect the complex nature of the DOE planning and funding process and is not unique to Y-12.

Additionally, a number of systems are in place to review new projects for potential environmental risks. Project-specific planning documents include review of environmental compliance and environmental protection issues; coordination is typically specified in program- and project-level planning documents and is accomplished through matrix support and oversight from the respective environmental support organizations within YSO, MMES Central and HSE&A. Additional mechanisms in place include reviews required by the NEPA, and Safety Analysis review processes.

In general, the audit team found processes in place which ensure the conduct of an appropriate level of environmental planning at the Y-12 Plant. The team also found a well-developed, technically documented risk-management program at the Y-12 Plant.

There were no findings in the environmental planning and risk management portion of the audit.

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APPENDIX A

BIOGRAPHICAL SKETCHES OF THE AUDIT TEAM

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NAME: William N. Hasselkus

AREA OF RESP: Team Leader

ASSOCIATION: U.S. Department of Energy, Office of Environmental Audit

EXPERIENCE: 21 Years

- U.S. Department of Energy, Washington, DC
  - — Environmental Engineer responsible for providing guidance, direction, and assistance to a multi-disciplined group of professionals performing Environmental Audits and Management Assessments at DOE facilities.
  - — Environmental Engineer providing environmental compliance support to DOE National Laboratory and ancillary facilities.
  - — Environment, Safety and Health Manager providing ES&H support for the Program Office for construction of the world's largest particle accelerator. Co-manager of the Environmental Impact Statement for the project.
- Booz, Allen and Hamilton, Inc., Consultants
  - — Area manager supporting Superfund policy development for the Environmental Protection Agency, and area manager for environmental compliance support for EPA's facilities, primarily through leading environmental audit teams.
- U.S. Army Materiel Command
  - — Chief, Environmental Quality Division, responsible for environmental compliance oversight and guidance. In this capacity, developed and implemented the Command's Environmental Auditing program. This position also involved operation of the Army's Installation Restoration Program.
- U.S. Army Environmental Hygiene Agency
  - — Sanitary Engineer serving as project leader for industrial and domestic wastewater investigations conducted by teams of professionals at Army facilities.
- U.S. Army Electronics Command
  - — Served as the original facility environmental coordinator at Fort Monmouth, N.J.

EDUCATION: M.B.A., Fairleigh Dickinson University
B.S., Chemical Engineering, New Jersey Institute of Technology

OTHER: Executive Excellence Program, Federal Executive Institute
Program for Senior Executives, MIT

NAME: Ching-San Huang, P.E.

AREA OF RESP: Deputy Team Leader

ASSOCIATION: U.S. Department of Energy

EXPERIENCE: 23 Years

- U.S. Department of Energy, Office of Environmental Audit
  - Deputy Team Leader. Responsible for providing guidance, direction, and assistance to a multi-disciplined group of professionals performing environmental audits and Tiger Team Assessments of DOE facilities. Involved in DOE pollution prevention project selection, review, and auditing.
- U.S. Department of Defense
  - U.S. Army Environmental Hygiene Agency. Sub-Program Manager for pollution prevention, and multi-disciplined team leader for environmental audits; also conducted special studies, medical waste management, hazardous waste sampling, and personnel training.
  - U.S. Army HQ V Corps. As Environmental Branch Chief, supervised engineering and consulting services and was responsible for planning, coordinating, and providing environmental protection program guidance/oversight to 10 military communities.
  - U.S. Air Force. Project Manager for preparing statements of work, program plans, budgets, contractor proposal evaluations, and contract selection. Oversaw other engineers, scientists, and contractors in conducting environmental impact statements (EISs), studies, design, troubleshooting, and analyses.
- Clinton Bogert Associates
  - Senior Staff Engineer responsible for supervising water/wastewater and solid waste treatment process design, detailed design, pilot plant studies, cost-effective analyses, cost estimate, specifications preparation, solid waste management plans, and 201 Facility Plans.
- Metcalf & Eddy, Inc.
  - Responsibilities included water/wastewater and solid waste treatment process design/detailed design and research, including reaction kinetics derivation, process parameter and process selection, pilot plant studies, treatment unit design and hardware selection, plant layouts, and technical report writing.

EDUCATION: Ph.D., Environmental Engineering, SUNY at Buffalo, NY
M.S., Civil Engineering, Cheng Kung University, Taiwan
B.S., Civil Engineering, Cheng Kung University, Taiwan

NAME: David J. Allard

AREA OF RESP: Environmental Protection Programs; Formality of Environmental Programs (Radiation)

ASSOCIATION: Arthur D. Little, Inc.

EXPERIENCE: 17 Years

- Arthur D. Little, Inc.
  - Senior Consultant and Certified Health Physicist providing technical support for DOE assessments and audits, and various other government and commercial client cases dealing with radiation protection issues, such as environmental monitoring, waste management, training, operational health physics, and radiation protection management.
  - Participated in the Tiger Team Assessments of the Morgantown Energy Technology Center, Idaho National Engineering Laboratory, and Los Alamos National Laboratory; the Environmental Audit of the Fossil Energy Sites in Wyoming; the Special Mixed Waste Review at the Y-12 Plant; the Environmental Management Assessments of the Continuous Electron Beam Accelerator Facility, Fernald Environmental Management Project, Superconducting Super Collider, Argonne National Laboratory-West, Pinellas Plant, Hanford, and the Nevada Test Site Offsite Areas; a special review of the Savannah River Plant F-Canyon; and the Progress Assessment of the Idaho National Engineering Laboratory. Currently is a DOE mentor at the Hanford Tank Farms.
- TGM Detectors, Inc.
  - Vice President with responsibilities for facility radiation protection, gas-filled radiation detector design, testing, engineering, and business management.
- Nuclear Metals, Inc.
  - Supervisor of Health Physics with responsibilities in the areas of environmental monitoring, external and internal dosimetry, shielding, radiation surveys, waste disposal, and regulatory affairs regarding various uranium and thorium manufacturing operations.
- Albany Medical Center
  - Medical Health Physicist with responsibilities involving worker and patient external and internal dosimetry, laboratory radiation protection, x-ray equipment testing, quality assurance, shielding, surveys, and waste disposal.

EDUCATION: M.S., Radiological Sciences and Protection, University of Lowell
B.S., Environmental Sciences, State University of New York at Albany
A.A.S., Environmental Health Technology, Hudson Valley College

NAME: Paul E. Flaherty

AREA OF RESP: Program Evaluation, Reporting, and Corrective Action; Environmental Protection Programs

ASSOCIATION: Arthur D. Little, Inc.

EXPERIENCE: 11 Years

- Arthur D. Little, Inc.
  - Performed INEL Tiger Team Assessment and Management Assessment for air pollution control. Also performed SPR Tiger Team Assessment for locations in Texas and Louisiana. Work included review of management systems, emissions inventories, control systems, permitting issues, compliance, meteorological data representation, and ambient monitoring programs.
  - Oversaw design and implementation of comprehensive air quality compliance plan for a large aerospace company. Work involved development of source inventories, regulatory requirements and interpretations, and a software system to manage the information.
  - Managed compliance evaluation project for a large utility's two fossil fuel-fired plants in an urban area. Work included control technology reviews, air quality dispersion modeling, ambient air monitoring, and representing client interests with state and federal regulatory officials.
  - Designed an advanced modeling technique for another utility to address a complex dispersion environment, including development of regulatory-acceptable assumptions for a fluid modeling study and the presentation of the study methods and results for state and federal support.
  - Assisted in development of a state-of-the-art modeling methodology for coke oven emissions and ambient air toxic concentrations. Work was reviewed and approved without comment at state and federal levels.
  - Managed PSD air permit applications for municipal solid waste, refuse-derived fuel, and RCRA/TSCA incinerators for several large energy recovery corporations. Work included technology reviews, ambient impact assessments for criteria and noncriteria pollutants, ambient monitoring, and representation of clients with state and federal regulatory personnel.

EDUCATION: B.S., Meteorology, Purdue University

NAME: Susan Holland

AREA OF RESP: Administrator

ASSOCIATION: DevTech Systems, Inc.

EXPERIENCE: 18 Years

- DevTech Systems, Inc.
  - — Team Administrator providing support to the Department of Energy, Office of Environmental Audit in conducting environmental assessments of DOE sites.
- Freelance Writer
  - — Wrote press releases, newsletters, articles, and speeches.
- C.G. Jung Society of Colorado
  - — Administrative Director, responsible for publicizing group's lecture series and arranged for meeting space and media services.
- Susan Holland & Friends Public Communications & Advertising, Inc.
  - — Owned and managed public relations firm, wrote and produced speeches, audio/visual programs, membership solicitation letters, print and radio advertising, brochures, catalog copy, newsletters, public service announcements, press releases, and other promotional copy.
- American Theatre Association
  - — Served as Director of Publications, responsible for writing, producing, and distributing theatre news magazine, annual directory, and program for annual fund-raiser.
- American Society for Psychoprophylaxis in Obstetrics, Inc.
  - — Served as Director of Publications, responsible for writing, producing, and distributing newsletter to all member segments.
  - — Served as Managing Editor for professional newsletter.

EDUCATION: Graduate Arts Management Program, American University
B.A., Dramatic Art, University of Maryland
A.A., Liberal Arts, Montgomery College

NAME: Karen L. Jones

AREA OF RESP: Staff Resources, Training, and Development; External Communication

ASSOCIATION: Arthur D. Little, Inc.

EXPERIENCE: 10 Years

- Arthur D. Little, Inc.
  - Participated as the Soil, Sediment, and Biota Specialist and Groundwater Specialist during the Tiger Team Assessment of the Naval Petroleum Reserve and the Strategic Petroleum Reserve; and acted as the Internal and External Communication Specialist during the Environmental Management Assessment of DOE's Superconducting Super Collider in Waco, Texas.
  - Environmental Business and Strategy Consultant. Principal responsibilities include assessing strategies for environmental businesses and potential investors, including market assessments and legislative/regulatory analysis. Special focus on soil and groundwater issues, solid waste management, and recycling.
- Environmental Consultant
  - Conducted studies for private companies to determine and evaluate waste disposal and recycling options. Designed, coordinated and wrote proposals to counties and municipalities addressing land disposal, transfer, and recycling of solid waste. Assessed strategic acquisitions within the Northeast for large waste management firms.
- Exploration and Development Geologist
  - Seven years of experience as a petroleum geologist working for two large independent oil and gas producers.
  - Mapped regional oil and gas trends in Texas, Louisiana, and Mississippi. Proposed and drilled over 40 wells in east Texas and established new reserves of oil and gas.

EDUCATION: M.S., Management, Yale University
B.S., Geology, Louisiana State University

NAME: Joseph Lischinsky

AREA OF RESP: Environmental Planning and Risk Management; Environmental Commitment

ASSOCIATION: Applied Consultants, Inc.

EXPERIENCE: 13 Years

- Applied Consultants, Inc.

  — Serves as President and supports a variety of projects in the areas of radiation protection, materials licensing, emergency planning, decommissioning, waste management, and training.

  — Participated in the environmental management assessments of DOE's Waste Isolation Pilot Plant; Sandia National Laboratories, California; and Hanford Site. Specific responsibilities included review of environmental protection programs, formality of environmental programs, and environmental planning and risk management issues.

  — Participated in the DOE Tiger Team Assessment of the Oak Ridge K-25 Site. Served as an Environmental Health Physicist to the assessment team.

  — Participated in the DOE Tiger Team Assessment of the Los Alamos National Laboratory. Served as emergency preparedness expert to the Technical Safety Appraisal Team.

  — Participated in the DOE Tiger Team Assessment of the Idaho National Engineering Laboratory. Served as an environmental health physicist to the assessment team.

  — Served as consultant health physicist to various environmental issues. These assignments have included the provision of expertise in radiological site assessment, health and radiation safety, site remediation, decommissioning, and expert witness testimony.

  — Performed numerous radiological health and safety reviews and emergency preparedness audits at both production and utilization facilities. These activities have included commercial nuclear power production as well as radioactive materials manufacturing facilities licensed by both the U.S. Nuclear Regulatory Commission and the Agreement States Program.

EDUCATION: M.Sc., Applied Management, Lesley College
B.S., Biology, Suffolk University

NAME: Raymond F. Machacek

AREA OF RESP: Environmental Protection Programs; Formality of Environmental Programs

ASSOCIATION: Arthur D. Little, Inc.

EXPERIENCE: 26 Years

- Arthur D. Little, Inc.
  - Senior Consultant: Responsible for conducting engineering evaluations, designing and testing systems, and conducting environmental evaluations for government and commercial clients.
  - Led a 3-year environmental support contract for start-up of the world's first chemical agent demilitarization plant on Johnson Island.
  - Participant in a DOE review of treatment of high-level radioactive wastes stored at Savannah River Site, including evaluation of the glassmaking process and a proposed ion-exchange system for removing cesium and strontium ions from waste.
  - Participant in Tiger Team Assessment, due diligence appraisals, and environmental audits.
  - Participant in chemical safety vulnerability studies for environmental protection aspects at three DOE sites.
  - Developed and wrote Feasibility Studies, Proposed Plans, and Records of Decisions for Superfund Sites of the U.S. Army.

EDUCATION:
Ph.D., Chemical Engineering, University of Iowa
M.S., Chemical Engineering, University of Iowa
B.S., Chemical Engineering, University of Iowa

OTHER:
Certified Hazardous Waste Site Supervisor, Occupational Safety Health Administration (OSHA), 1989
Certified Hazardous Waste Site Worker, OSHA, 1989-1994
Member, American Institute of Chemical Engineers, Environmental Section
Member, American Chemical Society, Polymer Section

NAME: Donald Neal

AREA OF RESP: Team Coordinator

ASSOCIATION: Arthur D. Little, Inc.

EXPERIENCE: 11 Years

- Arthur D. Little, Inc.
  - Senior Consultant. Team Coordinator for the environmental assessments of Lawrence Livermore National Laboratory (LLNL), the Stanford Linear Accelerator Center and the Savannah River Ecology Laboratory. Waste management specialist for the DOE Progress Assessments of LLNL, Savannah River Site, Rocky Flats Plant, and the Tiger Team Assessments of the Oak Ridge K-25 Site, Ames Laboratory, Naval Petroleum and Oil Shale Reserve, and the National Institute for Petroleum and Energy Research. Management specialist for the Environmental Management Assessment of the Waste Isolation Pilot Plant.
  - Provides technical guidance to commercial clients on hazardous waste management.
- CSI Resource Systems Inc.
  - Senior Associate. Managed environmental permitting of waste management facilities. Prepared solid and hazardous waste management plans for industry and municipalities and evaluated waste management facility compliance with environmental permits and regulations.
  - Investigated methods for and results of air pollution monitoring, air emissions control, and source testing.
- ENSR Consulting and Engineering
  - Project Manager. Managed environmental assessments and permitting of industrial facilities.
- GCA/Technology Division
  - Project Manager for quality assurance of 1985 National Acid Precipitation Assessment Program (NAPAP) emissions inventory.
  - Lead Programmer for the 1980 NAPAP emissions inventory.
  - Designed and implemented Continuous Emissions Monitoring Systems for air emission sources.

EDUCATION: M.S., Biology, University of Massachusetts
B.S., Biology, University of Massachusetts

NAME: Mark Pine

AREA OF RESP: Organizational Structure; Environmental Commitment

ASSOCIATION: Arthur D. Little, Inc.

EXPERIENCE: 10 Years

- Arthur D. Little, Inc.
  - Served as Environmental Management Specialist for the Environmental Management Assessments of the Bonneville Power Administration, covering the areas of staffing/resources and staff development/training; the Southwestern Power Administration, covering the areas of formality of programs and internal and external communications; the Fernald Environmental Management Project, covering the areas of organizational structure and internal and external communication; the Stanford Linear Accelerator Center, covering the areas of program evaluation and environmental commitment; and the Sandia National Laboratories, Livermore, covering the areas of organizational structure and environmental commitment.
  - Oversaw the revision of the Department of Energy's Performance Objectives and Criteria for Conducting DOE Environmental Audits. Led a 20-person team in revising and updating this document, which serves as DOE's guidelines for environmental audit team members.
  - Managed day-to-day conduct of the assessment of environmental liabilities at a major chemical company's manufacturing facilities. Coordinated onsite assessments by a team of 10 professionals, led document review at corporate headquarters, and managed delivery of the final report.
  - Served as Environmental Specialist for Alaska Pipeline Service Corporation's operational assessment of the Trans-Alaska Pipeline System. Covered the areas of air pollution control and spill prevention and response.
- Decision Resources, Inc.
  - Directed an information service related to environmental regulations, technologies, and markets. Supervised production of monthly reports analyzing the impacts of environmental legislation and regulation on manufacturing industry and waste management industry.

EDUCATION: M.P.A., Environmental Economics and Policy, Harvard University
B.A., English, Williams College

NAME: Mead L. Summer

AREA OF RESP: Technical Editor

ASSOCIATION: DevTech Systems, Inc.

EXPERIENCE: 11 Years

- DevTech Systems, Inc.
  - — Technical Editor, providing support to the Department of Energy, Office of Environmental Audit, in conducting environmental assessments of DOE sites. Served as technical editor for the Routine Environmental Audits of the Y-12 Plant, Oak Ridge, TN, and the Hanford Site, Richland, WA.
- National Endowment for the Arts
  - — Information Specialist, responsible for responding, both orally and in writing, to public and press inquiries regarding Endowment activities. Also was responsible for compiling staff biographies, official statements and other information released to the print and broadcast media.
- *Daytona Beach News-Journal*
  - — Assistant Business Editor. Principal duties included assigning, writing and editing stories for business and real estate sections of newspaper, and designing layout of pages for those sections. Also was responsible for supervising staff of four reporters and three columnists and for coordinating with other editors, photography staff and composing room.
  - — Columnist. Wrote weekly column on local and regional business and real estate issues, and was a regular participant in cable television roundtable on Florida business.
- *The Mesa Tribune*
  - — Sports Writer, responsible for coverage of professional, collegiate, high school, and amateur athletic events.
- Other Experience
  - — Editor of two "how-to" books, *Selling Your Own Home* and *Associations: Maintaining a Community.*
  - — Wrote travel articles for various newspapers and magazines.

EDUCATION: J.D. Program, The Catholic University of America
B.S., Journalism, Arizona State University

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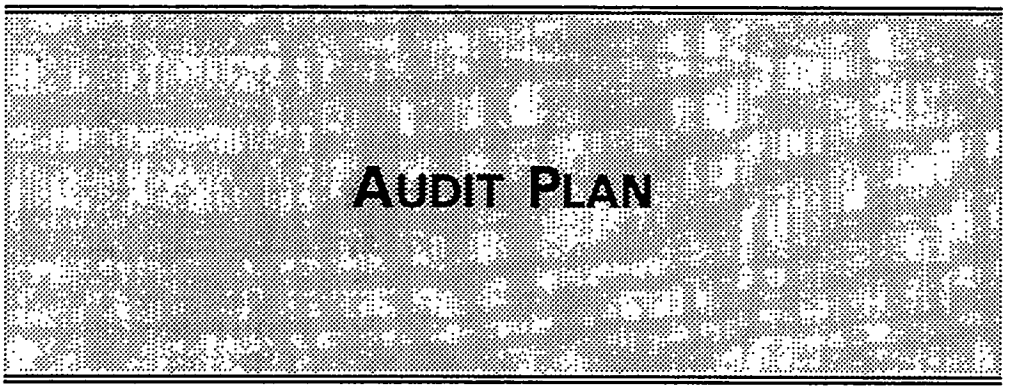
APPENDIX B



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1.0 INTRODUCTION

The DOE Environmental Audit Program is carried out by the Office of Environmental Audit (EH-24) within the Office of Environment, Safety and Health (EH). The program was created in 1985 with a goal to provide a continuing program of internal, independent oversight of line management's environmental performance, in support of DOE's broader goal of achieving full compliance and excellence in the environmental area. The objectives of the program in achieving this goal include:

- Conducting comprehensive baseline environmental audits of facilities that were not addressed in the Environmental Survey and that were not assessed by a Tiger Team;
- Conducting audits of environmental management within line programs;
- Conducting a continuing program of field/technical re-audits of major and other DOE facilities;
- Conducting special issue reviews to assess high priority issues at a particular site, or which cut across site and program lines; and
- Supporting line management self-assessment programs through continuing updates and automation of audit protocols, training, and other mechanisms of transferring the special auditing expertise of EH-24 to the field.

The audit of the Y-12 Plant during the period of August 22 through September 2, 1994, will be an Routine Environmental Audit. It will evaluate the effectiveness of environmental management programs established by DOE line organizations and their support contractor, Martin Marietta Energy Systems. The audit will be conducted in accordance with the DOE Environmental Audit Program Guidance (January 1992) and DOE/EH-0326, Protocols for Conducting Environmental Management Assessments of DOE Organizations, June 1993.

From an organizational perspective, the scope of the audit will include the Office of Defense Programs (DP), the Office of Environmental Management (EM), the Office of Energy Research (ER), the Oak Ridge Operations Office (ORO), the Y-12 Site Office (YSO), MMES, and M.K. Ferguson (MK-F). The audit team will focus on line management's performance in developing and implementing environmental management systems and programs, consistent with DOE expectations for environmental excellence.

From a functional perspective, the scope of the Routine Environmental Audit is comprehensive in that it covers a full range of relevant management systems. This includes:

- Organizational Structure;
- Environmental Commitment;
- Environmental Protection Programs;

- Formality of Environmental Programs;
- Internal and External Communication;
- Staff Resources, Training, and Development;
- Program Evaluation, Reporting, and Corrective Action; and
- Environmental Planning and Risk Management.

The Routine Environmental Audit will not address National Environmental Policy Act (NEPA) requirements, except as related to the effective management of the NEPA program.

The information in this Routine Environmental Audit plan is based on information received by the audit team as of the end of the day on August 11, 1994.

2.0 ROUTINE ENVIRONMENTAL AUDIT IMPLEMENTATION

The Y-12 Routine Environmental Audit will be conducted by a team consisting of a Team Leader and Deputy Team Leader from the DOE Office of Environmental Audit (EH-24) and a Team Coordinator, management systems specialists, and technical specialists from Arthur D. Little, Inc. (ADL). The administrative support will be provided by DevTech Systems, Inc. (DevTech Systems, Inc.). The names and assignments are listed below:

Bill Hasselkus	DOE/EH-24	Team Leader
Ching-San Huang	DOE/EH-24	Deputy Team Leader
Don Neal	ADL	Team Coordinator
Mark Pine	ADL	Organizational Structure Internal Communication
Paul Flaherty	ADL	Program Evaluation, Reporting, and Corrective Action Environmental Protection Programs
Karen Jones	ADL	Staff Resources, Training, and Development External Communications
Joe Lischinsky	ADL	Environmental Planning and Risk Management Environmental Commitment
David Allard	ADL	Environmental Protection Programs Formality of Environmental Programs
Ray Machacek	ADL	Environmental Protection Programs Formality of Environmental Programs
Susan Holland	DevTech	Team Administrator
Mead Summer	DevTech	Technical Editor

2.1 PRE-AUDIT ACTIVITIES

Pre-audit activities for the Y-12 Routine Environmental Audit included the issuance of an introduction and information request memorandum, an audit scoping meeting, a pre-audit site visit, and initial review of documentation provided to the audit team by YSO and MMES as a result of the information request memorandum and the visits.

The pre-audit site visit was conducted on July 28, 1994, by the DOE Team Leader, the DOE Deputy Team Leader, and the Team Coordinator from ADL. The purpose of the pre-audit site visit was to brief site personnel on the purpose and scope of the Routine Environmental Audit, to become familiar with Y-12 and its operations and environmental protection programs, to review information being supplied by Y-12, to request additional information, and to coordinate activities for the upcoming audit with both MMES and YSO. The visit included presentations by MMES and YSO. Prior to the pre-audit site visit the DOE Team Leader YSO and MMES to discuss scope and logistics.

Interviews with DP, EM, and ER managers with responsibility for Y-12 were conducted the week of August 8, 1994. The purpose of these interviews was to facilitate an understanding of the activities of DP, EM and ER with respect to effective environmental management of Y-12.

2.2 ONSITE ACTIVITIES AND REPORTS

The onsite activities for the Routine Environmental Audit will begin August 22 and continue through September 2, 1994. Onsite activities will include interviews with MMES, YSO, and ORO management and staff; telephone interviews with headquarters personnel as appropriate; interviews with regulatory agencies and citizens groups; and record and document reviews. The agenda for the audit and preliminary schedules for the management specialists are shown in Attachment A.

During the audit, the team will conduct daily debriefing sessions at Y-12 to review progress and concerns to date. All Y-12 personnel are welcome to attend the daily debriefs. Factual accuracy reviews of all findings will begin during the second week of the audit. On September 2, 1994, a closeout briefing will be conducted at the conclusion of the onsite portion of the audit. A summary of the results of the audit, including key findings, will be presented by the audit Team Leader at that time. Also at the closeout, a draft audit report will be provided to DP, EM, ER, EH, ORO, YSO, and Y-12 for review and comment.

2.3 POST-SITE ACTIVITIES

Following the onsite activities, DP, EM, ER, ORO, YSO, and MMES will have the opportunity to submit final comments on the draft audit report. After reviewing these comments, EH-24 will issue a final report.

Y-12 will be responsible for preparing a corrective action plan that will be reviewed by EH-24 and ORO. Following is a tentative schedule for completion of these post-audit activities.

September 16, 1994	Site comments on draft report due
September 30, 1994	Final audit report issued by EH-24
October 21, 1994	Draft corrective action plan due
November 4, 1994	Comments on draft corrective action plan by EH-24
November 18, 1994	Final corrective action plan due

APPENDIX C

SCHEDULE OF ONSITE ACTIVITIES

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SCHEDULE OF ONSITE ACTIVITIES

WK 1 - 8/21/94	Mon 8/22/94	Tue 8/23/94	Wed 8/24/94	Thu 8/25/94	Fri 8/26/94	Sat 8/27/94
Travel	Site briefing Begin interviews and document review Internal Team Meeting	Daily debriefing Continue interviews and document review Internal Team Meeting	Daily debriefing Continue interviews and document review Internal Team Meeting	Daily debriefing Continue interviews and document review Internal Team Meeting	Daily debriefing Continue interviews and document review Internal Team Meeting	Develop overviews and findings
WK 2 - 8/28/94	**Mon 8/29/94**	**Tue 8/30/94**	**Wed 8/31/94**	**Thur 9/1/94**	**Fri 9/2/94**	**Sat 9/3/94**
Define overviews and findings	Daily debriefing Followup interviews Draft report sections, overviews, and findings	Draft portions of report to Site for Factual Accuracy Review Followup interviews	Factual Accuracy Reviews Additional portions of report to Site for Factual Accuracy Review	Factual Accuracy Reviews Consolidate and edit report Develop Executive Summary	Prepare Closeout Presentation Closeout to Site Travel	

INTERVIEW SCHEDULES

Mon 8/22/94	Tue 8/23/94	Wed 8/24/94	Thu 8/25/94	Fri 8/26/94
Mark Pine **Organizational Structure; Internal and External Communication**				
• Site briefing • Site tour and overview • Interviews: - Organizational structure - Internal communication	• Interviews: - Organizational structure - Internal communication	• Interviews: - Organizational structure - Internal communication	• Interviews: - Organizational structure - Internal communication	• Interviews: - Organizational structure - Internal communication
Raymond F. Machacek **Environmental Protection Programs; Formality of Environmental Programs**				
• Site briefing • Site tour and overview • Interviews: - RCRA regulation compliance - RCRA permit status - water and air sampling system	• Interviews: - NPDES permit status - Trends in exceedances - Oversight of water programs - SPCC status - Coordination of environmental issues - Coordination of water and RCRA issues	• Interviews: - Compliance with RCRA regulations - Status of RCRA permits for Y-12 - Sampling system for water and air at Y-12	• Interviews: - Compliance programs - Tank dikes - Groundwater plumes - Budgets, programs, directions - Future role of environmental technical support - Environmental compliance at Y-12	• Interviews: - RCRA - TSCA - Pollution prevention - Waste management

INTERVIEW SCHEDULES (continued)

Mon 8/22/94	Tue 8/23/94	Wed 8/24/94	Thu 8/25/94	Fri 8/26/94
David J. Allard **Environmental Protection Programs; Formality of Environmental Programs**				
• Site briefing • Site tour and overview • Interviews: - Environmental monitoring plan - Annual site report - Environmental program implementation plan - Air effluent monitoring program - Air effluent program - Environmental ALARA program	• Interviews: - Environmental monitoring and survey program - 10 CFR 834 - Groundwater program - Air, water, soil sampling - Material release - Emergency response	• Interviews: - Self-assessments - QA programs, procedures - Environmental management, ALARA, monitoring, procedures - Waste management - Sanitary landfill - D&D - Pollution prevention - Mixed waste - Waste certification - Liquid effluents - Sanitary sewerage - Surface water	• Interviews: - Environmental restoration - RCRA closures - CERCLA investigations - D&D - Y-12 oversight - Sanitary sewerage - Y-12 emergency response plans and procedures - Radiation emergency response - Surveillance - Contractor performance	• Interviews: - Uranium facility inspection - Outside low-level and waste storage - Facility EU operations - Air, liquid effluent control, monitoring - Clean packaging material entering contaminated areas - Procedure initiation, development, review, revision, control
Karen L. Jones **Staff Resources, Training, and Development; Internal and External Communication**				
• Site briefing • Interviews: - Staff resources - Training	• Interviews: - Staff resources - Training - External communication	• Interviews: - Staff resources - Training - External communication - TMS system	• Interviews: - Staff resources - External communication	• Interviews: - Staff resources - Training - External communication - Development

INTERVIEW SCHEDULES (continued)

Mon 8/22/94	Tue 8/23/94	Wed 8/24/94	Thu 8/25/94	Fri 8/26/94
Paul E. Flaherty **Program Evaluation, Reporting, and Corrective Action;** **Environmental Protection Programs**				
• Site briefing • Site tour and overview • Interviews: - Environmental programs - Self-assessments - Corrective actions	• Interviews: - Environmental programs - Ambient/source monitoring - Air programs - Self-assessments - Corrective actions	• Interviews - Steam plant air permit - Plant operations - Air compliance - Self-assessments - Corrective actions - Environmental protection programs	• Interviews - Environmental compliance process - Ambient air network - Order compliance - Self-assessments - Corrective actions	• Interviews - Energy Systems Action Management System (ESAMS) - Task teams - Air programs
Joseph Lischinsky **Environmental Planning and Risk Management;** **Environmental Commitment;**				
• Site briefing • Site tour and overview • Interviews: - Environmental commitment - Environmental planning process at Y-12 - ES&H long-term planning - Site development - Safety analysis - Risk management	• Interviews: - Emergency management - Occurrence reporting - Emergency response - Shift supervision occurrence investigation - Environmental commitment - Environmental and long-range planning - Public interaction - Budgeting process - Risk-based priority system	• Interviews: - Environmental commitment - Environmental planning - Occurrence reporting system - Tracking and trending of occurrences - ER ADS process - Risk-based prioritization - Risk-based prioritization method process - Budget review	• Interviews: - Risk-based prioritization method review at ORO - Environmental commitment - Environmental planning - WM risk-based prioritization method process	• Interviews: - Environmental planning - Environmental commitment

APPENDIX D

SITE DOCUMENTS REVIEWED BY THE AUDIT TEAM

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SITE DOCUMENTS REVIEWED BY THE AUDIT TEAM

Document #	Title/Description	Author	Organization	Recipient	Document Date
Mark Pine: Organizational Structure; Internal and External Communication					
D-A-1	Johnson Controls Oak Ridge Operations' Pollution Prevention Program Plan	Johnson Controls World Services, Inc. (JCWS)	JCWS		2/16/94
D-A-2	Requirements for the Accomplishment of Construction Projects (. . .), Rev. 2	MMES	MMES		4/15/94
D-A-3	Environmental Officer Program Procedures	MMES	MMES		10/3/91
D-A-4	Development Division Assignments for HSE&A	R. Riepe	MMES		
D-A-5	Memo re: compliance issue	D. Deel	MMES	Development Division staff	8/22/94
D-A-6	Policy for Environmental Protection	D.J. Bostock	MMES		10/28/92
D-A-7	DOE Field Office, Oak Ridge Environmental Division, Policies and Procedures Manual/Memoranda of Understanding	Various	ORO		June 1993
D-A-8	Management Policies and Requirements Manual, Oak Ridge Operations Office, Environmental Protection Division	Various	ORO/PAI Corp.		December 1990
D-A-9	Memorandum of Agreement/Roles and Responsibilities Between Energy Systems Environmental Restoration Division and Oak Ridge Reservation Plant Organizations	MMES-Environmental Restoration Division (MMES-ERD)	MMES		3/28/91
D-A-10	Project Management Plan for the Decontamination and Decommissioning of Building 9201-4 at the Oak Ridge Y-12 Site		ORO		December 1993
D-A-11	DOE Y-12 Site Office, Y-12 Site Environmental Protection Program Implementation Plan (November 9, 1993 to November 9, 1994)	Various	YSO		
D-A-12	Supplemental Organization Charts for the Y-12 Plant		MMES		August 1993
D-A-13	Y-12 Roles and Responsibilities, Organizational Charters		YSO		

SITE DOCUMENTS REVIEWED BY THE AUDIT TEAM (continued)

Document #	Title/Description	Author	Organization	Recipient	Document Date
D-A-14	Organizational chart		MMES		
D-A-15	Organizational chart with phone numbers		MMES		
D-A-16	Awareness News (newsletter)	Y-12 Site Pollution Prevention Awareness Program	MMES	Various	May 1994
D-A-17	List of internal communications mechanisms	R. Riepe	MMES	EH-24 audit team	August 1994
D-A-18	Summary of JCWS Internal Environmental Assessment	M. Brown	JCWS	Various	10/21/93
Raymond F. Machacek: Environmental Protection Programs; Formality of Environmental Programs (Non-Rad)					
D-B-1	Oak Ridge Reservation Environmental Report 1992 (ES/ESH-31/V1)	F.C. Kornegay et al.	DOE		December 1993
D-B-2	Oak Ridge Reservation Environmental Report 1992 (ES/ESH 31/V2)	F.C. Kornegay et al.	DOE		December 1993
D-B-3	Y-12 Plant RCRA Hazardous Waste Program Management Plan		MMES		August 1994
D-B-4	Department of Energy Y-12 Plant NPDES Permit Application Category I, EPA Form 2C		MMES		1990
D-B-5	Department of Energy Y-12 Plant NPDES Permit Application Category II, EPA Form 2C		MMES		1990
D-B-6	Department of Energy Y-12 NPDES Permit Application Outfall Characterization		MMES		1990
D-B-7	MMES Standard Spill Prevention, Control and Countermeasures (ESS-EP-126)		MMES		February 1992
D-B-8	MMES Standard Compliance with Clean Water Act and NPDES (ESS-EP-130)		MMES		April 1992
D-B-9	MMES Standard Clean Water Act Best Management Practices Program (ESS-EP-133)		MMES		December 1992
D-B-10	The Spill Prevention, Control and Countermeasures Plan for the Oak Ridge Y-12 Plant (Y/SUB/92-21704/1)	M. West	MMES		August 1992

SITE DOCUMENTS REVIEWED BY THE AUDIT TEAM (continued)

Document #	Title/Description	Author	Organization	Recipient	Document Date
D-B-11	Oak Ridge Y-12 Plant Groundwater Protection Program Management Plan (Y/SUB/93-YP507C/4)		MMES		June 1993
D-B-12	Draft Groundwater Protection Program Quality Program (Y/SUB/94-99069C/Y13/1)		MMES		June 1994
D-B-13	Health and Safety Plan for Well Installation and Plugging and Abandonment Activities (Y/SUB/92-99928C/Y11/1)		MMES		July 1992
D-B-14	Monitor Well Inspection and Maintenance Plan for DOE Y-12 Plant (Y/SUB/91-YP507C/5)		MMES		July 1991
D-B-15	Y-12 Plant Groundwater Protection Program - Groundwater Monitoring Data Management Plan (Y/SUB/93-TK532C/1)		MMES		March 1993
D-B-16	Monitor Well Plugging and Abandonment Plan for DOE Y-12 Plant, Oak Ridge (Y/SUB/91-YP507C/6)		MMES		July 1992
D-B-17	Underground Storage Tank Management Plan Oak Ridge Y-12 Plant (Y/SUB/90/UK142C/1/RT)	D. Bohrman, E. Ingram	MMES		December 1991
D-B-18	Detection of Volatile Organic Compounds in Offsite Groundwater Sampling Wells (ORO-MMES-ENVRES-1994-0001)	J. Grumski	MMES		April 1994
David J. Allard: Environmental Protection Programs; Formality of Environment Programs (Rad)					
D-C-1	DOE Oak Ridge Operations Environmental Restoration Division Self-Assessment Program. Instruction Manual Audit Tracking System		ORO		July 1994
D-C-2	Memo re: Environmental Restoration Division - Policies and Procedures Manual		ORO		11/27/92
D-C-3	DOE Field Office, Oak Ridge Environmental Division, Policies and Procedures Manual/QA Plan		ORO		June 1993
D-C-4	DOE Field Office, Oak Ridge Environmental Division, Policies and Procedures Manual/Self Assessment Plan		ORO		June 1993

SITE DOCUMENTS REVIEWED BY THE AUDIT TEAM (continued)

Document #	Title/Description	Author	Organization	Recipient	Document Date
D-C-5	DOE Field Office, Oak Ridge Environmental Division, Policies and Procedures Manual/Environmental Restoration Division Policies		ORO		June 1993
D-C-6	DOE Field Office, Oak Ridge Environmental Division, Policies and Procedures Manual/Memorandums of Understanding		ORO		June 1993
D-C-7	DOE Field Office, Oak Ridge Environmental Division, Policies and Procedures Manual/Quality Assurance Procedures		ORO		June 1993
D-C-8	DOE Field Office, Oak Ridge Environmental Division, Policies and Procedures Manual/Technical Procedures		ORO		June 1993
D-C-9	Management Policies and Requirements Manual, Oak Ridge Operations Office, Environmental Protection Division		ORO/PAI Corp.		December 1990
D-C-10	Memorandum of Agreement/Roles and Responsibilities Between Energy Systems Environmental Restoration Division and Oak Ridge Reservation Plant Organizations		MMES		3/28/91
D-C-11	Agreement Between the United States Department of Energy and the State of Tennessee		Y-12		
D-C-12	Internal correspondence (61 separate memos)		Various		
D-C-13	Tennessee Air Pollution Control Board Operating Permit Issuance - Source Y-9401-3-[A,B9170) & C,D(171) & E] - Emission Source Reference No. 01-1020-31,31,33,34 - Y-12 Plant		Tennessee Department of Environment and Conservation (TDEC)		5/28/93
D-C-14	Environmental Restoration Quality Program Plan		MMES		
D-C-15	RCRA General Contingency Plan for Hazardous Waste Treatment, Storage, and Disposal Units at the Oak Ridge Y-12 Plant		MMES		November 1993
D-C-16	Martin Marietta Energy Systems, Inc., ERWM Programs Intersite Procedures Manual. Subject: Data Product Documentation for the Oak Ridge Environmental Information System		MMES		2/24/94

SITE DOCUMENTS REVIEWED BY THE AUDIT TEAM (continued)

Document #	Title/Description	Author	Organization	Recipient	Document Date
D-C-17	Health and Safety Procedures Table of Contents		MMES		
D-C-18	The Spill Prevention, Control, and Countermeasures Plan for the Oak Ridge Y-12 Plant		MMES		August 1992
D-C-19	Oak Ridge Reservation (ORR) Annual Emissions Report: Radionuclide National Emission Standards for Hazardous Air Pollutants (NESHAP)		ORO		6/6/94
D-C-20	Semiannual Tiger Team Status Report		MMES		7/12/94
D-C-21	Tennessee Oversight Agreement (TOA) Section B.3 Operations Notification		TDEC and DOE		9/23/92
D-C-22	Project Management Plan for the Decontamination and Decommissioning of Building 9201-4 at the Oak Ridge Y-12 Site		MMES		December 1993
D-C-23	Occurrence Report Number ORO-MMES-Y12DEFPGM-1993-0020		MMES		6/14/93
D-C-24	Internal correspondence: Environmental As Low As Reasonably Achievable (ALARA) Committee		MMES		6/28/94
D-C-25	Section C Waste Characteristics		MMES		
D-C-26	Y-12 FFCA Waste Streams/Inventory		ORO		
D-C-27	US DOE Annual Report on Waste Generation and Waste Minimization Progress 1991-1992		DOE		February 1994
D-C-28	Department of Energy Y-12 Plant Waste Minimization and Pollution Prevention Awareness Program Plan		ORO		June 1991
D-C-29	Waste Management Program Y-12 Plant Waste Management Plan as Required by DOE Order 5820.2A		MMES		December 1993
D-C-30	Environment, Safety, and Health Five-Year Plan for the Oak Ridge Y-12 Plant. Fiscal Years 1995-1999		MMES		March 1993
D-C-31	TDEC/DOE Organization Chart		TDEC		June 1994
D-C-32	US DOE Y-12 Site Office Operating Procedures Manual		YSO		2/14/94

SITE DOCUMENTS REVIEWED BY THE AUDIT TEAM (continued)

Document #	Title/Description	Author	Organization	Recipient	Document Date
D-C-33	US DOE Implementation Guidance Subject: Organization and Functions - Oak Ridge Operations Office		ORO		5/6/94
D-C-34	Y-12 Audit Report Memo and Cover Sheets		YSO		1/14/94
D-C-35	Environment, Safety, and Health Appraisal of the Y-12 Site Contractor Operations and Environmental Restoration Programs Volume I		ORO		7/19-8/6/93
D-C-36	Environment, Safety, and Health Appraisal of the Y-12 Site Contractor Operations and Environmental Restoration Programs Volume II		ORO		7/19-8/6/93
D-C-37	Environmental Monitoring Plan for the Oak Ridge Reservation US DOE Oak Ridge Field Office		ORO		September 1992
D-C-38	Oak Ridge Reservation, Environmental Report for 1992, Volume I		ORO		September 1993
D-C-39	Oak Ridge Reservation, Environmental Report for 1992, Volume II		ORO		September 1993
D-C-40	DOE Y-12 Site Office, Y-12 Site Environmental Protection Program Implementation Plan (November 9, 1993 to November 9, 1994)		YSO		
D-C-41	Supplemental organization charts for the Y-12 Plant		ORO		1/21/94
D-C-42	Environment, Safety and Health ES&H Strategic Plan, August 1993, Martin Marietta Energy Systems, Inc. Oak Ridge, Tennessee; Paducah, Kentucky; Portsmouth, Ohio		MMES		August 1993
D-C-43	Photographs		MMES		
D-C-44	Oak Ridge Health Studies Phase I Report, Volume II-Part A, DOSE Reconstruction Feasibility Study, Tasks 1&2, A Summary of Historical Activities on the Oak Ridge Reservation with Emphasis on Information Concerning Off-Site Emission of Hazardous Material		ChemRisk (division of Mclaren/Hart)	Tennessee Department of Health and Oak Ridge Health Agreement Steering Panel	September 1993

SITE DOCUMENTS REVIEWED BY THE AUDIT TEAM (continued)

Document #	Title/Description	Author	Organization	Recipient	Document Date
D-C-45	Y-12 Roles and Responsibilities, Organizational Charters		MMES		
D-C-46	Proposed Mission and Function Statement		YSO		
D-C-47	Organizational chart		ORO		
D-C-48	Organizational chart with phone numbers		ORO		
D-C-49	Fiscal Year 1995 Work Agreement		ORO		7/19/94
D-C-50	Fiscal Year 1994 Work Agreement		ORO		1/31/94
D-C-51	Table 2.8 Summary of Permits		MMES		
D-C-52	Guidelines for Conduct of Operations; Martin Marietta Energy Systems, Inc.		MMES		3/21/91
D-C-53	Environmental Restoration and Waste Management Program; Quality Assurance Plan; Rev. 3	ORO	City of Oak Ridge, TN		April 1994
D-C-54	Quality Assessment Program for Subcontracted Laboratories		MMES		
D-C-55	Summary of Typical MDAs for Non-Drinking Water Samples (Radiological Analysis)		MMES		
D-C-56	Quality Assurance Plan for the Plant Laboratory Quality Services Division (QAP-Y-PC-0080)		MMES		6/29/92
D-C-57	Y-12 Compliance with 5500 Order Series	R. Merrill	MMES		
D-C-58	Y70-300 Series Mixed Waste Procedures (Draft and Final)	K. Cooper	MMES		1994
D-C-59	ESH Progress Assessment of Y-12 Plant	DOE	DOE Office of Environment, Safety and Health (EH)		February 1992
D-C-60	Environmental Survey Procedures Quality Control Program (ES/ESH/INT14)		MMES		9/1/88 (Rev. 6)
D-C-61	Environmental Management Department Operating Procedures (Y50 Series)		MMES		6/28/94

SITE DOCUMENTS REVIEWED BY THE AUDIT TEAM (continued)

Document #	Title/Description	Author	Organization	Recipient	Document Date
D-C-62	HSE&A Division Health Physics Procedures (Y50 Series)		MMES		2/28/92
D-C-63	NPDES Implementation Procedures Manual (Y/TS-526)		MMES		April 1989
D-C-64	Memo re: radiological monitoring	K. Hanzelka	MMES	Staff	12/29/92
D-C-65	Radiological Monitoring Plan for Y-12 (Y/SUB/92-TK532C/1)	MMES subcontractor	MMES	MMES	August 1992
D-C-66	Environmental Management Department Program - QA Plan (Y-89-HSE-7000)		MMES	MMES	August 1992
D-C-67	Oak Ridge Reservation - Annual Site Environmental Report for 1993 (Draft)		MMES		8/12/94
D-C-68	Memo re: Y-12 Plant ALARA Policy (Y72-003)		MMES	MMES	4/2/93
D-C-69	Y-12 Plant Environmental ALARA Program Plan (Y/TS-1160/RI)		MMES		5/17/94
D-C-70	Quality Assurance Program Plan for Radionuclide NESHAP (Y/TS-874 Rev. 1)	M. Woltman	MMES		June 1992 (6/94 rev.)
D-C-71	Memo re: Y-12 Quality Assurance Project Plan for the Federal Facility Compliance Act	W. Smith	EPA	R. Nelson, DOE	7/14/94
D-C-72	Memo re: ALARA Goals for 1992	J. Stone	MMES	ALARA Steering Board	12/18/91
D-C-73	Memo re: Y-12 Plant Environmental ALARA Committee Agenda	J. Powell	MMES	ALARA Committee	6/8/94
D-C-74	Memo re: ALARA Steering Committee Meeting	L. Presley	MMES	Steering Committee	3/2/94
D-C-75	Revised Y-12 Environmental ALARA Program Plan (Draft)		MMES		5/17/94
D-C-76	Report re: Y-12 Plant Discharge of Enriched Uranium to Sanitary Sewer (Y/TS-776)		MMES		September 1991
D-C-77	Letter re: Enriched Uranium in Sanitary Sewer	M. Mobley	TDEC	G. Cinder, City of Oak Ridge Public Works	9/27/93

SITE DOCUMENTS REVIEWED BY THE AUDIT TEAM (continued)

Document #	Title/Description	Author	Organization	Recipient	Document Date
D-C-78	ORR Site Management Plan for Environmental Restoration (DOE/OR-1001/R3)		MMES	DOE	June 1994
D-C-79	Procedures Configuration Control Board Charter		MMES		12/20/91
D-C-80	Letter re: Conduct of Operations Implementation Status and Plan	D. Bostock	MMES	ORO	3/1/93
D-C-81	Health and Safety Procedures (70 Series)		MMES		7/28/94 (last rev.)
D-C-82	Emergency Procedures (40 Series)		MMES		6/21/94 (last rev.)
D-C-83	Administrative Procedures (10 Series)		MMES		7/20/94 (last rev.)
D-C-84	NPDES Permit (TN0002968)	EPA Region IV	Water Management Division	ORO	5/24/85
Karen L. Jones: Internal and External Communication; Staff Resources, Training, and Development					
D-D-1	The Tennesseee Oversight Agreement	State of Tennessee	State of Tennessee	DOE	5/13/91
D-D-2	MMES-OR Y-12 Plant Procedures: Environmental Officer Program, #POC 70-921	MMES	MMES		10/30/91
D-D-3	The Performance Planning & Review System (PPR) Form	MMES Corporate	MMES		
D-D-4	Draft: Workforce Restructuring Plan	ORO	ORO	ORO	August 1994
D-D-5	Miscellaneous TMS records	TMS Database	MMES		8/23/94
D-D-6	MK-Ferguson (MK-F) Formal Training Records	MK-F Database	MK-F	MK-F	8/26/94
D-D-7	DOE Training Evaluation Form	DOE Training Registration Center	DOE		
D-D-8	OJT Lesson Plan	MMES Disassembly and Special Materials	MMES		

SITE DOCUMENTS REVIEWED BY THE AUDIT TEAM (continued)

Document #	Title/Description	Author	Organization	Recipient	Document Date
D-D-9	Distribution List for Stakeholders	MMES Y-12 Public Relations	MMES		August 1994
D-D-10	Overview of Clean-Water Computer-Based Training	MMES	MMES		
D-D-11	Training bulletins	ORO Training and Development Division	ORO		
D-D-12	Action Plan: DOE Implementation Plan for DNFSB Recommendations 93-3 and 92-7	ORO	ORO		4/18/94
D-D-13	Facility Representative Training and Qualification Program Prioritization Program	ORO	ORO		1/26/94
D-D-14	Response to Comments on the Environmental Assessment for Proposed Interim Storage at Y-12	ORO	ORO	DOE	June 1994
D-D-15	Public Comments to the Environmental Assessment Report on Storage of Highly Enriched Uranium at Y-12	ORO	DOE	DOE	4/5/94
D-D-16	Y-12 Environmental Protection Program Implementation Program	Y-12	DOE	Y-12	11/9/93
D-D-17	DOE Site Information and Report Production Handbook for the Y-12 Plant	DOE	DOE	DOE Office of Environmental Audit (EH-24) audit team	8/22/94
Paul E. Flaherty: Environmental Protection Programs; Program Evaluation, Reporting, and Corrective Action					
D-E-1	Environmental Monitoring Plan for Oak Ridge Reservation (DOE/OR-1066)	YSO, MMES	ORO	Public/Regulators	September 1992
D-E-2	Letter and report on discontinuing ambient air sampling (Rev. 1, 3-17-94, Y/TS-1157/R1)	MMES	MMES	R. Spence	3/17/94
D-E-3	Steam plant air operating permit	TDEC Air Pollution Control Board	TDEC	YSO, MMES line organizations	5/28/94
D-E-4	Steam plant opacity trend	Steam plant staff	MMES		8/24/94
D-E-5	Y-12 Environmental Restoration briefing	J. Grumski, MMES/Y-12 ER Manager	MMES	EH-24 audit team	7/28/94

SITE DOCUMENTS REVIEWED BY THE AUDIT TEAM (continued)

Document #	Title/Description	Author	Organization	Recipient	Document Date
D-E-6	Environmental Non-compliance Report - Summary	M. Mitchell, Director	MMES Environmental Compliance	R. Spence	7/27/94
D-E-7	Weekly Y-12 Non-compliance Report	Compliance Integration Group	MMES	MMES managers	8/3/94, 8/22/94
D-E-8	ESAMS Report - Ambient Air Finding	MMES	MMES	EH-24 audit team	8/22/94
D-E-9	Fuel Purchase Agreement for RVP	Warren Distributing	Petroleum Company	MMES	4/11/94
D-E-10	MMES-ESH Strategic Plan	MMES	MMES	YSO	August 1993
D-E-11	Environmental Officer Program Description	MMES	MMES	Y-12	2/28/91
D-E-12	HSE&A Organization Chart	MMES	MMES	Y-12	5/2/94
D-E-13	HSE&A Self-assessments Checklists	MMES	MMES	Y-12	June 1994
D-E-14	Air Process Control Procedures	MMES, YSO	MMES	Y-12	December 1992
D-E-15	Steam Plant Fuel Use Records for 1993 and 1994	MMES	MMES	Y-12	8/24/92
D-E-16	Oak Ridge Implementation Guidance	ORO	DOE	Y-12	
D-E-17	ORO Functional Appraisal	MMES	MMES	Y-12	7/8/93
D-E-18	Y-12 Tiger Team Report	DOE	(EH-24)	Y-12	February 1990
D-E-19	Draft Annual Site Environmental Report	MMES, YSO	MMES	Public	8/12/94
D-E-20	ES&H Progress Assessment	DOE Headquarters	DOE Office of the Assistant Secretary for Environment, Safety and Health (EH-1)	Public	February 1992
D-E-21	MMES Y-12 Quality-Corrective Action Status Report	MMES Y-12 Quality Manager	MMES	YSO	August 1994
D-E-22	ES&H Tiger Team Assessment	DOE Headquarters	EH-1	Site/Public	February 1990
D-E-23	Y-12 Plant PCB Annual Inventory Report	S. Rathke	MMES	Regulators	June 1994

SITE DOCUMENTS REVIEWED BY THE AUDIT TEAM (continued)

Document #	Title/Description	Author	Organization	Recipient	Document Date
D-E-24	Performance Objectives and Criteria for Conducting DOE Environmental Audits	EH-24	EH-24		January 1994
Joseph Lischinsky: Environmental Commitment; Environmental Planning and Risk Management					
D-F-1	ES&H Five-Year Plan for Y-12	Y-12	MMES	DOE	March 1993
D-F-2	Y-12 Site Environmental Protection Program Implementation Plan, 11/9/93-11/9/94	YSO	DOE	DOE	October 1994
D-F-3	Training Overheads: Risk-based Prioritization Methodology	L. Hall	MMES	MMES	
D-F-4	Integrated Resource Management Guidance/ Technical Basis	M. Sparks	MMES Policy & Management Systems	DOE	August 1993
D-F-5	Y-12 Plant Technical Site Information	Y-12	MMES	DOE	September 1993
D-F-6	Occurrence Reporting System Categorization Handbook	MMES	MMES		
D-F-7	Y-12 Plant Procedure, Environmental Officer Program	HSE&A	MMES		October 1991
D-F-8	Y-12 Plant Procedure, Incident Investigation	QA	MMES		December 1991
D-F-9	Y-12 Plant Procedure, Incident Investigation	QA	MMES		June 1992
D-F-10	Y-12 Missions and Division Functions, Overhead Presentation	MMES Business Management	MMES		
D-F-11	Y-12 Site Office Mission Statement	YSO	DOE		
D-F-12	Organizational Improvement Programs Charter	Y-12	MMES		
D-F-13	ER-FY 1995 Funding Profile	ER	MMES		
D-F-14	ER Risk-based Prioritization Methodology	L. Nanstrad R. White	ER/MMES	DOE	March 1994
D-F-15	ER Program Mission Briefing Overheads	J. Grumski	ER/MMES		July 1994
D-F-16	ORPS Center Log, 8/19/94	MMES	MMES		August 1994

SITE DOCUMENTS REVIEWED BY THE AUDIT TEAM (continued)

Document #	Title/Description	Author	Organization	Recipient	Document Date
D-F-17	Occurrence Tracking and Trending Data 93-94	Y-12 Site Shift Operations	MMES		August 1994
D-F-18	Environmental Office Assignments Listing	HSE&A	MMES		August 1994
D-F-19	DOE Field Office, Oak Ridge Environmental Division, Policies and Procedures Manual/Environmental Restoration Division Policies		ORO		June 1993
D-F-20	DOE Field Office, Oak Ridge Environmental Division, Policies and Procedures Manual/Memorandums of Understanding		ORO		June 1993
D-F-21	Management Policies and Requirements Manual, Oak Ridge Operations Office, Environmental Protection Division		PAI Corp.		December 1990
D-F-22	Martin Marietta Energy Systems, Inc. Procedure; Subject: Lessons Learned and Alerts Systems		MMES		12/20/91
D-F-23	Martin Marietta Energy Systems, Inc., ERWM Programs Intersite Procedures Manual. Subject: Data Product Documentation for the Oak Ridge Environmental Information System		MMES		2/24/94
D-F-24	Internal Correspondence. Subject: Environmental As Low As Reasonably Achievable (ALARA) Committee		MMES		6/28/94
D-F-25	US DOE Implementation Guidance Subject: Organization and Functions - Oak Ridge Operations Office		ORO		5/6/94
D-F-26	Environmental Monitoring Plan for the Oak Ridge Reservation US DOE Oak Ridge Field Office		ORO		September 1992
D-F-27	Environment, Safety and Health ES&H Strategic Plan, August 1993, Martin Marietta Energy Systems, Inc. Oak Ridge, Tennessee; Paducah, Kentucky; Portsmouth, Ohio		MMES		August 1993
D-F-28	Proposed Mission and Function Statement		YSO		
D-F-29	Work Force Restructuring		MMES		

SITE DOCUMENTS REVIEWED BY THE AUDIT TEAM (continued)

Document #	Title/Description	Author	Organization	Recipient	Document Date
D-F-30	Y-12 Health & Safety Policy for Environmental Protection (Y-72-002)	Y-12 Command Media	MMES	MMES	September 1992
D-F-31	Core Decision Packages, FY 1994	L. Hall	MMES		August 1994
D-F-32	General Assumptions, FY 1996	P. Marquess	ORO	DOE	October 1993
D-F-33	FY 1996 Budget Submission - ORO	J. LaGrone	ORO	DOE	April 1994
D-F-34	Performance Evaluation Plan for MMES FY 1993	Weapons Business Unit	ORO	DOE	1993
D-F-35	Performance Evaluation Committee Report for MMES	Weapons Business Unit	ORO	DOE	1993

APPENDIX E

CONTACTS/INTERVIEWS CONDUCTED BY THE AUDIT TEAM

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CONTACTS AND INTERVIEWS CONDUCTED BY THE AUDIT TEAM

Ref. #	Date	Organization	Topic
Mark Pine: Organizational Structure; Internal and External Communication			
I-A-1	8/10/94	DP-24	Organizational structure, internal communication
I-A-2	8/10/94	DP-24	Organizational structure, internal communication
I-A-3	8/10/94	ER-8.2	Organizational structure, internal communication
I-A-4	8/10/94	EM-321	Organizational structure, internal communication
I-A-5	8/10/94	EM-422	Organizational structure, internal communication
I-A-6	8/22/94	ORO	Organizational structure, internal communication
I-A-7	8/23/94	MMES Y-12	Organizational structure, internal communication
I-A-8	8/23/94	MMES Y-12	Organizational structure, internal communication
I-A-9	8/23/94	MMES Y-12	Organizational structure, internal communication
I-A-10	8/24/94	MMES Y-12	Organizational structure, internal communication
I-A-11	8/24/94	MMES Y-12	Organizational structure, internal communication
I-A-12	8/24/94	MMES Y-12	Organizational structure, internal communication
I-A-13	8/24/94	MMES Y-12	Organizational structure, internal communication
I-A-14	8/24/94	MMES Central	Organizational structure, internal communication
I-A-15	8/25/94	MMES Y-12	Organizational structure, internal communication
I-A-16	8/25/94	MMES Y-12	Organizational structure, internal communication
I-A-17	8/25/94	MMES Y-12	Organizational structure, internal communication
I-A-18	8/25/94	MK-F	Organizational structure, internal communication
I-A-19	8/25/94	MMES Y-12	Organizational structure, internal communication
I-A-20	8/25/94	MMES Central	Organizational structure, internal communication
I-A-21	8/26/94	ORO	Organizational structure, internal communication
I-A-22	8/26/94	JCWS	Organizational structure, internal communication

CONTACTS AND INTERVIEWS CONDUCTED BY THE AUDIT TEAM (continued)

Ref. #	Date	Organization	Topic
I-A-23	8/26/94	JCWS	Organizational structure, internal communication
I-A-24	8/26/94	JCWS	Organizational structure, internal communication
I-A-25	8/26/94	ORO Construction and Engineering	Organizational structure, internal communication
I-A-26	8/26/94	Y-12 Site Office (YSO)	Organizational structure, internal communication
I-A-26	8/25/94	MMES Y-12	Organizational structure, internal communication
Raymond F. Machacek: Environmental Protection Programs; Formality of Environmental Programs (Non-Rad)			
I-B-1	8/22/94	MMES HSE&A	Compliance with RCRA regulations
I-B-2	8/22/94	MMES HSE&A	Status of RCRA permits for Y-12
I-B-3	8/22/94	MMES HSE&A	Sampling system for water and air at Y-12
I-B-4	8/23/94	MMES HSE&A	NPDES permit status and trends in exceedances
I-B-5	8/23/94	MMES HSE&A	Oversight of water programs, including NPDES, SPCC, and groundwater
I-B-6	8/23/94	MMES HSE&A	Status of SPCC
I-B-7	8/23/94	MMES HSE&A	Status of the groundwater monitoring program
I-B-8	8/23/94	YSO	Coordination between YSO and MMES on environmental matters
I-B-9	8/23/84	YSO	Coordination of water and RCRA issues
I-B-10	8/24/94	ORO	Relationship of ES&H between ORO and Y-12
I-B-11	8/24/94	ORO	Status of compliance issues at Y-12
I-B-12	8/24/94	MMES	Status of compliance issues at Y-12
I-B-13	8/24/94	MMES	Status of upgrade to steam plant water treatment facility
I-B-14	8/24/94	MMES	Plant effluents to steam plant water treatment facility
I-B-15	8/25/94	MMES	Compliance programs
I-B-16	8/25/94	MMES	Tank dikes, groundwater plumes
I-B-17	8/25/94	MMES	Budgets, programs, directions

CONTACTS AND INTERVIEWS CONDUCTED BY THE AUDIT TEAM (continued)

Ref. #	Date	Organization	Topic
I-B-18	8/25/94	ORO	Future role of environmental technical support
I-B-19	8/25/94	ORO	Environmental compliance at Y-12 over 30 years
I-B-20	8/26/94	YSO	RCRA, TSCA, pollution prevention
I-B-21	8/26/94	ORO	Pollution prevention, waste management
David J. Allard: Environmental Protection Programs; Formality of Environmental Programs (Rad)			
I-C-1	8/22/94	MMES	Environmental monitoring plan, annual site report, environmental program implementation plan
I-C-2	8/22/94	MMES	Air effluent monitoring program
I-C-3	8/22/94	MMES	Air effluent program and environmental ALARA program
I-C-4	8/23/94	MMES	ORO environmental monitoring and survey program
I-C-5	8/23/94	MMES	ORO environmental monitoring and survey program
I-C-6	8/23/94	MMES	ORO environmental monitoring and survey program
I-C-7	8/23/94	MMES	ORO environmental monitoring and survey program
I-C-8	8/23/94	MMES	10 CFR 834 and environmental ALARA program
I-C-9	8/23/94	MMES	Y-12 groundwater program
I-C-10	8/23/94	MMES	Air, water, soil sampling
I-C-11	8/23/94	MMES	Material release and emergency response
I-C-12	8/24/94	MMES	Self-assessments, QA program, procedures
I-C-13	8/24/94	MMES	Environmental management, environmental ALARA, environmental monitoring plan, procedures
I-C-14	8/24/94	MMES	Waste management, D&D, sanitary landfill
I-C-15	8/24/94	MMES	Pollution prevention, mixed waste, waste minimization program
I-C-16	8/24/94	MMES	Waste management, mixed waste, waste certification
I-C-17	8/24/94	MMES	Waste management, mixed waste, waste certification
I-C-18	8/24/94	MMES	Waste management, mixed waste, waste certification

CONTACTS AND INTERVIEWS CONDUCTED BY THE AUDIT TEAM (continued)

Ref. #	Date	Organization	Topic
I-C-19	8/24/94	MMES	Surface water, liquid effluents, sanitary sewerage
I-C-20	8/24/94	MMES	Surface water, liquid effluents, sanitary sewerage
I-C-21	8/24/94	MMES	Surface water, liquid effluents, sanitary sewerage
I-C-22	8/25/94	MMES	Environmental restoration, RCRA closures, CERCLA investigations, D&D
I-C-23	8/25/94	YSO	Y-12 Environmental programs oversight, surveillances, sanitary sewerage
I-C-24	8/25/94	ORO	Environmental restoration oversight, contractor performance, D&D
I-C-25	8/25/94	TDEC	Y-12 oversight, environmental monitoring and surveillance, sanitary sewerage
I-C-26	8/25/94	MMES	Y-12 Plant emergency response plans and procedures, radiation emergency response
I-C-27	8/25/94	MMES	Y-12 Plant emergency response plans and procedures, radiation emergency response
I-C-28	8/25/94	MMES	Y-12 Plant emergency response plans and procedures, radiation emergency response
I-C-29	8/26/94	MMES	Uranium facility inspections, outside low-level and waste storage
I-C-30	8/26/94	MMES	Facility Enriched Uranium (EU) operations, air and liquid effluent control and monitoring
I-C-31	8/26/94	MMES	Facility EU operations, air and liquid effluent control and monitoring
I-C-32	8/26/94	MMES	Facility EU operations, air and liquid effluent control and monitoring
I-C-33	8/26/94	MMES	Facility EU operations, air and liquid effluent control and monitoring
I-C-34	8/26/94	MMES	Facility EU operations, air and liquid effluent control and monitoring
I-C-35	8/26/94	MMES	Clean packaging material entering contaminated areas

CONTACTS AND INTERVIEWS CONDUCTED BY THE AUDIT TEAM (continued)

Ref. #	Date	Organization	Topic
I-C-36		MMES	Facility EU operations, air and liquid effluent control and monitoring
I-C-37		MMES	Procedure initiation, development, review, revisions, control
Karen L. Jones: Internal and External Communication; Staff Resources, Training, and Development			
I-D-1	8/10/94	MMES-Human Resources	Staff resources
I-D-2	8/10/94	MMES	Training
I-D-3	8/10/94	DOE; DP-80	Training
I-D-4	8/12/94	MMES-Disassembly & Special Materials (DSM)	Training
I-D-5	8/12/94	MMES; Y-12 Public Relations	External communication
I-D-6	8/17/94	MMES-HSE&A	Staff resources, training, external communication
I-D-7	8/17/94	TDEC DOE Oversight Division	External communication
I-D-8	8/17/94	Oak Ridge Chamber of Commerce	External communication
I-D-9	8/17/94	DOE	Staff resources, training
I-D-10	8/17/94	MMES	Staff resources, training
I-D-11	8/22/94	MMES; Y-12	Staff resources
I-D-12	8/22/94	MMES-Center for Continuing Education (CCE)	Training
I-D-13	8/22/94	MMES-CCE	Training
I-D-14	8/23/94	MMES-HSE&A	Staff resources, training, external communication
I-D-15	8/23/94	M.K. Ferguson	Staff resources, training
I-D-16	8/23/94	MMES-Compliance Monitoring Section	Staff resources, training, external communication
I-D-17	8/23/94	MMES-EHS&A Environmental Management	Staff resources, training
I-D-18	8/23/94	MMES-Training	Training

CONTACTS AND INTERVIEWS CONDUCTED BY THE AUDIT TEAM (continued)

Ref. #	Date	Organization	Topic
I-D-19	8/23/94	MMES-Training	Staff resources, training
I-D-20	8/24/94	DOE-YSO ES&H Branch	Staff resources, training
I-D-21	8/24/94	MMES Chemical Technology Division	Staff resources, training
I-D-22	8/24/94	MMES-Protective Services	Training, TMS system
I-D-23	8/24/94	MMES-Enriched Uranium Operations (EUO)	Staff resources, training, external communication
I-D-24	8/24/94	MMES-EUO	Staff resources, training, external communication
I-D-25	8/24/94	MMES-EUO	Staff resources, training, external communication
I-D-26	8/24/94	DOE-ORO Public Information	External communication
I-D-27	8/24/94	MMES-DSM	Staff resources, training
I-D-28	8/24/94	MMES-HSE&A Environmental Management Department	Staff resources, training
I-D-29	8/25/94	TDEC-DOE Oversight Division	External communication
I-D-30	8/25/94	TDEC-DOE Oversight Division	External communication
I-D-31	8/25/94	DOE-Personnel Division	Staff resources
I-D-32	8/25/94	Environmental Quality Advisory Board (EQAB)	External communication
I-D-33	8/26/94	MMES-Y-12 Environmental Restoration Division	Staff resources, training, development
I-D-34	8/26/94	MMES-Site Shift Operations Emergency Management	Staff resources, training, external communication
I-D-35	8/26/94	MMES-Site Shift Operations Emergency Management	Staff resources, training, external communication
I-D-36	8/26/94	MMES-Site Shift Operations Emergency Management	Staff resources, training, external communication
Paul E. Flaherty: Environmental Protection Programs; Program Evaluation, Reporting, and Corrective Action			
I-E-1	8/22/94	MMES	Environmental programs, self-assessment, corrective actions

CONTACTS AND INTERVIEWS CONDUCTED BY THE AUDIT TEAM (continued)

Ref. #	Date	Organization	Topic
I-E-2	8/22/94	MMES	Environmental programs, self-assessment, corrective actions
I-E-3	8/22/94	MMES	Environmental programs, self-assessment, corrective actions
I-E-4	8/22/94	MMES	Environmental programs, self-assessment, corrective actions
I-E-5	8/22/94	MMES	Environmental programs, self-assessment, corrective actions
I-E-6	8/23/94	MMES	Environmental programs, ambient/source monitoring
I-E-7	8/23/94	YSO	Air programs, self-assessment, corrective actions
I-E-8	8/23/94	YSO	Air, water, self-assessment, corrective action programs
I-E-9	8/23/94	YSO	Environmental programs, self-assessment, corrective actions
I-E-10	8/23/94	YSO	Environmental programs, self-assessment, corrective actions
I-E-11	8/23/94	MMES	Specific air issues
I-E-12	8/23/94	MMES	Responsibilities
I-E-13	8/24/94	MMES	Steam plant air permit
I-E-14	8/24/94	MMES	Steam plant air permit
I-E-15	8/24/94	MMES	Plant operations, air compliance
I-E-16	8/24/94	MMES	Self-assessments, corrective actions, environmental protection programs
I-E-17	8/24/94	MMES	Self-assessments, corrective actions
I-E-18	8/24/94	MKF	Environmental protection programs, self-assessments
I-E-19	8/25/94	MMES	Environmental compliance process
I-E-20	8/25/94	YSO	Ambient air network
I-E-21	8/25/94	YSO	Order compliance, self-assessments, corrective actions
I-E-22	8/25/94	MMES	Ambient air network

CONTACTS AND INTERVIEWS CONDUCTED BY THE AUDIT TEAM (continued)

Ref. #	Date	Organization	Topic
I-E-23	8/25/94	MMES	Ambient air network
I-E-24	8/25/94	MMES	Energy Systems Action Management System (ESAMS), corrective actions
I-E-25	8/25/94	MMES	Task teams, air programs
I-E-26	8/25/94	TDEC	Environmental Y-12 performance
Joseph Lischinsky: Environmental Commitment; Environmental Planning and Risk Management			
I-F-1	8/22/94	MMES	Environmental commitment, environmental planning process at Y-12
I-F-2	8/22/94	MMES	ES&H long-term planning, environmental commitment at site
I-F-3	8/22/94	MMES	Site development, long-range planning process
I-F-4	8/22/94	MMES	Safety analysis, risk management
I-F-5	8/23/94	MMES	Emergency management, occurrence reporting
I-F-6	8/23/94	MMES	Occurrence notification, shift supervision occurrence investigation
I-F-7	8/23/94	MMES	Emergency response, environmental commitment
I-F-8	8/23/94	MMES	Environmental commitment, environment and long-range planning
I-F-9	8/23/94	ORO	Environmental commitment, public interaction
I-F-10	8/23/94	MMES	Budgeting process, environmental commitment, environmental planning
I-F-11	8/23/94	MMES	Risk-based priority system, environmental commitment, environmental planning
I-F-12	8/24/94	MMES	Environmental commitment, environmental planning
I-F-13	8/24/94	MMES	Occurrence reporting system
I-F-14	8/24/94	MMES	Tracking and trending of occurrences
I-F-15	8/24/94	MMES	ER ADS process, environmental planning
I-F-16	8/24/94	MMES	ER, environmental planning, risk-based prioritization

CONTACTS AND INTERVIEWS CONDUCTED BY THE AUDIT TEAM (continued)

Ref. #	Date	Organization	Topic
I-F-17	8/24/94	ORO	Budget review, risk-based prioritization method process, environmental commitment
I-F-18	8/25/94	ORO	Risk-based prioritization method review at ORO, environmental commitment
I-F-19	8/25/94	MMES	Environmental planning, environmental commitment
I-F-20	8/25/94	MMES	WM risk-based prioritization method process
I-F-21	8/25/94	MMES	Environmental commitment
I-F-22	8/25/94	MMES	Environmental commitment
I-F-23	8/26/94	YSO	Environmental commitment
I-F-24	8/26/94	YSO	Environmental planning, environmental commitment
I-F-25	8/26/94	YSO	Environmental commitment

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APPENDIX F

REGULATIONS, REQUIREMENTS, AND GUIDELINES USED IN EVALUATING THE Y-12 PLANT

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REGULATIONS, REQUIREMENTS, AND GUIDELINES USED IN EVALUATING THE Y-12 PLANT

Requirements/ Guidelines	Sections/Title	Authority
Executive Order 11514 and 11991	Protection and Enhancement of Environmental Quality	Office of the President
Executive Order 12088	Federal Compliance with Pollution Control Standards	Office of the President
Executive Order 12856	Federal Compliance with Right-to-Know Laws and Pollution Prevention Requirements	Office of the President
Public Law 95-604	The Uranium Mill Tailings Radiation Control Act	EPA
Public Law 102-386	Federal Facilities Compliance Act	EPA
33 U.S.C. 1251 et seq.	Clean Water Act	EPA
33 U.S.C. 1344	Clean Water Act; Permits For Dredged or Fill Materials	EPA
40 U.S.C. 9601	Comprehensive Environmental Response, Compensation, and Liability Act	EPA
42 U.S.C. 6901 et seq.	Resource Conservation and Recovery Act	EPA
42 U.S.C. 7401 et seq.	The Clean Air Act	EPA
Titles I-VI	Clean Air Act Amendments of 1990	EPA
DOE 1280.1	Memoranda of Understanding	DOE
DOE 1324.5	Records Management Program	DOE
DOE 2321.1A	Auditing of Programs and Operations	DOE
DOE 3410.1B	Training	DOE
DOE 4300.1B	Real Property and Site Development	DOE
DOE 4320.1B	Site Development Planning	DOE
DOE 4700.1	Project Management System	DOE
DOE 5000.3B	Occurrence Reporting and Processing of Operations Information	DOE
DOE 5100.3	Field Budget Process	DOE
DOE 5400.1	General Environmental Protection Program	DOE

REGULATIONS, REQUIREMENTS, AND GUIDELINES USED IN EVALUATING THE Y-12 PLANT (continued)

Requirements/ Guidelines	Sections/Title	Authority
DOE 5400.2A	Environmental Compliance Issue Coordination	DOE
DOE 5400.3	Hazardous and Radioactive Mixed Waste Program	DOE
DOE 5400.4	Comprehensive Environmental Response, Compensation, and Liability Act Requirements	DOE
DOE 5400.5	Radiation Protection of the Public and the Environment	DOE
DOE 5400.9	Sealed Radioactive Source Accountability	DOE
DOE 5440.1E	National Environmental Policy Act Compliance Program	DOE
DOE 5480.1B	Environment, Safety, and Health Program for DOE Operations	DOE
DOE 5480.4	Environmental Protection, Safety and Health Protection Standards	DOE
DOE 5480.11	Radiation Protection for Occupational Workers	DOE
DOE 5480.15	DOE Laboratory Accreditation for Personnel Dosimetry	DOE
DOE 5480.19	Conduct of Operations Requirements for DOE Facilities	DOE
DOE 5480.20	Personnel Selection, Qualification, Training, and Staffing Requirements at DOE Reactor and Non-Reactor Nuclear Facilities	DOE
DOE 5481.1B	Safety Analysis and Review System	DOE
DOE 5482.1B	Environment, Safety, and Health Appraisal Program	DOE
DOE 5484.1	Environmental Protection, Safety, and Health Protection Information Reporting Requirements	DOE
DOE 5500.2B	Emergency Categories, Classes, and Notification and Reporting Requirements	DOE
DOE 5500.3A	Planning and Preparedness for Operational Emergencies	DOE
DOE 5700.6C	Quality Assurance	DOE

REGULATIONS, REQUIREMENTS, AND GUIDELINES USED IN EVALUATING THE Y-12 PLANT (continued)

Requirements/ Guidelines	Sections/Title	Authority
DOE 5820.2A	Radioactive Waste Management	DOE
DOE 6430.1A	General Design Criteria	DOE
DOE N5480.6	Radiological Control	DOE
DOE-STD-1027-92	Hazard Categorization and Accident Analysis Techniques for Compliance with DOE Order 5480.23, Nuclear Safety Analysis Reports	DOE
DOE/IG-0308	Packaging, Transporting, and Burying Low-Level Waste	DOE
DOE/EH-0070	External Dose Conversion Factors for Calculation of Dose to the Public	DOE
DOE/EH-0071	Internal Dose Conversion Factors for Calculation of Dose to the Public	DOE
DOE/EH-0125	DOE Environmental Audit Manual	DOE
DOE/EH-0173T	Environmental Regulatory Guide for Radiological Efficient Monitoring and Environmental Surveillance	DOE
DOE/EH-0256T	Radiological Control Manual	DOE
DOE/EH-0263T	Implementation Manual for Application of Best-Available Technology Process for Radionuclides in Liquid Effluents	DOE
DOE/EH-0326	Protocols for Conducting Environmental Management Assessments of DOE Organizations	DOE
DOE/EH-0358	Performance Objectives and Criteria for Conducting DOE Environmental Audits	DOE
January 1994 Draft Final (formerly DOE/EH-0232)	DOE Environmental Audit Program Guidance	DOE
June 1993 Secretarial Policy Statement	Environment, Safety and Health Policy for the DOE Complex	DOE

REGULATIONS, REQUIREMENTS, AND GUIDELINES USED IN EVALUATING THE Y-12 PLANT (continued)

Requirements/ Guidelines	Sections/Title	Authority
June 8, 1993 Secretarial Policy Statement (58 FR 33804-5)	Radiological Health and Safety Policy	DOE
November 1992 Guidance	Implementation Guide for Radiological Survey Procedures (Draft)	DOE
Interim Guide March 8, 1991	DOE Guidance on the Procedures in Applying the ALARA Process for Compliance with DOE 5400.5	DOE
Draft Guidance	Decontamination and Decommissioning Guidance Document-Draft 3	DOE
Guidance	Budget Formulation and Activity Data Sheet Development Field Guidance for the FY 1996 Planning and Budget Cycle	DOE
Implementation Guidance	Implementation Guidance for DOE Order 5400.1	DOE
March 24, 1990 Toxicity Characteristics Revisions 55 FR 11798	Hazardous Waste Management System, Identification and Listing of Hazardous Waste	
10 CFR 834 (Draft January 8, 1991)	Radiation Protection of the Public and Environment	DOE
29 CFR 1910.120	Occupational Safety and Health Standards; Hazardous Waste Operations and Emergency Response	EPA
33 CFR 320	General Regulatory Policies	U.S. Water Resources Council
40 CFR 50-88	Clean Air Act Implementing Regulations	EPA
40 CFR 50	National Ambient Air Quality Standards	
40 CFR 58	Ambient Air Quality Surveillance	
40 CFR 60	Standards of Performance for New Stationary Sources	

REGULATIONS, REQUIREMENTS, AND GUIDELINES USED IN EVALUATING THE Y-12 PLANT (continued)

Requirements/ Guidelines	Sections/Title	Authority
40 CFR 61	National Emission Standards for Hazardous Air Pollutants	EPA
40 CFR 61 Subpart H	National Emission Standards for Emissions of Radionuclides Other Than Radon from DOE Facilities	EPA
40 CFR 61 Subpart T	National Emission Standards for Radon Emissions from the Disposal of Uranium Mill Tailings	EPA
40 CFR 122	National Pollutant Discharge Elimination System (NPDES)	
40 CFR 123	State Pollution Discharge Elimination System (SPDES)	EPA
40 CFR 124	Pollutant Discharge Elimination; Procedures for Decisionmaking	
40 CFR 125	Criteria and Standards for the National Pollutant Discharge Elimination System	EPA
40 CFR 131	Water Quality Standards	EPA
40 CFR 136	Guidelines Establishing Test Procedures for the Analysis of Pollutants	
40 CFR 141	National Primary Drinking Water Regulations	EPA
40 CFR 142	National Primary Drinking Water Regulations Implementation	EPA
40 CFR 143	National Secondary Drinking Water Regulations	EPA
40 CFR 191	Environmental Radiation Protection Standards for Management and Disposal of Spent Nuclear Fuel, High-Level and Transuranic Radioactive Wastes	
40 CFR 192	Health and Environmental Protection Standards for Uranium and Thorium Mill Tailings	EPA
40 CFR 241	Guidelines for the Land Disposal of Solid Waste	EPA

REGULATIONS, REQUIREMENTS, AND GUIDELINES USED IN EVALUATING THE Y-12 PLANT (continued)

Requirements/ Guidelines	Sections/Title	Authority
40 CFR 243	Guidelines for the Storage and Collection of Residential, Commercial, and Institutional Solid Waste	EPA
40 CFR 260-280	Hazardous Waste Regulations	EPA
40 CFR 261	Identification and Listing of Hazardous Waste	EPA
40 CFR 262	Standards Applicable to Generators of Hazardous Waste	
40 CFR 264	Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities	
40 CFR 265	Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities	
40 CFR 268	Land Disposal Restrictions	
40 CFR 302	Designation, Reportable Quantities, and Notification	EPA
40 CFR 355	Emergency Planning and Notification	EPA
40 CFR 370	Hazardous Chemical Reporting: Community Right-To-Know	EPA
40 CFR 372	Toxic Chemical Release Reporting: Community Right-To-Know	EPA
40 CFR 761	Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions	EPA
40 CFR 1501-1508	CEQ NEPA Guidelines	EPA
40 CFR Subchapter N	Effluent Guidelines and Standards (400 Series, Including Stormwater Regulations)	EPA
49 CFR 171, 173, 177, 178, and 397	Transportation of Hazardous Materials, Packaging, Marking, Spill Reporting, etc.	DOT
49 CFR 397	Transportation of Hazardous Materials; Driving and Parking Rules	DOT
49 CFR Subchapter C	Hazardous Materials Regulations	DOT

REGULATIONS, REQUIREMENTS, AND GUIDELINES USED IN EVALUATING THE Y-12 PLANT (continued)

Requirements/ Guidelines	Sections/Title	Authority
CERCLA/SARA	Section 103-Notices, Penalties	EPA
CERCLA/SARA	Section 120-Federal Facilities	EPA
ANSI N13.1-1969	Guide to Sampling Airborne Radioactive Materials in Nuclear Facilities	ANSI
EPA 450/4-87-007	Ambient Monitoring Guidelines for PSD	
EPA-450/4-87-013	On-Site Meteorological Program Guidance for Regulatory Modeling Applications	EPA
EPA-520/1-88-020	Limiting Values of Radionuclide Intake and Air Concentration and Dose Conversion Factors for Inhalation, Submersion, and Ingestion - Federal Guidance Report No. 11	
NRC	Regulatory Guide 1.86, Termination of Operating License for Nuclear Reactors	NRC
NRC	Radiological Criteria for Decommissioning of NRC-1 Licensed Facilities; Workshops	NRC
NRC	Proposed Rulemaking to Establish Radiological Control for Decommissioning	NRC
NQA-1	Quality Assurance Program Requirements for Nuclear Facilities	ANSI/ASME

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APPENDIX G

ACRONYMS AND ABBREVIATIONS

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ACRONYMS AND ABBREVIATIONS

Acronym	Definition
ADS	Activity Data Sheet
ALARA	As low as reasonably achievable
AMCE	Assistant Manager for Construction Engineering
AMERWM	Assistant Manager for Environmental Restoration and Waste Management
BMP	Best Management Practice
CBT	Computer-based training
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COR	Contracting Officer's Representative
CSO	Cognizant Secretarial Office
D&D	Decontamination and Decommissioning
DNFSB	Defense Nuclear Facilities Safety Board
DOE*	U.S. Department of Energy
DP	DOE Office of Defense Programs
DU	Depleted Uranium
EC	Environmental Commitment
EH	DOE Office of Environment, Safety and Health
EH-1	DOE Office of the Assistant Secretary for Environment, Safety and Health
EH-24	DOE Office of Environmental Audit
EM	DOE Office of Environmental Management (formerly Office of Environmental Restoration and Waste Management)
EMP	Environmental Monitoring Plan
EO	Environmental Officer
EOC	Emergency Operations Center
EO Coordinator	Environmental Officer Coordinator
EPA*	U.S. Environmental Protection Agency
EP	Environmental Protection Programs

ACRONYMS AND ABBREVIATIONS (continued)

Acronym	Definition
EPPIP	Y-12 Environmental Protection Program Implementation Plan
EQAB	Environmental Quality Advisory Board
ER	DOE Office of Energy Research
ERBAM	Environmental Risk Based Benefit Assessment Matrix
ESAMS	Energy Systems Action Management System
ES&H	Environment, Safety & Health
EU	Enriched Uranium
FFCA	Federal Facility Compliance Agreement
FP	Formality of Environmental Programs
FY	Fiscal Year
HEPA	High Efficiency Particulate Air
HSE&A	Y-12 Health, Safety, Environment, and Accountability Office
IC	Internal and External Communication
JCWS*	Johnson Controls World Services, Inc.
K-25	K-25 Site
LREPP	Long Range Environmental Protection Plan
MK-F*	MK-Ferguson Company of Oak Ridge
MK-F-ESD	MK-F Environmental Services Division
MMES*	Martin Marietta Energy Systems
MMES-ECD	MMES Environmental Compliance Division
MMES-EMD	MMES Environmental Management Division
MMES-ERD	MMES Environmental Restoration Division
MMES-WMD	MMES Waste Management Division
NEPA	National Environmental Policy Act
NESHAPs	National Emission Standards for Hazardous Air Pollutants
NPDES	National Pollutant Discharge Elimination System
OJT	On-the-job training
OREIS	Oak Ridge Environmental Information Systems

ACRONYMS AND ABBREVIATIONS (continued)

Acronym	Definition
ORNL	Oak Ridge National Laboratory
ORO*	DOE Oak Ridge Operations Office
ORO-ENVPD	ORO Environmental Protection Division
ORO-ERD	ORO Environmental Restoration Division
ORO-ESD	ORO Engineering Services Division
ORO-TDD	ORO Training and Development Division
ORO-WMD	ORO Waste Management and Technology Development Division
ORR*	Oak Ridge Reservation
OS	Organizational Structure
PCCB	Procedures Configuration Control Board
PDC	Performance Documentation Checklist
PE	Program Evaluation, Reporting, and Corrective Action
PEG	Project Evaluation Group
PPC	Plant Procedures Coordinator
PPR	Performance Planning Review
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
RCRA	Resource Conservation and Recovery Act
RM	Environmental Planning and Risk Management
ROI	Return-on-investment
RPBM	Risk-based Prioritization Methodology
RPBS	Risk-based Prioritization System
SR	Staff Resources, Training, and Development
TBI	To be issued
TDEC	Tennessee Department of Environment and Conservation
TDEC/DOE-O	DOE Oversight Division, Oak Ridge, Tennessee
TMS	Training management system
TOA	Tennessee Oversight Agreement

ACRONYMS AND ABBREVIATIONS (continued)

Acronym	Definition
TSCA	Toxic Substances Control Act
U.S.C.	United States Code
UST	Underground Storage Tank
WM	Waste Management
X-10	X-10 Site
Y-12*	Y-12 Personnel
Y-12 Plant*	Y-12 Plant physical facilities
YSO*	DOE Y-12 Site Office

*These commonly used acronyms are spelled out only on first reference in the report. All others are spelled out on first reference in each subsection.