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Sandia National Laboratories, California
Quality Assurance Project Plan
For Environmental Monitoring Program

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1 Management

1.1 Program

1.1.1 Introduction

This Quality Assurance Project Plan (QAPP) applies to the Environmental Monitoring Program at the Sandia National Laboratories/California. This QAPP follows DOE *Quality Assurance Management System Guide for Use with 10 CFR 830 Subpart A, Quality Assurance Requirements, and DOE O 414.1C, Quality Assurance* (DOE G 414.1-2A June 17, 2005).

The Environmental Monitoring Program is located within the Environmental Operations Department. The Environmental Operations Department is responsible for ensuring that SNL/CA operations have minimal impact on the environment. The Department provides guidance to line organizations to help them comply with applicable environmental regulations and DOE orders. To fulfill its mission, the department has groups responsible for waste management; pollution prevention, air quality; environmental planning; hazardous materials management; and environmental monitoring.

The Environmental Monitoring Program is responsible for ensuring that SNL/CA complies with all Federal, State, and local regulations and with DOE orders regarding the quality of wastewater and stormwater discharges. The Program monitors these discharges both visually and through effluent sampling. The Program ensures that activities at the SNL/CA site do not negatively impact the quality of surface waters in the vicinity, or those of the San Francisco Bay. The Program verifies that wastewater and stormwater discharges are in compliance with established standards and requirements. The Program is also responsible for compliance with groundwater monitoring, and underground and above ground storage tanks regulatory compliance. The Program prepares numerous reports, plans, permit applications, and other documents that demonstrate compliance.

1.1.2 Responsibilities

The manager of the Environmental Operations Department retains the ultimate responsibility for the implementation of the Environmental Monitoring Program, including the implementation of this QAPP.

The manager will promote effective achievement of performance objectives through the following methods:

- establishing task assignments;
- identifying lines of communication; and
- determining and providing the necessary resources and environment to accomplish the required activities.

Other documents that report on the organizational structure and management processes are the:

- Sandia National Laboratories, California Environmental Management System Program Manual (B.L. Larsen August 2005),
- Quality Assurance of Data, Documents and Select Activities of the Environmental, Safety and Health Departments, 8516 and 8517 (April 2005), and
- Environmental Monitoring Annual Program Report (June 2005).

1.1.3 Graded Approach

A grading process will be used to determine the scope and depth of the requirements applied to a specific activity. The graded process will apply controls that best suit the facility or activity. It will also determine the appropriate level of effort necessary to attain the document the requirements established through consideration of prescribed factors. The facility or task-specific factors to be addressed will include (but not necessarily be limited to):
Level of risk;

- age, status, and condition of a facility or process;
- history of problems at a site or facility;
- adequacy of existing safety documentation; and
- complexity of products or services involved.

The graded approach process shall not be used to obtain relief from the requirements of 10 CFR 830.120 or other federal, state, or local regulatory requirements.

1.2 Personnel Training and Qualification

1.2.1 Introduction

A fundamental requirement for effective accomplishment of any mission is that all personnel be capable of performing their assigned tasks. Qualification and training programs ensure that the required capabilities are achieved and maintained by personnel.

1.2.2 Responsibilities

The manager of the Environmental Operations Department has the following responsibilities:

- develop job descriptions for all positions within the Environmental Monitoring Program describing the education and experience required to perform these functions,
- develop training and professional development plans which will allow personnel in the Environmental Monitoring Program to obtain and maintain the required level of expertise required to perform their duties efficiently, and
- provide adequate resources to ensure that Program personnel are able to meet established training and qualification goals and requirements.

1.2.3 Qualification of Personnel

Minimum applicable requirements will be established for all positions within the Environmental Monitoring Program. These requirements should include education, experience, and physical condition. Personnel may be qualified by the following factors:

- considering previous experience, education and training,

- demonstrating and testing to verify previously acquired skills, or
- completing a training or qualification program.

Determination of qualification will be accomplished before personnel are allowed to perform tasks without supervision by qualified personnel.

1.2.4 Training

The only training considered by this QAPP is training concerning the specific tasks performed by Environmental Monitoring Program personnel. All Program personnel shall receive training in the performance of specific sampling or administrative procedures before they are allowed to perform that activity independently.

Training methods and materials shall be documented and maintained. Training will include mission goals, methods, requirements, process metrics, and skills required to adequately perform the task at hand.

1.2.5 Training Plans

Training Plans should be developed for all personnel. These plans should maintain and promote aggressive improvement in job performance.

1.2.6 Instructors

Instructors may be external or internal training providers or qualified members of the Environmental Monitoring Program.

1.3 Quality Improvement

1.3.1 Introduction

Quality improvement is based on the premise that all work activities can be planned, performed, measured, and improved. The Environmental Operations Department manager is responsible for building a culture in which improvement is continuous and an integral part of the organization.

The continuous improvement approach focuses on problem prevention, corrective action, and performance improvement rather than relying on post-process inspection to prevent deficiencies.

1.3.2 Continuous Improvement

The Environmental Monitoring Program Lead will continuously evaluate program performance based on qualitative and/or quantitative information. These evaluations may include data from the following sources:

- periodic quality assurance assessment reports,
- nonconformance reports, and
- informal reports from program personnel.

All program personnel are encouraged to identify and report potential improvements to program activities.

The Environmental Monitoring Program has established a nonconformance reporting procedure. All nonconformances (including missed samples, equipment breakdowns, and data that does not meet acceptance criteria) are reported to the QA coordinator. Nonconformance reporting procedure is described in the operating procedure OP471411 *Administrative Procedure of Nonconformance Reporting, Form, Logging, and Tracking*. Nonconformance documentation includes corrective actions.

1.4 Documents and Records

1.4.1 Introduction

Documents and records are required in order to manage, perform, and assess work. Management should commit the resources required to satisfy document and record requirements.

1.4.2 Documents

The Environmental Monitoring Program produce documents in several forms:

- operational and administrative procedures;
- reports to DOE, or other Federal, State, or local agencies;
- permit applications;
- field logbooks and notes;
- sample control logbooks;
- analytical data reports;
- equipment history records (maintenance, calibration, etc.); and
- inspection records.

Document control requirements are included in operational and administrative procedures as appropriate.

1.4.3 Records

A record contains information that is retained for its expected future value.

SNL/CA has established ES&H Records Center. This records center maintains records from all ES&H programs as well as those of the Environmental Monitoring Program. Records center personnel have established records retention schedules in accordance with National Archives and Records Administration and DOE requirements.

All Environmental Monitoring Program procedures identify the records that are generated by those procedures. The procedures also address the schedule for transmittal of records from program personnel to the records center.

2 Performance

2.1 Work Processes

2.1.1 Introduction

A work process includes all activities involved in performing defined tasks to achieve an objective. The work process is a planned mix of people, equipment, environmental conditions, supply, management support, resources, and requirements. Each of these elements contributes to achieving process goals.

2.1.2 Management Responsibility

The Environmental Operations Department manager is responsible for setting requirements and policies that control the conditions under which the work process is required to function. These conditions should be considered as an element affecting product and service output and quality.

All work processes affecting quality shall be done in accordance with written procedures of a detail commensurate with the complexity and importance of the work. Personnel performing the work are included in the procedure preparation and review process as a means of implementing continuous process improvement.

2.1.3 Worker Responsibility

Workers are responsible for the quality of their own work. Workers should set goals for doing the work correctly the first time and to contribute to improving work processes.

Workers are considered prime resources concerning the various aspects of process performance.

2.1.4 Work Process Documents

The Environmental Operations Department manager should clearly identify authorities, responsibilities, and interfaces – both internal and external – regarding work processes.

Policies, procedures, goals, plans, and other information regarding a process are communicated to personnel performing that process through training, procedures, memoranda, and meetings.

All Environmental Monitoring Program personnel shall have a copy of the current operating and administrative procedures for processes they are required to perform.

Operational and administrative procedures will be written to a level of detail determined by the skills of the workers and the complexity and importance of the work. Procedures will include any requirements for special processes that are highly dependent on the skill of the operator, and for which the quality of the product cannot be readily determined by inspection or test, such as collection of environmental samples. Procedures will also include equipment control such as use, capability and calibration.

Operational and administrative procedures will address methods to ensure sample integrity – including collection, handling, preservation, shipping, and chain-of-custody. Operational and administrative procedures will also address methods for maintaining sampling and other equipment in an operational status, as required.

2.2 Design

2.2.1 Introduction

Definition, control and verification of design are necessary to ensure that systems, structures, and components fulfill contractual requirements and customer expectations.

Systems, structures, and components important to safety should be subject to more stringent operational criteria than those not important to safety.

Designs should provide for appropriate inspection, testing, and maintenance to ensure continuing reliability and safety of the system, structure or component. The design should consider the expected use and life expectancy of the system, structure, or component.

For the Environmental Monitoring Program design includes the design of sample collection programs, including sample collection locations and the parameters for sample analysis. Any changes to a sampling program constitutes a new sampling design.

2.2.2 Design Input

Inputs to the design process shall address the following issues:

- design bases,
- health and safety considerations,
- expected life cycle,
- performance parameters,
- codes and standards requirements, and
- reliability requirements.

Project-specific planning must involve the key users and customers of the systems.

2.2.3 Design Process

The design process translates design inputs into design output documents that are technically correct and meet the end user's requirements. In order to meet this goal, the following steps shall be performed:

- All calculations required during the design process shall be independently verified. This verification shall be documented.
- A preliminary design review shall be conducted. At a minimum this preliminary design review shall include reviews by the relevant Program lead and the end-users. This review shall be documented.

- A final design review shall be conducted. At a minimum, this final design review shall include reviews by the relevant Program lead, and the end-users. This review shall be documented.

2.2.4 Design Output

The completed design shall be recorded in design output documents such as drawings, specifications, test and inspection plans, maintenance requirements, and reports.

2.2.5 Design Verification

Design verification is a formal documented process to establish that the resulting system, structure, or component will be fit for the intended use. The following design verification methods are considered acceptable:

- technical reviews,
- peer reviews,
- alternate calculations, and
- qualification testing.

When appropriate, the verification may take previous validations of similar designs into account.

This verification should be performed by technically knowledgeable persons separate from those who performed the design.

Design verification shall be completed before design output is used to support other work such as procurement, manufacture, or construction.

2.2.6 Design Changes

Design changes, including field changes and nonconforming items dispositioned “use as is” or “repair” shall be controlled by measures commensurate with those applied to the original design. Any design changes shall be documented.

2.3 Procurement

2.3.1 Introduction

The procurement process should ensure that items and/or services provided by suppliers meet the requirements and expectations of the end-user. The stringency of procurement requirements should be commensurate with the importance of the purchased items or services to the project.

Environmental Monitoring Program personnel will work with SNL/CA Procurement personnel to ensure that appropriate requirements are included for items or services procured.

2.3.2 Procurement Documents

The procurement documents should clearly state test and inspection requirements and acceptance criteria for purchased items and services. Procurement documents should include any specifications, standards, and other documents referred to by the design documents.

2.3.3 Supplier Qualification

Qualified suppliers should be identified early in the design and procurement process. Program personnel evaluate prospective suppliers on technical issues. Procurement personnel evaluate suppliers on cost considerations.

Prospective suppliers should be evaluated to verify their capability to meet performance and schedule requirements.

2.3.4 Supplier Monitoring

Required supplier monitoring should be performed during the procurement process to ensure that acceptable items or services and schedule requirements are being met. Monitoring may include the following activities:

- surveillance of work activities,
- inspection of facilities and processes,
- review of plans and progress reports,
- processing of change information, and
- review and disposition of nonconformances.

2.3.5 Nonconformance and Corrective Action

Cases in which purchased items or services do not meet specifications shall be brought to the attention of Purchasing personnel for resolution.

2.3.6 Inspection

Requirements for inspections are obtained from design documents. Environmental Monitoring Program personnel shall work with Procurement personnel to ensure that appropriate inspection provisions are included in purchase documents. Inspection may include the following methods:

- inspections of materials or equipment at the supplier's plant,
- receipt inspection of the shipped items,
- review of objective evidence such as certifications and reports, and
- verification of testing of items prior to or following shipment.

2.3.7 Product Documentation

Supplier-generated documents should be included in the Document and Record system as outlined in Section 1.4 of this QAPP. These documents may include certificates of conformance, drawings, analyses, test reports, maintenance data, nonconformances, corrective actions, approved changes, waivers, and deviations.

2.4 Inspection and Acceptance Testing

2.4.1 Introduction

Inspections and tests are accomplished to verify that physical characteristics and functions of systems, structures, and components are acceptable.

Inspections and tests should be conducted according to a graded approach based upon the importance of the systems and upon the expected reliability of the system, structure or component.

Inspections and tests shall be performed by technically qualified personnel. Final acceptance of the system, components or structures will be verified and documented by the Environmental Monitoring Program personnel responsible for those systems, components or structures.

All personnel should check items supplied to their work process to ascertain that the items are correct and suitable for use. All personnel should check their process output to verify that it meets or exceeds requirements.

2.4.2 Process

Required inspections and tests are included in the operating and administrative procedures of the Environmental Monitoring Program. These procedures also include instructions for proper documentation of inspections and tests. Required inspections and tests may include visual inspections of equipment, periodic replacement of equipment, and periodic calibration of instruments.

2.4.3 Control of Measuring and Test Equipment

The following measuring and test equipment is used by the Environmental Monitoring Program:

- pH meters (both fixed and protable),
- liquid-level sensors (fixed),
- conductivity meters (portable), and
- turbidity meters (portable).

Fixed measuring and test equipment is calibrated on a quarterly basis. A third party contracted by SNL/CA will perform this calibration. Documentation of the calibrations includes the “as found” condition of the sensors. Calibrations are traceable to authoritative standards. Documentation is retained in the ES&H Records Center.

Portable measuring and test equipment is calibrated prior to each use. Calibrations are performed with standards that are supplied by the instrument manufacturer or are purchased for the specific calibration performed. Documentation of these calibrations is retained in the ES&H Records Center within the field data package submitted for the sampling performed.

3 Assessment

3.1 Management Assessment

3.1.1 Introduction

The manager of the Environmental Operations Department will periodically assess the performance of the Environmental Monitoring Program to determine how well they meet the customer's requirements and expectations. This assessment should place emphasis on the use of human and material resources to achieve the program's goals and objectives. The management assessment should include an introspective evaluation to determine if the integrated management system effectively focuses on meeting strategic goals.

3.1.2 Responsibility

The manager of the Environmental Operations Department retains overall responsibility for management assessments. Direct participation by the manager is essential to the success of the process since management is in the position to view the organization as a total system.

3.1.3 Process

The management assessment shall include the following methods:

- direct observation of work,
- interviews of workers and
- reviews of documentation.

The process assessed should include the following methods:

- strategic planning,
- organizational interfaces,
- cost control,
- use of performance indicators,
- staff training and qualifications, and
- supervisory oversight and support.

3.1.4 Results

Management assessment results should be used as input to the continuous improvement process.

3.2 Independent Assessment

3.2.1 Introduction

Periodic independent assessments will be used in order to evaluate the performance of the Environmental Monitoring Program with regard to the requirements and expectations of customers.

3.2.2 Performing Organization

These independent assessments will be carried out under the auspices of the ES&H Assessment Department.

3.2.3 Process

An independent assessment of the Environmental Monitoring Program will be performed annually. The criteria used for assessment will be developed by the CA Site Interface and Assessment Department. The assessor's responsibilities include the following tasks:

- evaluating work performance and process effectiveness,
- identifying abnormal performance and potential problems,
- finding opportunities for improvements, documenting and reporting results, and
- verifying satisfactory resolutions of reported problems.

3.2.4 Results

Assessment results shall be documented and presented to the Programs and to the manager of the Environmental Operations Department for review.

3.3 Program Self Assessment

3.3.1 Introduction

The Program Self Assessment is an annual effort to determine the completeness, quality and efficiency of the program structure and management. It shall also be used to determine the alignment of the program with ISO14001 EMS requirements and principals.

3.3.2 Performing Organization

These self assessments will be initiated by the Program Lead and carried out by Program staff.

3.3.3 Process

The objective of this assessment is to assure that the program provides all of the required elements and continually strives for areas of improvement. This assessment will include a review of all procedures, processes, technical work documents, web pages, publications, communications, etc. of the program to assure that they are streamlined, accurate and current.

One Program element will be chosen annually for self assessment.

3.3.4 Results

The *Programmatic Document Review Form* should be used to document this part of the self assessment (see *Quality Assurance of Data, Documents and Select Activities of the Environmental, Safety and Health Departments, 8516 and 8517* Attachment A). Assessment

results shall be documented and reviewed by the Program Lead. Self Assessment records will be retained in the Records Center.

3.4 Program Line Implementation Assessment

3.4.1 Introduction

The Program Line Implementation is an annual effort to determine how well the line or site is implementing the provisions or requirements of the program or supporting specific program-related objectives/targets. The success or failure of the line or site to implement program requirements or provisions can be attributed to many things: culture, line management support, communications, program management, etc. (Note: Poor program implementation by the line may not necessarily indicate poor program management or execution, but the Program Lead should consider whether these are contributing factors and take appropriate action.)

3.4.2 Performing Organization

In conducting these assessments the Program Lead shall consider aligning with the scheduled Line Self Assessments conducted by the ES&H Coordinators. This will minimize the disruption to the line and gain the manager's attention. Other line assessments include quarterly non-stormwater discharge observations and annual stormwater compliance evaluation inspections.

3.4.3 Process

For Department 8516 each assessment and its results shall be summarized in the annual update of each environmental program's Program Plan. It shall include:

- a discussion of the scope of the assessment and rationale,
- the methods used to conduct the assessment,
- a clear summary of the results,
- a discussion of the findings, strengths/weaknesses, recommendations, and areas for improvement.
- a summary of actions taken.

3.4.4 Results

Significant line violations to program requirements that are discovered during this assessment shall be input into the ES&H Self Assessment database for communications and tracking. (Note: the assessment should be "big picture" and not just conducted to find violations.) See *Quality Assurance of Data, Documents and Select Activities of the Environmental, Safety and Health Departments, 8516 and 8517* Attachment D for the *Assessment Finding Form*. The completed form is submitted to the Division 8000 ES&H coordinator for entry into the self-assessment tracking system.