WORKING COPY

VERIF. DATE: _____

INTIALS: _____

CP3-ES-1003 FRev. 1	**TITLE**: Developing, Implementing, and Maintaining Data Management Plans	Page 1 of 18

DOCUMENT CATEGORY: ☒ Administrative ☐ Technical

LEVEL OF USE: ☒ Information Level ☐ Reference Level ☐ Continuous Use

FUNCTIONAL AREA: Characterization **SUBJECT MATTER AREA:** Sample Management Office	**SUBJECT MATTER EXPERT**: Lisa Crabtree, Environmental Monitoring Manager
NUCLEAR SAFETY REVIEW DOCUMENTATION: N/A Non-intent change	**APPROVED BY/DATE** (Signature on file): Pam Baird, Characterization Manager 12/20/17
REQUIRED REVIEW DATE (or expiration date for temporary change): 12/20/20	**EFFECTIVE DATE**: 12/27/17

REVISION/CHANGE LOG

Revision/Change Letter	Description of Changes	Pages Affected	Date of Revision/Change
FR0	Bluesheet	ALL	10/20/17
FR1	Non-Intent Changes for Bluesheet Incorporation	ALL	12/20/17

TABLE OF CONTENTS

1.0 PURPOSE AND SCOPE 3
1.1 Purpose 3
1.2 Scope 3
2.0 REFERENCES 3
2.1 Use References 3
2.2 Source References 3
3.0 COMMITMENTS 3
4.0 RESPONSIBILITIES 3
4.1 Project Manager 3
4.2 Scientist 4
4.3 Scientist/ Data Entry Specialist 4
5.0 GENERAL INFORMATION 4
6.0 INSTRUCTIONS 4
6.1 Initiate Development of a Project DMIP 4
6.2 Develop Project DMIP 5
6.3 Implement and Maintain Project DMIP 6
7.0 RECORDS 6
7.1 Records Generated 6
7.2 Records Disposition 6
APPENDIX A – ACRONYMS/DEFINITIONS 7
APPENDIX B – PROJECT DATA MANAGEMENT IMPLEMENTATION PLAN TEMPLATE 8

1.0 PURPOSE AND SCOPE

1.1 Purpose

This procedure defines the process for environmental management projects to identify and document appropriate requirements and responsibilities for the management, quality assurance, use, and archival of environmental data collected by the project. These activities are documented in a project Data Management Implementation Plan (DMIP), as required by Paducah Gaseous Diffusion Plant Deactivation and Remediation (PGDP D&R) contractor. A project DMIP must provide sufficient detail to clearly define what data types the project will generate and use; who is responsible for the various activities related to environmental data management; how the project will manage its data; and the process and schedule for project data deliverables. This procedure provides a template to facilitate the development of a project DMIP that meets U.S. and Department of Energy requirements for environmental data operations (see *Project Data Management Implementation Plan Template*.)

1.2 Scope

This procedure applies to all PGDP D&R environmental management projects and associated contractors/subcontractors that will collect or use environmental data at the Paducah Gaseous Diffusion Plant (PGDP). Environmental data are any measurements or information that describes environmental processes or conditions or the performance of environmental technology. Environmental data include sampling and analysis data, data generated from field site preparation activities, geographic information, site survey data, information about construction activities, data generated from site and facility inspection and monitoring activities, and data generated from field measurement activities. Environmental data do **NOT** include financial or human resource data associated with a particular project. All PGDP D&R environmental management projects that will collect or manage environmental data must develop a DMIP; even if the extent of a project's environmental data management activities is considered to be minor, a DMIP is required to document this fact. Ongoing projects that do **NOT** have a DMIP should prepare one after the completion of the current investigative or reporting phase and before the initiation of the next phase.

2.0 REFERENCES

2.1 Use References

None

2.2 Source References

American National Standards Institute/American Society for Quality (ANSI/ASQ) E4-2014, *Quality Management Systems for Environmental Information and Technology Programs*

3.0 COMMITMENTS

None

4.0 RESPONSIBILITIES

4.1 Project Manager

- Directs the project team in determining potential sources of existing data, identifying the study area and/or facility to be addressed by the project, and selecting the most effective data collection to pursue.
- Serves as the technical contact for subcontracted project support.

- Ensures that the flow down of data management requirements is defined in the statement of work (SOW), if applicable.

4.2 Scientist

- Serves as a single point of contact for the project manager on all technical issues.
- Provides technical support during project conceptualization, scoping, execution, and post-action evaluation.
- Serves as technical contact for subcontracted project support.
- Ensures that the flow down of data management requirements is defined in the SOW, if applicable.

4.3 Scientist/ Data Entry Specialist

- Reviews project DMIP
- Implements approved project DMIP.

5.0 GENERAL INFORMATION

5.1 A DMIP should be developed early in the planning phase of a project to ensure that the proper data management system, staff, and processes are securely in place before the project begins to acquire and manipulate environmental data and that scheduled milestones (i.e., reports, data deliverables) are met.

5.2 Project scoping meetings and/or the Data Quality Objective (DQO) process define project objectives and the data requirements needed to reach these objectives.

5.3 A DMIP documents the use, quantity, and quality of the data that a project will need to collect, thus facilitating the correct specification of the project's decision criteria, acceptable levels of uncertainty, and acceptable tolerances for an incorrect decision.

5.4 A DMIP leads to the development of an efficient sampling and analysis plan (SAP), a cost-effective strategy of data assessment, data verification, data validation, and proper reporting to the regulators.

6.0 INSTRUCTIONS

6.1 Initiate Development of a Project DMIP

<u>Project Manager</u>

6.1.1 Instruct the Scientist to lead the development of the project DMIP.

<u>Scientist</u>

6.1.2 Ensure that the requirement to develop a project DMIP, or the DMIP itself, is included in any SOW or contract/subcontract that will initiate project activities that collect or manage environmental data.

6.1.3 Contact the Environmental Monitoring Manager to assist with the development of a project DMIP.

6.1.4 Designate project team members to assume the responsibilities of all the roles specified and defined in the DMIP.

6.2 Develop Project DMIP

Scientist

NOTE:

A project DMIP either may be a stand-alone document or part of another document, such as a project work plan, as appropriate.

6.2.1 Work with Environmental Monitoring Manager to do the following:

- Summarize project data management activities.
- Summarize project data management interactions with other organizations.
- Identify project data needs and sources.
- Define **and** schedule project data and data records transmittals.
- Identify project database needs.
- Identify project data management tasks.
- Identify **and** define project data management roles and responsibilities.

NOTE:

Appendix B is a DMIP template to be used by the Project to facilitate the development of a project DMIP. **NOT** all subsections in the template will be applicable to a particular project. Within the template, italicized bold text are place-holding instructions for project-specific input and do **NOT** belong in the project DMIP; regular text may be used verbatim, modified, or deleted, as appropriate. The format for this template is simple so that a project can cut and paste into another document (e.g., project work plan), if desired.

Scientist

6.2.2 Develops the project DMIP following the template's instructions and incorporating applicable information to a particular project.

6.2.3 Distribute the project DMIP for review and approval; at a minimum, the following people need to review and approve the DMIP

- Project Manager
- Environmental Monitoring Manager

6.2.4 Distribute the approved DMIP, as appropriate.

6.2.5 Ensure that a copy of the approved DMIP is distributed to the Project Manager, and Environmental Monitoring Manager.

6.2.6 **If** the DMIP is incorporated into another document, **then** distribute entire document.

6.3 Implement and Maintain Project DMIP

Project Manager

6.3.1 Ensure that adequate funding is provided to implement effectively the project DMIP.

6.3.2 Ensure that the DMIP is reviewed and updated, as necessary, to address changing project data management needs (an annual review before the beginning of the fiscal year is suggested for those projects that are ongoing).

6.3.3 Review the project DMIP **and** incorporate any changes.

6.3.4 Implement the approved project DMIP

7.0 RECORDS

7.1 Records Generated

The following records may be generated by this procedure:

DMIP

7.2 Records Disposition

The records are to be maintained in accordance with CP3-RD-0010, *Records Management Process*.

Appendix A – Acronyms/Definitions

ACRONYMS

ANSI – American National Standards Institute

ASQ – American Society for Quality

COC – chain- of- custody

DMIP – data management implementation plan

DQO – data quality objective

FFA – Federal Facility Agreement

GIS – geographic information system

OREIS – Oak Ridge Environmental Information System

PEMS – Project Environmental Measurements System

PGDP D&R –Paducah Gaseous Diffusion Plant Deactivation and Remediation

QC –quality control

RTL –ready-to-load

SAP –sampling analysis plan

SAS –statistical analysis system

SOW–statement of work

DEFINITIONS

Environmental Data - Any measurements or information that describe environmental processes or conditions or the performance of environmental technology, including sampling and analysis data, data generated from field site preparation activities, geographic information, site survey data, information about construction activities, data generated from site and facility inspection and monitoring activities, and data generated from field measurement activities.

Appendix B – Project Data Management Implementation Plan Template

THIS APPENDIX CONTAINS A "CONTROLLED" TEMPLATE

Please note that not all subsections in the DMIP template will be applicable to a particular project. Within this template, italicized bold text that is bracketed [such as this] are place-holding instructions and do not belong in the project DMIP; regular text may be used verbatim, modified, or deleted, as appropriate. For an electronic copy of this template, contact the Environmental Monitoring Manager.

CP2-XX-xxxx

Data Management Implementation Plan for the [Project Name]

Date Issued – ***[Month and Year]***

U.S. DEPARTMENT OF ENERGY
Office of Environmental Management

Prepared by
FOUR RIVERS NUCLEAR PARTNERSHIP, LLC,
managing the
Deactivation and Remediation Project at the
Paducah Gaseous Diffusion Plant
Under Contract DE-EM0004895

Appendix B – Project Data Management Implementation Plan Template (Continued)

APPROVALS

Data Management Implementation Plan
for the
[Name of Project]
at the
[Full Name of Facility],
[City and State]

CP2-XX-xxxx

_____ _____
Name Date
Title

_____ _____
Name Date
Title

DOE Approval Letter: _____ Date: _____

Nuclear Safety Documentation:

Appendix B – Project Data Management Implementation Plan Template (Continued)

CONTENTS

If the project DMIP is to be a stand-alone document, then after the DMIP is completed, mark the sections and generate a table of contents here.

Appendix B – Project Data Management Implementation Plan Template (Continued)

EXECUTIVE SUMMARY

[If the project DMIP is to be a stand-alone document, then an executive summary must be written here.]

Appendix B – Project Data Management Implementation Plan Template (Continued)

1. INTRODUCTION

The purpose of this data management implementation plan (DMIP) is to identify and document data management requirements and applicable procedures needed for the project, expected data types and flow, and roles and responsibilities for all data management activities associated with the ***[project name]***.

To meet current regulatory requirements for PGDP D&R environmental management projects, complete documentation of the information flow must be established. This necessitates that each phase of the environmental data management process (planning, collection, analysis, management, verification/validation, assessment, reporting, consolidation, and archival) be adequately planned and documented.

The primary purpose of environmental data management is to provide a system for efficiently generating and maintaining technically and legally defensible data that provide the basis for making sound environmental decisions.

The scope of this DMIP is limited to the ***[project name]*** environmental information. Environmental information includes electronic and/or hard copy records obtained by a project that describe environmental processes or conditions. Information generated by the project (e.g., analytical results from samples collected) and obtained from sources outside the project (e.g., historical data) fall within the scope of this DMIP. Certain types of information, such as personnel or financial records, are outside the scope of this DMIP.

1.1 PROJECT MISSION

[Briefly describe the project, its objectives, the types of data expected to be collected (e.g., field measurements, samples), and the specific use for the data types.]

1.2 DATA MANAGEMENT ACTIVITIES

[Summarize the project data management activities. The following data management activities should be addressed, as appropriate (i.e., not all projects will implement each activity listed)]:

- ***Scope Project,***
- ***Acquire Existing Data,***
- ***Plan Data Collection,***
- ***Prepare for Field Activities,***
- ***Collect Field Data,***
- ***Process Field Data,***
- ***Collect Field Samples,***
- ***Submit Samples for Analysis,***
- ***Process Laboratory Analytical Data,***
- ***Review Data,***
- ***Verify Data,***
- ***Validate Data, Consolidate Data and Records,***
- ***Analyze and Use Data, and***
- ***Submit Data to the Paducah Oak Ridge Environmental Information System (OREIS).***

Appendix B – Project Data Management Implementation Plan Template (Continued)

1.3 DATA MANAGEMENT INTERACTIONS

[Summarize the project's data management interactions with other organizations, agencies, etc. (e.g., Sample Management Office; Project Environmental Measurements System; Paducah Oak Ridge Environmental Information System; Industrial Hygiene; Health Physics; Site Compliance Organizations; Health and Safety).]

2. DATA NEEDS AND SOURCES

2.1 DATA TYPES

[Describe the data types needed by the project. General categories of these data types may include the following:]

- ***maps,***
- ***drawings,***
- ***photographs,***
- ***facility observations,***
- ***field measurements,***
- ***inspection checklists,***
- ***environmental media,***
- ***analytes,***
- ***sampling locations,***
- ***sampling dates,***
- ***total number of samples***
- ***necessary data quality.***

2.2 HISTORICAL DATA

[List all known historical sources.]

Existing and historical data will be evaluated prior to field activities (e.g., sampling, field measurements). Paducah OREIS will be queried for existing information relating to the project.

2.3 FIELD MEASUREMENTS

[Describe the types of field measurements that the project will collect (e.g., surface water flow measurements, surveys of monitoring locations, field screening instrument readings).]

2.4 ANALYTICAL DATA

[Describe the project's sample media, analytes of interest, types of analyses that will be performed, and the estimated number of samples that the project will collect.]

[List all analytical laboratories to be used by the project, reference the laboratory statement(s) of work (SOWs), including due dates.]

2.5 GEOGRAPHIC INFORMATION SYSTEM (GIS) COVERAGE

[Describe all known GIS coverages needed.]

Appendix B – Project Data Management Implementation Plan Template (Continued)

2.6 DATA FORMS/LOGBOOKS

[Identify all data forms and logbooks that the project will be using. Each form should be referenced, and a copy provided in the appendices. See the following subsection (2.6.1) as an EXAMPLE:]

2.6.1 Field Chain-of-Custody Forms

Field chain-of-custody (COC) forms contain sample-specific information recorded during collection of the sample. Any deviations from the sampling plan are noted on the field COC form and logbook. The Sample Team Leader reviews each field COC form for accuracy and completeness as soon as practical following sample collection.

Field COC forms (Appendix __) are generated from the Project Environmental Measurements System (PEMS) with the following information:

Information that is preprinted:	Information that is entered manually or through the use of a bar code reader:
- COC number - project name or number - sample ID number - sampling location (e.g., W05C00-08) - sample type (e.g., REG=regular sample) - sample matrix (e.g., soil) - analysis (e.g., metals) - sample container (volume, type, quantity) - preservative - SOW Number - analytical method	- sample date and time - sample comments (optional) - sampler's name

3. DATA AND DATA RECORDS TRANSMITTALS

3.1 PADUCAH OREIS DATA TRANSMITTALS

NOTE: All data (measurements and geographic) contained in reports submitted to state and federal regulators are required by the Federal Facility Agreement (FFA) to be transferred to Paducah OREIS before or on the date of report submission.

[Identify the data types (see Sect. 2.1) and frequency of project data transmittals to Paducah OREIS. Coordinate with SMO to determine deliverable due dates and to ensure that all ready-to-load (RTL) mandatory fields are completed.]

3.2 DATA RECORDS TRANSMITTALS

4. DATA MANAGEMENT SYSTEMS

4.1 PROJECT ENVIRONMENTAL MEASUREMENTS SYSTEM (PEMS)

Appendix B – Project Data Management Implementation Plan Template (Continued)

The Project Environmental Measurements System (PEMS) is the data management system that supports the ***[Project Name]***'s sampling and measurements collection activities and the generation of Paducah OREIS RTL files. PEMS can be accessed by appropriate ***[Project Name]*** staff throughout the life cycle of the project. The ***[Project Name]*** will use PEMS for the following functions ***[call out only those functions that are applicable]***:

- Initiate the Project;
- Plan for Sampling;
- Collect Samples and Field Measurements;
- Ship Samples to the Laboratory;
- Receive and Process Analytical Results;
- Evaluate and Qualify Data;
- Analyze and Access Data; and
- Transfer Project Data (in RTL format) to OREIS.

4.2 PADUCAH OAK RIDGE ENVIRONMENTAL INFORMATION SYSTEM

The Paducah OREIS is the centralized, standardized, quality assured, and configuration controlled data management system that is the long-term repository for environmental data (measurements and geographic) for all environmental management projects. OREIS is comprised of hardware, commercial software, customized integration software, an environmental measurements database, a geographic database, and associated documentation. The [Project Name] will use OREIS for the following functions ***[call out only those functions that are applicable]***:

- Access to Existing Data;
- Analysis and Access to Project Data;
- Analysis and Access to Data Across Projects;
- Spatial Analysis;
- Report Generation;
- Long-Term Storage of Project Data; and
- Submit Data to Regulators.

4.3 PADUCAH ANALYTICAL PROJECT TRACKING SYSTEM

The Paducah Analytical Project Tracking System manages analytical sample analyses for all projects within the Paducah site. Paducah Analytical Project Tracking System performs cradle-to-grave tracking of sampling and analysis activities. This system generates the SOW, tracks collection and receipt of samples by the laboratory, and interfaces with PEMS (output from Paducah Analytical Project Tracking System automatically goes to PEMS).

4.4 U.S. DEPARTMENT OF ENERGY PORTSMOUTH/PADUCAH PROJECT OFFICE ENVIRONMENTAL GEOGRAPHIC ANALYTICAL SPATIAL INFORMATION SYSTEM

Portsmouth/Paducah Project Office (PPPO) Environmental Geographic Analytical Spatial Information System (PEGASIS) provides a systematic approach to retrieve, display, and download analytical, geotechnical, and hydrological data, maps, and geophysical information for PPPO sites using a Web browser. The information includes analytical sample results from various environmental studies, restoration reports and supporting documents, maps, and facility drawings managed by DOE and its contractors. PEGASIS is a Web site that allows project managers, DOE, state and federal regulators, and the public to have access to sampling data for hundreds of investigative wells and sampling events, solid waste management units, and site-specific GIS features from all of the environmental studies at the site. Project data is uploaded from Paducah OREIS to PEGASIS on a monthly basis.

Appendix B – Project Data Management Implementation Plan Template (Continued)

5. DATA MANAGEMENT TASKS AND ROLES AND RESPONSIBILITIES

5.1 DATA MANAGEMENT TASKS

The following data management tasks are numbered and grouped according to the activities summarized in Section. 1.2:

[Describe in detail the project's data management tasks. These tasks should map back to the appropriate data management activities that were summarized in Section. 1.2. Reference all procedures used to implement the specific tasks.]

5.2 DATA MANAGEMENT ROLES AND RESPONSIBILITIES

The following project roles are defined, and the responsibilities are summarized, for each data management task described in the previous subsection. Following the roles and responsibilities definitions is a table listing the project staff member(s) responsible for each task.

[Define the roles and summarize responsibilities, for each data management task described in the previous subsection. Create a table listing the person(s) responsible for each data management task described in the previous subsection. The following subsections describe general project data management roles and may be used as is, modified, or deleted, as appropriate]

5.2.1 Project Manager

The project manager has total responsibility for completing an assigned project. The project manager leads the effort to define the scope of an environmental problem or facility operation. With respect to data management, this involves directing the project team in determining potential sources of existing data, identifying the study area and/or facility to be addressed by the project, and selecting the most effective data collection approach to pursue. The project manager may also be the technical contact for subcontracted project support and should ensure that the flow down of data management requirements is defined in a statement of work (SOW).

5.2.2 Scientist

The scientist is the technical "owner" of a project and typically serves as a single point of contact for the project manager on all technical issues. This person will provide appropriate technical support during project conceptualization, scoping, execution, and post-action evaluation. The scientist also may be the technical contact for subcontracted project support and should ensure that the flow down of data management requirements is defined in a SOW.

5.2.3 Project Team

The project team consists of the technical staff and support staff (including the data management team) that conduct the various tasks required to successfully complete the project. Team members develop a conceptual model of the project site. Based on this model, they determine if more information is needed to make decisions about the site. If more sampling and analyses are needed, the team develops a work plan or sampling and analysis plan (SAP) to acquire that information. This team provides information needed by the decision makers (i.e., stakeholders).

5.2.4 Scientist/Data Entry Specialist

The scientist/data entry specialist enters field and analytical data into PEMS. The scientist/data entry specialist ensures that the project data are properly incorporated into Paducah OREIS. The scientist/data entry specialist must ensure that hard copy and electronic data records are processed according to project data records management requirements as stated in the DMIP.

Appendix B – Project Data Management Implementation Plan Template (Continued)

5.2.5 Sample Management Office

The sample management office has the responsibility for developing and implementing the project DMIP to ensure that project data management requirements are met. The sample management office sees to it that any existing data or new project data are properly incorporated into the project's hard copy data record file or data base, as appropriate. The sample management office is responsible for identifying and obtaining data management training for the project team. The sample management office is responsible for contracting any fixed-base laboratory utilized during the sampling activities. The sample management office also provides coordination of sample shipment to the laboratory and contractual screening of data packages.

The sample management office is responsible for ensuring implementation (when needed) of validation through the appropriate data validation plans. CP3-ES-5003, *Quality Assured Data,* along with applicable data validation plans, serves as the documented strategy for implementation of data validation to meet project needs and includes approaches for verifying that analytical and field data are complete and have accurately fulfilled requested analyses and contractual requirements.

The sample management office is responsible for laboratory data package deficiencies. When data validation is performed external to the project, the sample management office should prepare a validation SOW as the mechanism by which validation implementation requirements are communicated from the project to the validation organization.

The sample management office has the responsibility for ensuring that analytical and field data are validated against a defined set of criteria, (i.e., the project data validation plans) and includes evaluating associated QC samples to ensure that analyses were performed within specified control parameters. Validation problems must be identified and appropriately resolved. Qualifiers and reason codes may be assigned to the data to indicate usability concerns.

5.2.6 Environmental Monitoring Manager

The Environmental Monitoring Manager is responsible for long-term storage of project data and for transmitting data to external agencies according to the Paducah Site Data Management Plan and the Paducah Data Management Policy. The Environmental Monitoring Manager ensures compliance to procedures relating to data management with respect to the project and that the requirements of CP3-ES-5003, *Quality Assured Data,* are followed. The Environmental Monitoring Manager is also responsible for overseeing activities of the rest of the project data management team (for small projects, the data management team may be comprised of just a scientist).

5.2.7 Scientist

A scientist conducts specifically defined tasks associated with a project. A scientist will supervise the field team activities for preparation and surveys of field sites and facilities and field data collection. The scientist ensures that the field activities have been properly recorded and reviewed in the field logbooks or data collection forms. Responsibilities include identifying, recording, and reporting project non-conformance or deviations. The scientist also may be the technical contact for subcontracted project support and should ensure that the flow down of data management requirements is defined in a SOW.

Appendix B – Project Data Management Implementation Plan Template (Continued)

5.2.8 Field Team

The field team consists of those individuals who perform any activities taking place in the field (e.g., inspections, monitoring, sampling, well construction, purging, equipment installation). They will be responsible for recording field activities in field logs and data sheets.

A field team member will be responsible for reviewing field logs to determine if all applicable procedures were followed by the field team. This field team member ensures that all samples were properly labeled, instruments were calibrated prior to taking measurements, and information was recorded correctly.

5.2.9 Data User

Data users typically are members of the project team who require access to project information to perform reviews, analyses or ad hoc queries of the data. The data user determines project data usability by comparing the data against pre-defined acceptance criteria and assessing that the data are sufficient for the intended use. This person performs data reviews, as appropriate [e.g., quality checks; assessing precision, accuracy, representativeness, completeness, comparability, and sensitivity (PARCCS) parameter conformance; evaluating adherence to data quality requirements].

The data user also shall be responsible for retaining any unique computer code [e.g., SQL code, Statistical Analysis System (SAS) code, GIS coverage] used to generate data products (e.g., tables, graphs, maps) included in project reports. This requirement ensures that data products can be reproduced in the future.