Guidance for the Preparation of the 2025 Department of Energy Annual Site Environmental Reports

February 2026

Office of Environment, Health, Safety and Security

Guidance for Preparation of the 2025

Department of Energy Annual Site Environmental Reports

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1 BACKGROUND

Department of Energy (DOE) Field Elements are responsible for the development and design of Annual Site Environmental Reports (ASERs) that are site specific and comply with DOE reporting requirements. The ASER is a key component of the Department's effort to keep the public informed of environmental conditions at DOE sites.

DOE O 231.1B, Admin Chg 1, Environment, Safety and Health Reporting, (November 2012) states that ASERs must be made available to the public, and submitted to the Chief Health, Safety and Security Officer[1] by October 1 of each year for the preceding calendar year, developed in accordance with the most recent applicable guidance provided by the Chief, Health Safety and Security Officer. This guidance provides recommendations for reporting that may be used to supplement the requirements of DOE Orders (DOE O) which were contractually applicable to DOE sites in part or all of the **reporting year**, Calendar Year 2025, including DOE O 231.1B and DOE O 458.1, Chg 5 (Admin Chg), Radiation Protection of the Public and the Environment, (September 2020). This guidance does not establish or invoke any new requirements.

This guidance is based on lessons learned and best practices, as well as DOE corporate reporting requirements and stakeholder input. This guidance promotes consistency and uniformity in the reporting of environmental information within ASERs. Past use of this guidance has resulted in ASERs that present environmental information in a common format that is easily understandable and readily usable by DOE organizations, stakeholders, and the public. Please note that not all sections/subsections of the guidance will apply to all sites.

1.1 DOE O 231.1B Requirements and DOE O 458.1 Reporting

As stated in DOE O 231.1B, Attachment 2, the DOE ASER must include the following information:

- **Site environmental management performance.** Data must include effluent releases, environmental monitoring, and types and quantities of radioactive materials emitted or discharged to the environment, the estimated or calculated Total Effective Dose (TED) to a representative person or maximally exposed individual (MEI) or member(s) of the public and the calculated collective dose to members of the public from exposure to radiation sources identified under DOE O 458.1 and, where it is of concern, releases of radon and its decay products from DOE sources and the resultant individual and collective dose from these radionuclides, which need not be combined with dose estimates from other sources.

[1] DOE O 231.1B lists this position as Chief of Health, Safety and Security. Its equivalent under the current organizational structure is Director, EH-10, Office of Health Programs & Environmental Radiation Protection.

- **Environmental occurrences and responses.** Information must include a summary of environmental occurrences and responses reported during the calendar year.
- **Environmental compliance.** Information must confirm compliance with environmental standards and requirements.
- **Significant programs and efforts.** Information must highlight significant environmental performance indicators and/or performance measures that reflect the size and extent of programs at a particular site.
- **Property clearance activities.** Information must include a summary of approved Authorized Limits, results of radiological monitoring and surveys of cleared property, types and quantities of property cleared, and independent verification program results in accordance with DOE O 458.1.

DOE O 458.1 states that sites must summarize, in the ASER, information on approved Authorized Limits, any approved revised Authorized Limits, use of pre-approved Authorized Limits, results of radiological monitoring and surveys of cleared property with type and quantity of property cleared, and independent verification results for Public Notification of Clearance of Property.

To meet the DOE O 458.1 reporting requirements as specified by DOE O 231.1B, sites should include information on the following:

- Environmental Radiological Protection Program
- Public Dose Limit and Temporary Dose Limits
- Airborne Radioactive Effluents
- Control and Management of Radionuclides from DOE Activities in Liquid Discharges
- Protection of Drinking Water and Ground Water
- Protection of Biota
- Release and Clearance of Property

Section 6, Environmental Radiological Protection Program and Dose Assessment provides the guidance needed to meet the DOE O 458.1 reporting requirements.

1.2 ASER Goals and Content

The ASER is the principal DOE document that demonstrates compliance with DOE O 458.1 requirements. Therefore, a comprehensive description of the radiological environmental protection program and real or potential radiological environmental impacts should be included for each site. The ASER is a backwards-facing document, focusing on actions taken in the reporting year.

The purpose of the ASER is to document the radiological and non-radiological condition of the environs, the effluents and emissions released from DOE operations, and noteworthy trends regarding these releases and environmental conditions at each DOE site. ASERs should accurately describe the radiological monitoring programs, non-radiological monitoring programs, and regulatory compliance required by DOE Orders and other applicable Federal and state regulations and requirements. They should also describe, at a high level, the environmental

impacts of DOE site operations. Where appropriate, the models and assumptions used to estimate releases and environmental conditions should be clearly documented.

To meet the requirements of DOE O 231.1B, ASERs should contain the most accurate and complete radiological and non-radiological monitoring data and up-to-date compliance information for the reporting year. DOE Field Elements are required to report non-radiological information in the ASER and comply with environmental standards and requirements. In addition, ASERs should highlight new site programs and initiatives, compliance successes, noteworthy practices, site environmental operating experience or environmental performance measures programs and, if applicable, site assessments that occurred during the reporting year to address the significant programs and efforts requirement of DOE O 231.1B.
See Section 3.0 Compliance Status and Section 5.0 Environmental Non-Radiological Protection for more detail.

If deemed appropriate by the site, any additional significant environmental issues, events, or noteworthy practices that emerge between the end of the reporting period and the actual public distribution of the site ASERs may be summarized in the transmittal memorandum releasing the ASER to the public or as a separate attachment.

DOE Field Elements are also encouraged, but not required to report on progress made in achieving their environmental goals, the measures used to track progress, and the results of those measures. This could include the site's progress on meeting the measurable environmental compliance and stewardship objectives identified in their Environmental Management System (EMS). These measures and accomplishments can be summarized in the **Executive Summary** chapter and detailed in the **Environmental Management System** chapter of the ASER.

Finally, to allow for public involvement and feedback on the ASER, sites are encouraged to provide a link to a questionnaire or reader comment form on the website where the ASER is electronically posted, which solicits public input and feedback on the current and future ASERs.
See Attachment V: ASER Public/Reader Comment Form for site-specific examples.

1.3 Public Information Source

The ASER serves as a key component of the Department's commitment to openness and public understanding of DOE operations. DOE sites use the ASER, along with other public information tools, to keep the public informed about environmental monitoring and performance. When sites maintain other publicly accessible information that contain environmental data, this information should be summarized and their locations referenced in the ASER to help streamline the production of the ASERs. The Office of Health Programs & Environmental Radiation Protection (EH-10 – formerly Environmental Protection and ES&H Reporting, EHSS-20) continues to recommend the ASERs be prepared in a manner that addresses likely public concerns and solicits feedback from the public and other stakeholders on site environmental management performance and compliance. Some successful approaches illustrating this include the following:

- An executive summary within the ASER that concisely highlights site operations, characterizes site environmental management performance and compliance, and describes significant environmental achievements, issues, and programs.

- A summary pamphlet targeted for the non-technical reader that accompanies the ASER.
- Site-specific web-based approaches to facilitate public outreach to, and feedback from, stakeholders on ASERs. Sites should consider providing a link on their Home Page to allow easy, direct access and navigation to current year and prior year ASERs.

Noteworthy site-specific examples can be found in Attachment V: Site -Specific Examples of Recommended ASER Reporting Formats.

1.4 Coordination, Production, and Distribution

Because most DOE Heads of Headquarters Elements (HHEs)[2] have delegated authority to DOE Heads of Field Elements (HFEs)[3] to prepare, approve, and release the ASERs, HFEs should coordinate the review process and comment period, as appropriate. EH-10 remains available to provide guidance regarding the preparation of ASERs, however, EH-10 does not have a formal review, comment, or approval role.

The 2025 ASERs should be approved by HFEs, or appropriate designee, and released to the public and/or placed on the site internet Home Page no later than October 1, 2026[4].

When releasing the ASERs to the public, the site should include a statement of DOE's commitment to environmental protection, compliance, and stewardship, and the site's best efforts to ensure the validity and accuracy of the monitoring data. This statement could be in the transmittal memorandum, the ASER Introduction chapter, and/or on the webpage that houses the ASER. Sites are encouraged to limit and optimize ASER hard copy production to reduce paper use.

[2] Whenever the term Heads of Headquarters Elements is used, it includes the heads of all headquarters first-tier organizations, to include Secretarial Officers, Administrator for NNSA, Administrators for the Power Administrations, and Heads of Staff Offices.

[3] Whenever the term Heads of Field Elements is used, it includes Operations Offices, Field Offices, Site Offices, Service Centers, Project Offices, Regional Offices and Area Offices.

[4] DOE expects all sites to comply with the required October 1 deadline as noted in DOE O 231.1B. If sites are unable to meet the aforementioned deadline, as a result of extraordinary and extenuating circumstances, they should consider requesting an extension from their Program Office consistent with DOE O 251.1D, Chg 1 (Admin Chg), Departmental Directives Program, (January 2017) exemption process and notify EH-10 within the Office of Health Programs & Environmental Radiation Protection.

The notification required by DOE O 231.1B should be made electronically to Dr. Josh Silverman (Josh.Silverman@hq.doe.gov), Director, Office of Health Programs & Environmental Radiation Protection (EH-10). HFEs should distribute ASERs to pertinent Heads of Headquarters Elements, the U.S. Environmental Protection Agency (EPA), appropriate state agencies, and other relevant agencies, organizations, or individuals. Distribution to the Office of Scientific and Technical Information (OSTI) is optional.

An electronic file of the approved site ASER should also be submitted to Ms. Una Song (una.song@hq.doe.gov) in the Office of Environmental Compliance & Radiation Protection (EH-11, formerly the Office of Sustainable Environmental Stewardship, EHSS-21). EH-11 will provide further notification and distribution within the Office of Health Programs & Environmental Radiation Protection (EH-10).

1.4.1 Addressing Errata

When changes (e.g., errors, typos, reinterpretation of data, etc.) need to be made to previously published ASERs, sites should maintain a list of these changes. This list should include any changes made to at least the last five ASERs: the current ASER and ASERs from the previous four years. If no changes have been made to previously published ASERs, there is no need to maintain or publish such a list.

Only major changes need to be tracked. Sites should decide whether the changes are significant enough to update previously published ASERs. If changes are found that warrant an update to a previously published ASER, sites should update the affected ASER(s), repost them on their website, and include the list of changes in the most current ASER and any affected ASER(s). Sites should email the ASER program manager, Una Song (una.song@hq.doe.gov), with the change being made and an electronic copy of any updated ASER(s) or a link to the updated ASER(s). Otherwise, ASERs do not need to be reprinted and redistributed.

1.5 ASER Production Streamlining Options

EHSS is committed to supporting efficiency in the ASER process. While DOE O 231.1B requires that ASERs be developed in accordance with the most recent applicable guidance provided by EHSS, HHEs and HFEs have discretion regarding the content and format of the site ASERs for which they oversee.

Sites, in collaboration with their HHE or HFE, should consider using one or more of the streamlining approaches listed below to reduce the size of their site ASERs. ASERs prepared using these options should still meet the expectations of DOE O 231.1B and DOE O 458.1.

1) **Weblink Report:** With this option, the ASER would be a short report with little or no narrative that includes links to publicly available reports. This would require that the information currently contained in the ASER be publicly available.
2) **Website Report:** With this option, the ASER would be a webpage that links to publicly available information. This option is similar to the weblink report but the ASER is a website and not a standalone document. To meet the submission requirement, sites should print the full contents of the website, updated to reflect the reporting year, to a Portable Document Format (PDF) file and submit that PDF to EH-10 to demonstrate their compliance on October 1 of each year.

3) **References Report:** With this option, the ASER would keep most of the current narrative but instead of including the detail contained in other public reports, the ASER would include that information by reference. This option is similar to the weblink report except that it provides context for the links.
4) **ASER Summary Report with Links to Additional Information:** With this option, sites would create a summary of their ASER information and instead of pointing readers to the full ASER, the summary would link to webpages or public reports for more information.
5) **Page limits or Percentage Reductions:** With this option, sites in collaboration with their HHE or HFE would establish restrictions on the size of their ASER through either page limits or a percentage reduction in page numbers from the prior year's ASER.
6) **Base Report:** With this option, sites would designate a base year ASER that they would update at planned internals (e.g., every five years). In the intervening years, sites would publish a short annual update with what has changed in the current year compared to the base year ASER.
7) **Alternate ASER Reporting for Closure Sites**: Closure sites may follow the streamlined process described in Attachment IV: Alternate ASER Reporting for Closure Sites. Non-closure sites wishing to adapt aspects of the Alternate ASER Reporting for Closure Sites for their site ASER should confer with EH-10 and their HHE or HFE.

If sites would like to utilize a streamlining option not listed here, they should confer with EH-10 and their HHE or HFE.

1.6 What's New in 2025 ASER Reporting

1.6.1 ASER Reorganization

The 2025 ASER Guidance document was reorganized this year. As a result, changes are not marked with change bars. The main goal for the changes to this ASER Guidance was to remove redundancy within the guidance itself. There were a number of places where the same information was repeated. Another goal was to suggest a restructure to site ASERs to reduce duplication in the reports themselves. To this end, EH-11 tried to note in the guidance where information in the ASERs should be cross-referenced with other ASER chapters. EH-11 also notes in the guidance that, if reports with additional information are available to the public, the site ASER should reference these reports and not duplicate the information contained in them.

EH-11 recognizes that it may take sites several ASER iterations to incorporate the new suggested changes provided in this guidance and appreciate any efforts sites make to adopt these recommendations.

A summary of the changes are listed below:

1) The major sections appear in the same order as last year's guidance for the most part:
   - The *Environmental Non-Radiological Protection Program Information* section comes before the *Environmental Radiological Protection Program and Dose Assessment* section. The Environmental Protection Program subsection was removed from the Environmental Management System section and combined with the Environmental Non-Radiological Protection Information to create the new section.

- Many of the subsections were rearranged.

2) Each section now has a "Background/Purpose" and "Content" section:
   - The intent for this change was to assist sites in navigating the ASER Guidance document to ensure that the regulatory driver and expected content for each section was clear. EH- 11 is not recommending that sites add a "Background/Purpose/Content" section to their site ASERs.
3) The *Compliance Status* section was reworked:
   - The *Compliance Status* section was moved from the *Recommended Format for Annual Site Environmental Reports* section and made its own section.
   - The section was renamed from *Compliance Summary* to *Compliance Status*
   - A new subsection called *Compliance Status Overview* was added. The purpose of this section is to recommend that sites include in their Site ASER an overview of the site's compliance status using tables.
   - The *Compliance Summary* subsection still includes the key environmental requirements as subsections.
   - The statutes listed under the Environmental Restoration and Waste Management were expanded to include a background and content section. Previously, no guidance was given for these statutes.
4) The *Environmental Management System* section was reworked:
   - The EMS background section was changed to add references to Integrated Safety Management (ISM) requirements. The content information was also changed to reflect the integration with safety management.
   - The *Environmental Protection Programs* and *Site Sustainability Plan Progress* sections were removed. This information was moved to the *Environmental Non-Radiological Protection Programs* section.
5) The *Environmental Non-Radiological Program Information* section was reworked and renamed:
   - This section was reworked to address the requirement that the ASER highlight significant programs and efforts. The non-radiological significant programs and efforts were consolidated into this chapter.
   - As stated earlier, the *Environmental Protection Programs* and *Site Sustainability Plan Progress* sections information was moved to this section.
   - *Unplanned Non-Radiological Reportable Releases* was moved from the *Unplanned Releases* section since there already was a *Radiological Unplanned Releases* section. This change reduces redundancy in the site ASERs.
   - *Natural Resources and Conservation Programs and Projects* was moved from the *Compliance Summary* section to this section and the *Recreational Hunting and Fishing* and the *Wildland Fire Protection Planning and Management sections* were moved under this subsection.
   - *Efficient Operations* is a new subsection and includes efforts that are still statutorily

required but had previously been covered by the *Site Sustainability Plan Progress* section. Sustainable Resilient Remediation is also included in this subsection.

6) New Appendices were added. These appendices were added to help sites navigate the ASER guidance and are not a recommendation that sites include similar appendices in their site ASERs.
   - *Appendix A* includes all the environmental requirements referenced in the ASER. The references in the body of the ASER are hyperlinked to the reference in the appendix for easy access.
   - *Appendix B* includes all the acronyms used in the ASER.
   - *Appendix C* includes the Subject Matter Expert Contact information for each ASER section.
7) Dates for the ASERs referenced in *Attachment V* were added to each example subsection.
8) The term "reporting year" is used throughout the guidance instead of noting the actual year for which the guidance applies. The "reporting year" is defined in the *Background* section of this guidance.

1.6.2 Compliance Summary

This section of *What's New* focuses on the regulatory changes that occurred in 2025 and newly added recommendations for content or clarification on existing content.

1.6.2.1 National Environmental Policy Act (NEPA)

Changes to the NEPA background section were made to reflect the two U.S. Supreme Court opinions released in 2025. No changes to the NEPA content section were made.

1.6.2.2 Water Quality and Protection

Changes to the Clean Water Act (CWA) background and content sections were made to include information about Section 404 permits and guidance on providing information about Section 404 permits.

Changes to the Safe Drinking Water Act (SDWA) background and content sections were made.

- Information on PFAS and the Lead and Copper Rule (LCR) was introduced in the ASER guidance last year. This information is repeated in the *What's New* section to remind sites of these new requirements.
- Background and content information on radionuclides was included in the SDWA section to clarify that compliance to DOE O 458.1 as it relates to drinking water systems should be included in the **Safe Drinking Water Act** chapter of the ASER.
- In addition, a recommendation that drinking water quality information be displayed in tabular format was added.
- Background information was added to account for the SDWA's underground injection control (UIC) program. A brief section was added covering recommended information to

provide about compliance with the UIC program.

Changes to the Stormwater Management background section were made to include a reference to stormwater management responsibilities under the CWA Section 402. Changes to the content section were made to recommend that information on stormwater activities related to CWA, EISA, and SDWA be included in the ASER and to recommend that the information be provided in tabular format.

1.6.3 Environmental Radiological Protection Program and Dose Assessment

1.6.3.1 Clearance of Property Requirements

Changes to the Clearance of Property Requirements background and content sections were not made. However, information on DOE-STD-1241-2023, Implementing Release and Clearance of Property Requirements, (March 2023) was introduced in the ASER guidance two years ago. This information is repeated in the "What's New" section to remind sites of this new standard.

2 RECOMMENDED FORMAT FOR ANNUAL SITE ENVIRONMENTAL REPORTS

The ASERs should, to the extent possible, follow the reporting format described herein. This recommended chapter order provides a logical flow:

- Executive Summary
- Introduction
- Compliance Status
- Environmental Management System (or Environmental Activities Integrated with Safety Management)
- Environmental Non-Radiological Protection Programs
- Environmental Radiological Protection Program and Dose Assessment
- Groundwater Protection Program
- Quality Assurance

While this is the recommended chapter order, sites should use their discretion and determine the chapter sequence that is most appropriate to the site's activities, mission and audience, as long as the applicable requirements of DOE O 231.1B and DOE O 458.1 are met. Alternate formats could include chapters on air monitoring, meteorological monitoring, surface water and groundwater monitoring, drinking water, wastewater, environmental restoration and waste management, soil monitoring, natural and cultural resources management, historic preservation, terrestrial monitoring/surveillance, ecological monitoring, and wildlife and agricultural products monitoring. See Attachment V: Alternate General ASER Format for site-specific examples.

ASERs should also include, as appropriate, a glossary of definitions and a list(s) of acronyms, abbreviations, symbols, units of measure, tables, figures, appendices, and references.

To make it easier for readers to peruse specific chapters of the ASER, include bookmarks in any electronic versions of the ASER. In addition, if there are chapters of the ASER that stay relatively static, consider including track change bars on the lefthand side of the document so readers can easily see which chapters have updated information.

2.1 Executive Summary

Purpose: To provide a short synopsis of site environmental performance. It should not simply repeat information found in the main body of the report and should be written in a manner that is understandable to the non-technical reader. This chapter should be concise and targeted at an audience that may not read the entire report.

Content: Highlight:

- the purpose of the ASER;
- primary site mission(s) and major activities[5];
- the site's compliance with environmental requirements;
- other significant programs, including environmental operating experience and performance measurement programs;
- a summary of radiological releases and doses to the public resulting from site operations, as well as a summary of non-radiological releases; and
- a brief description of the site's EMS, as appropriate.

To streamline ASER reporting and avoid redundancy, it is not necessary for sites that currently prepare and publish an ASER Summary Report to include an Executive Summary in their full ASER.

2.2 Introduction

Purpose: To provide context about the site's main missions and operations, environmental characteristics, and relationship with local communities.

Content: Include the following general information:

- site location;
- general environmental setting;
- site mission;
- primary operations and activities at the site; and

[5] If the primary remaining site mission is decontamination/decommissioning (D&D) and environmental restoration (clean-up), a brief statement discussing site historical operations should be included in this chapter.

- relevant demographic information from the census.

3 COMPLIANCE STATUS

Purpose: To provide an account of the site's compliance with respect to applicable major environmental requirements.

Content: **Compliance Status** should be a separate chapter in the ASER and should start with an overview of the site's compliance status. Following the compliance status overview, provide additional detail supporting the information provided in the overview.

3.1 Compliance Status Overview

Purpose: To provide an easy-to-read overview of the site's compliance with applicable environmental statutes, regulations, DOE Directives, Executive Orders (E.O), and other agreements the site is legally bound to follow.

Content: Provide an overview of the site reporting year compliance status for the following areas in tabular format. Sample example tables follow the list of items to be covered in the **Compliance Status Overview** chapter:

1) Environmental Compliance Obligations:
   - Major environmental statutes and regulations (see list in Section 3.1.2, Compliance Summary). If a major statute is not applicable, it should be listed in the table with the notation, "Not Applicable," along with a short explanation as to why it is not applicable;
   - DOE Directives, at a minimum including DOE environmental and radiation protection Orders, DOE O 231.1B, DOE O 435.1 Chg 2, Radioactive Waste Management, (January 2021) and DOE O 458.1.
   - Compliance and/or cleanup agreements, including those both in place and currently under negotiation; and
   - Executive Orders, as applicable.
2) Existing Permits.
3) Environmental Violations, Noncompliance Areas and Associated Corrective Actions:
   - Environmental violations cited by regulators (including any fines and penalties assessed);
   - Notices of Deficiency, Consent Orders, Notices of Intent to Sue, and other types of enforcement actions issued to the site as defined in DOE O 232.2A, Chg 1 (MinChg), Occurrence Reporting and Processing of Operations Information, (October 2019);
   - Areas of noncompliance;
   - Any reportable environmental occurrences that require notification to an outside regulatory agency; and
   - Corrective actions associated with any of the above.
4) Self-Assessments/Audits/Inspection Results, including Major Issues:

- Status and results of any self-assessments and/or environmental audits, including off-site sub-contracted DOE Consolidated Audit Program (DOECAP) audits, and EMS or Integrated Safety Management System (ISMS) assessments or audits;
- Inspection visit results; and
- Major issues identified from any of the above and their associated corrective actions.

Sites should consider using tables to summarize the information outlined above. Sample tables are shown below:

Table 1: Environmental Compliance Obligations Overview

Regulation requirement	***Reporting Year Compliance Overview***	***Report Chapter(s)***
Identify the relevant requirement from Federal/State/Local/DOE/agreement. May include the regulator in charge of compliance. May include a short description of the statute/regulation/agreement.	If there were no violations, sites should state that they were in compliance with the statute for the reporting year. Briefly summarize any violations or other instances of noncompliance that a) first occurred in prior years but were unresolved at any point during the reporting year or b) were cited during the reporting year. If appropriate, state affirmatively that there were no unresolved instances of noncompliance from prior years and/or no new instances of noncompliance. Provide information on how noncompliance events were addressed in the noncompliance table below, not in this overview table.	Refer to the relevant ASER chapter that provides detail. Add a link to the chapter to make it easier for the reader. If this information is on a website, sites can include a link to the webpage in lieu of providing additional information in their site ASERs.

The obligations can be listed alphabetically, grouped by media or in another way that makes sense for the site's audience. See Attachment V: Compliance Summary Table, for site-specific examples.

Table 2: Existing Permits

Regulatory Agency	*Media Area and Permit Type*	*Covered Site Facilities*	*Permit Number*	*Permit Period*	*Description of Activity Regulated by the Permit or Program*	*Compliance Activities*
Agency issuing the permit.	Media Area (e.g., air, hazardous waste, wastewater, etc.). Permit Type (e.g., Clean Air Act (CAA) Title V, CWA NPDES, etc.).	Site, facility, activity or component that is permitted or otherwise regulated.	The number of the permit assigned by the issuing agency.	Include the permit issue and expiration dates.	For example, construction, operations, and remediation activities that result in regulated environmental emissions or discharges. Include relevant figures (e.g., for CWA Section 404 permits, include amount of wetland acres impacted).	Briefly summarize the actions necessary to maintain compliance with permits, agreements, decrees, regulations, and statutes. If this detail is contained elsewhere in the site ASER, reference and link to the additional detail.

Table 3: Environmental Violations Cited by Regulators/Noncompliance Areas

Issuing Agency	*Relevant Statue/ Regulation*	*Violation Type*	*Reason for Violation*	*Violation Status*	*Penalty/ Fine*	*Correction Actions*	*Report Chapter(s)*
Agency issuing the violation.	Statute or regulation that was violated.	Notice of Violation, Significant Noncompliance, etc.	One or two sentences explaining what led to the violation.	Note when the violation was first issued and whether it has been returned to compliance.	List of any penalty or fine paid or assessed. Note if there was no penalty or fine assessed.	Summary of how the violation or noncompliance was addressed.	Refer to the relevant ASER chapter that provides detail. Add a link to the chapter to make it easier for the reader.

Before compiling and summarizing environmental violations for the reporting year, sites should consult EPA's Enforcement & Compliance History Online (ECHO) database. This is EPA's official record of the current compliance status for a given DOE site or particular facility within the site. Include a list of the facilities that a site monitors on EPA's ECHO database, including: Facility Name, Address (Street, City, State), Facility ID Number (listed as the Facility Registry Service [FRS] ID on the results page).

Table 4: Assessments/Audits and Associated Major Issues*

Assessment/Audit	*Audit Date*	*Auditor*	*Results/Major Issues Identified*	*Correction Actions*
Title of the Assessment/Audit (include self-assessments).	Date(s) the Assessment/Audit was conducted.	Name of the organization that conducted the Assessment/Audit.	Summary of the key findings of the Assessment/Audit including any major issues.	Summary of how the major issues were addressed.

* Sites may also include any inspection visits and their results in this table.

3.2 Compliance Summary

Purpose: To meet the DOE O 231.1B requirement that the ASER include information confirming compliance with environmental standards and requirements, the **Compliance Summary** chapter should include a discussion of compliance with relevant requirements and any cleanup agreements in place at the site. This chapter should elaborate on the information briefly summarized in **Table 1: Environmental Compliance Obligations Overview** in the **Compliance Status Overview** chapter to demonstrate how the site strives to stay in compliance with environmental requirements.

Content: Provide details of the site's compliance status with respect to applicable major environmental statutes, regulations, DOE Directives, and E.O.s, including, but not limited to those noted below. Sites should note that this is not a comprehensive list but lists the major statutes to which most sites are subject. Sites should also provide details on any compliance or cleanup agreements that are either in place or under negotiation. Sites should include all the requirements that apply to them in this section. If a major statute is not applicable and is listed in the **Table 1: Environmental Compliance Obligations Overview**, it does not need to be included in this chapter.

A discussion of cleanup agreements should include the enforceable milestones completed, as distinct from the milestones that were scheduled for completion in the reporting year pursuant to these agreements.

When possible, quantitative information should be provided. For example, if underground storage tanks have been removed from the facility, state the number of tanks that have been removed and the number of tanks that remain on-site.

Any monitoring data included in this chapter should indicate whether environmental releases and associated environmental impacts have improved, regressed, or remained the same over time. Trending data over a minimum of five years, the reporting year and the previous four years, is recommended for environmental media, such as air, surface water, groundwater, soils, and biota.

The **Compliance Summary** chapter should not present a large volume of supporting data or details on environmental protection programs that are presented in other chapters of the ASER, such as the **Environmental Radiological Protection Program and Dose Assessment** and **Environmental Non-Radiological Protection Program** chapters. References should be made to other chapters of the ASER, as appropriate, to minimize redundancy. Hyperlinks to the relevant chapters should be included to make it easier for the reader. In addition, if information

on site compliance programs can be found on their website, sites can direct readers to the appropriate websites for further information rather than in detail in the site ASER.

Sites may opt to combine the **Compliance Summary** with either the **Environmental Non-Radiological Protection Program** or **Environmental Radiological Protection Program and Dose Assessment** chapters and include data and details on supporting programs in a single chapter.

3.2.1 Environmental Restoration and Waste Management

3.2.1.1 Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and Superfund Amendments and Reauthorization Act (SARA)

Background: Under CERCLA (42 U.S.C. § 9601 et seq. and its amendments), the Federal government regulates hazardous substances, responds to releases of hazardous substances, and oversees long-term solutions for hazardous waste disposal and release sites.

Content:

- Identify the regulatory authorities involved in CERCLA-related activities.
- Identify any areas of the site that were subject to new or ongoing CERCLA-related activities in the reporting year and briefly describe those activities, including any:
  - Preliminary Assessment/Site Investigation (PA/SI);
  - Listing/delisting on the National Priorities List (NPL);
  - Remedial Investigation/Feasibility Study (RI/FS);
  - Record of Decision (ROD), Federal Facility Agreement (FFA), Consent Order, or similar document;
  - Remedial design, and removal and remedial action;
  - Engineering and/or Institutional Control (EC and/or IC);
  - Five-year review;
  - Long-term operations and maintenance; and
  - Maintenance of an Administrative Record.
- Include information on any past (i.e., occurred prior to the reporting year) significant CERCLA actions, per the list above, which provides important background context for readers.
- Identify any site-related CERCLA additions, corrections or deletions to the Federal Agency Hazardous Waste Compliance Docket in the reporting year.
- Summarize the reporting of any spill or other release of a hazardous substance that equaled or exceeded a reportable quantity (RQ) in the reporting year, per CERCLA section 103.
  - Details of unplanned releases reportable under CERCLA, and associated response actions, should be provided in the **Unplanned Non-Radiological Reportable Releases** and **Unplanned Radiological Releases** chapters, as appropriate, and readers should be redirected there for additional information.
  - If there were no releases of hazardous substances above reportable quantities, note

this.

- CERCLA section 103(f) allows for modified reporting of continuous releases of hazardous substances that meet certain criteria. Regulations require annual evaluation of continuous releases; summaries of these evaluations should be included in the ASER. Continuous release reporting should be reported in this chapter.

- Historical information.

3.2.1.2 Emergency Planning and Community Right-to-Know Act (EPCRA)

Background: EPCRA (42 U.S.C. §11001 et seq.), authorized by Title III of the Superfund Amendments and Reauthorization Act (SARA Title III), requires Federal facilities that use, store, or release certain extremely hazardous substances, hazardous chemicals, or toxic chemicals above certain regulatory thresholds to submit inventories to Federal, state, and local emergency planning authorities. EPCRA mandates annual reporting under Section 312, Emergency and Hazardous Chemical Inventory Reporting (Tier I/Tier II), and Section 313, Toxic Chemical Release Inventory (TRI) Reporting, that enables local emergency responders and the public to understand chemical hazards, prevent accidents, and respond effectively in the event that an incident occurs.

Content: Include summary information on the site-specific chemical inventories from Tier I/Tier II and TRI reporting, and any activities related to emergency planning procedures. Discuss any EPCRA reporting requirements that were completed or will be completed for the reporting year.

The following table is provided to assist DOE sites in presenting this information. Under the 'Status' column, if the site reported under the EPCRA Section, indicate "yes." If the site should have reported under the EPCRA Section, but did not, indicate "no." If the site was not required to report under the EPCRA Section (i.e., did not meet thresholds for any materials, did not have an extremely hazardous substance release), indicate "not required." Details of unplanned releases reportable under EPCRA should be provided in the **Unplanned Non-Radiological Reportable Releases** and **Unplanned Radiological Releases** chapters, as appropriate, and readers should be redirected there for additional information.

Table 5: Status of EPCRA Reporting

EPCRA Section	*Description of Reporting*	*Status**
EPCRA sec. 301-303	Planning Notification	
EPCRA sec. 304	EHS or HS HHS) Release Notification	
EPCRA sec. 311-312	Safety Data Sheet (SDS)/Hazardous Chemical Inventory	
EPCRA sec. 313	TRI Reporting	

* An entry of "yes," "no," or "not required" is sufficient for "Status."

3.2.1.3 Resource Conservation and Recovery Act (RCRA), Hazardous and Solid Waste Amendments of 1984 (HSWA), and Pollution Prevention Act (PPA)

Background: Under RCRA (42 U.S.C. § 6901 et seq. 1976) and its amendments, the Federal government regulates hazardous waste from "cradle-to-grave," which includes generation, transportation, treatment, storage, and disposal. Under RCRA, the Federal government also regulates non-hazardous solid waste, encourages waste minimization, and regulates underground storage tanks (USTs). Compliance and enforcement for some RCRA requirements is delegated to the states.

The HSWA (42 U.S.C. § 6901 et seq. 1984), created a set of restrictions on land disposal of hazardous waste. In addition, the HSWA requires that releases of hazardous waste or hazardous constituents from any RCRA-permitted facility be remediated.

The Pollution Prevention Act (PPA) created a national policy to promote the prevention of pollution or reduction at pollution sources wherever possible. While there are no regulatory requirements for Federal facilities related to PPA, actions taken consistent with the PPA can reduce or eliminate waste that must be managed under RCRA.

Content:

- Identify the regulatory authorities involved in RCRA-related activities.
- Indicate if the site is registered as a Very Small Quantity Generator (VSQG), Small Quantity Generator (SQG) or Large Quantity Generator (LQG) of hazardous waste.
- Detail hazardous waste generation and disposal quantities for the reporting year, as well as the means of disposal for all hazardous waste that was removed from the site during the reporting year.
- Summarize the site inventory, operations, and any closures of hazardous waste treatment, storage, and disposal facilities (TSDFs) in the reporting year.
- Summarize the site inventory, operations, and any closures of USTs in the reporting year.
- Summarize the results of any RCRA compliance inspections that occurred in the reporting year, including any Notices of Violation, compliance orders, and follow-up

corrective actions.

- Identify any areas of the site that were subject to new or ongoing RCRA-related corrective activities in the reporting year and briefly describe those activities, including any:
  - RCRA Facility Assessment (RFA)/Initial site assessment;
  - RCRA Facility Investigation (RFI)/Site characterization;
  - Interim actions;
  - Corrective Measures Study (CMS)/Evaluation of remedial alternatives;
  - Corrective Measures Implementation (CMI)/Remedy implementation;
  - Long term maintenance and monitoring; and
  - EC and/or IC.

- Describe the additions, corrections or deletions reported in the site's most recent RCRA section 3016 report, or other site-related RCRA additions, corrections or deletions to the Federal Agency Hazardous Waste Compliance Docket, in the reporting year. If nothing was reported, note this.
- Describe the quantities of construction and demolition waste and municipal waste generated and disposed of during the reporting year, as well as the composition of the municipal waste stream, if known. If trend information is available, summarize the levels of waste generation and disposal over time.
- Summarize the pollution prevention strategies employed by the site to minimize waste.

3.2.1.4 Federal Facilities Compliance Act (FFCA)

Background: The FFCA (Public law 102-386, Title I) amends the Solid Waste Disposal Act to waive the sovereign immunity of the United States for purposes of enforcing Federal and state requirements with respect to solid and hazardous waste management. FFCA also required the preparation of Site Treatment Plans (STPs) for the handling of mixed wastes (hazardous and radioactive) at DOE sites.

Content:

- Provide a summary of any active STP and any required reporting, as applicable, for mixed waste management
- Summarize any site actions to ensure compliance with all Federal, state, interstate, and local solid and hazardous waste requirements, not covered in other chapters (e.g., RCRA, Toxic Substances Control Act [TSCA]), Federal Insecticide, Fungicide, and Rodenticide Act [FIFRA]).

3.2.1.5 National Environmental Policy Act (NEPA)

Background: NEPA (42 U.S.C. § 4331, et seq.), as amended, requires Federal agencies to incorporate evaluation of environmental effects into agency planning and decision-making. Specifically, agencies are to prepare detailed statements assessing the environmental impact of, and alternatives to, major Federal actions that will have a significant impact on the human environment.

In 2025, two U.S. Supreme Court opinions fundamentally altered Federal NEPA implementation. Additionally, the White House Council on Environmental Quality (CEQ) revoked its own NEPA regulations in response to a Supreme Court decision, finding that CEQ lacks authority to issue regulations. A separate Supreme Court opinion curtailed the scope of analysis to only "reasonably foreseeable" impacts and accorded substantial discretion to Federal agencies in how they approach NEPA implementation. Accordingly, DOE revoked most of its own NEPA regulations and replaced them with non-regulatory, advisory procedures that emphasize the kinds of DOE activities to which NEPA does not apply. Remaining DOE NEPA regulations principally address categorical exclusions and emergency actions.

Content: Summarize any NEPA-related actions taken during the reporting year, including Categorical Exclusion (CATEX) determinations, Environmental Assessments (EA); and Environmental Impact Statements (EIS).

3.2.1.6 Toxic Substances Control Act (TSCA)

Background: Under TSCA (15 U.S.C. § 2601 et seq. [1976]), as amended by the Frank R. Lautenberg Chemical Safety for the 21st Century Act, EPA evaluates potential risks from new and existing chemicals and acts to address, through regulation, any unreasonable risks chemicals may have on human health and the environment. Risk management options may include limiting manufacturing, restrictions on use, partial or total bans, disposal requirements, and/or Worker Chemical Protection Program requirements, to which DOE must comply.

Content:

- Summarize site compliance with TSCA with regards to procurement, use and disposal of polychlorinated biphenyls (PCBs), if applicable.
- Summarize site compliance with TSCA with regards to asbestos and lead-based paint detection and abatement, if applicable.
- Summarize site compliance with TSCA radon requirements to measure radon levels within buildings and mitigate unsafe exposure, if applicable.

Radon-222 emissions and associated requirements in NESHAP Subparts Q and T should be addressed in the **Environmental Radiological Protection Program and Dose Assessment** chapter.

3.2.1.7 Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)

Background: FIFRA (7 U.S.C. § 136-136y) governs the registration, distribution, sale, and use of pesticides in the United States.

Content:

- Summarize site compliance with FIFRA and related state regulations, with regards to procurement, use, and disposal of pesticides.
- Describe use of Integrated Pest Management (IPM) techniques on site, if applicable.

3.2.2 Radiation Protection

3.2.2.1 Atomic Energy Act of 1954 (AEA)

Background: AEA (42 U.S.C. § 2011, et seq.) effectuates programs including, but not limited to, encouraging widespread participation in the development and utilization of atomic energy for peaceful purposes to the maximum extent consistent with the common defense and security, and with the health and safety of the public.

Content: Describe compliance with the provisions in DOE O 458.1 for the management, storage, and disposal of 11e.(2) byproduct material, as defined in Section 11e.(2) of the AEA, and other wastes containing uranium, thorium, and their decay products, which are not subject to the requirements of 40 CFR Part 192, Health and Environmental Protection Standards for Uranium and Thorium Mill Tailings. Details of compliance with these requirements should be provided in the **Environmental Radiological Protection Program and Dose Assessment** chapter and readers should be redirected there for additional information.

3.2.2.2 DOE O 458.1, Radiation Protection of the Public and the Environment, Chg 4, 2020

Background: DOE O 458.1 establishes requirements to protect the public and the environment against undue risk from radiation associated with radiological activities conducted under the control of DOE pursuant to the AEA. DOE sites should conduct radiological activities so that exposure to members of the public is maintained within the dose limits established in the Order; control the radiological clearance of DOE real and personal property; and ensure that potential radiation exposures to members of the public are below the limits. DOE sites should have the capabilities, consistent with the types of radiological activities conducted, to monitor routine and non-routine radiological releases, and to assess the radiation dose to members of the public, as well as to provide protection of the environment from the effects of radiation and radioactive material.

Content:

- Summarize demonstration of compliance with public dose limits.
- Summarize airborne radioactive effluent discharges both air and liquid.
- Summarize demonstration of compliance for biota considerations.
- Summarize release and clearance of property.
- Details of compliance with these requirements should be provided in the **Environmental Radiological Protection Program and Dose Assessment** chapter and readers should be redirected there for additional information.

3.2.2.3 DOE O 435.1 Radioactive Waste Management

Background: DOE O 435.1 establishes requirements for DOE radioactive waste management activities which shall be systematically planned, documented, executed, and evaluated. Radioactive waste shall be managed to protect the public, workers, and the environment while maintaining compliance with applicable Federal, state, and local regulations.

Content: Summarize site compliance with DOE O 435.1 and the associated DOE Manual (M) 435.1 Chg 3, Radioactive Waste Management Manual, (January 2021). At a minimum, include information on the wastes that are managed at the site (e.g., high level, low level, or transuranic waste) and what type of waste management the site is performing (e.g., generation, treatment, storage, disposal).

For those sites that are authorized to manage a low-level waste (LLW) facility, include a table or a listing of the status of each phase of the LLW management process (e.g., performance assessment [PA], composite analysis [CA], closure plan, PA/CA maintenance program, and disposal authorization statement [DAS]), and a narrative description of the site LLW management program.

Identify the commercial TSDFs contracted to receive DOE radioactive waste from the site. Describe any uses of an annual DOECAP audit by the Field Element Manager for their annual acceptability review of a commercial TSDF. Indicate whether participation in DOECAP (or similar audits) is included in each commercial TSDF contract. If this information is provided in the **Quality Assurance** chapter of the ASER, do not include in this chapter but reference the appropriate chapter.

Additional radioactive waste management activities not covered in this chapter can be included in the **Environmental Radiological Protection Monitoring Program and Dose Assessment** chapter.

Note: Management of byproduct material, defined in Section 11e.(2) of the AEA is conducted under the provisions of DOE O 458.1, except where such material meets the conditions set forth in to allow disposal in an authorized LLW disposal site. Any information on 11e.(2) byproduct materials should be included in the AEA chapter.

3.2.3 Air Quality and Protection

3.2.3.1 Clean Air Act (CAA)

Background: CAA (42 U.S.C. § 7401 et seq.) is the comprehensive Federal law that regulates air emissions from stationary and mobile sources.

Content: Discuss the compliance status of site air emissions, including regulated pollutants and hazardous air pollutants.

- Describe any major events that occurred at the site in the reporting year pertaining to CAA compliance.
- Describe whether a major source of air pollutants, as defined in 40 CFR Part 70.2, is present at the site and include information on those operations for which emissions

contribute most substantially to the major source. Conversely, if the site does not have a major source, then this should be explicitly stated.

- Ensure active air permits are included in **Table 2: Existing Permits**. Any additional information should be reported in this chapter.
- Ensure active air-related compliance agreements are included in **Table 1: Environmental Compliance Obligations Overview**. Any additional information should be reported in this chapter.
- Information on air permit exceedances, NOVs, and other air quality non-compliances should be included in the **Environmental Violations, Issues, and Noncompliance Summary** chapter, and that chapter should be referenced, if appropriate.

3.2.3.2 National Emission Standards for Hazardous Air Pollutants (NESHAP) 40 CFR Part 61 Subpart H, National Emissions Standards for Emissions of Radionuclides Other Than Radon from Department of Energy Facilities

Background: NESHAP Subpart H protects the public and the environment from radionuclide emissions other than radon from DOE facilities. It sets a limit on the emissions of radionuclides so that no member of the public would receive an effective dose equivalent of more than 10 millirem/year (0.1 millisievert/year).

Content: Summarize compliance with the monitoring and other requirements in NESHAP Subpart H. For example, note NESHAP Subpart H compliance agreement negotiations and other discussions with regulatory agencies or applications for waivers. If a site is exempted from any requirements, state the reason(s) for the exemptions. Discuss issues concerning site compliance status with radionuclide NESHAP Subpart H and NESHAP Subpart H-specific radionuclide monitoring

Information on NESHAP Subpart H compliance for DOE sites is reported annually in the NESHAP report for radionuclides required by EPA and should be included in this chapter. The information provided in a site's ASER for the reporting year should be consistent with the information reported in the site NESHAP report for the same time period for the air emission of radionuclides, to demonstrate compliance with the EPA's NESHAP Subpart H requirements. The NESHAPs report may be referenced for more information and any significant differences between the ASER and NESHAP Subpart H air emissions and estimated doses reported should be clearly explained.

Detailed reporting and discussion of site radiological air emissions and doses should be included in the **Environmental Radiological Protection Program and Dose Assessment** chapter. Radon-222 emissions are addressed in NESHAP Subparts Q and T and should be addressed in the **Environmental Radiological Protection Program and Dose Assessment** chapter.

3.2.3.3 American Innovation and Manufacturing (AIM) Act of 2020 and Hydrofluorocarbon (HFC) Phasedown

Background: The AIM (42 U.S.C. § 7675) authorizes EPA to address the environmental risk of HFCs by enacting regulation that phases down HFC production and consumption;

maximizes reclamation and minimizes releases from equipment; and facilitates the transition to next-generation technologies through sector-based restrictions on HFCs.

Content: Summarize current HFC uses, procurement, management and repositories. Summarize proactive measures taken to phase out and/or replace targeted HFCs because of the AIM Act.

3.2.4 Water Quality and Protection

3.2.4.1 Clean Water Act (CWA)

Background: The CWA of 1972 (33 U.S.C. § 1251 et seq.) establishes water quality standards for waters of the United States and regulates discharges of pollutants into those waters under the National Pollution Discharge Elimination System (NPDES), and controls the discharge of dredge and fill material into receiving waters, including wetlands, under the CWA Section 404 program administered jointly by EPA and the U.S. Army Corps of Engineers.

The following subsections detail what sites should discuss related to their compliance.

3.2.4.1.1 CWA Section 402 Compliance

Content: Include relevant NPDES and State Pollutant Discharge Elimination System (SPDES) data:

- Permit type and Coverage Period,
- Pollutants with numerical effluent limits that are covered by the permit[6],
- Outfalls or facility area covered by the permit and the United States Geological Survey (USGS) Hydrologic Unit Code (HUC)12 Watershed to which each outfall or the project area drains,
- Total number of permit violations per pollutant or other permit requirement, such as failure to monitor or report,

[6] Some SPDES permits may include PFAS monitoring requirements and/or effluent limits. This information should be noted in this section of the ASER.

- For any violation:
  - Date of the violation,
  - Cause of each violation,
  - Corrective action(s), and
  - Current compliance status.

Sites are encouraged to document this data in tabular form via the sample table below.

Table 6: CY 2025 NPDES/SPDES Compliance Reporting

Permit Type	*Issuing Authority*	*Permit Number and Coverage Period*	*Outfalls/Facility Area and HUC 12 Watersheds*	*Pollutants with Numeric Effluent Limits Covered by the Permit*	*Permit Violations*	*Date(s) of Violation*	*Cause of Violations, Corrective Actions, and Current Compliance Status*

Information in this table may elaborate on the violation summary information provided in **Table 3: Environmental Violations Cited by Regulators/Noncompliance Areas** in the **Compliance Overview** chapter.

If the information on violations is included in the **Environmental Violations, Issues, and Noncompliance Summary** chapter, reference that chapter.

In addition to reporting individual NPDES and SPDES permits, provide information about the compliance status of general permits, such as those covering stormwater management during construction projects and from certain industrial facilities. Industrial facilities that discharge to publicly-owned treatment works (POTWs) may be required to pretreat effluents so that they do not interfere with the plant's treatment technology or get passed through to waterways without being treated. Provide basic information about any pretreatment permits issued to the site by the local POTW. If this information is covered in the **Stormwater Management** chapter, reference that chapter.

3.2.4.1.2 CWA Section 404 Compliance

Background: The CWA requires a permit to discharge dredged or fill material into wetlands and other waters of the United States. Permittees may seek coverage for their dredge or fill activities under general or individual permits, depending on the nature of the activity and the location of the project.

Content: Ensure CWA section. 404 permits are included in **Table 2: Existing Permits** table. Any additional information should be reported in this chapter.

3.2.4.2 Safe Drinking Water Act (SDWA)

Background: The SDWA of 1974 (42 U.S.C. § 300f et seq.) was established to protect the quality and safety of drinking water in the United States and focuses on all waters actually or potentially designed for drinking use, whether from aboveground or underground sources. This law authorizes EPA to establish standards to protect tap water and requires all owners or operators of public water systems to comply with these health-based standards, known as the National Primary Drinking Water Regulations (NPDWR). EPA sets standards for drinking water, including maximum contaminant levels (MCLs), maximum residual disinfectant levels (MRDLs), and treatment techniques (TT), and provides oversight to the states, localities, and water suppliers who implement those standards. The SDWA was amended in 1986 and 1996 and requires many actions to protect drinking water and its sources – rivers, lakes, reservoirs, and groundwater. The SDWA requires that each Federal agency owning and/or operating a public water system comply with all Federal, state, and local requirements regarding safe drinking water.

Content: Include a description of the drinking water source(s) and public water systems at the site, source water protection efforts, and the results of monitoring and reporting conducted at the site to demonstrate compliance with SDWA. If monitoring information is covered in the **Environmental Non-Radiological Protection Program Chapter**, reference that chapter.

Information about drinking water quality can be displayed in tabular format, elaborating on any information about drinking water issues referenced in the **Compliance Overview** chapter of the ASER.

Public Water System	***Source***	***Ownership***	***Public Water System Type***	***CY 2025 Violations and Violation Status***	***CY 2025 Sanitary Surveys and Inspections***
Name and ID Number	Identify aquifer or surface water source	DOE or Name of Public Utility	Community, Non-Transient Non-Community, Transient Non-Community	For facilities that purchase drinking water, report only health-based violations from most recently available Consumer Confidence Report or Regulator Database, such as Drinking Water Watch. For DOE owned/operated systems, report all violation types.	Report only for DOE owned/operated drinking water systems. Report the status of any significant deficiencies, including unresolved significant deficiencies identified during prior year sanitary surveys and inspections.

3.2.4.2.1 SDWA: PFAS

Background: In April 2024, EPA announced a new National Primary Drinking Water Regulation for six PFAS. The regulation established legally enforceable Maximum Contaminant Levels (MCLs) as contaminants with individual MCLs for:

- perfluorooctanoic acid (PFOA),
- perfluorooctane sulfonate (PFOS),
- perfluorohexanesulfonic acid (PFHxS),
- perfluorononanoic acid (PFNA), and
- hexafluoropropylene oxide dimer acid (HFPO-DA or C3 Dimer Acid)

PFAS mixtures containing at least two or more of PFHxS, PFNA, HFPO-DA, and perfluorobutane sulfonate (PFBS) had MCLs established using a Hazard Index MCL to account for the combined and co-occurring levels of these PFAS in drinking water.

The regulation includes an initial monitoring period (2024-2027) that will determine future routine compliance monitoring requirements. On September 11, 2025, EPA filed a motion with the U.S. Court of Appeals for the D.C. Circuit indicating it would defend its MCLs for PFOA and PFOS, but seek vacatur on procedural grounds of the MCLs for PFHxS, PFNA, HFPO-DA (or C3 Dimer Acid), and the mixture of two or more of PFHxS, PFNA, HFPO-DA, and PFBS. The Court has yet to rule on EPA's request and the April 2024 rule remains in effect.

Content: If available, sites with DOE owned and/or operated public water systems should report on the results from the initial PFAS monitoring period required under EPA's April 2024 rulemaking.

- If sites have conducted other monitoring for PFAS from the source(s) or the treated water of their drinking water systems, this information also should be reported in this chapter or provide a reference to the location in the ASER where this information can be found.
- If known, sites should report on the results of any PFAS testing conducted by their water supplier and if PFAS is present in the water served to the DOE facility.
- Note any treatment installed to limit PFAS levels.

3.2.4.2.2 SDWA: Lead

Background: In October 2024, EPA issued the Lead and Copper Rule Improvements (LCRI) final rule, which updates various aspects of the Lead and Copper Rule (LCR), including requiring public water systems to replace all lead and galvanized requiring replacement (GRR) service lines within 10 years and setting minimum annual service line replacement rates. The LCR applies to community and non-transient non-community public drinking water systems. Of note, the LCRI also lowered the lead action level from 15 µg/L to 10 µg/L. Litigation over the lead service line replacement requirements in the LCRI is currently pending in the U.S. Court of Appeals for the D.C. Circuit, though EPA has indicated it will defend the October 2024 rule and it remains in effect.

Content: Sites with community and non-transient, non-community public drinking water systems should report on their compliance with the LCR requirement to prepare an initial service line inventory that identifies the material of each service line in the drinking water distribution system, which was due October 16, 2024.

- If lead or GRR service lines were identified during the inventory process, the site should report on the status of replacing those service lines.
- If the inventory included service lines of unknown material, sites should provide a status update on their actions to determine the material of those service lines.

The change in lead action level from 15 µg/L to 10 µg/L as a result of the LCRI may result in additional lead action level exceedances (ALE). ALEs should be noted in this chapter as well as reported at the time of occurrence through the DOE Occurrence Reporting and Processing System, as per DOE O 232.2A.

3.2.4.2.3 SDWA: Radionuclides

Background: DOE O 458.1 requires all DOE owned and/or operated drinking water systems to comply with EPA's radionuclides MCL. DOE O 458.1 also requires DOE sites to ensure their legacy and current operations are not the cause of any exceedances of the radionuclides MCL at off-site public and private water systems.

Content: Summarize compliance with the DOE O 458.1 requirement to comply with EPA's radionuclides MCL, including the drinking water monitoring and environmental surveillance activities conducted in support of demonstrating compliance with the Order DOE O 458.1.

3.2.4.2.4 SDWA: Underground Injection Control (UIC)

Background: Part C of the SDWA protects underground sources of drinking water through the Underground Injection Control (UIC) program, which establishes requirements and permits for six classes of wells that receive various types of liquids into porous geologic formations.

Content: Identify any underground injection wells regulated by the UIC program by referencing the number of wells, their well classification, the types and quantities of fluids injected, compliance activities, and compliance status in the reporting year. If stormwater management information related to UICs is covered in the **Stormwater Management** chapter, reference that chapter.

3.2.4.3 Stormwater Management

Background: Section 438 of EISA (42 U.S.C. § 17001 et seq.) requires Federal agencies to reduce stormwater runoff from Federal development and redevelopment projects to protect water resources. Federal agencies can comply using a variety of stormwater management practices often referred to as "green infrastructure" or "low impact development" practices, including reducing impervious surfaces, using vegetative practices, and installing porous pavements, cisterns and green roofs. In 2009, EPA, in close coordination with other Federal agencies, developed Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal Projects under Section 438 of the Energy Independence and Security Act to assist Federal agencies in implementing EISA section 438.

As noted in Section 3.2.4.1.1, CWA Section 402 Compliance, sites may also have stormwater management responsibilities under various CWA section 402 (NPDES) permits,

including for construction projects, at certain industrial facilities, and under the municipal separate storm sewer system (MS4) program. Additionally, some state regulators may require drinking water systems to have wellhead or source water protection programs, which could include stormwater runoff management.

Content: Summarize stormwater management activities and requirements, which could include CWA, EISA, and SDWA requirements, state and local requirements, as well as best management practices.

For EISA section 438 compliance, provide information on impacted projects. The columns in the table below note the information that should be included. Use of this tabular format is encouraged:

Project Name	***Project Description***	***Project Footprint***	***Performance Design Specification***	***Best Management Practices Used to Manage Stormwater and Meet the Requirements***
		Units: Square Feet	See EPA Guidance Document for Description	

If this information is covered in the **Clean Water Act** or **Safe Drinking Water Act** chapter, reference that chapter.

3.2.4.4 PFAS and Additional Emerging Contaminants

Background: Federal and state regulatory agencies continue to develop regulatory approaches for PFAS and emerging contaminants, such as PFOS, PFOA, perchlorates, 1,4- dioxane, and other persistent contaminants that may be present at DOE sites.

DOE continues to provide resources and meet required actions per the PFAS Strategic Roadmap: DOE Commitments to Action 2022-2025 (August 18, 2022).

In January 2023, DOE published the Guide for Investigating Historical and Current Uses of Per- and Polyfluoroalkyl Substances at Department of Energy Sites. This guide outlines a framework for DOE programs investigating historic or current PFAS uses at DOE-owned or -operated entities nationwide.

Content: As appropriate, provide a summary of any PFAS and/or other emerging contaminants detected at the site, including:

- efforts used to determine their presence
  - historical/current review of records;
  - database searches;
  - locating materials/waste areas;

  - releases (see Section 5.2 Unplanned Non-Radiological Reportable Releases for additional information);
  - disposal;
  - analysis of past practices and sources

- analytical methods;
- any associated regulatory developments, and/or recent discussions held with EPA, state regulators, or stakeholders/interested parties regarding emerging contaminants detected;
- progress toward setting related cleanup standards; and
- potential remediation technologies being considered.

Sites should reference the **Clean Water Act** and **Safe Drinking Water** Act chapters if they include relevant discussions of PFAS monitoring or regulatory requirements. Duplication of information with these chapters should be avoided.

3.2.5 Natural and Cultural Resources

3.2.5.1 Endangered Species Act (ESA)

Background: The ESA of 1973 (16 U.S.C. § 1531 et sq.) protects Federally listed threatened and endangered species and their habitats from "take"[7] and ensures that Federal actions do not jeopardize the continued existence of a listed species or result in the destruction or adverse modification of designated critical habitat. If any aspect of a DOE action may affect a listed species or designated critical habitat, consultation with the U.S. Fish and Wildlife Service (USFWS) and/or the National Oceanic and Atmospheric Administration – National Marine Fisheries Service (NMFS) is required, usually resulting in either a Letter of Concurrence (LOC) or a Biological Opinion (BO).

Content:

- List, as appropriate, threatened and endangered species managed.
- Discuss activities conducted at the site to comply with ESA and to protect endangered or threatened species and their critical habitat. Include summaries of any active BOs that apply to site operations.
- Summarize all ESA section 7 consultation activities that occurred during the reporting year.

[7] The term "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. The term "critical habitat" means the specific areas within the geographical area occupied by the species on which are found those physical or biological features essential to the conservation of the species and which may require special management considerations or protection; and specific areas outside the geographical area occupied by the species that are essential for the conservation of the species (excerpted from the Endangered Species Act of 1973).

- State the maximum "take" allowed for each threatened or endangered species, and the "take" that occurred for each species during the reporting year.
- Discuss monitoring or other research done in support of threatened or endangered species management at the site. If this information is covered in the **Environmental Non-Radiological Protection Program Chapter**, reference that chapter.

3.2.5.2 E.O. 13751 Safeguarding the Nation from the Impacts of Invasive Species (December 5, 2016)

Background: E.O. 13751 which amended E.O. 13112, Invasive Species (February 3, 1999), calls on Federal agencies to prevent the introduction, establishment, and spread of invasive species, as well as to eradicate and control populations of invasive species that are established.

Content: List those invasive species present at the site and describe activities conducted to address them in compliance with E.O. 13751.

3.2.5.3 National Historic Preservation Act (NHPA)

Background: The NHPA of 1966 (54 U.S.C. § 100101 formerly 16 U.S.C. § 470, as amended), requires Federal agencies to establish programs to identify, record, and protect cultural resources and to assess the impact of proposed projects on historic or culturally important sites, structures, or objects within the area of potential effect for a proposed project. The NHPA further requires Federal agencies to assess all archaeological sites, historic buildings, and objects on such sites to determine qualification for inclusion in the National Register of Historic Places (NRHP). In addition, section 106 of the NHPA requires Federal agencies to consult with State Historic Preservation Offices and the Federal Advisory Council on Historic Preservation, as appropriate, when determining if proposed actions would adversely affect properties eligible for listing on the NRHP. Federal regulations under 36 CFR 800.8 provide direction on coordinating Section 106 compliance with steps taken to meet applicable NEPA requirements.

Content:

- Discuss activities conducted at the site to comply with NHPA, including any assessments and/or surveys conducted to protect cultural resources.
- Discuss programs and plans put in place to manage cultural resources such as the site's Cultural Resources Management Plan, the site's cultural resources review process, and relevant monitoring and results can be discussed in this chapter. If this information is covered in the **Environmental Non-Radiological Protection Program Chapter**, reference that chapter.

3.2.5.4 Migratory Bird Treaty Act (MBTA)

Background: The MBTA of 1918, as amended, (16 U.S.C. § 703-712) is intended to ensure the sustainability of populations of all protected migratory bird species. The MBTA prohibits the take (including killing, capturing, selling, trading, and transport) of protected migratory bird species without prior authorization from the USFWS. The list of MBTA-

protected birds is codified at 50 CFR Subpart 10.13. E.O. 13186, Responsibilities of Federal Agencies to Protect Migratory Birds (66 FR 3853, 2001) directs Federal agencies to further implement the MBTA. The E.O. defines "take" to include both intentional and unintentional take. Specifically, E.O. 13186, directs agencies whose actions may have a negative effect on migratory bird populations to develop and implement a Memorandum of Understanding (MOU) with the USFWS to promote the conservation of migratory bird populations.

The 2013 DOE-USFWS MOU and E.O. 13186 commit DOE to take certain actions to implement the MBTA.

Content: Describe activities conducted at the site to protect or promote the welfare of migratory birds, especially specific DOE responsibilities detailed in the 2013 DOE-USFWS MOU. These include efforts or instituted procedures to evaluate and minimize or mitigate adverse impacts to migratory birds and their habitats through the NEPA process and development and implementation of strategies to:

- continually improve conservation of migratory birds and their habitat in the conduct of environmental cleanup activities;
- improve or enhance conservation of migratory bird habitats at DOE's National Environmental Research Parks and other ecological resource preservation areas;
- improve or enhance the conservation of migratory birds and their habitats at water impoundment structures (e.g., dams and retention ponds); and
- consider the USFWS recommendations and suggested practices regarding energy development to avoid or minimize effects on migratory birds and their habitats.

Include separate statements on intentional and unintentional take of migratory birds for the reporting year:

- For intentional take, report the number of migratory birds of each species intentionally taken during the conduct of any program, activity, or action, including, but not limited to banding, other marking, scientific collection, taxidermy, and depredation control. Provide data trends, if available.
- Information on unintentional take can focus on efforts to mitigate observed losses and related interaction with offices of the USFWS.

3.2.5.5 E.O. 11988, Floodplain Management (May 24, 1977)

Background: E.O. 11988 requires Federal agencies to consider, evaluate, and avoid, to the extent possible, adverse impacts associated with the occupancy and modification of floodplains, to reduce the risk of flood loss, to minimize the impact of floods on human safety, health, and welfare, and to restore and preserve the natural and beneficial values of floodplains.

As of the date of the issuance of this Guidance, DOE implements E.O. 11988 in part through its regulations in 10 CFR Part 1022, Compliance with Floodplain and Wetland Environmental Review Requirements.

Content: Describe activities conducted at the site to protect floodplains and to evaluate the potential effects of any actions the site may take in a floodplain to ensure that the site's planning programs reflect consideration of flood hazards and floodplain management.

3.2.5.6 E.O. 11990, Protection of Wetlands (May 24, 1977)

Background: E.O. 11990 requires Federal agencies to identify potential impacts on wetlands resulting from proposed activities and to minimize the destruction, loss, or degradation of wetlands and preserve and enhance the natural and beneficial values of wetlands.

As of the date of the issuance of this Guidance, DOE implements E.O. 11988 and E.O. 11990, in part, through its regulations in 10 CFR Part 1022, Compliance with Floodplain and Wetland Environmental Review Requirements.

Content: Describe activities conducted at the site to protect wetlands and otherwise comply with E.O. 11990.

3.2.6 Other Environmental Statutes and Executive Orders

Any other major environmental statutes, including those issued at the state or local level, or E.O.s applicable to the site, should also be included in the **Compliance Summary** chapter.

3.3 Environmental Violations, Issues, and Noncompliance Summary

Purpose: Provide additional details for the information presented in **Table 3: Environmental Violations Cited by Regulators/Noncompliance Areas** in the **Compliance Overview** chapter, which outlines environmental violations and other noncompliance issues. Information that did not fit into the table should be included in this summary.

Content: Provide details of environmental violations and other noncompliance issues, including but not limited to:

- Environmental violations cited by regulators (including any fines and penalties assessed);
- Notices of Deficiency, Consent Orders, Notices of Intent to Sue, and other types of enforcement actions issued to the site as defined in DOE O 232.2A;
- Areas of noncompliance; and
- Any reportable environmental occurrences that require notification to an outside regulatory agency.

For each item included in this chapter, provide the date the event occurred, and whether it has been resolved or is still outstanding. Summarize the resolution, including the date the issue was resolved, or the corrective action plan with the planned date for resolution.

3.4 Self-Assessments/Audits/Inspections

Purpose: Provide additional detail for the information presented in **Table 4: Assessments/Audits and Associated Major Issues** in the **Compliance Overview** chapter outlining self-assessments, audits, and inspection results. Information that did not fit into the table should be included in this summary.

Content: Summarize DOE environmental audits (e.g., DOECAP audits, EMS audits, ISMS audits), inspection visits, progress assessments, DOE program or contractor self-assessments or program appraisal findings and follow-up actions. Additional detail on the major issues identified and corrective actions should be summarized in this chapter. Publicly available documents that can be referenced for additional information should be cited. If audit information is covered in either the **Environmental Management System** or **Quality Assurance** chapters, reference those chapters.

4 ENVIRONMENTAL MANAGEMENT SYSTEM(S) (OR ENVIRONMENTAL ACTIVITIES INTEGRATED WITH SAFETY MANAGEMENT)

Background: DOE sites are required to maintain ISMSs per 48 CFR Subpart 970.5223-1, Integration of Environment, Safety, and Health into Work Planning and Execution for contractors and DOE O 450.2, Chg 1 (MinChg), Integrated Safety Management, (2011) for DOE elements. In both cases, "safety" encompasses environment, safety, and health, including pollution prevention and waste minimization. Using an ISO 14001:2015 conformant EMS meets these requirements, per DOE Guide (G) 450.4-1C, Integrated Safety Management System Guide, (September 2011). EHSS recommends that Departmental Elements and contractors maintain their current ISO 14001:2015 conformant EMSs to continue complying with their ISM requirements.

Content: Sites that opt to discontinue use of an ISO 14001:2015 conformant EMS can use an alternate title to best reflect the way environmental activities are integrated into their Safety Management System. Since most sites have noted that they will retain their EMS, this ASER Guidance will continue to use EMS to reference environmental activities integrated into safety management. Summarize the defined EMS scope, objectives, performance and evaluation, and site implementation experiences, consistent with the recommendations below. DOE sites that maintain this EMS information on a publicly available website may refer readers to their website and provide highlights in this chapter in lieu of repeating this information in their ASER.

- Provide a brief description of the EMS framework used (i.e., International Organization for Standardization [ISO] 14001 based on Plan-Do-Check-Act [PDCA], DOE Integrated Safety Management [ISM], DMAIC [define, measure, analyze, improve and control]); when the EMS was last assessed to that framework; and if applicable, the date of certification to that framework.
- Describe how the EMS is or will be integrated with site ISMSs.
- Qualitatively describe the status of the site's EMS performance during the reporting year. Sites should list what they determined to be the site processes and activities from operations that have a potential to significantly impact the environment, both adversely and beneficially.
- A summary table listing the EMS objectives for the reporting year, along with the status of the site's progress toward meeting these objectives, should be included in this chapter. (See Attachment V: Environmental Management Systems and EMS Summary Tables for

site-specific examples.)

- Discuss results in achieving EMS objectives, a comparison of recent years' performance, and objectives planned for the future.
- If applicable, a summary of the site's reporting year EMS compliance report submitted via the Department of Energy Environmental Management System Site Information Database (login required) may be included along with the red, yellow, or green score received.
- A summary of key EMS best practices and lessons learned in the reporting year. Detailed information on best practices shared with other sites can be documented in Section 4.1, Environmental Operating Experience.
- Describe any key EMS challenges or barriers to EMS implementation, including plans for resolution, where appropriate, in the reporting year.

To the extent possible, sites should also describe the effectiveness of the EMS since its inception at the site, including the benefit of the EMS to the facility or organization and the impact of the EMS on the environment and environmental issues.

4.1 Environmental Operating Experience

Background: The sharing and proactive use of environmental operating experience is integral to an EMS and its goals of continuous improvement. The Department provides tools and sets requirements for sharing operating experience and related best practices and lessons learned through DOE O 210.2A, DOE Corporate Operating Experience Program, (April 2011). Local/site operating experience that can benefit other sites are shared complex-wide through the online DOE OPEXShare platform to enable use by other sites for operational improvement and reduction of environmental risks. They can also be shared via internal DOE community of practices or working groups, videos, reports, and conferences. While the identification and sharing of operating experience are key initiating steps in the process, the ultimate goal is the use and incorporation of those lessons into a site's environmental programs and practices to drive continuous improvement and mission success.

Purpose: To highlight how the site is continually improving its environmental programs and to demonstrate its commitment to continuous improvement.

Content: Describe implementation of best practices to achieve continuous improvement. If this information is covered in different chapters of the ASER, these chapters should be referenced in this chapter. If appropriate, sites can note cases where they applied operating experiences from other DOE sites or external organizations to address local challenges and/or improve their environmental programs. For example, sites could highlight environmental operating experiences that were shared with others; highlight how lessons from other organizations were incorporated into their site environmental operations; or reference the number and/or topics of any environmental best practices, lessons learned, reports, videos, or other media that were shared via formal or informal means.

4.2 Accomplishments, Awards and Recognition

Purpose: To highlight recognition that the site has received in the reporting period for environmental stewardship.

Content: Describe pollution prevention or environmental stewardship accomplishments for which the site was recognized, including any DOE, Federal or state awards or recognition received in the reporting year as well as any industry-sponsored environmental awards or recognition.

5 Environmental Non-Radiological Protection Programs, including Training and Community Outreach and Performance Measurement

Purpose: DOE O 231.1B requires that ASER include significant programs and efforts. In order to give site stakeholders a comprehensive understanding of the site's environmental performance, this chapter should discuss major environmental protection programs and efforts in place at the site to ensure continued compliance with its environmental obligations.

Content: Describe significant environmental protection programs and efforts implemented to help the site meet its environmental compliance obligations and EMS objectives, such as site meteorology, groundwater protection, environmental restoration and monitoring, and waste management. Address, as appropriate:

- Special environmental studies conducted, or in progress.
- Significant environmental performance indicators and/or performance measures that reflect the size and extent of programs at the site.
- Major environmental programs and initiatives (e.g., efforts to improve water quality through collaborative approaches to watershed management) with States, Tribes, local communities and governments, industry, other Federal agencies and interested stakeholders.
- Site-wide land use plan and natural resource management plan implementation.
- Other significant environmental activities at the site (e.g., environmental training programs) that are not adequately covered in other chapters.

Consider including information on programs in the areas listed in the chapters below, as applicable. However, this is not a comprehensive list of environmental protection programs that could be included.

References should be made to other chapters of the ASER, as appropriate, to minimize redundancy. Hyperlinks to the relevant chapters should be included to make it easier for the reader. In addition, if information on environmental protection programs can be found on their website, sites can direct readers to the appropriate websites for further information rather than in detail in the site ASER.

Sites may opt to combine the **Compliance Summary** with either the **Environmental Non-Radiological Protection Program** or **Environmental Radiological Protection Program and Dose Assessment** chapters and include data and details on supporting programs in a single chapter.

Redundancy with information presented in the **Compliance Summary**, **Environmental Management System**, or other chapters of the ASER should be avoided.

5.1 Environmental Non-Radiological Monitoring Program Information

Background: DOE O 231.1B requires that site ASERs must include data on environmental monitoring. In addition, even with advanced operational and technological controls in place at DOE sites, the release of non-radioactive pollutants does occur. Some of those releases resulting from legacy and current DOE operations may occur at levels above regulatory limits or other applicable standards. It is important to communicate to the public how the site monitors releases on- and off-site, and which populations may be exposed to those releases through various pathways, including soil, air, plants, animals, and surface and groundwater.

Environmental monitoring is required by some statutes and is a best practice for managing some environmental protection programs, like natural and cultural resources.

Content: Include and discuss non-radiological environmental monitoring data and information, to provide a comprehensive summary of the environmental impacts associated with site operations and the environmental monitoring efforts underway on site.

- Monitoring data should indicate whether environmental releases and associated environmental impacts have improved, regressed, or remained the same over time.
- Trending data over a minimum of five years, the reporting year and the previous four years, is recommended for environmental media, such as air, surface water, groundwater, soils, and biota.
- Include relevant graphical displays of non-radioactive gaseous, liquid, and solid emissions, including any discharges to air, surface water, soils, and groundwater and, as applicable, used in demonstrating compliance with applicable permit limits. For example, use graphs to show that, when a permit contains both daily and annual release limits, exceeding the daily limit may not necessarily result in noncompliance with the annual limit.
- Include the Federal and state regulatory limits applicable to site emissions.
- Where appropriate, interpretation should be made of how the environmental pollutant discharge levels (resulting from site operations) compared to relevant parameters, such as background levels and applicable effluent or environmental standards.
- Specify detection limits, where appropriate.
- Discuss other environmental monitoring efforts performed at the site to support compliance with statutes or to support program implementation. For example, species or cultural resources monitoring efforts to support natural resource or cultural resource management plans.

5.2 Unplanned Non-Radiological Reportable Releases

Purpose: Provide a summary of unplanned, non-routine releases of non-radiological pollutants and hazardous substances that occurred in the reporting year, and how the site responded to these releases.

Content: Summarize unplanned, non-routine releases of non-radiological pollutants or hazardous substances, including causes and corrective actions taken to prevent their recurrence, especially as they pertain to facility operations, waste handling programs, and emergency response programs.

Provide information on non-radiological releases (e.g., substances requiring release reporting per EPA's Consolidated List of Lists) to the environment whether on-site or off-site, including:

- reportable occurrences under DOE O 210.2A and DOE O 231.1B,
- releases reported to the Headquarters Emergency Operations Center, and
- releases reported to the Coast Guard National Response Center.

For these releases, include the date the release occurred, the amount of material released, an explanation of the release and how it was detected, and corrective actions taken. Sites should note if the release resulted in a compliance violation and/or penalty. If a violation is noted in this chapter, detail on the violation should be included in the **Environmental Violations, Issues and Noncompliance Areas** chapter of the ASER and that chapter should be referenced.

If applicable, discuss the recommended actions implemented to mitigate the effects of the occurrences.

Consistent with the guidance provided in Section 6.5, Unplanned Radiological Releases, clearly state the basis for any estimates regarding the magnitude of potential impacts of releases in terms that the non-technical reader can easily understand.

Generalized statements such as "no significant off-site effects occurred" or "doses were small" should be avoided. If such descriptors are necessary, release information should be compared to known values; for example: small relative to applicable dose limits or to doses received from natural background at the site or in the United States (include the numerical value for this dose); or released quantity was below the regulatory reportable quantity or action level (include the reportable quantity or action level). Statements indicating concentrations are below detectable levels may also be acceptable when the ASER contains general information on detectable concentrations. This approach ensures that the ASER clearly states the bases for any scientific judgments regarding the magnitude of potential impacts of releases in terms that the non-technical reader can easily understand.

5.3 Other Potentially Significant Programs

Other significant site programs or efforts not covered in the preceding sections should be included in this chapter. Some of the programs listed below may be included in the ASER if they are significant for the site or meaningful for the site stakeholders.

5.3.1 Natural Resources Conservation Programs and Projects

Background: Many DOE sites, due to their geographic location, size, and seclusion, manage significant, relatively undisturbed land and natural resources. As natural hazards continue to escalate in frequency and intensity, landscape-level management to conserve and restore land health and natural resource values is increasingly fundamental to reducing risk to DOE facilities, workforce and sensitive missions. Accordingly, sites proactively characterize site geography, geology and ecology to identify and retain protective natural features, maintain ecosystem services and encourage native biodiversity. Sites may also partner with other Federal agencies, state, local and Tribal governments to implement priority conservation programs and projects.

Content: Include a summary of site efforts to support and maintain site land and natural resource conditions to sustain beneficial habitat for native plants and animals, retain or preserve ecosystem functions, and otherwise preserve natural systems and land features.

- Describe new projects or programs, or notable progress made on existing ones. For example, sites may include how their efforts will preserve or restore ecosystem services, promote native habitat health and/or install nature-based infrastructure.
- Describe efforts where site personnel consulted or collaborated with Federal, state, local or Tribal governments or other organizations on shared conservation priorities, including participation in or support of related scientific research.
- Summarize key indicators of natural resource conditions and land health by reporting trend information (from reporting year and four years prior) resulting from any assessment, inventory, and monitoring activities.
- DOE sites that are designated National Environmental Research Parks or those with ecological research preservation areas should discuss activities or research particular to those designations.

There may be interdependencies or cross-referencing opportunities with other chapters associated with biological monitoring, natural resource conservation-related elements of EMS, cultural resource management, endangered species, invasive species, and migratory bird protections. If relevant information is covered in other chapters, it should be referenced as appropriate.

5.3.1.1 Recreational Hunting and Fishing

Background: Public recreational hunting and fishing opportunities are allowed during open seasons at certain DOE sites to control wildlife populations and provide opportunities for hunters and fishermen in a controlled setting. Sites that allow hunting and fishing should, but are not required to, report on hunting and fishing activities that took place in the reporting year.

Content:

- List which wildlife species were hunted (e.g., deer, elk, feral pigs, waterfowl, etc.), the duration of the hunting season in the reporting year, the number of permits issued, and the "kill" or "take" numbers documented during the hunting season(s) for the reporting year.

- Describe the allowance of fishing activities for the reporting year, and the duration of fishing season and species populations that inhabit DOE property rivers/streams.

5.3.1.2 Wildland Fire Protection Planning and Management

Background: Wildland fires continue to threaten DOE property and disrupt operational activities. The local community, and other interested parties, are interested in better understanding DOE approach to wildland fire protection. Certain DOE field sites, such as Los Alamos National Laboratory (LANL) and Idaho National Laboratory (INL), have initiated prescribed (controlled) burns on select portions of DOE property and other related fire suppression actions to reduce ground fuel levels. These controlled burns serve to provide further protection to workers, site facilities, and local communities adjacent to DOE sites. Other sites have started select forest harvesting practices and clearing of fire break zones as further protective actions to minimize or eliminate wildland fire damage.

Content:

- Summarize any wildland fires that occurred at the site during the reporting year.
- Provide information about the need for and benefits of developing and implementing wildland fire protection and recovery programs and activities. This can include a discussion of any annual wildland fire protection planning and management actions, such as integrating site expertise in fire ecology into planning efforts, collaboration with adjacent land managers that share DOE borders, prescribed burns, other fuel reduction efforts such as harvesting, and the installation of fire break zones.
- Report any post-fire restoration and recovery actions and their intended objectives.

5.3.2 Efficient Operations

5.3.2.1 Energy and Water Efficiency Programs

Background: DOE must report annually on compliance with legislation and regulation mandating energy and water efficiency and reduction of energy costs. Sites report data and narratives on progress meeting energy and water requirements through DOE's Energy and Water Dashboard.

Content: Sites may discuss their performance as reported in their Energy and Water Management Narrative for the reporting year in their ASER, either summarizing or including the text from the Narrative.

5.3.2.2 Strategic Acquisition

Background: Multiple acts of Congress require the Federal government to use its purchasing power to reduce the negative effects on the environment and promote energy efficiency. Information on the regulations and requirements for strategic acquisition can be found on the EHSS Environmental Compliance Strategic Acquisition SharePoint Regulations

and Requirements Page[8]. Federal agencies are required to give preference to products that are energy and water efficient, made from biobased or recycled content, and non-ozone depleting substances and to alternative fuel/fuel-efficient vehicles

Content: Sites may include a summary of how strategic acquisition is used in various areas of operation. More information on designated products can be found on the EHSS Environmental Compliance Strategic Acquisition SharePoint Acquisition Resources Page.

5.3.2.3 Site Resilience

Background: Resilience is the ability to prepare for and withstand an extreme natural or manmade event (e.g., wildfire, hurricane, tornado, earthquake, blizzard/ice storm, heat wave, power outage, cyberattack, etc.), with little or no damage, or to recover more quickly from an extreme event. Like many Federal agencies, DOE is faced with the challenge of strengthening its resilience to a growing number of hazards. Making sites more resilient makes them capable of withstanding potentially more frequent and severe hazards, minimizes the impact of extreme events, and enables sites to quickly return to normal operations.

[8] The EHSS Environmental Compliance SharePoint is accessible by DOE employees and contractors by invitation only.

Content:

- Discuss planning and implementation of resilience activities at the site in the reporting year.
- Include information about planning, training, and other cooperative activities with Federal, state and local governments and organizations.

If there is information on the benefits of resilience activities that were realized in the reporting year, include a discussion of the relevant extreme event and the outcome.

6 Environmental Radiological Protection Program and Dose Assessment

Background: DOE O 231.1B requires sites to report on their compliance with DOE O 458.1 in the ASERs. Consistent data reporting facilitates efforts to compare data from facility to facility and meaningfully aggregate the information.

Content: Describe the assessments for doses to the public and releases to the environment conducted during the reporting year. Detail the models and assumptions used in performing the dose calculations and any new monitoring data, as appropriate. Monitoring data should indicate whether environmental releases and associated environmental impacts have improved, regressed, or remained the same over time. Trending data over a minimum of five years, the reporting year and the previous four years, is recommended for environmental media, such as air, surface water, groundwater, soils, and biota. More specific details are provided in the sections below.

6.1 Environmental Radiological Monitoring

- Provide information on the models and the assumptions used in estimating the data so that data can be consistently and usefully aggregated.
- State the "background" radiation levels used for comparison with off-site monitoring results, and the locations at which the background levels were measured.
- Provide summaries or tables of measured concentrations or activity following the guidance in section 8.5.2 of DOE-HDBK-1216-2015, Chg 1, Environmental Radiological Effluent Monitoring and Environmental Surveillance, (Reaffirmed 2022), (pages 143-145) regarding the use of "Less-Than-Detectable-Values" for statistical analysis and data reporting.

6.2 Radiological Discharges and Doses

Background: DOE O 458.1 requires reporting of collective doses to the public around DOE sites, as well as radiation doses to the representative person or the MEI. DOE O 458.1 requires that DOE-approved dose coefficients be used to evaluate doses resulting from DOE radiological activities. The DOE approved dose coefficients can be found within DOE-STD-1196-2022, Derived Concentration Technical Standard, (December 2022). If a site is contractually obligated to use an older STD, the site must specify which STD was used for evaluating doses in the report.

NESHAP Subpart H sets a limit on the emission of radionuclides so that no member of the public would receive an effective dose equivalent of more than 10 millirem/year (0.1 millisievert/year).

Content: Estimates of doses to individuals should include multiple exposure pathways and releases from multiple sources (e.g., point and diffuse) if they contribute to the dose to the same individuals. The collective dose is the sum of the TED to all persons in a specified population received during a specified time period. It can also be expressed as the product of the average dose(s) to a specified population(s) and the number of exposed persons within each population group, if more than one. Maximum potential doses should never be used to calculate the collective dose.

For compliance with the radiological air emission standards in NESHAP Subpart H, sites should report doses in terms of effective dose or effective dose equivalent, calculated using the CAP-88 or other EPA-approved air dispersion model software, and compared to the 10 mrem/yr air emission, EPA's standard under NESHAP Subpart H. This chapter should expand on the information provided in the **NESHAPs** chapter and duplication of information should be avoided.

To meet the requirements of DOE O 458.1 and NESHAP Subpart H, the following data should be presented in tabular form in this chapter.

- The TED to the representative person or to the MEI in units of millirem per year (mrem/y) and parenthetically in SI units of millisievert per year (mSv/yr), and collective dose (Population dose) in units of person-rem and parenthetically SI units (person-Sv) within a year, and total population[9] within 50 miles (80 kilometers)[10]. An estimated background dose in mrem/yr must be provided. To estimate the dose to an MEI or to the representative person it is recommended to use the Per Capita Dose coefficient provided in DOE Standard, DOE-STD-1196-2022, Appendix A. Clearly indicate when alternative dose coefficients are used and the rationale for their use.
- A comparison of the dose to the representative person or MEI with DOE, EPA or other standards and with the natural background at the site (mrem/yr). Provide the annual dose to the MEI in millirem per year (mrem/y) followed parenthetically by the value in SI

[9] EH-11 recommends that the most recent census data be used for air dose modeling within six to nine months of its release or sooner if possible.

[10] In certain instances, populations outside of the region of the 50 mi (80 km) radius may be affected by releases to that region. For example, in a predominately agricultural area, more foodstuffs may be grown that are assumed to be consumed by the resident population. In such cases, the difference should be assumed to be consumed outside the region, and the resulting collective (population) dose should be estimated and reported. Similarly, if a major drinking water system is located beyond the 50 mi (80 km) distance, but the input for that system receives the majority of liquid discharging from this site, it should be evaluated. In such situations, the population used to support the calculations should be described.

units (mSv/yr).

- Unplanned radionuclides released to air and water during the year in units of curies (Ci) and becquerels (Bq)[11].
- Totals by radionuclide released and the half-life of each of the radionuclides reported.
- Provide drinking water information in the **Safe Drinking Water Act** chapter of the ASER. Section 3.2.4.2.3, SDWA: Radionuclides has information on what should be included.
- Groundwater information should be reported in the **Groundwater Protection Program** chapter of the ASER. Section 5.3, Groundwater Protection Program provides guidance on groundwater reporting that fulfills DOE O 458.1 requirements.

TED, MEI, and collective doses should be calculated following the requirements and effective standards cited in DOE O 458.1[12]. The representative person, the MEI, or the Per Capita Dose should be selected based on the requirements of DOE O 458.1, paragraph 4.e.

- This annual individual dose calculation should be an estimate based on a scenario and parameters that approximate an actual situation.
- The estimate should be reasonable but not likely to underestimate the dose. Calculation of the dose to a person spending 100 percent of his or her time at the fenceline is useful for comparison purposes, but it overestimates the dose to the representative person or the MEI and biases comparative analyses.
- Provide estimates based on realistic situations and clearly describe the location of critical receptors and the scenarios used to calculate the estimated doses. For some sites this estimate will include dose from ingestion of wildlife. Sites that calculate maximum potential dose from ingestion of wildlife (animal or fish) caught on or near the site should clearly state which pathways are summed as part of the reported dose to the representative person or to the MEI.
- Include the calculations of dose.

For cases in which monitoring data are below minimum detectable levels, those levels should be specified and, as noted in Section 6.1, Environmental Radiological Monitoring, should be reported consistent with guidance specified in DOE-HDBK-1216-2015, regarding the use of "Less-Than-Detectable-Values" for statistical analysis and data reporting.

[11] As appropriate, Ci and GBq may be used. Uranium releases should be reported in terms of both Ci (Bq, or GBq, as appropriate) and grams.

[12] In particular, the total dose in terms of the dose from external exposures plus the 50- year committed effective dose from intakes of radioactive material should be calculated and reported. Where sites are using more recent dose factors than the ICRP Publications 26/30-based factors, the report should clearly document the source of the dose factors (e.g., Federal Guidance Report No. 13 supplemental CD and DOE-STD-1196-2022).

For NESHAPs reporting:

- Report doses in terms of effective dose or effective dose equivalent, calculated using the CAP-88 or other EPA-approved air dispersion model software, and compared to the 10 mrem/yr air emission, EPA's standard under NESHAP Subpart H.
- State the version of CAP-88 used to recognize the associated dose factors.
- State which dose methodologies were used for the calculations.
- Compliance with DOE public dose limits should also be evaluated in terms of TED.
- Discuss compliance with the radon emissions limits in Subparts Q and T for those facilities subject to the specific requirements in NESHAP Subpart H.

Attachment I: Recommended Formats for Radiological Dose and Release Reporting in ASERs in ASERs, provides a recommended format for radiological dose and release reporting. Instructions for reporting and use of the tables is below and in Attachment I.

The ASER should confirm that all of the types of radionuclides released from the site have been reported. A clear statement should be made indicating that there are no known significant discharges of radioactive constituents from the site other than those reported in the tables. In addition, most non-routine radiological releases typically do not significantly contribute to the overall radiological doses when compared to the doses resulting from routine DOE operations. This should also be clearly communicated in the **Unplanned Radiological Releases** chapter of the ASER, where applicable.

The required tables shown in Attachment I provide examples of formats used by EH-10 to summarize ASER radiological dose and release data for a site. These formats are recommended for reporting doses, atmospheric releases, and liquid effluent releases in ASERs, to simplify aggregation of data across DOE and enable DOE-wide site comparisons. However, these example formats should not replace site-specific presentations that contain more detailed radionuclide-specific information that are relevant to describing site-specific operations.

The required table should list all significant radionuclides present at a site and their actual releases. In the reporting of atmospheric and liquid discharges, some radionuclides may not be applicable to certain DOE sites. If this is the case, indicate "NA" in the tables. In addition, sites should include the following:

- Data should be presented using scientific notation (e.g., 3.2×10^{-3} for 0.0032), where appropriate and two significant figures should be used for scientific notations.
- Data should indicate whether background correction was done, and the value of the background used.
- Where appropriate, the ASER should state that, because the doses are calculated (based on actual radionuclide[s] concentration releases rates at each site) rather than measured,

they represent potential or estimated, rather than actual doses[13].

The text associated with the tables should address the primary contributors (the radionuclides and processes creating them) to the doses and should identify the models and any pertinent assumptions used in estimating the doses, for example:

> "The maximum TED for a member of the public was estimated to be 5 mrem (0.05 mSv) from all pathways. This was principally from Cs-137 and Sr-90 airborne emissions from [facility/process] and was calculated using CAP-88."

If more than one radionuclide is a major contributor to the dose, a pie chart representing the relative contributions can be useful.

If the maximum dose through the waterborne pathway and the airborne pathway are to individuals from different communities, then the dose from each community should be reported separately.

6.3 Clearance of Property Containing Residual Radioactive Material

Background: DOE's radiation protection framework and 100 mrem/year (1 mSv/year) dose limit are applicable to an "all sources and all pathways" policy[14]. In addition to air and water discharges to the environment, the clearance of property (real or personal) containing residual radioactive material is another type of "release" to the environment and is a potential contributor to the estimated dose received by the public.

DOE-STD-1241-2023 provides updated guidance for implementing the release and clearance of property requirements of DOE O 458.1. DOE-STD-1241-2023 assists DOE Field Element Managers and DOE contractors in meeting release and clearance of property requirements provided in DOE O 458.1 by consolidating all previously published pre-approved Authorized Limits and including newly approved volumetric pre-approved Authorized Limits.

[13] To demonstrate compliance with standards when sources are extremely small, the dosimetry models and evaluations are sometimes selected to be very conservative and simplistic. When this is the case, it should be so stated, and where possible, a qualitative discussion should be included that describes the level of magnitude of conservatism.

[14] Estimate of public dose limits required by DOE O 458.1 do not apply to dose from radon or its decay products in the air, background radiation dose, occupational dose, medical and accident exposures.

Content: Specific authorized limits are used to govern the radiological clearance of sites, structures, and materials; thus, a summary of authorized limits for clearance of property should be reported. If appropriate, discuss real property (lands and structures) and personal property (equipment and soils) separately. Summarize property clearance activities for the site, including:

- The approved authorized limit used for clearance and the basis for its derivation (i.e., dose, graded approach) with the date of approval or effective date, DOE pre-approved surface activity authorized limits, or DOE pre-approved volumetric activity authorized limits;
- The type of material or property (i.e., open land, structures, material and equipment, or laboratory waste)
- The basis for its clearance; and
- The expected end-use scenario (i.e., disposal, recycle, reuse). If the clearance of property is for recycling or reuse purposes, any discussion of these activities in this chapter may also be referenced.

Where practical, also provide information on:

- The volume, residual radionuclide concentrations, and total activity of the material;
- The dose to the MEI from the material being released to the public (authorized limits for personal property less than 1 mrem/yr [0.01 mSv] and real property, below 25 mrem [0.25 mSv]);
- Collective dose estimates; and
- The estimated cost savings and other benefits from the clearance or a qualitative discussion of the benefits of the clearance program.

Discuss any actions taken to implement the improvements to monitoring, documenting, and coordinating clearance recommended in DOE-STD-1241-2023.

Provide any locations or methods by which interested parties could obtain more detailed data on clearance (e.g., reading rooms, records centers, or other locations where certification and clearance data are publicly available).

It is also recommended that DOE property clearance information be made available at surplus property sales locations and on surplus property websites.

Requirements for the development and approval of authorized limits are contained in DOE O 458.1. Guidance on the development and approval of authorized limits is provided in several supporting DOE radiation protection guidance documents and are available online on the EHSS Policies, Standards, Guidance, and Statutes page. For more specific information on surface and volumetric pre-approved Authorized Limits guidance go to DOE's Standards Page.

6.4 Addressing Radiation Protection of Biota in ASERs

6.4.1 Dose Rate Limits for Protection of Biota and Methods for Demonstrating Compliance

As part of integrating EMSs into a site's ISMS, DOE elements must, as applicable, consider protection of biota. Both aquatic and terrestrial evaluations should be conducted. DOE O 458.1 requires the protection of populations of aquatic animals, terrestrial plants, and terrestrial animals in local ecosystems from adverse effects due to radiation and radioactive material released from DOE operations. DOE O 458.1 also provides a graded (tiered) approach to evaluating biota protection. The DOE Technical Standard, DOE-STD-1153-2019, A Graded Approach for Evaluating Radiation Doses to Aquatic and Terrestrial Biota, (February 2019), is available for use in evaluating and reporting compliance with the biota protection requirements of DOE O 458.1.

6.4.2 The RESRAD-BIOTA Code as a Tool for Evaluating Doses to Biota

The RESRAD-BIOTA Code provides a complete spectrum of biota dose evaluation capabilities, from general screening to comprehensive receptor-specific dose estimation. The Code was principally sponsored and developed by DOE, with support from EPA and the Nuclear Regulatory Commission. The Code was released in September 2003 and a User's Guide was published in January 2004. The RESRAD-BIOTA Code was designed to be consistent with the DOE graded approach to biota and the method's Biota Concentration Guides. The RESRAD-BIOTA Code is recommended as the preferred companion software tool to DOE-STD-1153-2019 for demonstrating protection of biota in the ASER. DOE-STD-1153-2019, the RESRAD-BIOTA Code, and the RESRAD-BIOTA Code User's Guide (DOE/EH-0676; ISCORS Report 2004-02) are available on the RESRAD website. Refer to Attachment II: Addressing Radiation Protection of Biota in ASERs and Attachment V: Biota Dose Evaluations, for specific details and site-specific examples for demonstrating and reporting compliance with dose limits for biota in the ASER. If alternative approaches to the Standard are used to demonstrate protection of biota consistent with DOE O 458.1 paragraph 4.j.(2), this chapter should summarize the approach used and the results.

6.5 Unplanned Radiological Releases

DOE O 458.1 refers to all emissions in the annual dose determination, routine, and non-routine emissions, that would impact members of the public subject to the 100 mrem/y (1 mSv/year) standard. Sites can find information on unplanned releases in DOE O 458.1

section 4.g[15]; and section 5.b.5[16]. Additionally, sites can find information in Attachment 1 of DOE O 458.1. Please note the Order does not provide a specific definition of unplanned releases, but relevant definitions for MEI and public dose should be used for guidance.

This information is required to be included in the ASER per DOE O 231.1B and DOE O 458.1.

Doses associated with unplanned radiological releases should be consistent with the chapter regarding **Radiological Discharges and Doses** and clearly state the basis for any estimates regarding the magnitude of potential impacts of unplanned releases.

- Discuss the date the release(s) occurred, the amount of material released, an explanation of the release, and corrective actions taken.
- In the case where releases are insignificant with respect to normal release-related doses (i.e., a few percent or less), they should be reported as such.
- If they exceed appropriate limits, this should also be noted and the process and corrections needed to address the excess dose limits should be provided.

Utilize the following language to document if there were no unplanned releases at the site during the reporting period:

- There were no unplanned releases in 2025;
- There were no unplanned releases of radionuclides during 2025; and
- There were no unplanned radiological airborne releases during 2025.

To ensure regulatory consistency, information presented in the site ASER must align with other official reports. Specifically, any unplanned release reported to the EPA under the NESHAP Subpart H, must be acknowledged in the site ASER, unless no emissions resulted from the event. While a full reiteration of event details may not be necessary for releases with minimal dose consequences, their reporting status must be consistent between the NESHAP annual report and the ASER publication. Events that received abundant press/social media coverage should be reported in both publications.

Additional guidance on reporting unplanned releases can be found in Attachment I: 12.1 Instructional Guidance for Reporting Unplanned Radiological Releases in the ASER.

[15] Characterize planned and unplanned releases of liquids containing radionuclides from DOE activities, consistent with the potential for on- and off-site impacts and provide an assessment of radiological consequences as necessary to demonstrate compliance with the requirements of this Order.

[16] Ensure that appropriate capabilities are maintained for monitoring and assessing routine and unplanned releases of radioactive materials, consistent with the types of radioactive materials released, release modes, and radiological activities conducted.

7 GROUNDWATER PROTECTION PROGRAM

Background: Groundwater monitoring and public drinking water protection continue to receive emphasis at EPA and within DOE. These are also topics that would be of interest to the general public, especially those residing close to a DOE site. Groundwater can be susceptible to contaminants that are released at the land surface and eventually infiltrate the ground or that are directly injected into underground wells. It is important to monitor groundwater resources in areas where contamination is likely or has been known to occur.

One important driver for groundwater monitoring are the groundwater protection requirements found in DOE O 458.1:

> Ground water must be protected from radiological contamination to ensure compliance with dose limits in the Order and consistent with radiation protection program requirements. To this end, DOE must ensure that: (a) Baseline conditions of the ground water quantity and quality are documented; (b) Possible sources of, and potential for, radiological contamination are identified and assessed; (c) Strategies to control radiological contamination are documented and implemented; (d) Monitoring methodologies are documented and implemented; and (e) Ground water monitoring activities are integrated with other environmental monitoring activities.

Content: Both radiological and non-radiological data should be provided in this ASER chapter. Readers should be referred to this data that is included in other relevant chapters (**Environmental Radiological Protection Program and Dose Assessment** and **Environmental Non-Radiological Protection Program**), as appropriate.

If a site's **Groundwater Protection Program** has only non-radiological data to include, sites can consider making it a subchapter under the **Environmental Non-Radiological Protection Program** chapter.

Provide a brief description of site hydrological conditions, including cross-sections of subsurface conditions at the site. References to additional technical documents detailing the hydrological conditions, including groundwater flow and potential receptors, should also be provided in this chapter. Detail efforts to determine the presence of contaminants (i.e., historical review of records, database searches, locating materials/waste areas, analysis of past practices and sources, etc.), analytical methods used for environmental samples, any associated regulatory developments, and/or recent discussions held with EPA or state regulators on the topic. Similarly, any notable discussions with local officials or community representatives may be summarized in this chapter.

Sites should also provide a narrative explaining the drivers for the groundwater monitoring program. The requirements described in the above **Background** section can serve as an outline for describing how a site's groundwater monitoring program fulfills the requirements of DOE O 458.1.

Provide a summary description of the site groundwater monitoring network.

- State the various monitoring objectives, which could include tracking groundwater plume movement and satisfying regulatory requirements such as RCRA hazardous waste units, DOE Radioactive Waste Management Units, RCRA or CERCLA remediation sites, and other compliance programs.
- Include groundwater monitoring wells operated for other purposes, such as subsurface or aquifer characterization wells (used for environmental surveillance), environmental radiological program monitoring wells, or wells operated for detection monitoring at non-RCRA and non-CERCLA facilities at the site.
- Include a summary of PFAS and/or other emerging contaminants detected due to Aqueous Film Forming Foam (AFFF) use or other operational processes.

Include trends in the groundwater data over time.

- Prepare tables to indicate trends in groundwater plume movement over a five-year period: the reporting year and the previous four years, at a minimum.
- Data should be displayed graphically or presented as basic statistics (such as median values and ranges) for contaminants commonly detected at or near the site.
- A series of tables could be used to summarize the number of active wells by area of the site and by purpose. The tables should address the number of wells installed or abandoned during the reporting year and any unique or innovative techniques used in the site groundwater monitoring network.
- Discuss the real or potential impact of groundwater plume and contaminant movement on public drinking water supplies.
- Highlight monitoring wells with significant changes in contamination indicator parameters above background levels.

A recommended tabular format that provides summary information on a site groundwater monitoring network is depicted in Attachment III: Recommended Reporting Format for DOE Site-Wide Groundwater Monitoring Program. Site-specific examples are referenced in Attachment V: Site-Wide Groundwater Monitoring Program Summary Tables and Trending

If available, include aerial photographs and/or maps to depict groundwater monitoring points, consistent with site security requirements. Include maps depicting the extent of contamination and migration of groundwater contaminant plumes over time to meet the needs of regulators and the interests of the public and site stakeholders. These maps should indicate the locations of the plumes with respect to site boundaries, lakes, rivers, aquifers, and relevant groundwater monitoring and drinking water wells.

8 QUALITY ASSURANCE

Background: DOE O 414.1E, Quality Assurance, (December 2024) establishes an integrated Quality Assurance Program (QAP) that assures controls for the conduct of work, that requirements are met, and achievement of an organizational mission needs. Contracted

analytical laboratories should produce defensible, valid, and reliable environmental analytical data which field management can use in decision-making for clean-up, remediation, and on-going operations. In addition, radiological and hazardous waste disposition at waste vendor facilities should be managed in a regulatory compliant manner and in conformance with DOE procurement contract stipulations and requirements.

Content: Describe the measures taken to ensure the quality of radiological and non-radiological data through the implementation of a quality system for the management of environmental data as required by DOE O 414.1E. Explain site data collection and analysis programs and present summary information from participation in inter-laboratory cross-check programs, including site results and expected results. Discuss the general implications of the results of inter-laboratory comparisons, along with any actions taken or needed to improve data quality.

Identify all contracted analytical laboratories and waste vendor facilities used by the site in the reporting year. Summarize major audit findings at contracted on-site/off-site commercial analytical laboratories and/or waste vendor facilities that could adversely impact site operations. Corrective actions taken to address major audit findings should also be noted. Examples of potential major audit findings that may impact field operations include:

For Analytical Laboratories:

- Proficiency test failures by analytes/matrices
- Not adequately following approved analytical method(s) for given analytes
- Not preserving thermal integrity samples during the laboratory log-in process
- Missed sample holding times prior to analysis
- Breaks in internal laboratory sample chain-of-custody
- Improper data validation/verification processes

For TSDFs:

- Not treating radiological/hazardous waste within mandated regulatory timeframes
- Improper storage of incompatible wastes
- Incomplete recordkeeping of waste drums
- Not adhering to internal worker safety standard operating procedures (e.g., electrical safety, noise abatement, confined space entries, operable eye washes and safety showers)

Discuss the extent to which contractors conducting environmental monitoring and contracted laboratories performing environmental analysis participate in the DOECAP and the Visual Sample Plan (VSP) performance evaluation programs to ensure the quality of analytical data. Identify which of the following programs are being used at the site and how they assist in quality assurance functions and reviews:

- **DOECAP Accreditation Program (DOECAP-AP) Assessment Reports**: Sites that contract analytical services with environmental testing laboratories that participate in the DOECAP-AP should utilize the results of third-party accreditation assessments to evaluate analytical performance and technical competence in producing valid results. Identify all laboratories contracted for analytical services, or approved for use, and

whether they participate in the DOECAP-AP.

- **DOECAP TSDF Audits**: TSDF audit reports generated annually by DOECAP are one tool that can be used in performing DOE O 435.1 annual acceptability reviews for commercial TSDFs. DOECAP audit reports are also used in satisfying quality assurance requirements and various contractual oversight functions, such as those required by DOE O 414.1E. Identify the TSDFs used, or approved for use (i.e., Basic Ordering Agreements [BOAs], approved vendors listings, etc.), and if they are contractually required to participate in DOECAP TSDF Audits.
- **VSP**: VSP software toolkits provided by PNNL assist in meeting data quality objectives (DQO) and regulatory acceptance. Discuss site participation or use of VSP.
- **Proficiency Testing (PT)**: PT samples must be procured from an ISO 17043 PT provider. Discuss use of ISO 17043 PT providers.

Discuss any additional quality assurance protocols, guidelines or relevant national or international consensus standards used.

9 APPENDIX A: ENVIRONMENTAL REQUIREMENTS REFERENCES

This appendix is for use with this ASER guidance. The purpose of this appendix is to consolidate the environmental requirements included in this guidance to make it easier for sites. This is not a requirement to include a similar appendix in site ASERs.

9.1 U.S. Code (U.S.C.) and Public Law (P.L.)

7 U.S.C. § 136-136y, Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)

15 U.S.C. § 2601 et seq., Toxic Substances Control Act (TSCA) of 1976

16 U.S.C. § 703-712, Migratory Bird Treaty Act (MBTA)

16 U.S.C. § 1531et seq., Endangered Species Act (ESA) of 1973

33 U.S.C. § 1251 et seq., Clean Water Act (CWA) of 1972

42 U.S.C. § 300f et seq., Safe Drinking Water Act (SDWA)

42 U.S.C. § 2011, et seq., Atomic Energy Act of 1954 (AEA), as amended

42 U.S.C. § 4331, et seq., National Environmental Policy Act

42 U.S.C. § 6901 et seq., Resource Conservation and Recovery Act (RCRA) (1976)

42 U.S.C. § 7401 et seq., Clean Air Act (CAA)

42 U.S.C. § 7675, American Innovation and Manufacturing (AIM) Act of 2020

42 U.S.C. § 9601 et seq, Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (1980)

42 U.S.C. § 11001 et seq., Emergency Planning and Community Right-to-Know Act (EPCRA)

42 U.S.C. § 17001 et sq., Energy Independence and Security Act (EISA) of 2007

54 U.S.C. § 100101 (16 U.S.C. § 470), National Historic Preservation Act (NHPA)

P.L. 102-386 Title I, Federal Facilities Compliance Act (FFCA)

Appendix A: Environmental Requirement References

9.2 Code of Federal Regulations

10 CFR Part 1022, Compliance with Floodplain and Wetland Environmental Review Requirements

40 CFR 61 Subpart H, National Emission Standards for Emissions of Radionuclides Other Than Radon From Department of Energy Facilities

40 CFR Part 192, Health and Environmental Protection Standards for Uranium and Thorium Mill Tailings

48 CFR Subpart 970.5223-1, Integration of Environment, Safety, and Health into Work Planning and Execution

9.3 Executive Orders

E.O. 11988, Floodplain Management

E.O. 11990, Protection of Wetlands

E.O. 13112, Invasive Species (February 3, 1999)

E.O. 13186, Responsibilities of Federal Agencies to Protect Migratory Birds

E.O. 13751, Safeguarding the Nation From the Impacts of Invasive Species

9.4 DOE Orders

DOE O 210.2A, DOE Corporate Operating Experience Program, (April 2011)

DOE O 231.1B, Admin Chg 1, Environment, Safety and Health Reporting, (November 2012)

DOE O 232.2A, Chg 1 (MinChg), Occurrence Reporting and Processing of Operations Information, (October 2019)

DOE O 251.1D, Chg 1 (Admin Chg), Departmental Directives Program, (January 2017)

DOE O 414.1E, Quality Assurance, (December 2024)

DOE O 435.1 Chg 2, Radioactive Waste Management, (January 2021)

DOE O 450.2, Chg 1 (MinChg), Integrated Safety Management, (2011)

DOE O 458.1, Chg 5 (Admin Chg), Radiation Protection of the Public and the Environment, (September 2020)

9.5 DOE Manuals

DOE Manual (M) 435.1 Chg 3, Radioactive Waste Management Manual, (January 2021)

9.6 DOE Guides

DOE Guide (G) 450.4-1C, Integrated Safety Management System Guide, (September 2011)

9.7 DOE Standards

DOE-STD-1153-2019, A Graded Approach for Evaluating Radiation Doses to Aquatic and Terrestrial Biota, (February 2019)

DOE-STD-1196-2022, Derived Concentration Technical Standard, (December 2022)

DOE-STD-1241-2023, Implementing Release and Clearance of Property Requirements, (March 2023)

9.8 DOE Handbooks

DOE-HDBK-1216-2015, Chg 1, Environmental Radiological Effluent Monitoring and Environmental Surveillance, (Reaffirmed 2022)

10 APPENDIX B: ACRONYMS

This appendix is for use with this ASER guidance. The purpose of this appendix is to consolidate the acronyms included in this guidance to make it easier for sites. This is not a requirement to include a similar appendix in site ASERs.

AEA	Atomic Energy Act
AFFF	Aqueous Film Forming Foam
AIM	American Innovation and Manufacturing
ALE	Acton Level Exceedances
ASER	Annual Site Environmental Reports
BCG	Biota Concentration Guides
BNL	Brookhaven National Laboratory
BO	Biological Opinion
BOA	Basic Ordering Agreements
C3 Dimer Acid	hexafluoropropylene oxide dimer acid
CA	Composite Analysis
CAA	Clean Air Act
CATEX	Categorical Exclusion
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CEQ	Council on Environmental Quality
C.F.R.	Code of Federal Regulations
CPG	Comprehensive Procurement Guidelines
CWA	Clean Water Act

Appendix B: Acronyms

CY	Calendar Year
DAS	Disposal Authorization Statement
DCS	Derived Concentration Standards
DMAIC	Define, Measure, Analyze, Improve, and Control
DOE	Department of Energy
DOECAP	DOE Consolidated Audit Program
DOE-HQ	Department of Energy-Headquarters
DQO	Data Quality Objectives
ECHO	Enforcement & Compliance History Online
EH-10	Office of Health Programs & Environmental Radiation Protection
EH-11	Office of Environmental Compliance & Radiation Protection
EIS	Environmental Impact Statements
EISA	Energy Independence and Security Act
EMS	Environmental Management System
E.O.	Executive Order
EPA	Environmental Protection Agency
EPCRA	Emergency Planning and Community Right-to-Know Act
ES&H	Environment, Safety and Health
FAR	Federal Acquisition Regulation
FFCA	Federal Facilities Compliance Act
FGR	Federal Guidance Reports
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act

Appendix B: Acronyms

FRS	Facility Registry Service
GRR	Galvanized requiring replacement
HFC	Hydrofluorocarbon
HFEs	Heads of Field Elements
HFPO-DA	Hexafluoropropylene oxide dimer acid
HUC	Hydrologic Unit Code
ICRP	International Commission on Radiological Protection
IMP	Integrated Pest Management
INL	Idaho National Laboratory
ISM	Integrated Safety Management
ISMS	Integrated Safety Management System
ISO	International Organization for Standardization
LANL	Los Alamos National Laboratory
LCR	Lead and Copper Rule
LCRI	Lead and Copper Rule Improvements
LLW	Low-Level Waste
LM	Legacy Management
LOC	Letter of Concurrence
MBTA	Migratory Bier Treaty Act
MCLs	Maximum Contaminant Levels
MEI	Maximally exposed individual
MOU	Memorandum of Understanding
MRSLs	Maximum Residual Disinfectant Levels

Appendix B: Acronyms

MS4	Municipal Separate Storm Sewer
NA	Not Applicable
NEPA	National Environmental Policy Act
NESHAP	National Emissions Standards for Hazardous Air Pollutants
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NNSA	National Nuclear Security Administration
NNSS	Nevada National Security Site
NOAA	National Oceanic and Atmospheric Administration
NORM	Naturally Occurring Radioactive Material
NOV	Notices of Violation
NPDWR	National Primary Drinking Water Regulations
NRHP	National Register of Historic Places
NPL	National Priorities List
ORR	Oak Ridge Reserve
OSTI	Office of Scientific and Technical Information
PA	Performance Assessment
PA/SI	Preliminary Assessments and Site Investigations
PCBs	Polychlorinated Biphenyls
PDCA	Plan-Do-Check-Act
PFAS	Per- and polyfluoroalkyl substances
PFBS	Perfluorobutane
PFHxS	Perfluorohexanesulfonic acid

Appendix B: Acronyms

PFNA	Perfluorononanoic acid
PFOA	Perfluorooctanoic
PFOS	Perfluorooctane sulfonate
PL	Public Law
POTW	Publicly-Owned Treatment Works
PT	Proficiency Testing
RCRA	Resource Conservation and Recovery Act
RI/FS	Remedial Investigations and Feasibility Studies
ROD	Records of Decision
RQ	Reportable Quantity
SARA	Superfund Amendments and Reauthorization Act
SDWA	Safe Drinking Water Act
SI	International System
SPDES	State Pollutant Discharge Elimination System
SRR	Sustainable Resilient Remediation
SRS	Savannah River Site
TED	Total Effective Dose
TRI	Toxic Release Inventory
TSCA	Toxic Substances Control Act
TSDFs	Treatment, Storage, and Disposal Facilities
TT	Treatment Techniques
U.S.C.	United States Code
USGS	United States Geological Survey

Appendix B: Acronyms

USFWS	U.S. Fish and Wildlife Service
USTs	Underground Storage Tanks
VSP	Visual Sample Plan
WIPP	Wase Isolation Pilot Plant
WVDP	West Valley Demonstration Project

11 APPENDIX C: ASER SUBJECT MATTER EXPERT CONTACT INFORMATION

This appendix is for use with this ASER guidance. The purpose of this appendix is to consolidate the list of subject matter experts associated with the sections/subsections of guidance to make it easier for sites. This is not a requirement to include a similar appendix in site ASERs.

ASER Topic Area	*EHSS Contact*
Addressing Radiation Protection of Biota in ASERs	Christine Lobos EH-11 christine.lobos@hq.doe.gov
American Innovation and Manufacturing (AIM) Act of 2020 and Hydrofluorocarbon (HFC) Phasedown	Cate Berard EH-11 cate.berard@hq.doe.gov
Atomic Energy Act of 1954 (AEA)	Tom Carver EH-11 tom.carver@hq.doe.gov
Attachment I: Recommended Formats for Radiological Dose and Release Reporting in ASERs	Christine Lobos EH-11 christine.lobos@hq.doe.gov
Attachment II: Addressing Radiation Protection of Biota in ASERs	Christine Lobos EH-11 christine.lobos@hq.doe.gov
Attachment III: Recommended Reporting Format for DOE Site-Wide Groundwater Monitoring Program	Paul Winters EH-11 paul.winters@hq.doe.gov
Attachment IV: Alternate ASER Reporting for Closure Sites	Una Song EH-11 una.song@hq.doe.gov

Appendix C: ASER Subject Matter Expert Contact Information

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Attachment V: Site -Specific Examples of Recommended ASER Reporting Formats	Una Song EH-11 una.song@hq.doe.gov
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Clean Water Act (CWA)	Paul Winters EH-11 paul.winters@hq.doe.gov
Clearance of Property Containing Residual Radioactive Material	Mike Stewart EH-11 mike.stewart@hq.doe.gov
Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and Superfund Amendments and Reauthorization Act (SARA)	Cate Berard EH-11 cate.berard@hq.doe.gov
DOE O 435.1, Radioactive Waste Management	Tom Carver EH-11 tom.carver@hq.doe.gov
DOE O 458.1, Radiation Protection of the Public and the Environment, Chg 4, 2020	Tom Carver EH-11 tom.carver@hq.doe.gov
E.O. 11988, Floodplain Management (May 24, 1977)	Sarah Jensen EH-11 sarah.jensen@hq.doe.gov
E.O. 11990, Protection of Wetlands (May 24, 1977)	Sarah Jensen EH-11 sarah.jensen@hq.doe.gov

Appendix C: ASER Subject Matter Expert Contact Information

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Emergency Planning and Community Right-to-Know Act (EPCRA)	Tameka Taylor EH-11 tameka.taylor@hq.doe.gov
Endangered Species Act (ESA)	Paul Winters EH-11 paul.winters@hq.doe.gov
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Environmental Non-Radiological Monitoring Program Information	Una Song EH-11 una.song@hq.doe.gov
Environmental Operating Experience	Maria Dikeakos EH-23 maria.dikeakos@hq.doe.gov
Environmental Radiological Monitoring	Christine Lobos EH-11 christine.lobos@hq.doe.gov
Federal Facilities Compliance Act (FFCA)	Kris Hewitt EH-11 kristoffer.hewitt@hq.doe.gov

Appendix C: ASER Subject Matter Expert Contact Information

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Groundwater Protection Program	Paul Winters EH-11 paul.winters@hq.doe.gov
Migratory Bird Treaty Act (MBTA)	Sarah Jensen EH-11 sarah.jensen@hq.doe.gov
National Emission Standards for Hazardous Air Pollutants (NESHAP) 40 CFR Part 61 Subpart H, National Emissions Standards for Emissions of Radionuclides Other Than Radon from Department of Energy Facilities	Christine Lobos EH-11 christine.lobos@hq.doe.gov
National Environmental Policy Act (NEPA)	Sarah Jensen EH-11 sarah.jensen@hq.doe.gov
National Historic Preservation Act (NHPA)	Una Song EH-11 una.song@hq.doe.gov
Natural Resources Conservation Programs and Projects	Sarah Jensen EH-11 sarah.jensen@hq.doe.gov
PFAS and Additional Emerging Contaminants	Tameka Taylor EH-11 tameka.taylor@hq.doe.gov
Quality Assurance	Tameka Taylor EH-11 tameka.taylor@hq.doe.gov

Appendix C: ASER Subject Matter Expert Contact Information

ASER Topic Area	*EHSS Contact*
Radiological Discharges and Doses	Christine Lobos EH-11 christine.lobos@hq.doe.gov
Recreational Hunting and Fishing	Sarah Jensen EH-11 sarah.jensen@hq.doe.gov
Resource Conservation and Recovery Act (RCRA)	Cate Berard EH-11 cate.berard@hq.doe.gov
Safe Drinking Water Act (SDWA)	Paul Winters EH-11 paul.winters@hq.doe.gov
Site Resilience	Kris Hewitt EH-11 kristoffer.hewitt@hq.doe.gov
Stormwater Management	Paul Winters EH-11 paul.winters@hq.doe.gov
Sustainable Acquisition Regulatory Drivers	Shab Fardanesh EH-11 shabnam.fardanesh@hq.doe.gov
Sustainable Acquisition Statutes and Acts	Shab Fardanesh EH-11 shabnam.fardanesh@hq.doe.gov
Sustainable Resilient Remediation (SRR)	Sarah Jensen EH-11 sarah.jensen@hq.doe.gov

Appendix C: ASER Subject Matter Expert Contact Information

ASER Topic Area	*EHSS Contact*
Toxic Substances Control Act (TSCA)	Tameka Taylor EH-11 tameka.taylor@hq.doe.gov
Unplanned Radiological Releases	Christine Lobos EH-11 christine.lobos@hq.doe.gov
Wildland Fire Protection Planning and Management	Paul Winters EH-11 paul.winters@hq.doe.gov

12 ATTACHMENT I: RECOMMENDED FORMATS FOR RADIOLOGICAL DOSE AND RELEASE REPORTING IN ASERS

Instructions for reporting and use of the tables are below and in Section 6.2, Radiological Discharges and Doses.

The ASER should confirm that all of the types of radionuclides released from the site have been reported. A clear statement should be made indicating that there are no known significant discharges of radioactive constituents from the site other than those reported in the tables. In addition, most non-routine radiological releases typically do not significantly contribute to the overall radiological doses when compared to the doses resulting from routine DOE operations. This should also be clearly communicated in the **Unplanned Radiological Releases** chapter of the ASER, where applicable.

The required tables shown in Attachment I provide examples of formats used by EH-10 to summarize ASER radiological dose and release data for a site. These formats are recommended for reporting doses, atmospheric releases, and liquid effluent releases in ASERs, to simplify aggregation of data across DOE and enable DOE-wide site comparisons. However, these example formats should not replace site-specific presentations that contain more detailed radionuclide-specific information that are relevant to describing site-specific operations.

The required table should list all significant radionuclides present at a site and their actual releases. In the reporting of atmospheric and liquid discharges, some radionuclides may not be applicable to certain DOE sites. If this is the case, indicate “NA” in the tables. In addition, sites should include the following:

- Data should be presented using scientific notation (e.g., 3.2 x 10-3 for 0.0032), where appropriate and two significant figures should be used for scientific notations.
- Data should indicate whether background correction was done, and the value of the background used.

Attachment I: Recommended Formats for Radiological Dose and Release Reporting in ASERs

- Where appropriate, the ASER should state that, because the doses are calculated (based on actual radionuclide[s] concentration releases rates at each site) rather than measured, they represent potential or estimated, rather than actual, doses[17].

The text associated with the tables should address the primary contributors (the radionuclides and processes creating them) to the doses and should identify the models and any pertinent assumptions used in estimating the doses, for example:

> "The maximum TED for a member of the public was estimated to be 5 mrem (0.05 mSv) from all pathways. This was principally from Cs-137 and Sr-90 airborne emissions from [facility/process] and was calculated using CAP-88."

If more than one radionuclide is a major contributor to the dose, a pie chart representing the relative contributions can be useful.

If the maximum dose through the waterborne pathway and the airborne pathway are to individuals from different communities, then the dose from each community should be reported separately.

Example Table 7: Site X Radiological Dose Reporting Table for CY 2025

Pathway	***Dose to the Representative Person or the Maximally Exposed Individual (MEI) mrem (mSv)***	***% of DOE 100 mrem/yr Limit***	***Estimated Collective (Population) Dose person-rem (person-Sv)***	***Population within 50 miles (80 km*)***	***Estimated Background Radiation Dose mrem (mSv)***
Air			Average dose X population exposed	*	Pathway-specific background doses need not be estimated
Water			Average dose X population exposed	*	Pathway-specific background doses need not be estimated

[17] To demonstrate compliance with standards when sources are extremely small, the dosimetry models and evaluations are sometimes selected to be very conservative and simplistic. When this is the case, it should be so stated, and where possible, a qualitative discussion should be included that describes the level of magnitude of conservatism.

Attachment I: Recommended Formats for Radiological Dose and Release Reporting in ASERs

Pathway	*Dose to the Representative Person or the Maximally Exposed Individual (MEI) mrem (mSv)*	*% of DOE 100 mrem/yr Limit*	*Estimated Collective (Population) Dose person-rem (person-Sv)*	*Population within 50 miles (80 km*)*	*Estimated Background Radiation Dose mrem (mSv)*
Other Pathways			Average dose X population exposed	*	Pathway-specific background doses need not be estimated
All Pathways	{Note: This should be the total dose to the representative person or the MEI, but it should not be the sum of the individual pathway doses unless all the pathway-specific MEI doses are to the same receptor **}		{Note: This should normally be the sum of the average pathway-specific Population Doses}		{Note: Total natural background doses from all sources}

* Pathway-specific populations should be specified only if they are significantly different from the total population.

** Some sites sum the representative person or the MEI doses from various pathways to different receptors to bound MEI doses. In such cases, the conservative nature (overestimation of dose) should be discussed. Other unrealistic assumptions, such as assumed occupancy factors for exposures of 24 hours/day for 365 days, should be explained if they are used in establishing bounding dose estimates. Although reported doses should not underestimate likely doses, DOE prefers dose estimates to be as realistic as possible.

Example Table 8: Site X Radiological Atmospheric Releases for CY 2025 (in Ci, Bq or GBq, as appropriate) ***

Tritium	*^{3}H ^{85}Kr*	*Noble Gases ($T_{1/2}$ <40 days)*	*Short-Lived Fission and Activation Products ($T_{1/2}$ <3 hr)*	*Fission and Activation Products ($T_{1/2}$ >3 hr)*	*Total Radio-iodine*	*Total Radio-strontium*	*Total Uranium*	*Plutonium*	*Other Actinides*	*Other*

Attachment I: Recommended Formats for Radiological Dose and Release Reporting in ASERs

Example Table 9: Site X Liquid Effluent Releases of Radioactive Material for CY 2025 (in Ci, Bq or GBq, as appropriate)***

Tritium	*Fission and Activation Products ($T_{1/2}$>3hr)*	*Total Radio-iodine*	*Total Radio-strontium*	*Total Uranium*	*Total Plutonium*	*Other Actinides*

*** These example tables are to assist in DOE-wide comparisons. If used, they should be presented along with more detailed site-specific-based tables. They should not replace or deter more informative site-specific reporting formats.

12.1 Instructional Guidance for Reporting Unplanned Radiological Releases in the ASER

12.1.1 Preamble and Regulatory Basis

In accordance with DOE O 231.1B and DOE O 458.1, each site ASER must provide a comprehensive and transparent account of the site's environmental performance. This includes a summary of environmental occurrences, with specific attention to routine and non-routine (unplanned) radiological releases that contribute to the annual public dose determination which must not exceed 100 mrem/year (1 mSv/year). DOE CRD 458.1 [2.c] includes the possibility of an authorization for a temporary, higher dose limit, upon request, up to 500 mrem/yr, under special circumstances). The objective of this section is to ensure consistent, accurate, and thorough reporting of events that are considered unplanned releases in site ASERs.

DOE acknowledges that establishing specific criteria for an ASER-reportable "unplanned release" is difficult. A hazardous material release event to the ambient environment can evolve and resolve in a multitude of ways. The difficulty in establishing concrete criteria arises when considering the various facility operations, permit limits, work plans, maintenance activities, and other site procedures. A reportable unplanned release may (and many times does, in fact) result in public and environmental impacts well below the dose standards but was the unanticipated result of site operations. The following criteria are to be used to consider whether an event resulting in an estimated radiological dose impact to the public should be reported in a site ASER.

Attachment I: Recommended Formats for Radiological Dose and Release Reporting in ASERs

12.1.2 Definition of an Unplanned Radiological Release for ASER Context

While DOE O 458.1 does not provide a prescriptive definition of an "unplanned release," its characterization for ASER reporting purposes shall be derived from a synthesis of existing regulatory drivers. An event shall be considered for inclusion in the ASER's unplanned release section if it meets one or more of the following criteria:

- **Reportable Occurrence:** The event is classified as a reportable occurrence under DOE O 232.2A, particularly within the following groups related to radiological impact to a member of the public or environment:
  - Group 1: Operational Emergencies
  - Group 5: Environmental
  - Group 6: Contamination/Radiation Control (specifically for offsite impacts)
  - Group 8: Packaging and Transportation (applicable to public or environmental impact occurs)
  - Group 9: Noncompliance Notifications

- **Non-Routine Radiological Event:** The event is identified as a "non-routine radiological event" (e.g., accidental, unplanned, or inadvertent release) as referenced in DOE O 458.1, Section 4.d.3, which necessitates characterization and potential remediation activities.
  - The event may result in a request for a temporary dose limit under DOE O 458.1.
  - The event, whether involving the release of liquids or airborne materials, contains radionuclides that require characterization to assess radiological consequences and demonstrate compliance, as mandated by DOE O 458.1, Sections 4.g.(1) and 5.b.5.

12.1.3 Required Content and Structure for Reporting

When one or more unplanned radiological releases have occurred during the reporting period, the site ASER should include a dedicated discussion containing the date and location of the release and the following elements for each significant event:

- **General Timeline:** Date, release period, indication of event cleanup activities and whether cleanup is ongoing or resolved.
- **Material Description:** The specific radionuclides involved and the estimated quantity of material released (e.g., in Curies).
- **Explanatory Narrative:** A concise explanation of the event, including its cause and the circumstances of the release.
- **Dose and Impact Assessment:** A quantitative assessment of the radiological impact, including:

- The estimated dose to the MEI and, if applicable, the collective dose.
- A clear statement of the basis for all dose estimates and a description of the primary exposure pathways.
- Dose calculations must be consistent with methodologies used in the ASER's primary **Radiological Discharges and Doses** or related chapter.
- A "less-than" dose is acceptable when impacts are very low and conservatively calculated.

- **Corrective Actions:** A brief summary of corrective actions taken to mitigate impacts, control the source, and prevent recurrence.
- **Compliance statement:** If a release results in an exceedance of applicable limits, this fact must be explicitly stated, along with a brief description of the corrective measures initiated to address the exceedance.

12.1.4 Consistency with Other Compliance Reporting

To ensure regulatory consistency, information presented in the site ASER must align with other official reports. Specifically, any unplanned release reported to the EPA under the NESHAP Subpart H, must be acknowledged in the site ASER, unless no emissions resulted from the event. While a full reiteration of event details may not be necessary for releases with minimal dose consequences, their reporting status must be consistent between the NESHAP annual report and the ASER publication. Events that received abundant press/social media coverage should be reported in both publications.

12.1.5 Standardized Statement for Absence of Unplanned Releases

In the event that no unplanned radiological releases occurred at the site during the reporting year, one of the following standardized statements shall be utilized in the corresponding ASER section:

- "There were no unplanned releases in [Year]."
- "There were no unplanned releases of radionuclides during [Year]."
- "There were no unplanned radiological airborne releases during [Year]."

13 ATTACHMENT II: ADDRESSING RADIATION PROTECTION OF BIOTA IN ASERS

13.1 Guidance for Demonstrating and Reporting Compliance with Dose Limits for Biota

DOE O 458.1 provides a graded approach (including screening methods and methods for detailed analyses) and related guidance that may be used to evaluate compliance with specified criteria on radiation dose to populations of aquatic animals, terrestrial plants, and terrestrial animals due to anthropogenic sources at DOE sites. Compliance with DOE O 458.1, paragraph 4.j.(1), can be demonstrated in one or more of the following ways:

1) Use DOE-STD-1153-2019.
2) Use an alternative approach to demonstrate that the dose rates to representative biota populations do not exceed the dose rate criteria in DOE-STD-1153-2019, Table 1.1.
3) Use an ecological risk assessment to demonstrate that radiation and radioactive material released from DOE operations will not adversely affect populations within the ecosystem.

Document compliance to DOE O 458.1 in the ASER, as appropriate, to the following screening criteria or describe the results of a relevant ecological risk assessment:

1) The absorbed dose to aquatic animals will not exceed 1 rad/day (10 milliGray [mGy]/day) from exposure to radiation or radioactive material.
2) The absorbed dose to terrestrial plants will not exceed 1 rad/day (10 mGy/day) from exposure to radiation or radioactive material.
3) The absorbed dose to terrestrial animals will not exceed 0.1 rad/day (1 mGy/day) from exposure to radiation or radioactive material.
4) The absorbed dose to riparian animals will not exceed 0.1 rad/day (1 mGy/day) from exposure to radiation or radioactive material.

The screening and analysis methods described below provide a means of demonstrating that the above dose rate criteria for aquatic and terrestrial biota are being achieved.

13.2 A Graded Approach for Demonstration of Protection

DOE-STD-1153-2019 provides practical screening and analysis methods for demonstrating compliance with the requirements for protection of biota. The Technical Standard provides a graded approach for demonstrating compliance with the biota dose limits and for conducting ecological assessments of radiological impact.

Attachment II: Addressing Radiation Protection of Biota in ASERs

The graded approach consists of a three-step process that guides the user from an initial, prudently conservative set of screening values to (if needed) a more rigorous analysis using site-specific information. This process includes data assembly, a general screening phase, and an analysis phase. In data assembly, the site area to be evaluated is defined and measured maximum or mean radionuclide concentration data are assembled for subsequent screening. In the general screening phase, measured radionuclide concentrations in environmental media are compared with the Biota Concentration Guides (BCG). Each radionuclide-specific BCG represents the limiting radionuclide concentration in environmental media that would not cause the biota dose limits to be exceeded. The analysis phase consists of three increasingly more detailed steps of analysis: a site-specific screening, using site-representative parameters instead of default parameters; a site-specific analysis, employing a kinetic modeling tool; and, if necessary, a site-specific biota dose assessment involving the collection and analysis of biota employing ecological risk assessment protocols. This three-phase scheme helps to ensure that the evaluation effort is commensurate with the likelihood and severity of potential environmental impacts. Implementation experience at DOE sites to date suggests that most sites will likely be able to demonstrate compliance with biota dose limits using the general screening phase.

13.3 The RESRAD-BIOTA Code as a Tool for Evaluating Doses to Biota

The RESRAD-BIOTA Code (released in September 2003; User's Guide in January 2004) is the preferred companion software tool for implementing the methods contained in DOE-STD-1153-2019 and for demonstrating protection of biota in ASERs. The RESRAD-BIOTA Version 1.8 computer model released in 2016 is available to evaluate compliance with biota protection requirements and implementing DOE-STD-1153-2019. The code provides a complete spectrum of analysis capabilities, from methods for general screening to comprehensive receptor-specific dose estimation. The code contains many advanced features, such as sensitivity analysis for studying parameter sensitivity; text reports and graphing capabilities for easy interpretation of data; an advanced "Organism Wizard" for configuring user-defined organisms; and capabilities to save and retrieve evaluation data and user-defined organisms.

DOE-STD-1153-2019, the RESRAD-BIOTA Code, and the RESRAD-BIOTA User's Guide (DOE/EH-0676; ISCORS Report 2004-02) can be downloaded at RESRAD page. DOE-STD-1153-2019 and the RESRAD-BIOTA Code are the preferred tools for estimating and evaluating doses to biota, unless there are site-specific requirements that necessitate the use of an alternative method or model, or it is determined that such alternate approaches will provide better results.

If alternative approaches to the Standard are used to demonstrate protection of biota consistent with DOE O 458.1 paragraph 4.j.(2), this chapter of the ASER should summarize the approach used and results.

13.4 Specific Guidance and Sample Reporting Format for ASERs

Compliance with the biota protection requirements in Section 4.j of DOE O 458.1 should be reported in the **Environmental Radiological Protection Program and Dose Assessment** chapter of the ASER under the **Addressing Radiation Protection of Biota in ASERs**, or comparable chapter. The ASER should include a text summary section and a supporting summary table for the evaluations conducted. To demonstrate compliance with DOE biota protection requirements found in DOE O 458.1, include the following elements:

1) biota dose rate criteria being met (e.g., 1 rad/day for aquatic organisms);
2) method(s) used to demonstrate compliance with these dose rate criteria and briefly describe the process used (e.g., screening methods using DOE-STD-1153-2019 and the RESRAD-BIOTA Code, or other site-selected method);
3) site areas evaluated and supporting data used in the evaluation (i.e., sources of exposure to biota for the site area evaluated, specific organism types or receptors used, media type and radionuclide concentration data used);
4) summary of results (e.g., concentrations of radionuclides in environmental media are less than screening values, doses calculated are less than biota dose rate criteria); and
5) conclusion from evaluation and results (e.g., populations of biota are protected at recommended dose rates and no impacts from ionizing radiation to populations of biota are indicated).

Also highlight, as appropriate:

1) any significant site outreach efforts or initiatives with stakeholders and local regulators;
2) integration of biota dose evaluation within the site's environmental surveillance program; and
3) site recognition of biota protection as a good business practice and as an important element of environmental stewardship. Refer to Section 7, Documenting Your Biota Dose Evaluation Results, in DOE-STD-1153-2019 for additional guidance.

Noteworthy site-specific examples of how to present and summarize this information in the ASER are referenced in Attachment V: Biota Dose Evaluations.

14 ATTACHMENT III: RECOMMENDED REPORTING FORMAT FOR DOE SITE-WIDE GROUNDWATER MONITORING PROGRAM

Summary of DOE Site-Wide Groundwater Monitoring Program

Example Table 10 below is the recommended format for summarizing all active groundwater monitoring wells at the site. Active wells are those that are currently being used (i.e., samples were taken during the reporting year). This summary table includes only monitoring wells; it does not include injection wells, production wells, extraction wells (e.g., for remediation), piezometers, or drainage wells, unless a sample is withdrawn for chemical, physical, radiological, or other analysis.

The summary table is structured according to the primary purpose (or driver) for sampling the well and includes the following broad categories:

1) Remediation – Wells that are associated with a groundwater remediation project, including subsurface investigation monitoring and evaluation of the progress of the remediation.
2) Waste Management[18] – Wells that are sampled to determine the impact, if any, of a waste management unit (e.g., RCRA hazardous waste, DOE low-level radioactive waste, other RCRA waste, CERCLA remediation waste) on the groundwater.
3) Surveillance – Wells that are sampled to detect possible impact of any other site operations (non-waste management units) on the groundwater and would include both radiological and non-radiological sampling data. This includes PFAS related contaminant monitoring.
4) Other – Wells that are sampled for any other purpose.

Example Table 11 provides the format for including information on the ranges of results for the most commonly detected contaminants. Noteworthy site-specific examples are referenced in Attachment V: Site-Wide Groundwater Monitoring Program Summary Tables and Trending.

[18] Waste Management wells are associated with landfills that require groundwater monitoring for leachate. Waste Management/landfill-associated wells are distinct from Remediation wells, which are specific to environmental monitoring associated with cleanup (e.g., to determine the nature and extent of contamination or monitoring for pump and treat effectiveness).

Attachment III: Recommended Reporting Format for DOE Site-Wide Groundwater Monitoring Program

Table 10: Summary of CY 2025 DOE Site -Wide Groundwater Monitoring Program*

	Remediation	***Waste Management***	***Surveillance***	***Other***
Number of Active Wells Monitored On-site				
Number of Active Wells Monitored Off-Site				
Number of Samples Taken				
Analyses Sampled				
Analyses Exceeding a Standard in 2025[19]				

[19] A "standard" refers to an applicable regulatory limit (e.g., a SDWA maximum contaminant level (MCL), RCRA permit value, or consent order requirement), or in the case of environmental surveillance or emerging contaminants, may be defined as values that the site and regulators agree is protective of public health and the environment (e.g., below regional screening levels). For nuclides that have no applicable regulatory standard, sites should consider referencing the DCS found in DOE-STD-1196-2022).

Attachment III: Recommended Reporting Format for DOE Site-Wide Groundwater Monitoring Program

Table 11: Ranges of Results for Positive Detections

	Remediation	*Waste Management*	*Surveillance*	*Other*
Tritium				
Krypton-85				
TCE				
Heavy Metals				
VOCs				
Other Contaminants (list separately)				

If appliable, an additional table could be included in this chapter to summarize the ranges of results for positive detections from off-site groundwater monitoring.

15 ATTACHMENT IV: ALTERNATE ASER REPORTING FOR CLOSURE SITES

This attachment provides alternate ASER options for DOE sites whose primary mission is environmental restoration with a goal of closure in the near future and for sites managed by the DOE Office of Legacy Management (LM). DOE O 231.1B and annual ASER guidance allow for sites to use a graded approach to tailor their ASERs based on the site mission, breadth of operations, active monitoring conducted (including the level of activity of remedial action systems), and the potential impact site activities may have on the public and environment proximate to the site.

Alternatives include:

1) Preparing a scaled-down, streamlined version of the ASER that reflects the current nature and extent of site operations and monitoring programs. A scaled-down ASER should summarize any relevant new information for the reporting year and appropriately reference the previous ASER for a description of unchanged or static conditions at the site.
2) Submitting the relevant and equivalent regulatory environmental compliance and radiological protection documentation to EH-10 in lieu of preparing the traditional ASER. For example, NESHAP, NPDES, and other regulatory environmental reporting that may be required and appropriate to the site, should be submitted. This documentation should characterize site environmental monitoring program and results, site activities, regulatory compliance status, and compliance with DOE O 458.1.

These alternative approaches should demonstrate compliance with the spirit of the environmental protection reporting requirements of DOE O 231.1B and the annual ASER guidance issued to Field elements regarding the preparation of ASERs.

For either alternative approach, the site or program should electronically submit the equivalent document required by DOE O 231.1B to Dr. Josh Silverman (Josh.Silverman@hq.doe.gov), Director, EH-10, Office of Health Programs & Environmental Radiation Protection, via a transmittal memorandum from the Site Manager, Field Office Manager, or appropriate designee, no later than October 1 of each calendar year. This memorandum should state that the site is self-declaring compliance with the radiation protection requirements of DOE O 458.1 and that the associated documentation and rationale that is forwarded with the memorandum supports this self-declaration.

Regardless of the option certain sites may choose to pursue, appropriate measures should be taken to continue to effectively communicate site environmental status to EH-10, the public and other key stakeholders. Specifically, sites should identify, in their ASER, the future

mechanisms that will be used to keep regulators and the public informed of site activities, closure progress, environmental activities, and monitoring results.

16 ATTACHMENT V: SITE -SPECIFIC EXAMPLES OF RECOMMENDED ASER REPORTING FORMATS

Below are site-specific examples of model reporting formats referenced in this ASER guidance. These examples provide recommended reporting options for sites to consider for incorporation into their respective ASERs, as appropriate.

ASER reports for each site can be accessed directly from the DOE ASER page.

16.1 Executive Summary:

(updated based on the 2021 ASERs)

- Brookhaven National Laboratory
- Hanford
- Idaho National Laboratory (also has a "Helpful Information" section which was good)
- Los Alamos National Laboratory
- Lawrence Livermore Laboratory
- National Renewable Energy Laboratory
- Nevada National Security Site
- Sandia National Laboratory-Albuquerque

16.2 Introduction:

(updated based on the 2021 ASERs)

- Argonne National Laboratory
- Brookhaven National Laboratory
- Hanford
- National Renewable Energy Laboratory
- Office of Legacy Management
- Pacific Northwest National Laboratory
- Sandia National Laboratory

16.3 Compliance Summary Table:

(updated based on the 2021 ASERs)

- Argonne National Laboratory
- Brookhaven National Laboratory
- Idaho National Laboratory
- Moab
- National Renewable Energy Laboratory

- Nevada National Security Site
- Princeton Plasma Physics Laboratory
- Pacific Northwest National Laboratory
- Sandia National Laboratories, Albuquerque
- Sandia National Laboratories, California
- Sandia National Laboratories: Kauai Test Facility and Tonopah
- Strategic Petroleum Reserve
- West Valley Demonstration Project

16.4 NPDES Exceedances:

(updated based on the 2021 ASERs)

- Nevada National Security Site
- Oak Ridge Reservation
- Savannah River Site

16.5 EPCRA Reporting:

(updated based on the 2021 ASERs)

- Hanford
- Lawrence Livermore National Laboratory
- Sandia National Laboratory-Albuquerque

16.6 Environmental Management Systems and EMS Summary Tables:

(updated based on the 2021 ASERs)

- Argonne National Laboratory
- Brookhaven National Laboratory
- Hanford
- Idaho National Laboratory
- Lawrence Berkeley National Laboratory
- Lawrence Livermore National Laboratory
- Nevada National Security Site
- National Renewable Energy Laboratory
- Office of Legacy Management
- Princeton Plasma Physics Laboratory
- Sandia National Laboratory-Albuquerque
- Sandia National Laboratory-California
- Savannah River Site

- Waste Isolation Pilot Plant
- West Valley Demonstration Project

16.7 Radiological Doses and Releases:

(updated based on the 2017 ASERs)

- Hanford
- Idaho National Laboratory
- Los Alamos National Laboratory
- Nevada National Security Site
- Oak Ridge Reservation
- Savannah River Site
- Waste Isolation Pilot Plant
- West Valley Demonstration Project

16.8 Biota Dose Evaluations:

(updated based on the 2017 ASERs)

- Idaho National Laboratory
- Pantex
- West Valley Demonstration Project

16.9 Site-Wide Groundwater Monitoring Program Summary Tables and Trending:

(updated based on the 2022 ASERs)

- Brookhaven National Laboratory
- Paducah Gaseous Diffusion Plant
- Savannah River Site
- Pantex

16.10 Environmental Operating Experience and Performance Measures:

(updated based on the 2017 ASERs)

- Argonne National Laboratory
- National Renewable Energy Laboratory
- Princeton Plasma Physics Laboratory
- Sandia National Laboratory-California
- West Valley Demonstration Project

16.11 Quality Assurance:

(updated based on the 2017 ASERs)

- Brookhaven National Laboratory
- Idaho National Laboratory
- Nevada National Security Site
- Savannah River Site

16.12 Alternate General ASER Format:

(updated based on the 2017 ASERs)

- Argonne National Laboratory
- Brookhaven National Laboratory
- Hanford
- Idaho National Laboratory
- Lawrence Livermore National Laboratory
- Los Alamos National Laboratory
- Nevada National Security Site
- Oak Ridge Reservation
- Pantex
- Sandia National Laboratory- Albuquerque
- Savannah River Site

16.13 ASER Public/Reader Comment Form:

(updated based on the 2021 ASERs)

- Ames Laboratory
- Brookhaven National Laboratory
- Lawrence Berkeley National Laboratory
- Pacific Northwest National Laboratory
- Paducah Gaseous Diffusion Plant
- Savannah River Site
- Strategic Petroleum Reserve
- Waste Isolation Pilot Plant
- West Valley Demonstration Project

16.14 ASER Summary Report:

(updated based on the 2021 ASERs)

- Idaho National Laboratory
- Kansas City National Security Site
- Nevada National Security Site
- Savannah River Site

16.15 ASER Web Page Model Format:

(updated based on the 2021 ASERs)

- Brookhaven National Laboratory
- Hanford Site
- Idaho National Laboratory
- Lawrence Livermore National Laboratory
- Los Alamos National Laboratory
- National Renewable Energy Laboratory
- Nevada National Security Site
- Oak Ridge Reservation
- Pacific Northwest National Laboratory
- Pantex Plant
- Portsmouth Gaseous Diffusion Plant
- Sandia National Laboratories, Albuquerque
- Sandia National Laboratories: Kauai Test Facility and Tonopah
- Savannah River Site
- Southwestern Power Administration
- Waste Isolation Pilot Plant
- West Valley Demonstration Project

16.16 Other Chapters of Note:

(updated based on the 2023 ASERs)

- Idaho National Laboratory – Chapter 9, Natural and Cultural Resources Conservation and Monitoring