

Direct Feed Low Activity Waste Integrated Permitting – 16642

Jack Donnelly*, Tom Beam*, Roger Landon**, Lori Huffman***, Mary Burandt***

*Washington River Protection Solutions LLC

**Bechtel National Incorporated

***U.S. Department of Energy, Office of River Protection

ABSTRACT

An overall Hanford permitting strategy for the U. S. Department of Energy (DOE) Office of River Protection (ORP) is being developed to support the Direct Feed Low-Activity Waste (DFLAW) Program. The strategy identifies new permits and modifications of existing permits, as well as major regulatory approvals to support the startup and operation of nuclear systems necessary to feed low activity tank waste, pretreat the waste, operate the Waste Treatment and Immobilization Plant (WTP) Low Activity Waste (LAW) facility to treat tank waste, and dispose of waste streams. Types of permits include hazardous waste, toxic air, and radiological air licenses. Four different Contractors manage operations at Tank Farms, WTP, Utilities/Infrastructure, and Waste Disposal. Due to this complexity and the number of interfaces required, the need to have a strategic overview of all permits was evident.

Approximately 25 permits and 4 major regulatory approvals are identified to implement DFLAW. The strategy will help guide integrated planning, scheduling and sequencing of permits and regulatory approvals to support DOE ORP's overall schedule for construction, commissioning and operation of DFLAW.

Development of the strategy included extensive collaboration and coordination of an Integrated Permitting Team with staff and management representation from DOE, CH2M Hill Plateau Remediation Contractor (CHPRC), Washington River Protection Solutions LLC (WRPS), and Bechtel National Inc. (BNI). Information sessions and briefings have been conducted with the Washington State Department of Ecology (Ecology) and Washington State Department of Health (DOH) in the development of this overall strategy. Additionally, interface meetings are held with Ecology and DOH on specific projects early in the design phase to validate the permitting approach, identify key issues and information, and discuss requirements and assumptions.

INTRODUCTION

The Integrated Permitting Team was assembled in January 2014 and includes personnel responsible for permit development, negotiations, submittals, and approvals. Project and permitting scope for WRPS includes the LAW Pretreatment System (LAWPS), Liquid Effluent Retention Facility/Effluent Treatment Facility (LERF/ETF), and Double-Shell Tanks (DST) Upgrades. For BNI, the project and permitting scope includes the LAW Facility, WTP Effluent Management Facility (EMF), and Analytical Laboratory (Lab). In addition, an integrated contractor

organization called One System (O/S) has been established by WRPS and BNI to help facilitate DFLAW project (including permitting) integration. CHPRC performs the project and permitting scope for the Integrated Disposal Facility (IDF).

Informal discussions on DFLAW permitting preliminarily estimated the number of permit modifications and approvals as less than 10 permits that were representative of the “big hitters.” After doing a more complete evaluation of proposed project activities, permitting criteria and project assumptions, the initial list of DFLAW permitting activities was generated by September 2014 and included 28 permits and 4 major regulatory approvals for a total of 32 actions. In order to broadly communicate the magnitude of the required permitting effort, briefings were provided to DOE, contractor management and regulatory agency personnel in early FY2015 to identify additional information for consideration and “vet” the results. The Integrated Permitting Team continues to meet monthly to discuss changes, new information, and updated project schedules. Since the initial list was generated in September 2014, there have been only minor changes identified in the number of permits anticipated.

As of September 2015, the total number of individual permitting actions and regulatory approvals identified to support DFLAW stands at twenty-nine (29). The permit actions necessary to support implementation of DFLAW include modifications to the Hanford Site-Wide Resource Conservation and Recovery Act of 1976 (RCRA) permit for new and modified treatment storage and disposal units, new and modified radioactive air emissions licenses and criteria toxic air permits, modifications to State waste water discharge permits, and evaluation of National Environmental Policy Act (NEPA) coverage. DFLAW permit actions also include some unique regulatory actions such as a waste incidental to reprocessing (WIR) determination pursuant to DOE Order 435.1, a land disposal restrictions treatability variance for the Immobilized Low-Activity Waste (ILAW), a dimethyl mercury (DMM) health impacts assessment (HIA) to support air permitting activities, and an update to a risk-based disposal approval under the Toxic Substances Control Act (TSCA).

Key information for each permit and regulatory approval is captured in an overall draft work plan created and maintained by the Integrated Permitting Team. This work plan serves as a working tool for the team. Best available schedule information for the individual permitting actions and regulatory approvals is pulled from the project baseline schedule, current forecast schedules, or contractor proposal schedules, depending on the maturity of the subject activity. The individual permitting action and regulatory approval schedules are incorporated into a newly developed tool called the One System Integrated Overall DFLAW Schedule for formal tracking and updating. This schedule is a logic driven schedule and utilizes routine software for managing tasks and activities.

REGULATIONS AND REGULATORY INTERFACES

The applicable requirements and regulations associated with environmental permitting and regulatory approvals include:

- Federal Resource Conservation and Recovery Act (RCRA) / Hazardous Waste Management Act¹ [1] [2]
- Federal and state Clean Air Act (CAA) [3] [4] [5] [6]
- State Water Pollution Control [7]
- State On-Site Sewage Systems (OSS) [8] [9]
- National/State Environmental Policy Act (NEPA)/(SEPA) [10] [11]
- Federal Toxic Substances Control Act (TSCA) [12]
- DOE O 435.1, *Radioactive Waste Management* [13]

The federal, state and local regulatory agencies with varying levels of oversight authority and jurisdiction for the identified permitting actions and regulatory approvals include:

- U.S. Environmental Protection Agency, Pacific Northwest (Region 10)
- State of Washington, Department of Ecology
- State of Washington, Department of Health
- Benton Clean Air Agency (BCAA)
- DOE Headquarters Office (DOE-HQ)
- DOE Office of River Protection (ORP)
- DOE Richland Operations Office (RL)

PERMITTING STRATEGY APPROACH

To ensure the identification of all permitting actions and regulatory approvals necessary to implement DFLAW, collaboration by various contractor staff was required to gather existing data and information (including existing or planned timelines), and define the individual activities. Several criteria were considered as the individual activity timelines were developed and evaluated:

- Is the permitting timeline based on a current project schedule, a forecasted schedule, a submitted contractor proposal, or is it a placeholder based on professional judgment awaiting future information?
- Are the identified durations for permit application preparations and regulatory review based on past experience, what is realistically achievable, what is desired, or a combination thereof?
- Is the project funded?
- When will project design information be available and is the timing adequate to provide required information for permit application preparation and submittal?
- Have permitting timelines been shared with regulatory agencies reviewing and approving the permit applications?

¹ The Hazardous Waste Management Act (HWMA) is the Washington state corollary to RCRA. Washington is an authorized state, and has implemented RCRA and the HWMA through their dangerous waste regulations. In Washington State, hazardous waste is termed “dangerous waste” and the Washington Department of Ecology is the state agency responsible for ensuring implementation of those regulations. For the purposes of this paper, the term RCRA will be used to refer to both RCRA and the HWMA, and the term dangerous waste also refers to hazardous waste.

- How are public involvement requirements reflected in the permit approval process?

After the Integrated Permitting Team assembled the raw information on the projects involved, type of permits, types of other regulatory approvals, and estimated permitting timelines, it was apparent a visual graphic or display depicting the entire picture would more effectively communicate the situation to senior management. Figure 1 is an illustrative overview of the DFLAW permitting activities and regulatory approvals. Each permitting activity or regulatory approval is listed and for each of these the following information is presented:

- Responsible contractor and project/facility.
- Type of permit or regulatory approval (i.e., description).
- Whether permit is a new permit or a modification of an existing permit.
- A timeline for each activity and three key check points along each timeline (start of preparation, submittal to the agency and regulatory approval).
- To help track progress on this effort, a green check mark is overlaid in the graphic as individual key check points are completed.
- Major construction and operational milestones/activities are also provided to provide context and relevance for the permitting activity.

Using Figure 1, one can readily see the complexity of the planned DFLAW permitting effort, and need for an effective integrated permitting team, and management oversight, to ensure the success of DFLAW. Additionally, it becomes apparent that the number of permitting activities and regulatory approvals being processed during certain time periods is high and could present resource challenges for DOE, contractor and regulatory agency staff. Tools and strategies being considered to overcome these challenges, as well as others, are discussed later.

Figure 1 was shared with the two primary regulatory agencies (Ecology and DOH) early in the process. Briefings started in October 2014 with the primary objective being to solicit their input and feedback, as well as to see if this tool was useful for their needs. Both agencies expressed an appreciation for the time and effort taken to integrate and assemble a strategic overview of the sequencing and timing of the permits and approvals. Ecology and DOH were focused on what the near-term permitting needs were in order to ensure sufficient resources to review and process permit applications. Periodic updates and briefings continue to be shared with Ecology and DOH, and project specific interface meetings are held for various projects. In general, many benefits have been recognized and a summary of those benefits from the DFLAW integrated permit strategy are discussed later.

Permitting strategy documents are being developed with the regulators to document key agreements among the parties, sequencing of permitting information submittal, and informal review timeframes.

DFLAW Permitting Activities and Regulatory Approvals

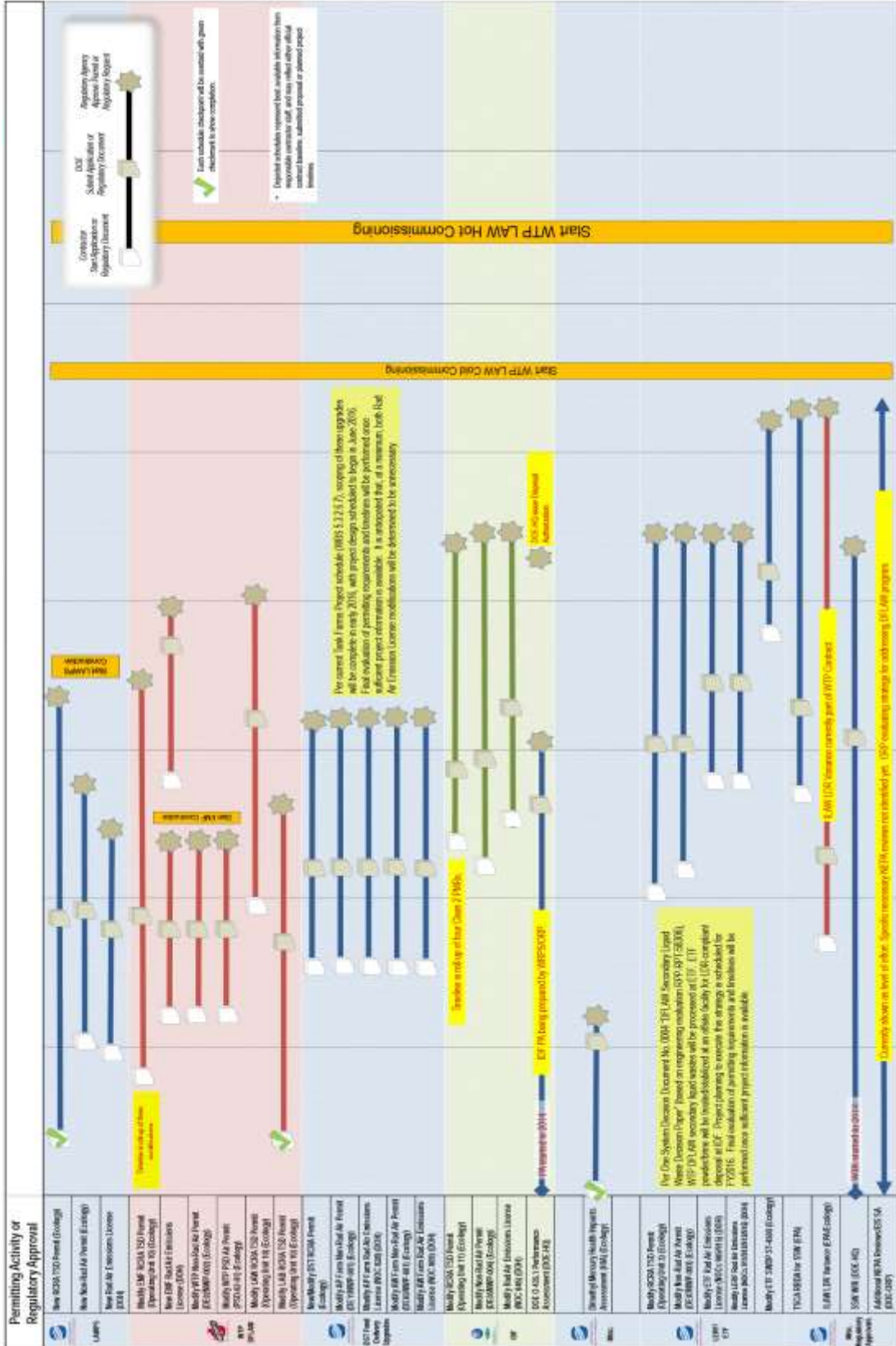


Figure. 1. DFLAW Permitting Activities and Regulatory Approvals

Other Hanford Site Permitting Activities

Permitting actions and regulatory approvals outlined in Figure 1 do not include ongoing, routine activities that must continue to be performed to ensure daily compliance, but which are not directly necessary to support DFLAW. Because these ongoing activities are being performed in parallel, often utilizing the same staff resources (from regulatory agencies, DOE and site contractors), it is important that they be appropriately considered and monitored to enhance potential efficiency or integration opportunities for the DFLAW effort. Some of the significant activities include:

- Preparation and issuance of Hanford Facility Dangerous Waste Permit Renewal (Revision 9). [14]
- Periodic renewal of other existing site-wide environmental permits (e.g., Hanford Site Air Operating Permit No. 00-05-06 [AOP], State Waste Discharge Permit [SWDP] ST-4511) as they reach their respective current expiration dates. [15] [16]
- Updating of WTP non-DFLAW related RCRA, air and water permits to reflect ongoing design changes and transition from construction to operations.
- Completion of Double Shell Tank system "10 year" Independent Qualified Registered Professional Engineer (IQRPE) re-certification.
- Preparation, submittal and approval of Single-Shell Tank closure documentation outlined in the Tri-Party Agreement (TPA). [17]

Elements Necessary for Permit Development and Review

It is expected that certain information elements will be common to the individual permit types, and that there are a number of assumptions associated with preparation of those permit applications. Having a good understanding up front of the required information is important to ensure necessary project design information is made available in a timely manner and to optimize resource planning efforts.

RCRA permit modification requests include the following types of information, as applicable:

- IQRPE Report (the report requires vendor design drawings and calculations as well as many of the items listed below)
- General Arrangement Drawings (GA)
- Process Flow Diagrams (PFDs)
- Piping and Instrument Diagrams (P&IDs)
- Mechanical Equipment Drawings (tank/vessel and evaporator system drawings)
- Engineering Specifications
- Mechanical Data Sheets
- Corrosion Evaluations

- Updates to existing “permit documents” to reflect new design (e.g., secondary containment design and underground transfer piping permit documents).
- Develop new permit documents to include evaporator and effluent management instrument System Logic Descriptions, Leak Detection, and Waste Removal documents.
- System Descriptions
- Site plans and topographic information

Radioactive air emissions notice of construction (NOC) applications will typically include the following elements:

- Compliance matrices for the American Society of Mechanical Engineers (ASME) AG-1 standards [18]
- Information to demonstrate compliance with American National Standards Institute (ANSI) N13.1 standard [19]
- Updated ventilation and process off gas code compliance matrices
- “Best Available Radionuclide Control Technology” (BARCT) analysis, emission estimates, and air dispersion modeling

Criteria/Toxic air pollutant NOC and prevention of significant deterioration (PSD) applications will typically include the following elements:

- “Best available control technology (BACT) analyses for toxic and criteria air pollutants, emission estimates, and air dispersion modeling.
- Health impact assessment to satisfy tier 2 review requirements related to emissions of di-methyl mercury compounds.

Tools to Enhance Permitting Process and Overcome Challenges

A variety of potential program challenges were identified as the overall DFLAW permitting actions illustrated in Figure 1 came into focus. These include, but are not limited to the following:

- Resources to prepare and review permit applications (DOE, Contractors, Ecology, DOH).
- The number of permitting actions being worked concurrently and the large number of permits being processed in a given time frame.
- Aggressive timelines for regulatory agency review of permit modifications and applications, including major regulatory approvals.

Several strategies have been implemented to overcome or minimize these challenges, including adopting lessons learned from the ongoing permitting of WTP. The primary measure has been to involve regulatory agencies early in the process and share permit needs and time lines as soon as possible to help ensure sufficient resources can be planned and budgeted. Early briefings provided advance awareness of the planned effort to projects, DOE, stakeholders, regulators, and

technical staff. As a result, additional hiring of permit resources has occurred. Another measure underway is evaluating if some permits can be shifted in the schedule to gain additional flexibility. For example, DOE, BNI, and Ecology are currently working on RCRA permit for operations of the WTP analytical laboratory facility. The timing for this activity has been shifted to begin earlier than originally planned. This not only takes advantage of the opportunity to develop the operating permit early, but will also provide lessons learned to support developing the operating permit for WTP's LAW facility in support of DFLAW.

Expedited agency review schedules are typically not requested, but if they become necessary, early and frequent communication with Ecology or DOH have proven effective and both parties attempt to work with each other. Within the LAWPS permitting scope, agreement has been obtained to share the key sections of the RCRA permit application as they are developed so that when the entire permit application is submitted, the Ecology permit writer will have reviewed and seen the information before and the formal review process will be shortened. This process also allows for early identification and resolution of issues or concerns rather than taking valuable time during the review and approval process.

For WTP only, an additional process has been implemented by Ecology. In this process, Ecology has employed a phased RCRA (dangerous waste) permitting approach in order to begin tank waste treatment as soon as practical. Specifically, this allows the close-coupled engineering, procurement, and construction process used to build large complex projects to be employed.

An initial WTP LAW RCRA permit application was previously submitted and approved, that included permit conditions requiring "agency initiated" permit modifications be utilized to incorporate additional engineering details prior to each phase of construction. Once a particular system design is incorporated into the permit, modifications to the permit are made using the standard Class 1, 2, and 3 RCRA permitting process.

DOE, BNI and Ecology have agreed that permitting EMF will follow the standard permittee-initiated permit modification process for incorporation into the Hanford Site RCRA (dangerous waste) Permit. However, the design will still be submitted in phases to allow design, procurement, and construction to proceed in parallel, and to support the earliest possible operation of the facility. In this case, EMF will require three separate permit modifications, one each for transfer lines, secondary containment systems, and the evaporator system itself. The content of each modification is developed by the project and shared with Ecology. Where possible, advance copies of documents are provided to the agency for informal review, and when the draft modification package is complete and ready for submittal, a final table top review of the package will be performed with the agency. Following comment resolution, the package is submitted and the agency plans and executes the public review process, responds to public comments and prepares and issues the final permit. This process generally results in an acceptable product that does not require rework or resubmittal.

A Class 3 permit modification will be used to incorporate operations information about 18 months before the start of cold (non-radioactive) commissioning of the WTP. This includes the operating portions of the WTP section of the Hanford Site RCRA (Dangerous Waste) Permit that need relatively complete design to finalize (e.g., training, contingency, and inspection plans). At this point, the information normally included in a permit application will have been submitted, reviewed, and approved through public comment. Approval is then given to begin cold commissioning.

The use of RCRA Temporary Authorizations (TA) to allow early construction and implementation of proposed facility modifications has been discussed in advance with Ecology. In this process, the DOE must provide a justification as to why a TA is being requested. Ecology has been open to the idea, but with an abundance of caution. For example, the LAWPS RCRA permit application is currently being planned as a complete submittal to reflect both construction and operations. After submittal of the permit application, if there are issues with providing permit details for operations due to availability of specific engineering information, DOE and WRPS would consider requesting a temporary authorization to allow construction to proceed. This contingency is being discussed in advance so as to obtain expectations from Ecology and better support the mission.

Benefits of an Integrated Permit Strategy Involving Complex and Numerous Facilities

By teaming with all of the responsible organizations to develop an integrated permitting plan, four principal benefits were realized. A comprehensive list of permitting actions was identified early in the planning process; regulatory agencies were engaged early to assist in decision making; permitting activities were integrated with construction and operations schedules; and, if required, activities can now be prioritized based on the availability of project and regulatory agency resources.

Specifically, having a group of subject matter experts evaluate the entire scope of work, across contractors and projects, resulted in the identification of more permitting actions than originally anticipated.

Early engagement with regulatory agencies increased their understanding of the proposed actions, allowed the agencies to assist in defining the permit modification processes, and increased the likelihood of a positive outcome. In addition, the agencies have the opportunity to better plan for their involvement in the permitting process, including resources required for review of draft applications, public involvement, permit development, and issuance. Sharing of information also helps to assure Ecology and the public that they have a full description of the project when reviewing individual designs as part of the phased permitting process. Permitting activities required prior to construction and/or operations were incorporated into project schedules with appropriate predecessor and successor ties to engineering deliverables and construction activities. Schedules are routinely updated to identify the status of permitting activities, and are monitored by

responsible management to identify potential impacts to downstream activities and project milestones.

CONCLUSION

Creation of an Integrated Permitting Team in 2014, comprised of permit experts, helped to alleviate or minimize permit impacts for DFLAW. Environmental permitting processes have a tendency to make folks uneasy or nervous as some aspects of the process are not controlled by your area of responsibility. Furthermore, it requires a constant vigilance to identify and resolve issues, communicate early and often, maintain sound relationships, and continuously evaluate efficiencies and opportunities for improvement. Public involvement is often a forethought in permitting but having an overall plan also helps to ensure compliance with your public relations plan and commitment to the public and stakeholders, and avoid unnecessary delays. As projects execute their schedules, the identification of when design information will be available within your permit timeline is critical. This is evident for the first wave of facility permits for LAWPS (WRPS), EMF (BNI), and Analytical Laboratory (BNI). These are the permits that will set the tone for the remaining permits for DFLAW, and the goal is to be successful from the beginning.

Collaboration between contractors and regulators to develop an integrated permitting plan and strategy provides the best opportunity for successful permitting, construction, and operation on a defined schedule. The Integrated Permitting Team remains a valuable asset to ensure proper execution of permitting actions and regulatory approvals to support DFLAW construction, commissioning, and operations.

REFERENCES

1. *Resource Conservation and Recovery Act of 1976*, 42 U.S.C 6901, et seq.
2. *Hazardous and Solid Waste Management Act of 1984*, 42 U.S.C 6961, et seq.
3. *Clean Air Act of 1986*. Public Law 88-206, as amended, 42 U.S.C. 7401, et seq.
4. WAC 173-400, "General Regulations for Air Pollution Sources," *Washington Administrative Code*, as amended.
5. WAC 173-460, "Controls for New Sources of Toxic Air Pollutants," *Washington Administrative Code*, as amended.
6. WAC 246-247, "Radiation Protection – Air Emissions," *Washington Administrative Code*, as amended.
7. RCW 90.48 Water Pollution Control.
8. WAC 246-272A, "On-site Sewage Systems," *Washington Administrative Code*, as amended.
9. WAC 246-272B, "Large On-site Sewage Tank System Regulations," *Washington Administrative Code*, as amended.
10. *National Environmental Policy Act of 1969*, Public Law 91-190, as amended, 42 U.S.C. 4321 et seq.

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