Energy Northwest
New Nuclear LLC
345 Hills Street
Richland, WA 99352

Lisa Williams
Nuclear Development
P.O. Box 968, MD 1035
Richland, WA 99352-0968
Ph. 509-377-8148
llwilliams@energy-northwest.com

January 15, 2026
XO1-26-003

ATTN: Document Control Desk
US Nuclear Regulatory Commission
Washington, DC 20555-0001

Subject: Acceptability of Historical Information - Volcanic (Project #99902130)

Reference:
1. Energy Northwest New Nuclear, LLC. "Methodology for Determining the Acceptability of Historical Information," White Paper, XO1-25-009, July 2025, ML25183A400.
2. Nuclear Regulatory Commission. "Safety Evaluation Report related to the operation of WPPSS Nuclear Project No. 2, Docket No. 50-397," NUREG-0892 Supplement 3, May 1983.
3. United States Geological Survey. "A Probabilistic Assessment of Tephra-Fall Hazards at Hanford, Washington, from a Future Eruption of Mount St. Helens," OFR 2020-1133, L.G. Mastin, A. Van Eaton, and H.F. Schwaiger, 2020.

This letter transmits Energy Northwest New Nuclear, LLC's (ENNN) Acceptability of Historical Information - Volcanic white paper (Enclosure 1) to the U.S. Nuclear Regulatory Commission (NRC). The paper is provided for NRC review, planning and familiarization in support of pre-application discussions.

ENNN intends to submit a Construction Permit Application (CPA) for up to twelve Xe-100 small modular reactors at a site adjacent to Columbia Generating Station (Columbia). The project will be known as the Cascade Advanced Energy Facility or Cascade. Using the methodology described in Reference 1, the enclosed white paper provides ENNN's evaluation of the acceptability of using existing Columbia and Hanford volcanic hazard evaluations to satisfy the requirements for assessing volcanic hazards in Cascade's CPA. The following information was evaluated for acceptability to Cascade:

1. Columbia's original volcanic hazard assessment in the Final Safety Analysis Report which was accepted by the NRC in 1983 (Reference 2).

2. U.S. Geological Survey (USGS) 2020 assessment of tephra-fall hazards at Hanford WA (Reference 3).

ENNN requests the NRC review this white paper and provide feedback on ENNN's evaluation of the acceptability of applying the historical information mentioned above to the volcanic hazard evaluations necessary for the proposed Cascade license application.

This letter contains no commitments. If you have any questions or need any additional information, please contact Nathan Clark at ndclark@energy-northwest.com or 509-377-6069.

Sincerely,

Signed by:
Lisa Williams
D582EC1FE95E4D8...
Lisa Williams
Operations, Licensing, Environmental Manager, Nuclear Development

Enclosures
1. Acceptability of Historical Information - Volcanic, ENNN White Paper, Rev 0, January 2026.

cc:
Greg Cullen
Ken Langdon
Energy Northwest Legal Services
Ms. Denise McGovern, NRR/DANU/UAL2
Ms. Madelyn Nagel, NMSS/REFS/EPMB3

Energy Northwest
New Nuclear LLC
345 Hills Street
Richland, WA 99352

White Paper

Acceptability of Historical Information - Volcanic

Revision 0

January 2026

Prepared by: Signed by: Stephan C. Moen 3E30B180D5B34C3... **Date:** 1/15/2026

Reviewed by: Signed by: Nathan Clark AAFBBC92031B450... **Date:** 1/15/2026

Approved by: Signed by: Lisa Williams D382EC1FE95E4D8... **Date:** 1/15/2026

Executive Summary

Recent increases in demand for carbon-free energy have led to support for construction of new nuclear power capability. Energy Northwest New Nuclear, LLC (ENNN) is considering the construction and operation of up to twelve Xe-100 small modular nuclear reactors at the former Washington Nuclear Project No. 1 (WNP-1) and Washington Nuclear Project No. 4 (WNP-4; collectively WNP-1/4) sites adjacent to the Columbia Generating Station (Columbia) in southeastern Washington State. The project will be called the Cascade Advanced Energy Facility (Cascade). The recently passed Public Law 118-67, July 9, 2024, (referred to as the ADVANCE Act) requires the U.S. Nuclear Regulatory Commission (NRC) to make use of applicable licensing information of existing nuclear facilities to the extent practical when evaluating adjacent new nuclear sites. The projected Cascade site, like Columbia, is on the Hanford Site and would benefit from the historical analyses performed for Columbia and other Hanford Site facilities.

ENNN plans to submit a Construction Permit Application (CPA) for Cascade, which will include an evaluation of the volcanic hazard for the proposed site in the Preliminary Safety Analysis Report (PSAR). The Columbia design basis ashfall event documented in Columbia's Final Safety Analysis Report (FSAR) was approved in NUREG-0892 Supplement 3, Safety Evaluation Report related to the operation of WPPSS Nuclear Project No. 2, May 1983 (NRC, 1983). Subsequently, studies of potential volcanic hazards in the vicinity of Columbia and Cascade have been performed by the U.S. Geological Survey (USGS) and others to support Department of Energy projects. ENNN plans to use much of this information in its volcanic evaluations. In particular, the Columbia design basis volcanic hazard will be adopted for Cascade since it bounds both the actual 1980 Mt. St. Helens and USGS, 2020, ashfall quantities.

Six questions were used to evaluate the acceptability for using the historical volcanic analyses. Responses to the questions support a conclusion that the historic volcanic analyses are appropriate to use in the application for the proposed site.

1. INTRODUCTION

1.1 Purpose

The purpose of this white paper is to provide a basis for using existing historical volcanic hazard analyses for the proposed Energy Northwest New Nuclear, LLC (ENNN) Construction Permit Application (CPA) for the Cascade Advanced Energy Facility (Cascade). The historical analyses to be relied upon for the CPA were developed in support of the operating license for Columbia Generating Station (Columbia) and for design of certain Department of Energy facilities on the Hanford Site. The Hanford Site studies were performed by the U.S. Geological Survey (USGS) and others. This paper addresses the appropriateness of using volcanic hazard analyses applicable to the Cascade site but does not evaluate the Cascade design. The Cascade design features relied upon to mitigate the hazards of volcanic activity will be documented in the Cascade Preliminary Safety Analysis Report (PSAR). Loss of offsite power coincident with a volcanic event will also be addressed in the PSAR in accordance with NEI 18-04, Risk-Informed Performance-Based Technology Inclusive Guidance for Non-Light Water Reactor Licensing Basis Development, Revision 1, August 2019, as endorsed by Regulatory Guide 1.233, Guidance for a Technology-Inclusive, Risk-Informed, and Performance-Based Methodology to Inform the Licensing Basis and Content of Applications for Licenses, Certifications, and Approvals for Non-Light Water Reactors, Revision 0, June 2020.

ENNN intends to use the Columbia design basis volcanic hazard presented in “Nuclear Project No. 2 Volcanic Ashfall Protection,” GO2-82-825, October 4, 1982 (EN, 1982) as approved by the NRC in “Safety Evaluation Report related to the operation of WPPSS Nuclear Project No. 2, Docket No. 50-397,” NUREG-0892 Supplement 3, May 1983 (NRC, 1983). The Columbia analysis bounds both the historical 1980 Mt. St. Helens eruption and the 2020 USGS report “A Probabilistic Assessment of Tephra-Fall Hazards at Hanford, Washington, from a Future Eruption of Mount St. Helens,” OFR 2020-1133 (USGS, 2020), in terms of depth of ashfall.

Section 505(c) of the Public Law 118-67, July 9, 2024 (ADVANCE Act) requires that the Commission, to the extent practicable, use information that was part of the licensing basis of any licensed production or utilization facility located at the same site. ENNN intends to apply this concept to its CPA for NRC review.

1.2 Project Background

ENNN is considering the construction and operation of up to twelve Xe-100 reactors at the former WNP-1 and WNP-4 sites adjacent to Columbia in southeastern Washington State. The Xe-100 reactor is a high temperature helium gas-cooled advanced reactor designed by X-energy. ENNN plans to submit a CPA for Cascade, which will include a PSAR addressing safety implications of volcanic hazards.

The Cascade site is located on the Hanford Site in the Pasco Basin, a physiographic depression of the Columbia Plateau province in southeastern Washington state, about one mile east of Columbia, closer to the Columbia River and located on the same relatively flat, featureless desert scrub plain. The relative position of Columbia and the Cascade site to the Columbia River is shown in Figure 1.

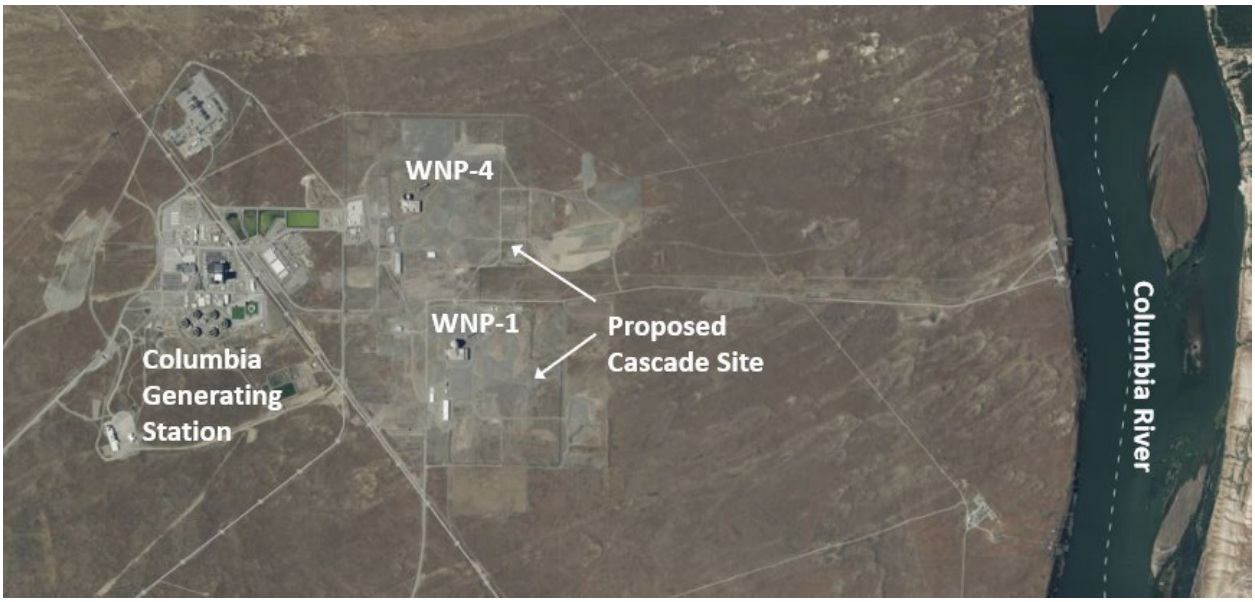

Figure 1: Cascade site relative to Columbia Generating Station and the Columbia River

1.3 Volcanic Characteristics of the Cascade Site

On May 18, 1980, Mt. St. Helens erupted, sending approximately 1.1 cubic kilometers of ash into the atmosphere, where it traveled east-northeast across Washington State and around the world. Ashfall at Columbia was approximately 1 mm over nine hours. Had the ash plume been centered over Columbia, it would have received up to two inches of ashfall, as shown in Table 1. “Mt. St. Helens has a propensity for frequent large explosive eruptions; a propensity that is unusual even in a global context. …other regional volcanoes—Adams, Hood, Rainier, Glacier Peak, and Jefferson—do not contribute significantly to the total probability [of ashfall at Columbia] because of low eruption probabilities, low explosivities, greater distances from Hanford, less favorable azimuths, or combinations thereof. Mt. St. Helens has been particularly active in the past approximately 500 years.” (USGS, 2011)

Columbia and Cascade are within 200 miles of eight volcanoes as shown in Figure 2. The closest volcano to the site is 105 miles away. Because most volcanic activity is confined to the immediate area of the volcano, mud flows, avalanches, pyroclastic rock flows, lava flows, and shock waves that may be associated with such activity do not pose a hazard to the site. The only potential hazard to the site is ashfall resulting from a major eruption of one of these volcanoes. Based on an examination of world-wide data regarding volcanic eruptions and processes, except for ashfall, the major volcanic hazards generally occur within about 40 km of an explosive volcano. As the 40-km radius is approached these processes become more and more confined to the drainage. Because Cascade lies about 105 miles east of the closest Cascade composite volcano (Mount Adams) and since these sites are not downstream on a drainage emanating from a Cascade composite volcano, the major processes and secondary effects (except for ashfall) do not pose hazards to the site.

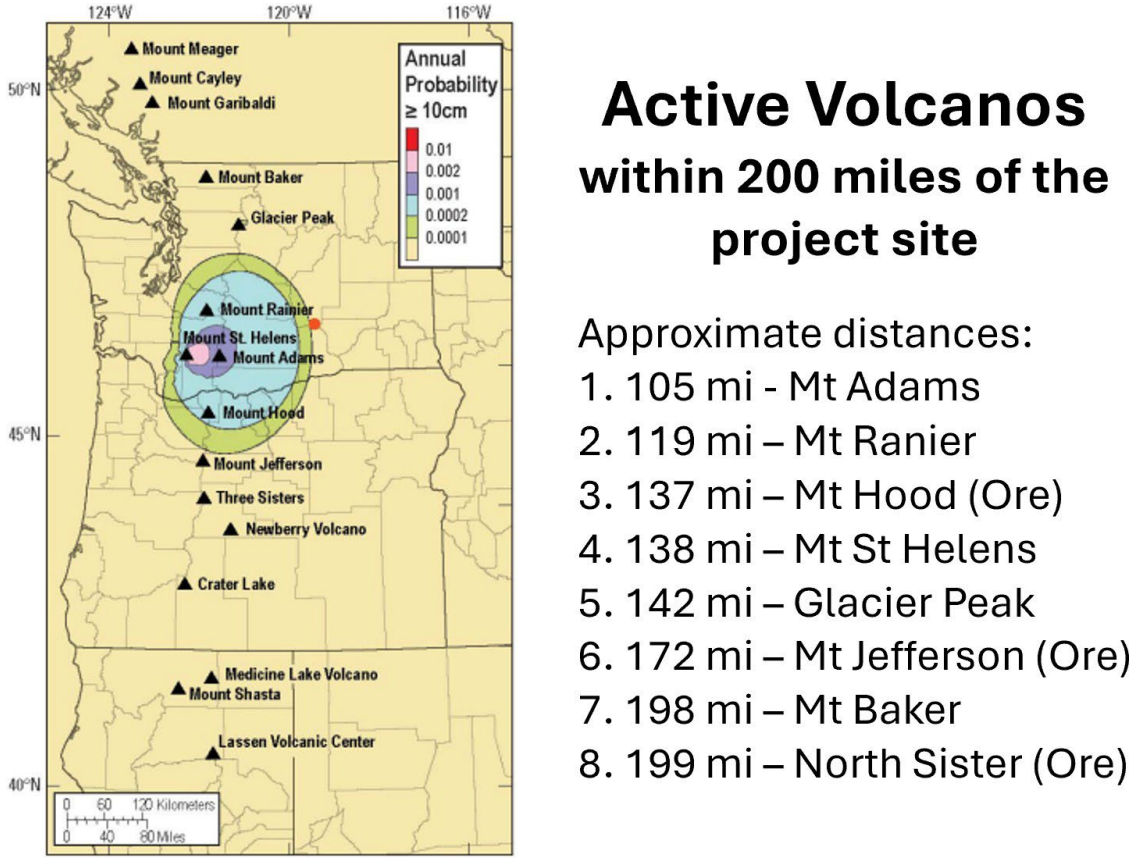

Figure 2: Volcanoes within 200 miles of Cascade.

1.4 Historical Hanford Site Volcanic Evaluations

ENNN's intent is to utilize Columbia's TM-1250 (EN, 1981) for developing the design basis volcanic hazard for Cascade as confirmed with insights from USGS 2020 for updated probabilistic ashfall evaluations. A brief history of the analyses associated with Columbia and the Hanford Site is given in the next sections. These analyses are directly applicable to the proposed Cascade facility.

Columbia TM-1250 (FSAR Section 2.5)

The information provided in Columbia Final Safety Analysis Report (FSAR) Section 2.5, Geology, Seismology, and Geotechnical Engineering, was based on the volcanic hazard documented in "Volcanic Ash Study," TM-1250, Revision 0 (EN, 1981). This TM (technical memorandum) develops the design basis ashfall event based on a large volume, explosive composite Cascade Mountain volcano. The design basis bounds the actual 1980 Mt. St. Helens eruption event as well as a postulated event that assumed meteorological conditions had centered the May 18, 1980, Mt. St. Helens plume over Columbia. The details are provided in Table 1. The table gives estimates of the ashfall duration, total compacted ashfall thickness, average air concentration, dry ash density, and average grain size for the design basis hazard as presented in TM-1250 and the postulated Mt. St. Helens eruption. The actual ashfall at Columbia in 1980 was less than one millimeter received over nine hours with no concurrent loss of offsite power event.

USGS 2020

The USGS produced a study, "A Probabilistic Assessment of Tephra-Fall Hazards at Hanford, Washington, from a Future Eruption of Mount St. Helens," OFR 2020-1133 (USGS, 2020), under contract to the U.S. Department of Energy, Office of River Protection, to predict the "deposit thickness and airborne ash concentration" at the Hanford Site for "a Mt. St. Helens eruption with an annual exceedance probability of 1 in 10,000." The study specifically evaluates the volcanic hazard for a nuclear waste treatment facility on the Hanford Site (Department of Energy's (DOE) Waste Treatment Plant, WTP). This study used Ash3d for its ash transport model to perform 10,000 model simulations while varying eruption size and other parameters appropriate to Mt. St. Helens based on measurements from Mt. St. Helens and similar sized eruptions around the world.

Th 2020 study builds on a USGS study from 2011, "Estimate of Tephra Accumulation Probabilities for the U.S. Department of Energy's Hanford Site, Washington," OFR 2011-1064 (USGS, 2011), that evaluated the following:

1) the annual probability of a large ash-producing eruption from Mt. St. Helens
2) the probability that wind would be blowing towards Hanford during an eruption
3) the exceedance probability for a given amount of ashfall at the Hanford Site

The 2020 study adopted the results from 1) and 2) and performed a more rigorous evaluation of item 3) that resulted in a reduced ashfall load at the Hanford Site (USGS, 2020; USGS, 2011). Results from the 2011 and 2020 USGS studies are combined and presented in Table 1.

Note that the Columbia design basis ashfall bounds both the 1980 Mt. St. Helens and USGS, 2020 ashfall quantities.

Table 1: Comparison of predictions of ashfall at Columbia to 1980 Mt. St. Helens actual (assuming optimal direction of ash path to Hanford) and USGS, 2020 probabilistic estimate

Evaluation	Columbia Design Basis (TM-1250, 1981)	1980 Mt. St. Helens, max at Columbia	USGS 2020
Duration of ashfall	20 hrs	12 hrs	6 to 16 hrs (Duration doesn't correlate well with total ashfall)
Compacted ash thickness	3 inches	2 inches	2 inches
Average Concentration	200 mg/m3	70 mg/m3	1513 mg/m3
Density of ash	96 pcf (dry, compacted)	57-110 pcf (dry, compacted)	Assumes 62.4 pcf
Average grain size	0.075 mm	0.075 mm	Extensively reported in the paper; statistically varied for the calculations

2. EVALUATION PROCESS

As described in ENNN White Paper “Methodology for Determining the Acceptability of Historical Information” (ENNN, 2025), the following criteria (questions) are used to determine the acceptability of historical analyses:

1. Regulatory Changes—Are the applicable regulations associated with the required information the same as during the time of the historical analysis?
2. Analysis Methodology—Is the same analytical methodology in effect today as was when the historical analysis was performed?
3. Scope of Analysis—Does the scope of the historical analysis fully address the project site?
4. Site Changes—Is the project site today consistent with the project site that was analyzed?
5. Quality Assurance (QA)--Was the historical analysis developed under an Appendix B QA program?
6. Copy of Record—Is a copy of the historical analysis still available today?

For each question, if the answer is “yes” then no new analysis is needed. If an answer is “no” then ask, “Does a reasonable basis for applying the historical analysis to the current project exist?” If “yes”, document the basis and conclude that the historical analysis is adequate. If not, then conclude that a new or revised analysis is needed.

3. EVALUATION OF HISTORIC VOLCANIC ANALYSES

Introduction

The presence of volcanoes within 200 miles of the Cascade facility requires the consideration of volcanic hazards (i.e., ashfall, debris flow, and other proximal hazards) in the design of structures, systems, and components (SSCs) to ensure the protection of the health and safety of the public (NRC, 2024). The six questions posed in Section 2 above for evaluating historical analyses for acceptability are answered in the following discussions.

Analyses Considered: Columbia Volcanic Ash Study TM-1250 (EN, 1981), Assessments of Tephra-Fall Hazards at Hanford Site (USGS, 2020)

Methodology Applied: As described by the reports

NRC Documentation of Acceptance: NRC SER for WNP-2, NUREG-0892 Supplement 3 (NRC,1983)

Question 1, Regulatory Changes

Are the applicable regulations associated with the required information the same as during the time of the historical analysis?

No. The reason for this response is:

1. Columbia, as a light water reactor, falls under the general design criteria (GDC) requirements of 10 CFR 50 Appendix A. Cascade involves a non-light water reactor so the GDC would not apply. Principal Design Criteria (PDC) developed with guidance from the GDC in accordance with Regulatory Guide (RG) 1.232, “Guidance for Developing Principal Design Criteria for Non-Light Water Reactors,” Revision 0, April 2018, are applicable.
2. Columbia was licensed prior to January 1997 and so was subject to 10 CFR 100.10 and Appendix A. Cascade is subject to Subpart B, which includes 100.23.
3. 10 CFR 100.23 was added in 1997.
4. The USGS reports do not describe use of NRC requirements.

Table 2 summarizes the requirements applicable to Columbia at the time of TM-1250 compared to the current requirements.

Table 2: Summary of Regulations Applicable for Volcanic Analyses

Columbia TM-1250	USGS 2020	Current Requirements
10 CFR 50 App. A GDC 2 10 CFR 100.10 10 CFR 100 App. A	None Reported	10 CFR 50 App. A GDC 2[1] 10 CFR 100.23

[1] Applicable as guidance for non-light water reactors.

However, a reasonable basis for applying the historical analysis to the current project exists based on the following details.

1. ENNN intends to apply PDCs associated with the Xe-100 design to Cascade. X-energy's PDC-2, Design Bases for Protection Against Natural Phenomena, is applicable here and is nearly identical to GDC 2 such that the GDC and PDC are the same for the present purpose of evaluating volcanic hazards. Table 3 compares GDC 2 and PDC-2. Differences are underlined and highlighted in red text. The PDCs were presented by X-energy in their NRC-approved licensing topical report, "Xe-100 Licensing Topical Report Principal Design Criteria," 004799-A, Rev. 3, 12 Aug 2023 (X-energy, 2023).

2. In terms of volcanic assessment requirements, there are no material differences between Subpart A and B of 10 CFR 100 respecting TM-1250 (EN, 1981) for analyses performed in 1981 and requirements for new construction.

   The regulations do little more than mention that volcanic hazards are to be addressed if applicable. 10 CFR 100 Appendix A reads, "These criteria do not address investigations of volcanic phenomena required for sites located in areas of volcanic activity. Investigations of the volcanic aspects of such sites will be determined on a case-by-case basis." 10 CFR 100.10, .20, and .21 do not mention volcanoes. 10 CFR 100.23 reads, "…each applicant shall investigate all geologic and seismic factors (for example, volcanic activity)…."

3. No material changes to 10 CFR 50 App. A GDC 2 or 10 CFR 100 requirements have occurred since the historical analyses were completed in 1983.

4. USGS reports were performed under DOE contract in support of the WTP on the Hanford Site, a facility designed to handle nuclear material. Appropriate DOE and USGS requirements such as 10 CFR 830, Nuclear Safety Management, are assumed to have been applied.

Table 3: Comparison of 10 CFR 50 Appendix A GDC Criterion 2 to X-energy PDC-2

GDC 2	X-energy PDC-2
Structures, systems, and components important to safety shall be designed to withstand the effects of natural phenomena such as earthquakes, tornadoes, hurricanes, floods, tsunami, and seiches without loss of capability to perform their safety functions. The design bases for these structures, systems, and components shall reflect: (1) Appropriate consideration of the most severe of the natural phenomena that have been historically reported for the site and surrounding area, with sufficient margin for the limited accuracy, quantity, and period of time in which the historical data have been accumulated, (2) appropriate combinations of the effects of normal and accident conditions with the effects of the natural phenomena and (3) the importance of the safety functions to be performed.	Safety-significant structures, systems, and components shall be designed to withstand the effects of natural phenomena such as earthquakes, tornadoes, hurricanes, floods, tsunami, and seiches without loss of capability to perform their safety functions. The design bases for these structures, systems, and components shall reflect: (1) Appropriate consideration of the severity of the natural phenomena that have been historically reported for the site and surrounding area, with sufficient margin for the limited accuracy, quantity, and period of time in which the historical data have been accumulated, (2) appropriate combinations of the effects of normal, anticipated operational occurrence, design basis event, and design basis accident conditions with the effects of the natural phenomena, (3) the safety-significance of the functions to be performed.

Question 2, Analysis Methodology

Is the same analytical methodology in effect today as was when the historical analysis was performed?

No. Reasons for this response are:

1. Guidance or defined methodology did not exist when Columbia was licensed in the early 1970s, as shown in Table 4. Since then, RG 4.26, “Volcanic Hazards Assessment for Proposed Nuclear Power Reactor Sites” (NRC, 2023), that addresses volcanic hazard assessment was introduced, Rev. 0 in June 2021, Rev.1 in August 2023.
2. Guidance methodology is not identified in the USGS reports.

However, a reasonable basis for applying the historical analysis to the current project exists based on the following:

1. The Columbia and USGS Hanford Site volcanic hazard evaluations essentially follow the risk-informed framework provided in RG 4.26 (NRC, 2023), shown in Figure 3 below, even though they were performed prior to the existence of RG 4.26, as shown in Table 4. DANU-ISG-2022-02 Section 2.7 identifies RG 4.26 as

providing guidance for performing the volcanic hazard assessment. As shown in Table 5, evaluations in TM-1250 and the USGS reports satisfy the intent of the steps in the RG 4.26 process. The similarity between the approaches suggests that a new analysis would be done the same way and produce similar results. Columbia's results were accepted by the NRC as documented in NUREG-0892, Supplement 3, which resolved questions on the design-basis ashfall.

2. USGS reports were performed under DOE contract in support of the WTP on the Hanford Site, a facility designed to handle nuclear material. Appropriate government standards are assumed to have been applied in accordance with DOE standards. USGS results are only used to illustrate the conservatism in Columbia's design basis.

Table 4: Comparison of Historical to Current Guidance Documents for Volcanic Hazard Analysis

Evaluation	Eval Date	Guidance Used for Historical Analyses	Rev Used	Current Guidance	Current Rev
TM-1250	1981	None	N/A	RG 4.26	R1, 8/2023
USGS	2020	None	N/A		

Table 5: Comparison of RG 4.26 guidance with analyses in EN, 1981, and USGS 2020

RG 4.26 Step	Guidance	Columbia TM-1250	USGS 2020
1) Quaternary Volcanoes in Region or Vicinity?	Include if volcano or its deposits within 200 or 25 miles of site, respectively, within past 2.6 million years	Identified five volcanoes based on proximity and ashfall in site vicinity	Examined 16 volcanoes within 450 miles of Hanford Site
2) Screen Volcanic Hazards	Determine maximum distance potentially hazardous volcanic phenomena can travel from volcanic source	Determined that ashfall is only hazard, used Adams or Rainier as primary source	Focused on ashfall as only hazard
3) Develop Initial Risk Insights	Calculate the likelihoods of future volcanic eruption and associated hazards	Deterministic, source Adams or Rainier with max St. Helens eruptive volume	Developed annual eruption and wind direction probabilities
Engineering Analysis Option?	Proceed directly to Step 6 or 7; beyond the scope of this white paper	Completed for Columbia	N/A
4) Evaluate Eruption Potential and/or Hazard Potential	Determine product of probabilities of eruption and of hazard reaching the site	N/A	Identified Mt. St. Helens as most significant volcanic hazard source
5) Develop Risk Insights	Product >1E-4 is design basis; 1E-4> product>5E-7 is beyond design basis event. Determine level of hazard (e.g., amount and ashfall grain size distribution)	Determined amount of ashfall as 7.4 cm, density and grain size distribution	Evaluated ashfall thickness from 14 volcanoes at exceedance probability of 1E-4: 5.1 cm, mass load and grain size distribution (USGS, 2020)
6) Evaluate SSC Performance	Beyond the scope of this white paper	Completed for Columbia	N/A
7) Evaluate Mitigating Actions	Beyond the scope of this white paper	Completed for Columbia	N/A

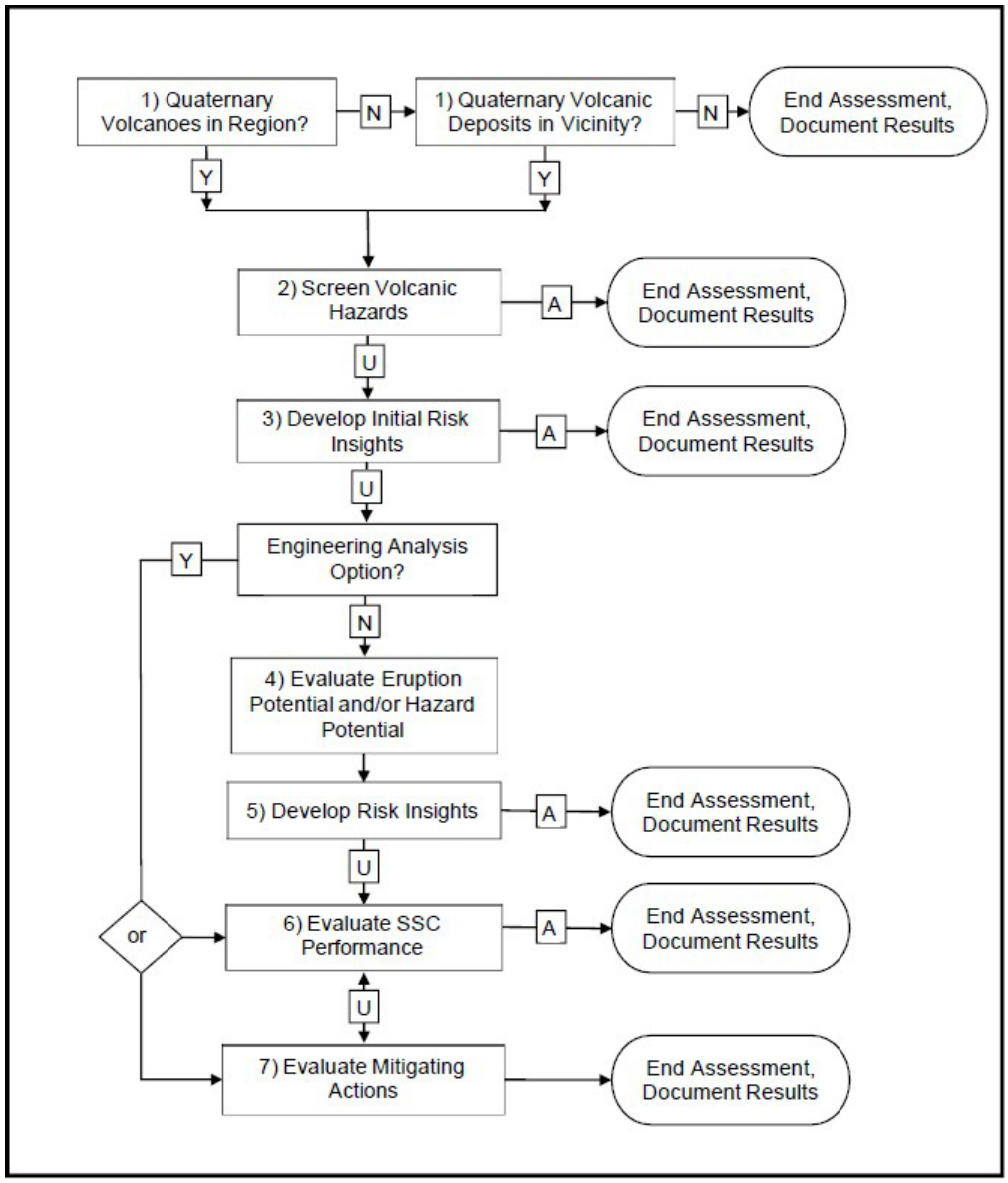

Figure 3: Flowchart for an acceptable volcanic hazards assessment ("Y" = Yes, "N" = No, "U" = Unacceptable performance, "A" = Acceptable performance) (RG 4.26 Figure 1 (NRC, 2023))

Question 3, Scope of Analysis

Does the scope of the historical analysis fully address the project site?

Yes. Columbia and Cascade are about one mile apart and both within the Hanford Site. WTP is about ten miles northwest of Columbia. Ashfall is independent of plant type and specific location at this small of a distance.

Question 4, Site Changes

Is the project site today consistent with the project site that was analyzed?

Yes. There have been no changes to the Columbia or Cascade sites that would affect ashfall.

Question 5, Quality Assurance

Was the historical analysis developed under an Appendix B QA program?

No. Reasons for this response are:

Yes for Columbia but No for USGS. While TM-1250 for Columbia was performed under EN's Appendix B QA program, USGS reports do not identify what processes governed the report preparation.

However, a reasonable basis for applying the historical analysis to the current project exists based on the following: The USGS maintains a comprehensive quality assurance program. USGS, 2011, and USGS, 2020, were performed by USGS under contract to the DOE for WTP to define the design basis volcanic hazard for that facility. As such, extensive DOE quality requirements flowing out of 10 CFR 830.202, Safety Basis, are expected to have been applied to the USGS work. ENNN therefore concludes that the two USGS reports were performed to an acceptable level of quality.

Question 6, Copy of Record

Is a copy of the historical analysis still available today?

Yes. The Columbia hazard analysis reports are all available in public documents or EN records. ENNN has copies of the USGS reports that summarize the inputs, methodology, and results.

4. SUMMARY OF RESULTS

As summarized in Table 6, the six questions for evaluating the WNP-1/4 and Columbia original analyses and Columbia post-Fukushima reevaluation have all been answered as “yes” or a basis for applying the historical seismic reevaluation analysis has been provided in discussions above.

Table 6: Summary of responses to evaluation questions for Project Site

Evaluation	Columbia	USGS
Same Regulations?	No but justified	No but justified
Same Methods?	No but justified	No but justified
Same Scope of Analysis?	Yes	Yes
Site Consistent?	Yes	Yes
App B Program?	Yes	No but justified
Copy of Record?	Yes	Yes

5. CONCLUSIONS

ENNN concludes that the historical analyses performed for Columbia and by the USGS are applicable to Cascade for evaluating the volcanic hazard. The USGS, 2020, results are bounded by the TM-1250 analysis and ENNN plans to use the TM-1250 volcanic hazard in CPA and OLA submittals. Specific justification for using historical analyses will be documented in the Cascade PSAR.

6. REFERENCES

Energy Northwest (EN), 1981. "Volcanic Ash Study," TM-1250, Revision 0, December 22, 1981. Note the report was revised in November 2006 to correct a typographic error; the analysis is unchanged from Revision 0.

EN, 1982. "Nuclear Project No. 2 Volcanic Ashfall Protection," GO2-82-825, October 4, 1982.

EN, 2005. "Geology, Seismology, and Geotechnical Engineering Report," TM-2143, Revision 0, November 2005. (Amendment 58, Dec 2005)

EN, 2023. Final Safety Analysis Report, Amendment 67, December 2023.

Energy Northwest New Nuclear (ENNN), 2025. "Methodology for Determining the Acceptability of Historical Information," White Paper, XO1-25-009, July 2025, ML25183A400.

NRC, 1983. "Safety Evaluation Report related to the operation of WPPSS Nuclear Project No. 2, Docket No. 50-397," NUREG-0892 Supplement 3, May 1983.

NRC, 2023. "Volcanic Hazards Assessment for Proposed Nuclear Power Reactor Sites," Revision 1, RG 4.26, August 2023, ML23167A078.

NRC, 2024. "Advanced Reactor Content of Application Project, Chapter 2, Site Information," Interim Staff Guidance," DANU-ISG-2022-02, March 2024, ML23277A140.

United States Geological Survey (USGS), 2011. "Estimate of Tephra Accumulation Probabilities for the U.S. Department of Energy's Hanford Site, Washington," OFR 2011-1064, R.P. Hoblitt and W.E. Scott, 2011.

USGS, 2020. "A Probabilistic Assessment of Tephra-Fall Hazards at Hanford, Washington, from a Future Eruption of Mount St. Helens," OFR 2020-1133, L.G. Mastin, A. Van Eaton, and H.F. Schwaiger, 2020.

X-energy, 2023. "Xe-100 Licensing Topical Report Principal Design Criteria," 004799-A, Revision 3, 12 Aug 2023, ML24319A155.

Certificate Of Completion

Envelope Id: 603282D2-50B9-4917-8869-0A7A6ADB9DBE
Status: Completed
Subject: Docusign: Volcanic Historical Analyses Letter and White Paper.pdf
Source Envelope:
Document Pages: 19
Signatures: 4
Certificate Pages: 5
Initials: 0
AutoNav: Enabled
EnvelopeId Stamping: Enabled
Time Zone: (UTC-08:00) Pacific Time (US & Canada)

Envelope Originator:
Angela Homuth
P.O. Box 968
Richland, WA 99352-0968
amhomuth@energy-northwest.com
IP Address: 66.119.205.190

Record Tracking

Status: Original
1/15/2026 1:57:27 PM
Holder: Angela Homuth
amhomuth@energy-northwest.com
Location: DocuSign

Security Appliance Status: Connected
Pool: FedRamp

Storage Appliance Status: Connected
Pool: Energy Northwest
Location: Docusign

Signer Events	Signature	Timestamp
Stephan C. Moen scmoen@energy-northwest.com Licensing Engineer Security Level: Email, Account Authentication (Optional)	Signed by: Stephan C. Moen 3E36B180D5B34C3... Signature Adoption: Pre-selected Style Using IP Address: 66.119.205.190	Sent: 1/15/2026 1:58:52 PM Viewed: 1/15/2026 1:59:19 PM Signed: 1/15/2026 2:03:00 PM
Electronic Record and Signature Disclosure: Accepted: 1/15/2026 1:59:19 PM ID: 4f25e8b3-a5e4-4282-ad16-7be62e35ae13 Company Name: Energy Northwest		
Nathan Clark ndclark@energy-northwest.com Security Level: Email, Account Authentication (Optional)	Signed by: Nathan Clark AAFBBC92031B450... Signature Adoption: Pre-selected Style Using IP Address: 66.119.205.190	Sent: 1/15/2026 2:03:02 PM Viewed: 1/15/2026 2:03:50 PM Signed: 1/15/2026 2:08:37 PM
Electronic Record and Signature Disclosure: Accepted: 1/15/2026 2:03:50 PM ID: 3749943c-4b53-484e-afa3-636852cb942e Company Name: Energy Northwest		
Lisa Williams llwilliams@energy-northwest.com Manager - Operations, Licensing & Environmental Security Level: Email, Account Authentication (Optional), Logged in	Signed by: Lisa Williams D582EC1FE95E4D8... Signature Adoption: Pre-selected Style Using IP Address: 66.119.205.190	Sent: 1/15/2026 2:08:38 PM Viewed: 1/15/2026 2:09:20 PM Signed: 1/15/2026 2:10:58 PM
Electronic Record and Signature Disclosure: Accepted: 12/30/2024 7:57:43 AM ID: 4c86323f-a203-4bad-8554-ef6809620c18 Company Name: Energy Northwest		

In Person Signer Events	Signature	Timestamp

Editor Delivery Events	Status	Timestamp

Agent Delivery Events	Status	Timestamp

Intermediary Delivery Events	Status	Timestamp

Certified Delivery Events	Status	Timestamp

Carbon Copy Events	Status	Timestamp

Witness Events	Signature	Timestamp

Notary Events	Signature	Timestamp

Envelope Summary Events	Status	Timestamps
Envelope Sent	Hashed/Encrypted	1/15/2026 1:58:52 PM
Certified Delivered	Security Checked	1/15/2026 2:09:20 PM
Signing Complete	Security Checked	1/15/2026 2:10:58 PM
Completed	Security Checked	1/15/2026 2:10:58 PM

Payment Events	Status	Timestamps

Electronic Record and Signature Disclosure