February 2, 2026

Bobbak Talebi
Washington Department of Ecology
Southwest Regional Office
PO Box 47775
Olympia, WA 98504-7775

RE: SEPA Revised Draft EIS for Chehalis Flood Damage Reduction Project

Dear Mr. Talebi,

Please accept the following comments from the Wild Salmon Center on the Department of Ecology's (DOE) draft environmental impact statement (DEIS) for the proposed Chehalis River Basin Flood Damage Reduction Project construction of a Flood Retention Expandable dam (FRE) and improvement to the Airport Levee (collectively referred to as the proposed project) as proposed by the Chehalis River Basin Flood Control Zone District (FCZD) based in Lewis County, Washington. The Wild Salmon Center appreciates the opportunity to comment on this proposed action.

Interested Party Background

The Wild Salmon Center is the only conservation organization working to protect the strongest wild salmon rivers across the entire North Pacific. We focus on salmon because they are an iconic and powerful conservation symbol, wild to the core, with an incredible life story. The most beautiful and important rivers of the North Pacific all depend on salmon and the nutrients they carry inland from the ocean. When you protect salmon, you protect entire watersheds and everything within them, including people.

We focus on wild salmon. If we want salmon around for our kids and grandkids, we must protect wild salmon, which are among some of the most adaptable creatures on the planet. We focus on strongholds. We target salmon strongholds, like the Chehalis Basin, the richest, strongest salmon rivers in the Pacific, because it is easier to protect rivers while they are still healthy and thriving. History tells us it is incredibly difficult and expensive to try and restore a river once it is dammed, mined, diverted, or otherwise broken.

We build powerful alliances with the most effective local and regional partners working in salmon strongholds. We help these groups design and implement winning strategies built on our collective scientific, political, legal, fundraising, and communications expertise. Since 1992, we and our partners have together secured dozens of rivers and millions of acres of protected areas in our efforts to protect salmon strongholds and restore salmon populations.

Summary

Overall, we find that the information provided in the DEIS is not adequate, deficient in both the specific information and data analysis used to allow thorough scientific evaluation of its findings. Substantial uncertainties regarding the models, methods, and parameters employed in the DEIS

remain deficient as outlined below. Most striking was the failure to include a proposed Mitigation Plan for public review. Our assessment remains that the impacts from the proposed project would be significant and adversely affect the ecosystem processes of the Chehalis River Basin necessary to sustain salmon and steelhead, other aquatic and non-aquatic ecosystems, and the human communities that depend upon them for both income, sustenance, and cultural and spiritual survival. These impacts would be biologically, socially, and economically unmitigable.

Technical Comments

Our comments are broken out into primary discipline areas, and where content warrants, additional subdiscipline areas.

Alternatives Analysis Inadequate

DOE was receptive to comments received on the draft EIS questioning the adequacy of the alternatives analysis by including some broad considerations of several components of the Local Actions Non-Dam (LAND) Alternative being evaluated in the Chehalis Basin Strategy in the 2025 DEIS (DEIS Section 2.5.1, page 28). Critically, inclusion of some LAND elements in the DEIS as part of a viable alternative to the FRE and airport levee changes, is clear acknowledgement that a less environmentally harmful method to accomplish the FCZD's flood damage reduction project (both project purpose and objective) is viable. However, questions remain regarding the overall adequacy of alternatives analysis per SEPA process requirements.

Failure to follow WAC 197-11-940

DOE's analysis in the 2025 DEIS is unchanged from the 2020 DEIS, focusing on the applicant's statement of purpose and goals and failing to explicitly consider the degree to which implementing the proposed project would foreclose future options for succeeding generations as specified in WAC 197-11-440 part 5, subparts b and c(vii):

> WAC 197-11-440 *EIS Contents, part 5 Alternatives Including the Proposed Action, subpart (b): Reasonable alternatives shall include actions that could feasibly attain or approximate a proposal's objectives, but at a lower environmental cost or decreased level of environmental degradation. (c)(vii) Discuss the benefits and disadvantages of reserving for some future time the implementation of the proposal, as compared with possible approval at this time. The agency perspective should be that each generation is, in effect, a trustee of the environment for succeeding generations. Particular attention should be given to the possibility of foreclosing future options by implementing the proposal.*

By not fully considering the possibility of foreclosing on future options for the suite of ecosystem services provided to the community by the free flowing river, DOE has failed to provide decision makers with a comprehensive understanding of the scale, extent, magnitude, and enduring ramifications of the proposed project.

The DEIS fails to provide a meaningful comparison of alternative flood damage reduction options citing the lack of project level details. This is in stark contrast with the proposed project and belies the lack of resources applied to identifying and fully considering alternatives (e.g. LAND) in the EIS, not a lack of flood damage reduction benefit. If implemented, the LAND actions being actively analyzed as part of the Chehalis Basin Strategy and in parallel to the DEIS process, would reduce flood damage risk to people and structures, be more predictable, actionable, and less costly near term. In conjunction with implementation of land use management plans and policies, adoption of new flood data, flood proofing of at-risk properties and structures, buyouts and relocations, and restoring natural floodwater storage processes are viable flood damage reduction options with significantly decreased environmental costs.

Purpose and Objective too Narrow

The 2025 DEIS, like the 2020 DEIS, presents a narrow purpose and set of objectives focused solely on

reducing flood damage emanating from precipitation originating in the Willapa Hills areas of the basin.

> *"The Applicant's purpose for the Proposed Action is to reduce flood damage in the Chehalis-Centralia area by constructing a flood retention facility and temporary reservoir near Pe Ell and making changes to the Chehalis-Centralia Airport levee.*
> *"The Applicant's objective for the Proposed Action is to reduce flooding coming from the Willapa Hills and improve the levee protection level at the Chehalis-Centralia Airport."* (DEIS Section 2.1, page 7)
> *"The Applicant has identified the following metrics for the reduction in flood damage:*
>
> - *Protect approximately 635 structures of value from flooding risk during a 100-year flood.*
> - *Reduce disruption of access via main transportation routes, specifically ensuring access along SR 6 and Interstate 5 (I-5) is open within 24 hours of a 100-year flood.*
> - *Minimize flood-related impacts (e.g., closure) at the Chehalis-Centralia Airport."* (DEIS Section 2.3.2, page 9)

The analysis presented in the DEIS claims that the FRE will effectively reduce flood peaks in the Chehalis-Centralia area. Such claims ignore the regular flood damage the area experiences from several local creeks (China Creek, Salzer Creek, Coal Creek and Dillenbaugh Creek) and storms centered over the Black Hills and Cascade Range foothills that cause flooding in the Skookumchuck, Newaukum, and Chehalis Rivers effecting the Centralia/Chehalis area. DOE's analysis fails to deeply consider the LAND as a means of reducing local flood damage originating from streams and rivers other than the Upper Chehalis, which could provide more comprehensive relief throughout the Basin.
Why were flood risks posed to the target area in and around the cities of Centralia and Chehalis not evaluated comprehensively to understand the geographic sources of flooding by a range of storm events that include the following:

- Storm events centered over the Cascade Range where the bulk of flood water originates from the Skookumchuck and Newaukum Rivers. These storm event evaluations should include variations where Skookumchuck Reservoir has storage capacity to dampen the flood event, and where it does not have flood storage capacity. Storm events centering over this area have the added risk of being rain-on-snow events that can significantly amplify the magnitude of flooding.
- Storm event centered in the Willapa Hills, but with most of the flow coming from the Stillman Creek and South Fork Chehalis River versus the Upper Chehalis River.
- Storm events centered in the Willapa Hills similar to the 2007 flood event. We understand that for the late-century catastrophic flood scenario for the DEIS, rainfall and runoff projections were modeled statistically throughout the Basin, with peak flows distributed in all areas in the basin and not focused on a particular area as occurred in the 2007 flood when rainfall was concentrated in the Willapa Hills.
- Cloudburst rain events with intense rainfall centered over the Centralia and Chehalis subbasins, including China, Salzer, Coal and Dillenbaugh Creeks.

The failure to adequately evaluate different geographic sources of flooding and a range of storm events belies the failure of the proposed project to meet its stated flood damage reduction purpose and objectives. For instance, flooding that recently occurred in December 2025 would have triggered backwatering of FRE conduits but would not have triggered FRE operational thresholds. Had the FRE dam been constructed, it would not have reduced flooding and road closures of I-5 and adjacent arterials, impacts that were primarily due to severe flooding in the Newaukum basin. Floods are defined in the DEIS based on flows at the Grand Mound gage. However, as noted above, storms can hit the basin from many different directions, resulting in floods that often come out of subbasins other than the headwaters. The value of a flood damage reduction project that addresses only a small part of the large basin may be relatively small, and the absence of such analysis in the DEIS raises doubt about

the estimated use of the dam once every 7 years. Categorizing floods by the area of the basin impacted by storms and calculating benefits from the proposed project on storms that specifically impact the upper watershed is a deficiency in the DEIS.

Furthermore, modeling of the proposed increase in the airport levee showed increased flooding upstream of the levee from the vicinity of Route 6 up to the Newaukum River. This particular area also includes toxic waste cleanup sites. Thus, the DEIS claim that the levee height increase reduces flooding is factually inaccurate – it reduces flood impacts in some areas and increases impacts in other areas. Given the occurrence of toxic waste cleanup areas in the upstream areas, and the modeled increased flooding in this area, additional and specific analysis and findings should have been clearly presented in the DEIS.

Failure to assess the scenarios outlined above is particularly acute for the residential and business district of Centralia. This area is shown in the DEIS flood inundation maps as "no longer flooded" during the catastrophic flood with the proposed project. However, because the DEIS does not comprehensively evaluate potential sources of flooding for this area and pathways of flooding, it cannot definitively conclude that these areas would actually be removed from flood risk with the proposed project, rather than just removed from flood risk for only the specific Chehalis River storm event evaluated in the DEIS. This approach contradicts sound standards of flood risk management practices to comprehensively assess flood risks to an area and then develop solutions to address those risks.

Mitigation Plan Not Included

DOE failed to include the Mitigation Plan as part of the DEIS made available for public review, despite specifically and repeatedly referencing the mitigation proposed by the applicant throughout the DEIS, and despite the fact that the FCZD prepared both a Revised Project Description and its detailed design-related appendices including a proposed Mitigation Plan in November 2024. The DEIS largely avoids any substantive technical analysis of the proposed mitigation actions, instead simply listing the proposed measures by the FCZD, those proposed by DOE and WDFW and repeatedly stating that there is uncertainty around whether the proposed mitigation is technically feasible or economically practicable.

Notwithstanding the failure to include the Mitigation Plan, DOE clearly indicates that the process to design adequate, feasible, and economically practicable solutions to mitigate the impacts from damming the upper Chehalis River would be long, complex, and expensive. The DEIS identifies the multiple, interrelated regulatory review and approval requirements that would need to be met (e.g., Chapter 4 and Section 5.17.3).

WAC-197-11-660(2)(a and b) states that SEPA decision makers are required to analyze the environmental impacts of mitigation measures when the measures themselves represent a substantive change to the proposal so that the mitigation measures themselves are likely to have significant adverse environmental impacts and the mitigation will not be analyzed in a subsequent environmental document prior to their implementation.

> *Per WAC-197-11-660(2)(a and b)* Substantive Authority and Mitigation
>
> > *(2) Decision makers should judge whether possible mitigation measures are likely to protect or enhance environmental quality. EISs should briefly indicate the intended environmental benefits of mitigation measures for significant impacts (WAC 197-11-440(6)). EISs are not required to analyze in detail the environmental impacts of mitigation measures, unless the mitigation measures:*
> > *(a) Represent substantial changes in the proposal so that the proposal is likely to have significant adverse environmental impacts, or involve significant new information indicating, or on, a proposal's probable significant adverse environmental impacts; and*
> > *(b) Will not be analyzed in a subsequent environmental document prior to their implementation*

The absence of any specificity or critical analysis of the mitigation proposed is a critical failure by DOE to convey to the public the intensity, scale, and cost which would be required to address the significant adverse impacts if the proposed project were to move forward.

Based on impacts from previous projects, we are left to deduce that adverse impacts to critical ecosystem processes, species, and habitats, as well as impacts to human recreation, land use, and public services and utilities would be significant, "unless mitigation is feasible." Impacts to known and unknown archaeological resources and Traditional Cultural Places would be significant, even despite the relocation of the proposed project upstream in an attempt to address what was already deemed unmitigable destruction to Traditional Cultural Places, the relocation which adds even more complexity and costly geotechnical and constructability constraints. As such, significant impacts to Environmental Justice communities remain and would be significant and disproportionate.

Disproportionate & Unmitigable Impacts to Tribal Rights & Resources

The DEIS clearly states that there would be disproportionate and unmitigable impacts to Tribal rights and resources of both the Confederated Tribes of the Chehalis and the Quinault Indian Nation. Yet as described in Section 7, the true nature, intensity, and duration of the anticipated impacts from the proposed dam are likely to be even more profound and permanent than described in the DEIS.

We stand in solidarity with our Tribal partners at the Confederated Tribes of the Chehalis Reservation and the Quinault Indian Nation with a position opposing the disproportionate effect on tribal and cultural resources and to Quinault Indian Nation treaty rights. This position is still supportable based on the 2025 DEIS, due to the severity of impacts to spring Chinook and steelhead populations, critical resources for both Tribes, as well as the acknowledged significant adverse impacts on other aquatic species, terrestrial wildlife and habitats that support native plants of importance for cultural practices, on a diversity of cultural resources and traditional cultural properties, and on the ecological integrity of the Chehalis River and its landscape.

> Section 5.6 of the DEIS states: "*The EIS analyses found probable significant impacts on multiple resource areas associated with Tribal use, including fish species and habitats, wildlife species and habitats, water resources, wetlands, cultural resources, and earth. Impacts to these resources would result in significant impacts to Tribes and Tribal resources.*" (page 120)

Impacts on Tribal Resources and Treaty Rights - Fisheries

The 2025 DEIS acknowledges the FRE would result in dramatic declines in abundance of spring Chinook, fall Chinook, coho, steelhead, and lamprey during construction (DEIS Exhibit 5.3-2 page 89), as well as from operation of the dam, including elimination of spring Chinook above the dam by mid-century. Elimination of spring Chinook and detrimental reduction of coho populations are stark findings given the State's co-responsibility as a joint cooperative manager with tribes of the state's fisheries.

> "*Between floods, habitat in the temporary reservoir area would be permanently degraded due to tree and wood removal, sedimentation, and the long-term effects from flood retention events that inundate (fill) all or portions of the temporary reservoir. Changes in riparian vegetation as a result of tree removal would result in less shade, increased water temperatures, reduced inputs of fish prey such as insects entering the river channel from the riparian zone, and less large wood supplied to the river channel. Sediment deposition between flood retention events, increased bed scour, and a reduction in large wood supply would change the structure and complexity of the river channel habitat and would reduce the quality of spawning and rearing habitat for salmon and steelhead*" (DEIS page 90).
>
> "*Aquatic habitat downstream of the FRE facility would also be impacted by the operation of the*

FRE facility. A reduction in large wood would change and simplify the structure of in-channel habitat, reducing pool areas and shelter for fish from flows and predators. A reduction in wood supply would result in more bed scour, reduced habitat complexity, and less spawning area for fish. Water temperatures downstream would increase" (DEIS page 91).

"The loss of production from one population in a subbasin could lead to a reduction in the resilience of the overall population and an increase in vulnerability to environmental variables through the following effects:

- *Decreasing the spatial structure of populations in the Chehalis Basin by eliminating spring-run Chinook salmon, coho salmon, and steelhead populations in the Rainbow Falls to Crim Creek Subbasin by late-century*
- *Eliminating spring-run Chinook salmon and nearly eliminating coho salmon in the Above Crim Creek Subbasin by mid-century*
- *Causing major reductions in steelhead and fall-run Chinook salmon in the Above Crim Creek and Rainbow Falls to Crim Creek subbasins in both the mid-century and late-century periods*

The reduction or loss of salmon or steelhead from one population (subbasin) would also result in a loss of genetic diversity within and among populations of each species across the Chehalis Basin." (DEIS page 93).

Impacts on Tribal Resources and Treaty Rights - Cultural Resources

We agree with the unambiguous statement from the 2025 DEIS of adverse impacts to Tribal and cultural resources, which was also identified in the 2020 DEIS.

"The Proposed Action would result in significant adverse impacts to Tribal and cultural resources." (DEIS, Appendix D Environmental Justice, p. 15)

Even so, there are multiple adverse impacts that are not included in this analysis. The DEIS also does not analyze cultural landscapes and place-based Tribal use in a meaningful way. Although the Tribal Resources report broadly acknowledges impacts to significant cultural places, Traditional Cultural Properties (TCPs), and archaeological sites, the analysis is skewed toward discrete locations rather than larger cultural landscapes. This approach underestimates impacts to Tribal and cultural resources, particularly those related to sense of place, access, and ongoing cultural practices. The absence of a finalized Traditional Cultural Property report further renders the cultural impacts analysis incomplete. Without a defined Area of Potential Effect and completed surveys across the full project footprint, the DEIS cannot adequately assess the full scope of cultural resource impacts, further rendering the analysis incomplete.

The DEIS structures its analysis around "construction" and "operation" phases and describes the dam as a flow-through structure with a temporary reservoir that fills only during major flood events. This framing emphasizes inundation as temporary and episodic, when in reality the proposed project would permanently and significantly alter the landscape. These changes fundamentally transform the cultural landscape and result in permanent cultural resource impacts that are not adequately disclosed or evaluated.

Cumulative Impacts Analysis Insufficient

According to WAC 197-11-792(c), SEPA requires that an EIS must fully evaluate all the direct, indirect, and cumulative impacts of projects. Implicit in SEPA is the requirement that the decision makers consider more than what might be the narrow, limited environmental impact of the immediate, pending action. Despite this requirement, many cumulative and indirect impacts were not included or analyzed in the DEIS.

Unaddressed Expansion of the Dam

Most obvious is the absence of any analysis of the reasonably foreseeable expansion of the FRE to a dam with a permanent reservoir, which would result in additional significant impacts and further investment of billions of additional public dollars which would be necessary to construct the expandable design as reviewed in greater detail elsewhere in this document. The building of an expanded dam is likely an indirect consequence of the building of an expandable dam to begin with, and therefore, reasonably foreseeable. Accordingly, the impacts of an expanded dam with a permanent pool should have been analyzed as both an indirect and cumulative impact.

Unaddressed Cumulative Impacts

Cumulative Impacts on Salmon and Steelhead Populations

The analysis of cumulative impacts on salmon and steelhead populations fails to consider many important factors that adversely affect these populations. As a result, the analysis does not meet the requirements for SEPA. Salmon population sustainability is influenced by the cumulative effects of many factors operating over the life cycle of these species. The factors operate over a vast expanse of freshwater and ocean environments across the extensive life history migrations of these species. These factors include the quality of diverse habitats, harvest impacts (in both the ocean and river), predation, climate and ocean conditions, and hatchery interactions, among others. These factors can have significant near term and cumulative impacts on survival in combination with the population's intrinsic productivity (i.e., its existing natural ability to grow and replace itself) (Mobrand et al. 1997; Blair et al. 2009; Ulaski et al. 2025). Even seemingly small impacts on the landscape, when repeated or combined with other stressors over time and space, can contribute incrementally to substantial cumulative harm (Ulaski et al. 2025).

The modeling approach to assess the cumulative impacts of many of these factors on salmon populations in the DEIS employed the EDT Model, which was developed on the concepts and algorithms described in Mobrand et al. (1997) and Blair et al. (2009); the model is conceptually sound to assess cumulative impacts. However, the modeling did not incorporate several factors that have significant effects on life cycle productivity, namely fishery exploitation, changes in Chinook age structure, maturation rates, body size, and fecundity. Since the 1980s, the total exploitation rate on coastal fall Chinook, including Chehalis fall Chinook, has averaged 60% and shows no decline over time as had been expected under the Pacific Salmon Treaty (CBD & PR 2023; CTC 2023). It is certain that the total exploitation rate on Chehalis spring Chinook, while probably not as high, is exceeding a sustainable rate (CBD & PR 2023). The DEIS fails to analyze impacts to future salmonid harvest both locally, and throughout the Pacific Rim.

Compounding the situation, the age structure and body size of Washington coastal Chinook, including Chehalis populations, have declined in recent decades, resulting in reduced fecundity and therefore the intrinsic productivity of these populations (Ohlberger et al. 2018; Malick et al. 2023). The EDT Model was not updated to incorporate these changes, and without these updates, the model project Chinook population performance that is too high.

Another factor that was not incorporated into the modeling efforts is the hybridization that is now known to be occurring between spring and fall Chinook in the Chehalis Basin (Thompson et al. 2019b), which is having an adverse impact on the spring Chinook population (Thompson et al. 2019a). Hybridization should have been discussed in the DEIS because it adds a further burden to spring Chinook in the Chehalis Basin.

In addition, the survival rules in the EDT Model, as configured for the Chehalis Basin, do not sufficiently account for high predation rates that are occurring on Chehalis Chinook due to large numbers of smallmouth bass in the mainstem Chehalis River (Winkowski et al. 2024) and the increasing population of pinnipeds (e.g., seals and sealions) in Grays Harbor and along the Washington Coast (Clark 2025).

The EDT Model was not updated to incorporate these factors, meaning that the cumulative impacts of all factors together are much greater than described in the DEIS. The added contribution of the proposed project is therefore much greater than described in the DEIS.

Cumulative Land Use Impacts

Although the DEIS acknowledges that potential cumulative impacts might occur, little attention is given to assessing any specifics around these types of cumulative impacts related to land use.

> *"New construction in the study area is expected to be concentrated in Urban Growth Areas and incorporated areas, such as Chehalis and Centralia. Potential for future expansion of agriculture, rural, residential, and commercial development could contribute to impacts. However, compliance with permit requirements would minimize these impacts. While the potential expansion of development would increase the intensity or density of land use, consistency with Comprehensive Plans and zoning would decrease the potential for adverse impacts"* (DEIS Chapter 6.4.7 Land Use, pg. 258).

Particularly given climate change projections, any such expansion would put more people and assets at risk, increasing the risk of future flood damage. To be consistent with project goals, new development should not occur in flood-prone areas (including the area that would be impacted by a catastrophic dam failure with a full reservoir pool).

Unjustified Expandable Design Impacts and Costs

As was the case with the 2020 EIS, the 2025 DEIS analyzes an 'expandable dam' which "may or may not be built in the future" (DEIS Section 2.3.2, page 8) based on the specific project proposed by the FCZD and does not consider any potentially less environmentally damaging, smaller footprint, non-expandable structure aligned with the FCZDs stated purpose. Why is the scale of such a facility, and the associated costs of the geotechnical investigations, engineering design, and vast volume of materials and time necessary to build the expanded foundation, additional conduits, etc. needed to meet the project's stated purpose and objectives?

The shift to a revised upstream location and change to a curved design footprint results in a project width that is 700 feet wider at the crest (a 45% increase in width) and an increase in length from 1,550 feet to 2,250 feet. The corresponding increase in the volume of the dam (which would consist mostly of concrete) would be more than 65% for the FRE from 870,000 to 1,470,000 cubic yards (DEIS Appendix 1, Section 3.2.6, pg. 37).

The expandable base and location together increase the geotechnical design and construction complexities, with an even larger base zone needed to *"found the dam on a large concrete mat/shaping block overlying weathered rock"* over which the roller-compacted concrete dam would be constructed (HDR 2025, page 3).

Constructing a base sufficient for the dam to be expandable at the new location requires deeper excavation, more water withdrawal from the river throughout the years of construction, more grouting, more mining of more rock, more concrete production and greenhouse gas emissions, a larger construction footprint, and a larger footprint and longer duration construction impacts. The expandable design increases impacts over and above what would be required solely to meet the FCZD's stated purpose and objectives.

The totality of the additional costs of the design, analyses, and construction and operation costs associated with this possible future purpose, as compared to its stated purpose, are not clearly laid out. However, the possibility of a future permanent reservoir is clearly being factored into the proposed project, the project's design and analyses, and the anticipated construction costs and operational considerations of the dam, with additional elevation/increased height and elevation of the dam crest, as well as the spillway extent required for the expandable aspect being necessary parts of the structural and geotechnical design of the FRE.

The supporting materials to the 2024 revised project description report clearly anticipate the possibility of a future expanded dam with a permanent reservoir, as indicated by the following quotes, among others.

- "The proposed dam will be designed as an expandable flood retention structure, meaning the dam would be capable of future vertical expansion that would increase the dam height to provide a combination of flood control storage and permanent reservoir storage" (Appendix E – Conceptual Geotechnical Design Report page 3).
- "The proposed dam design includes the ability to expand in the future and provide a permanent reservoir if this expansion occurs. Therefore, HDR's recommendations for the foundation treatment plan consider the seepage potential created by additional hydrostatic pressure from the presence of a permanent pool" (Appendix E – Conceptual Geotechnical Design Report page 6).
- "The proposed dam design includes the ability to expand in the future and provide a permanent reservoir if this expansion occurs." (Appendix B: Technical Memo: Foundation Treatments April 24, 2024, page 5).
- "To simplify fish passage gate design and stilling basin size, a 9-foot-diameter evacuation conduit would be included for high head flow releases to provide large flow releases when the fish passage conduit gates are closed during a flood retention event. This also would allow regular flow releases for the FRE-FC condition with a permanent pool" (Appendix D2 Fish Passage and Evacuation Conduits, page 5).
- "During preliminary design, the expected thalweg and sediment transport location will be further evaluated and additional modification to the upstream approach channel considered. Additional details also need to be considered for the fish passage conduits and to evaluate conduit stilling basin performance during partial gate opening for the FRE-FC" (Appendix D2 Fish Passage and Evacuation Conduits, page 22).
- "The fish passage conduits are primarily intended to function with the FRE structure, where the gates are normally open for fish passage and only closed for flood retention. During initial phases of flood retention, the fish passage gates would be used to regulate the flow until flow control is transferred to the evacuation conduit. After the fish passage gates are closed, the evacuation conduit would be used for reservoir releases. Three of the five fish passage conduits would be permanently closed for the flood retention expandable – future condition (FRE-FC) structure. The two remaining fish passage conduits would be used for emergency flood releases or reservoir drawdown. For the FRE-FC, normal flow releases would be through the water quality ports" (Appendix D2 Fish Passage and Evacuation Conduits, page 2).

These statements directly contradict the seemingly definitive statements made in the description of the FRE Structure in DEIS Appendix 1 Section 3.1.3 "*The proposed FRE facility is considered to be expandable because it would be built with a foundation, hydraulic structure, and additional conduits so as not to preclude the future construction of a larger structure that could increase the design water storage in the temporary reservoir from 62,000 acre-feet up to 130,000 acre-feet. This expansion may or may not occur. If pursued, it would be subject to a separate environmental review and permitting process. As such, a future potential expanded facility is not included in the current project description.*".

Omissions of Major Costs for the FRE

The Revised DEIS estimates the cost of the FRE project at $1.3 to $2.3 billion (HDR 2025b). However, this estimate grossly underestimates the likely actual project cost because it omits multiple components of the proposed project, including but not limited to major components of permitting, construction, site development, operations, mitigation design, construction, monitoring, and facility life-cycle costs that would be essential to project completion and operation. Inclusion of these numerous and substantive omitted elements would substantially increase the total project cost and thus these omissions raise serious concerns regarding constructability, feasibility, and purported cost benefit.

Major omitted or inadequately described cost elements identified in the 2024 and 2025 project designs include, but are not limited to:

- Stockpiling site development, haul, and stabilization (minimum of 5 million cubic yards of excavation and hauling (500,000+ truck trips)
- Water sourcing for construction (with high potential for water import and storage)
- Foundation excavation dewatering
- Foundation excavation stabilization
- Water treatment and management
- Bypass channel management (barrier for summer hydrologic loss associated with foundation excavation and dewatering and barrier to contain winter floods while foundation excavation is open)
- Deep foundation excavation (160 feet) into weathered and fractured bedrock and stabilization
- Large, deep-seated landslide stabilization (both within foundation and throughout reservoir)
- Complex cutoff wall excavation, stabilization, materials, and construction
- Schedule delays
- Additional grouting and foundation treatment acknowledged, but not described
- Coring and grouting water treatment
- Imported structural concrete aggregate and steel
- Imported materials, such as fly ash and steel, that currently may have steep tariffs
- Armoring sediment bypass tunnels (conduits) to prevent erosion. Bedload transport through the tunnel Mud Mountain Dam threatened the integrity of the dam and required expensive maintenance (Auel et al. 2017)
- Development, implementation, monitoring and adaptive management of the proposed vegetation management plan and compensatory mitigation
- Regular FRE Operations staffing, monitoring, maintenance
- Facility insurance, taxes, licensing, regulatory reporting, certification and other compliance and administrative needs
- Additional facility and structure damages repair and maintenance, e.g. post flood event damages
- Land acquisition needed through easements and control or management obligations (dam site, reservoir footprint, mitigation lands, access roads/easements, soil disposal areas)
- Likely risks (diversion exceedance during construction, foundation risk, litigation with tribes)

The *Technical Review of FRE Construction and Operations Impacts Memo* (NSD and Saturna Watershed Sciences 2026c), showed that just the omitted project elements related to foundation excavation and stockpiling alone could potentially add $1 billion to $2 billion additional dollars to the construction cost. It is important that decision makers and the public are aware of the incomplete nature of the construction costs and the reasonable likelihood that they will substantially increase from that currently disclosed in order to determine the course of action to achieve the Chehalis Basin Strategy's goal of flood damage reductions across the Chehalis Basin.

Continued Omissions and Inadequate Impacts Analysis

While some aspects of the substantial issues raised regarding the adequacy of the 2020 DEIS impact analysis have been at least cursorily addressed in the 2025 DEIS, multiple substantive issues remain omitted or inadequately considered.

- Significant omissions related to dam construction:

        - Water use and water supply
        - Materials production at quarries and stockpiling of dam excavation materials
        - Geotechnical uncertainty related to FRE dam foundation design
        - Infeasible FRE dam construction schedule
        - Misleading and incomplete construction cost estimate.
    - Significant omissions related to dam operations:
        - Infeasible reservoir drawdown rate
        - Elevated turbidity during drawdown
        - The loss of floodplain groundwater recharge
        - Infeasible and inadequate vegetation management
        - Landslide risk, sedimentation, and impacts associated with catastrophic failure
        - Claims of a "free flowing" condition and fish passage
    - Continued inadequate representation of direct and indirect impacts from the cascade of connected natural processes
    - Inadequate analysis of impacts from quarries and complexity of permitting new quarries
    - Inadequate representation of climate change
    - Inadequate representation of regulatory permitting approval complexity

Omissions related to Construction Feasibility, Water Supply, and Water Quality Impacts

There are four key issues related to the constructability of the proposed FRE dam and operational elements that reveal fundamental flaws in the analysis presented in the DEIS and that challenge the basic feasibility of the proposed project. These issues relate to:

- duration, volume, and timing of surface water withdrawal
- implications of the proposed dam location and drawdown rate for landslide stability
- implications of geotechnical, water withdrawal, and construction complexity on the construction duration and schedule, and
- the implications of these factors as well as others on escalating project costs.

We conclude that:

- There are fundamental flaws with key elements of the proposed construction methods that call into question whether the proposed project is feasible under existing state law.
- The scale and intensity of dam operations and consequent impacts are more significant than disclosed in the DEIS and the analysis presented in the DEIS includes substantial errors.
- The mitigation proposed for the understated impacts does not adequately minimize the significance of the impacts.
- The likely duration/construction schedule and the cost of the project have been grossly underestimated and misrepresented.
- Consequently, the information presented in the DEIS and related documents misinforms decision makers, the public, and permitting agencies about the intensity, duration, and nature of the impacts from the proposed dam and its cost. We also conclude that the construction and operation of the FRE dam would result in significant and unmitigable impacts.

Water Supply Issues

The DEIS did not adequately identify and analyze the water use necessary to complete the proposed project. There was no evaluation of impacts from water withdrawal on water quality, wetlands, wildlife, or aquatic species and habitats in the DEIS, and no potential mitigation measures were included.

Water availability is a cornerstone of FRE construction feasibility as the FRE dam cannot be constructed without a significant source of water. Given the state of the watershed and existing instream flow laws, water withdrawals from the Chehalis River sufficient for this project are likely infeasible. In the unlikely event that a withdrawal permit was obtained, the construction methods, project costs, and schedule would be significantly influenced by water availability and constitute a major change of the assumptions used to develop the DEIS and likely the Mitigation Plan (though that cannot be ascertained as one was not provided for public review).
Water withdrawals from the Chehalis River would have an undisclosed direct and significant impact on the river and its water quality, wetlands, wildlife, aquatic habitats and species, downstream water users, and Tribal treaty rights. The required water withdrawals would have implications for all aspects of project construction, including duration/schedule and cost, and on the feasibility of any mitigation measures that depend on water within the river.
In Summary:

- The proposed FRE dam construction would require substantial volumes of water due to the scale of concrete placement and associated construction activities. Despite this, the 2025 DEIS provides only a single high-level reference to construction-related water withdrawals and omits quantitative analysis, sourcing methods, alternatives, impacts, or mitigation measures. This omission is significant given that the project would require an order of municipal-scale water use over multiple years. The 2024 Revised Project Description Report (RPDR) partially fills this gap by estimating construction water demand at approximately 2,000,000 gallons per day (gpd), but this estimate is not carried forward or analyzed in the DEIS.
- The RPDR proposes that construction water would likely be obtained from surface water withdrawals from the Chehalis River, with a feasibility study to be conducted later to determine water rights requirements. However, the Chehalis River basin is heavily regulated under Washington State instream flow rules (WAC 173-522) and is largely closed to new surface water appropriations due to chronic low flows and overallocation. DOE guidance indicates that new non-mitigated surface water rights in such basins are difficult or effectively unavailable, and any new right would require fully protective mitigation and interruptible conditions. As a result, the assumption that a large, multi-year surface water withdrawal could be permitted is highly uncertain and likely infeasible.
- The proposed withdrawal rate of 2,000,000 gpd constitutes a very large water right in regulatory and practical terms. For context, this volume exceeds the City of Chehalis' existing surface water allocation and is comparable to a municipal supply serving tens of thousands of people. Further complicating this issue, updated design information indicates that the volume of concrete required for the project has increased by approximately 25 percent relative to the RPDR, implying an even greater water demand. The DEIS does not disclose updated water use quantities, clarify whether the stated rate represents a 24-hour or workday withdrawal, or identify peak demand rates, all of which are critical for evaluating instream flow impacts to the river's ecosystem and to downstream water right holders.
- Analysis of recent hydrologic data demonstrates that minimum instream flow requirements in the Chehalis River are routinely not met during the summer low-flow season. From water years 2020 through 2024, instream flows were below regulatory thresholds for an average of approximately 102 days per year, with some years exceeding 150 days of curtailment conditions. Flows at the proposed FRE site are lower than those measured at the downstream Doty gauge, with summer base flows estimated around 20 cubic feet per second (cfs) or less. Under these conditions, even a 3 cfs withdrawal would represent a substantial proportion of available flow and could severely degrade aquatic habitat or eliminate surface flow altogether during critical periods.
- Given these hydrologic and regulatory constraints, the feasibility of meeting construction water needs through surface water withdrawals is extremely limited. Even if a permit were obtained, water would likely only be available during higher-flow winter months, when turbidity and weather conditions complicate roller-compacted concrete production and

placement. Outside of these periods, water would need to be imported from off-site sources, potentially requiring hundreds of tanker truck deliveries per day. This would introduce major logistical challenges, significantly increase costs, and further extend the construction schedule. These feasibility risks and environmental impacts were not adequately disclosed or analyzed in the DEIS and represent a major deficiency in the project's environmental review.

Dewatering, Stream Bypass, Water Discharge, and Treatment

The DEIS did not adequately identify and analyze the project elements related to construction dewatering, water discharge, and water treatment. There was no evaluation of impacts on water quality, wetlands, wildlife, or aquatic species and habitats in the DEIS, and no potential mitigation measures were included. These construction elements would have undisclosed additional direct and significant adverse impacts on the river and its water quality, wetlands, wildlife, aquatic habitats and species, downstream water users, and Tribal treaty rights. These elements would have implications for all aspects of project construction, including duration/schedule and cost, and on the likely feasibility of proposed mitigation measures that depend on water quality (though that cannot be ascertained as one was not provided for public review). These project elements have the potential to cause irrecoverable harm to Waters of the U.S., Waters of the State, and to aquatic species and habitats and subsequently cultural and treaty-protected resources.
Major project elements that require dewatering include:

- Excavation of temporary diversion channel
- Excavation of FRE foundation, including floating concrete mat and cut-off wall

Construction-related water discharge would include dewatering from foundation excavation, grout curtain construction and coring, concrete processing, concrete construction, and quarry rock processing. Many of the discharge vectors would require treatment methods to maintain adequate water quality. Discharging construction-related water could affect both surface and groundwater conditions adjacent to and downstream of the discharging locations; the discharged water could ultimately re-enter the Chehalis River and associated Waters of the US and Waters of the State, including federal and state-regulated wetlands along the river.

Foundation construction for the FRE dam would require extensive dewatering, and the Applicant's own supporting documents acknowledge continuous groundwater inflow through the rock mass and the need to pump and potentially treat water before discharge to the Chehalis River. Although the DEIS describes dewatering as "brief," the described phasing and the scale/depth of excavation indicate that dewatering would persist for a time ranging from months to more than a year, likely with near-continuous pumping due to groundwater seepage, hyporheic exchange, precipitation/runoff, and cofferdam leakage. This mismatch between language ("brief") and apparent duration and complexity represents a material under-disclosure in the impact analysis.

The foundation excavation and cutoff wall concept introduces particularly high dewatering risk because excavation depths are on the order of ~160 feet below the existing floodplain surface, extending below the Chehalis River and crossing the channel/floodplain footprint. This is important information to inform an impact analysis and while the information was available prior to the DEIS publication, it was not considered in the impact analysis.

The cutoff wall is described as a low permeability, engineered backfill element installed through weathered siltstone into fresh siltstone, beneath a thick concrete mat, with trench excavation and backfill methods that are not fully disclosed. Excavating and stabilizing a deep vertical trench in saturated conditions typically requires sophisticated slurry/shoring systems, staged excavation, and intensive pumping—yet the DEIS provides insufficient detail on trench width, stabilization approach, dewatering sequencing, or how these actions interact with river hydraulics and flood contingencies.

The dewatering conditions directly implicate instream flow and fish passage feasibility, especially because construction would occur across seasons and maintain open excavations for extended periods

while subgrade preparation and grouting proceed. A key unaddressed risk is induced loss of surface flow to the excavation during low-flow periods: pumping from a deep excavation adjacent to (and below) a river can capture hyporheic flow and potentially draw down connected groundwater, thereby reducing bypass-channel flows or even dewatering reaches of the Chehalis River through the project area. The DEIS does not present a quantitative assessment of potential drawdown, capture zones, or bypass-channel maintenance requirements during low-flow periods, despite proposing fish passage continuity as an essential project element.

The stream bypass and phasing plan shown for the earlier design appears incompatible with the 2025 foundation design elements (deep excavation, concrete mat, cutoff trench/wall). If the bypass alignment overlies the dam axis and the foundation trench area, then the physical space and sequencing required to excavate, dewater, construct cutoff features, and maintain stable bypass hydraulics over multiple seasons becomes highly constrained. The likely result is a longer construction duration and increased exposure of the bypass to both low-flow and flood conditions, amplifying risk to fish passage, aquatic habitat continuity, and downstream water users—yet these duration and feasibility consequences were not part of the DEIS impact analysis.

Rock coring and grouting for the FRE dam foundation would involve installation of a deep, two-row grout curtain with treatment depths extending up to approximately 220 feet below the dam, generating substantial volumes of contaminated wastewater from drilling fluids, rock cuttings, additives, and grout materials that are explicitly treated under industry standards as controlled waste streams. These effluents are typically highly alkaline and sediment-laden and may contain metals and chemical additives that pose serious risks to water quality, aquatic life, and downstream users if discharged without rigorous treatment. Because coring, grouting, cutoff wall construction, and deep foundation excavation would occur concurrently within an actively dewatered excavation area located well below the Chehalis River channel, there is a high likelihood of cross-contamination between dewatering discharges and drilling/grouting wastewater, increasing the risk of turbidity, elevated pH, and chemical contamination in the river. The DEIS does not disclose expected wastewater volumes, treatment methods, discharge locations, monitoring requirements, or contingency measures, nor does it account for the significant cost and complexity of managing these waste streams. As a result, the DEIS and Mitigation Plan fail to adequately assess or address the probable significant adverse impacts of grouting and coring on water quality, aquatic habitats, and associated treaty-protected resources, rendering the analysis incomplete and insufficient to support a finding of mitigated impacts.

Concrete production for the FRE project would occur at a substantially large on-site batch facility to support the placement of well over 1.5 million cubic yards of roller-compacted concrete, with updated estimates indicating substantial increases beyond those analyzed in the DEIS and additional volumes likely required for the cutoff wall. The proposed production rates—up to 1,000 cubic yards per hour with peak placement approaching 9,500 cubic yards per day—far exceed typical central-mix plant capacities and imply continuous, high-intensity operations involving extensive aggregate hauling, material handling, and washout activities within a roughly 40-acre processing area adjacent to the Chehalis River. Such operations would generate large volumes of highly alkaline wash water and slurry, along with sediment-laden stormwater runoff, all of which pose significant risks to water quality if not rigorously contained, treated, and permitted. Despite these risks, the DEIS does not disclose how concrete wash water, plant runoff, or stormwater would be managed, whether industrial stormwater or individual NPDES permits would be required, or how pH and turbidity standards would be maintained. This lack of analysis and disclosure prevents a meaningful assessment of water-quality impacts and subsequently impacts any actions identified in a mitigation plan to address the probable significant adverse effects to aquatic habitat and associated treaty-protected resources arising from concrete processing activities.

Stockpiling Scale and Impacts

Based on the FCZD's information, a minimum of 5 million cubic yards of material would be generated for stockpiling (DEIS Appendix 1; HDR, 2025c), a volume substantially greater than prior estimates and equivalent to hundreds of thousands of truckloads and a stockpile height exceeding 100 feet in

height if concentrated in limited areas. The DEIS does not disclose the locations, methods, or stabilization approaches for excavation spoils, quarry overburden, or aggregate processing waste, precluding meaningful evaluation of impacts and costs. While the DEIS suggests that disposal would likely occur within the temporary reservoir area, the only feasible terrain in that area is the Chehalis River floodplain, where stockpiles would be vulnerable to instability, erosion, and channel migration, with a high likelihood of increased sediment delivery to the Chehalis River and adjacent tributaries. A stockpile location depicted in the DEIS appears to be immediately adjacent to nearly a mile of stream and riparian habitat, placing it within a channel migration zone and posing risks to aquatic resources, infrastructure, and public safety.

The lack of stockpile site location(s) and plans is an omission that results in undisclosed impacts, likely to aquatic species and habitats, and the inability to determine if proposed mitigation is adequate. Furthermore, it is likely to be a significant additional project cost.

Quarries Scale and Impacts

The proposed quarry components of the FRE project are large in scale and intensity, with each quarry occupying an estimated 65-acre footprint and supporting sustained operations including blasting, crushing, washing, water treatment, stockpiling, and hauling over multiple years. Aggregate demand has increased substantially since early project estimates, rendering previously disclosed operational assumptions underestimated and implying longer durations and higher levels of disturbance than acknowledged in the DEIS. Each quarry would remove well over 2 million cubic yards of material and are proposed to be located immediately adjacent to the Chehalis River, placing quarry faces, overburden areas, and support facilities directly within sensitive floodplain, wetland, and channel migration zones.

Despite these conditions, the DEIS provides little site-specific information on groundwater and surface water interactions, stormwater management, habitat protection, or shoreline compliance, and the proposed quarry sites are not currently zoned for mineral resource extraction. Given the absence of detailed quarry plans, publicly accessible mitigation measures, and no-net-loss demonstrations required under SEPA and the Shoreline Management Act, the DEIS does not meet the analytical standards typically applied to quarries in similar ecological and regulatory settings and fails to adequately disclose or address the high likelihood of significant and potentially irreparable impacts to aquatic resources and subsequently treaty-protected interests.

Foundation Design Uncertainties

The proposed FRE dam foundation design is characterized by substantial geotechnical uncertainty that undermines the feasibility assumptions presented in the DEIS. Site investigations reveal unusually thick zones of highly to moderately weathered bedrock beneath the right abutment, with fresh rock occurring as deep as 168 feet below ground surface, yet the FCZD proposes to found the dam on weathered rock using a concrete mat, cutoff wall, grout curtain, and consolidation grouting—an approach for which there is little to no precedent for large RCC gravity-arch dams. Both case histories and the FCZD's consultants acknowledge that geological and geotechnical conditions are the leading causes of concrete dam failures and that the FRE site contains many of the known risk factors, including weathered rock, weak zones, and complex volcanic geology.

The DEIS further concedes that critical subsurface conditions remain poorly defined and that additional excavation, ground improvement, or design modifications may be required during final design. These unresolved uncertainties introduce significant risk of design changes, extended construction duration, and major cost increases, and they invalidate key assumptions underlying the DEIS impact analysis, which does not account for the likelihood of altered foundation design, prolonged construction, and associated environmental impacts.

Extended Construction Schedule and Uncertainties

The FRE dam construction schedule presented in the DEIS is not supported by disclosed analysis and is likely infeasible given the project's scale, complexity, and known uncertainties. Although the DEIS

assumes a five-year construction duration, it does not account for major design elements added in 2025 (including the concrete mat and cutoff wall), increased concrete volumes (approximately 25 percent greater than previously disclosed), expanded foundation preparation requirements, or documented regulatory, hydrologic, and seasonal constraints such as instream work windows, surface water withdrawal curtailments, weather delays, and water-quality limitations on concrete production.

Recent hydrologic data indicate that surface water withdrawals would have been restricted approximately 25 percent of the time over the past five years, which alone would significantly delay construction activities reliant on water availability. Because concrete production and foundation work are primary drivers of construction sequencing, the omission of these factors renders the five-year schedule unrealistic. The FCZD has already indicated a need to triple the standard 31 day in-water work window (August 1 to 31) to 90 days (July 1 to September 30), every year of construction. Extended construction delays would require even more work outside the standard in-water work window and/or additional years with the river in the bypass channel and additional years of impacts to the aquatic and terrestrial habitats and species surrounding the construction zone.

In addition, the DEIS fails to anticipate the possibility of non-continuous construction activity due to seasonal wildlife restrictions. These seasonal restrictions are proposed by the DEIS as mitigation measures to minimize disturbance impacts to wildlife (e.g., amphibians, bald eagles, and marbled murrelets) but then are not incorporated into estimates of construction duration. Additional concurrent years of disturbance due to construction activities spanning a greater number of years would occur, increasing the duration and potential severity of wildlife impacts over what was considered in the DEIS. The DEIS references a requirement to avoid noise disturbance for bald eagles until after August 1. While at the same time failing to state the noise disturbance avoidance date for marbled murrelet which is typically set later than August 1. Delaying disturbance-level (our louder) noise generation until late summer in any given year would prolong the project construction period and create tangible issues vis a vis aquatic species, erosion and runoff potential, and water quality.

The proponent also incorrectly assumes that construction of the FRE Facility would be completed within 4 - 6 years based on a presumed approval of an in-water work window (IWWW) extension for the required Hydraulic Project Approval (HPA). WDFW has the authority to modify timing windows if the proponent can demonstrate there is a low risk to fish life, but to date no such approval has occurred. WAC 220-660-110 (2) states "Work in or near watercourses can harm fish life including incubating eggs and fry, juveniles, spawning adults, and other sensitive life history stages.

Therefore, work must occur at times of the year when the risk to fish life is reduced or can be avoided." September is a critical time for spring Chinook spawning near the construction area and juvenile coho, steelhead, fall Chinook, rainbow trout, and cutthroat trout utilize the construction area for up and downstream movement. Extending the work window will negatively affect critical spawning habitat and migration corridors for juvenile and adult salmonids.

A longer construction duration is therefore likely and would result in extended environmental disturbance, prolonged need for the bypass channel and related impacts to fish passage, increased duration of water-quality risks, and greater effects to salmon, aquatic habitat and wildlife, none of which were disclosed or evaluated in the DEIS.

Underestimated Construction Costs

The construction cost estimate presented in the DEIS for the FRE project ($1.3–$2.3 billion) substantially understates the true cost of the project by omitting numerous essential and high-cost elements required for construction, operation, and long-term performance. Key missing cost components include water sourcing and treatment, deep foundation excavation and dewatering, stockpile development and stabilization for at least five million cubic yards of material, landslide stabilization, complex cutoff wall construction, bypass channel management, additional grouting and coring wastewater treatment, schedule delays, operations and maintenance, land acquisition, adaptive mitigation and vegetation management.

A planning-level cost example for just two omitted elements—deep foundation excavation and stockpiling—indicates potential additional costs on the order of $1.0 to $1.7 billion, exceeding or rivaling the entire stated project estimate. When combined with construction cost escalation, inflation to the anticipated 2030 start date, and risks associated with tariffs, litigation, and geotechnical uncertainty, the total project cost is likely far higher than disclosed. As a result, the DEIS presents a materially incomplete and misleading cost estimate, preventing decision makers and the public from accurately evaluating project feasibility, cost-effectiveness, and reasonable alternatives such as property acquisition or structural floodproofing.

Water Quality Implications

The proposed FRE would have negative effects on both stream temperature and dissolved oxygen (DO) during construction long term, in addition to elevated turbidity during construction and following drawdown during proposed FRE operations. The DEIS does not acknowledge the full significance of these impacts and proposed mitigation actions are uncertain given lack of public review opportunity to address water quality impacts.

Misinterpretation of Washington Administrative Code

Appendix N Section 2.2.2.4 acknowledges that "major causes of water quality impairment in the upper Chehalis Basin include degraded riparian conditions," which is a human-caused condition. The interpretation of WAC 173-201A-200 that a 0.3°C increase in stream temperature is the threshold for 'significant impacts' is flawed (Appendix N, page 58), because the Chehalis River's temperature is warmer than state criteria due to human-caused conditions.

Any increase in temperature resulting from the proposed FRE should thus be considered significant in a Water of the State that is already thermally impaired. In addition to misinterpreting the WAC, the proposed action would not align with water quality recovery efforts being implemented by DOE based on the Chehalis River's 303d listing and established TMDLs.

Construction Related Impacts

Construction of the proposed FRE would impact water quality directly by removal of riparian canopy that currently provides shade to the river, in addition to indirect effects of surface water withdrawals, if surface water from the Chehalis is used for construction as proposed. Construction impacts to existing landcover associated with the proposed project include the permanent removal of 53.1 acres of evergreen forest and the temporary removal of 34.5 acres of evergreen forest (Appendix N, section 3.2.1.1.1.1). Appendix N page 61 indicates that *"Once construction of the FRE facility foundation is complete, the bypass system would be removed, and vegetation would be restored."* The vegetation management plan specifies that fast growing and water-tolerant species such as willows and alders would be used to revegetate impacted areas. These species do not provide the same functions as evergreen forests and there will be a substantial lag between replanting efforts and the benefits of existing forests such as large wood supply, stream shading, and habitat for invertebrates and other animals that form an important component of food webs for salmonids. Does the sponsor propose mitigation to address these long term impacts, and if so, is it adequate to offset construction impacts (both near and long term?

The DEIS inappropriately concludes that removal of riparian vegetation adjacent to the Chehalis River and Crim Creek during construction of the proposed project would result in negligible effects on water temperature, citing PSU (2025). However, thorough review of the PSU (2025) shading inputs indicates that the construction scenario does not account for all construction related vegetation removal. Specifically, the model appears to include only vegetation removal below the FRE (see PSU 2025, Figure 9), while excluding clearing associated with access roads, quarries, bypass channel, staging areas, and laydown areas located above the proposed facility.

As discussed elsewhere in this document, construction water withdrawals would impact streamflows during periods when minimum baseflow conditions are already not met on an average of 82 days per

year (Appendix N, section 2.2.2.3). If Chehalis River surface water is used for construction as proposed, those withdrawals would reduce baseflow, thereby reducing thermal mass and increasing water temperatures. Because DO and water temperature are negatively correlated, higher stream temperatures would also result in lower DO. The Chehalis River is 303d listed for both temperature and DO and further impacts to these water quality parameters do not align with TMDLs established by DOE.

The DEIS acknowledges (Appendix N, page 73) the potential impacts of summer water withdrawals: "*Some of the most stressful months (e.g., July and August) for cold water species, like rearing juvenile salmonids, are concurrent with when water withdrawal percentages may be greatest.*" As such, the proposed use of surface water for constructing the proposed FRE is not feasible given that existing low flow conditions are already less than the minimum instream flow criteria for the Chehalis River. The DEIS determination that water quality impacts of the proposed project would be "less than significant" is flawed. Given that a mitigation plan was not made available for public review, we are unable to determine if any mitigation for water quality impacts was proposed and if so, whether or that mitigation would be sufficient.

Riparian Canopy and Water Quality in Bypass Channel

The DEIS identifies likely staging areas along the southern channel margins of the Chehalis River upstream of the proposed FRE site (Appendix 1, page 34, Figure 1-9), which abut the channel edge in some locations. The staging area to the south of the proposed FRE site also overlaps with the proposed bypass channel during Phase 1 of construction. While the applicant states that best management practices will be used to avoid removing riparian and upland vegetation, the current alignment of the proposed bypass channel and staging areas, precludes the retention of riparian canopy along the southern channel margins. Riparian canopy to the south of the river channel is especially important for stream shading in northern latitudes. Implementing best management practices in this location is not feasible and construction impacts to riparian and wetland function are thus underestimated in the DEIS.

Omissions related to Dam Operations Feasibility

Infeasible Drawdown Rate and Inundation Duration due to Faulty Analysis

The FCZD utilized flawed geotechnical conditions and analysis conducted for a drawdown rate that dropped from 10 ft/day to 2-ft/day and required 70 days to evacuate the reservoir in a manner that reduced landslide risk. The 10-ft/day drawdown rate proposed for this project was never analyzed. As a result, all impact analyses, fish passage assumptions, mitigation effectiveness determinations, and vegetation management strategies that rely on a 10 ft/day drawdown rate and a typical 32-day inundation duration are infeasible as they are based on flawed analysis.

The DEIS drawdown rate and reservoir inundation duration assumptions for the FRE are based on a flawed and misapplied geotechnical analysis and are not supported by best available science. The DEIS assumes a continuous drawdown rate of up to 10 feet per day, resulting in a 32-day inundation period, citing a 2019 Shannon & Wilson slope stability and landslide evaluation as the basis for the drawdown rate. However, drawdown rate is a critical operational and public-safety parameter, and peer-reviewed literature and dam safety guidance consistently show that rapid drawdown significantly increases the risk of landslide initiation, excessive turbidity, and downstream sediment transport, particularly in watersheds with known instability and hydrologically sensitive soils.

Furthermore, the drawdown scenario analyzed by Shannon & Wilson in 2019 is not the same scenario adopted in the DEIS. The Shannon & Wilson 2019 analysis assumed only a brief initial drawdown of 10 feet per day for approximately 3.8 days, followed by a much slower rate of 2 feet per day specifically to reduce landslide risk. The DEIS instead assumed a sustained 10-foot-per-day drawdown for the entire reservoir, a rate that was never analyzed and that exceeds typical dam safety guidance by a factor of four to ten. Moreover, the Shannon & Wilson 2019 analysis contains internal inconsistencies and errors in factor-of-safety calculations, friction angle assumptions, groundwater conditions, and

landslide geometry that systematically over-predict slope stability during drawdown at the slower analyzed rate.

Correct interpretation of the Shannon & Wilson 2019 modeling results demonstrates that at least one representative landslide (LS-5) would become unstable during drawdown when calibrated parameters are applied, indicating that even 2 feet per day may be too rapid under realistic conditions. Achieving slope stability would require slower drawdown rates and therefore much longer inundation durations than assumed in the DEIS.

The vegetation management plan aligns vegetation management activities with inundation for a maximum period of 32-35 days. While they do acknowledge that reservoir impoundment could be longer (up to 60 days) if storms occur in succession, the approach is fundamentally based on a limited 32-day duration of inundation. The proposed approach to impact minimization promulgated in the Vegetation Management Plan is insufficient to address expected significant impacts on vegetation in the impounded area particularly given the infeasible drawdown rate.

Critically, the DEIS fails to analyze the effects of the very high proposed drawdown rate on fish. The proposed reservoir drawdown rate of 10 feet per day equates to 5 inches per hour, which is 2.5 times higher than the maximum rate of drawdown established in 2022 by WDFW and DOE. In addition, WDFW and DOE regulations currently disallow drawdown during daylight hours between February 16 and June 15 to be protective of salmon fry. The proposed drawdown does not comply with this guidance because it includes daylight drawdown.

Elevated Turbidity During Drawdown

Turbidity would be elevated for weeks following FRE operations during drawdown, versus the hours to days of high turbidity that occur with natural flooding. As described in the DEIS, reservoir drawdown would require 32-60+ days (in the event of successional floods) at current proposed drawdown rates, which exceed the upper end of safe drawdown rates. The current proposed drawdown rates of 10 ft/day are likely to result in excessive landslides within the FRE inundation area due to excess pore water pressure. The DEIS acknowledges that landslides are a major source of excess turbidity (Appendix N, section 2.2.2.4.5). Turbidity downstream of the proposed FRE would likely increase during and following FRE drawdown, prolonging the duration of high turbidity conditions downstream.

Landslides would be highly likely with proposed drawdown rates, which would exacerbate turbidity issues. Slower drawdown would likely be necessary to safely evacuate sediments from the reservoir area and would further prolong high turbidity conditions downstream. These impacts to water quality are not acknowledged in the DEIS.

Thermal Impairment from Changes in Groundwater Recharge

The loss of floodplain groundwater recharge from flood retention during FRE operations would adversely impact baseflows and floodplain wetland function, exacerbating temperature impairment. The DEIS states that 'bank recharge' to the groundwater table or alluvial aquifer could potentially be increased during reservoir drawdown, relative to existing conditions (Appendix N, Section 3.2.2.1.2). Groundwater recharge is directly influenced by the width of the recharge area (Doble et al., 2012). Bank recharge of the alluvial aquifer thus forms a substantially lower exchange rate than the vast areas of floodplain inundation during flood events, which are an important source of groundwater recharge. The assumption that bank recharge from elevated streamflow during reservoir drawdown will offset the losses of groundwater recharge caused by the proposed project is flawed.

The DEIS acknowledges that groundwater contributions can make up to 89% of total streamflow in July, citing USGS (2011). The DEIS also states that summer groundwater temperatures are cooler than surface water temperatures (Page 49 of Appendix N, part 1 per Anchor QEA (2014)). As already indicated above, less water in the stream channel will exacerbate elevated stream temperatures due to less thermal mass. Groundwater inputs to the river channel provide cold contributions to baseflows

during the hot summer months and help to regulate stream temperature. Any loss of groundwater recharge resulting from the proposed project has the potential to reduce these cool water contributions in reaches of the Chehalis that are typically gaining during low flow summer conditions. Was any mitigation proposed to offset the loss of cool groundwater contributions resulting from less floodplain groundwater recharge, and if so, was that mitigation deemed to be sufficient?

Feasibility and Adequacy of Vegetation Management and Mitigation Measures for Water Quality

The proposed VMP to mitigate for the significant impacts of the proposed FRE operations on water quality is not feasible. Flood-tolerant tree species will not grow at the stated rates to provide adequate shade to the river channel between inundation events, during which time the reservoir area will be dry with well-drained soils. The proposed riparian corridor restoration downstream of the FRE site extends for 30 miles and includes many (131) privately owned parcels. The cooperation of those landowners now and in perpetuity is not guaranteed. The proposed riparian restoration also relies on the cooling effects of 30 miles of restored riparian canopy to offset the impacts of the FRE on stream temperature and dissolved oxygen. This spatial lag results in up to 30 miles of stream channel where stream temperatures are elevated and dissolved oxygen is lowered because of the effects of the FRE. As described above, there is also a temporal lag between the impacts of the FRE (e.g. immediately upon construction clearing) and the assumed benefits of riparian shading, which could take decades to become effective.

Furthermore, the VMP references a study by Fuller et al. (2022) to illustrate the perceived benefits of riparian reforestation for improving stream temperature. The Fuller study evaluated small streams with bankfull widths less than 10 meters, despite the fact that the bankfull width of the mainstem Chehalis in the upper basin generally ranges between 30 and 100 meters. This justification for riparian shading effects also conflicts with the DOE 2007 study cited within the VMP, which suggests that trees with heights 1.5 times bankfull width are needed. In the Chehalis, this would require trees 180-250 feet tall, which is substantially larger than the mature height of trees in the proposed VMP.

Within the FRE reservoir area, the VMP also assumes that trees will reach sufficient heights to provide shade on a relatively short timeline of 5-10 years. These assumptions fail to acknowledge the likelihood of shorter recurrence intervals from climate change or the occurrence of multiple operational events in close succession, which would limit plant establishment and maturation due to prolonged (>30 days) and canopy-flooding events (>150 ft).

Omission of Soil Chemistry Impacts

The DEIS fails to address issues related to changes in soil and surface water biogeochemistry in the reservoir area and there is no discussion of changes in wetland, floodplain, or riparian soil biogeochemistry from hydrologic alterations downstream of the site resulting from flood retention. In particular, there is no discussion of changes in soil reduction/oxidation (REDOX), nutrient retention, or impacts to downstream primary productivity driven by changes to nutrient loading. This is another indication of the lack of consideration of the amplification of ecological impacts inherent in the FRE proposal.

Landslide Sedimentation, Stability Impacts, Stabilization, and Risks

Landslides are a pervasive and significant risk within the proposed FRE reservoir. Drawdown during FRE operations would exacerbate landsliding within the reservoir basin due to increased pore water pressures within the soil and colluvium on steep slopes within inundated areas; geotechnical mechanics that are well documented in peer-reviewed literature as landsliding is a common outcome of uniformed dam operations (Morgenstern, 1963; VandenBerge, et al. 2013; Bijeljanin et al. 2008). It is a major omission that the DEIS fails to account for the significant scale and cost of landslide mitigation nor include a disclosure of the full range of potential impacts from landsliding. While we agree with the DEIS conclusions that landsliding would be a significant and unavoidable adverse impact, our review of the DEIS and supporting documents led us to conclude that there are significant errors and

omissions with the disclosed impacts.

Greater Instability Potential and Landslide Occurrence Than Reported

The landslide and slope stability analysis supporting the DEIS does not appear to rely on best available science and likely underestimates the extent and risk of unstable landforms within the proposed FRE reservoir basin. The primary technical studies focus narrowly on relict deep-seated landslides and do not adequately evaluate other hydrologically sensitive mass-wasting processes, such as shallow landslides, debris flows, and erosion, that are known to influence sediment delivery, reservoir function, and aquatic habitat. Geomorphic interpretation using modern LiDAR-derived digital terrain models indicates that additional deep-seated and shallow landslides were not mapped or analyzed, and prior landslide inventories and modeling efforts by DNR and private landowners were not incorporated. Although the DEIS includes updated mapping that increases the number of identified landslides relative to earlier studies, it still underestimates the density and extent of unstable landforms compared to those identified in the 2020 DEIS. This under-representation limits the ability to assess drawdown-induced instability, sediment loading, and associated risks to water quality, aquatic species, reservoir operations, and public safety, and therefore undermines the adequacy of the DEIS impact analysis.

More Sediment Delivery to Chehalis River

Landslides would contribute more sediment to the Chehalis River than under existing conditions because reservoir drawdown procedures would increase landslide occurrence. This increased sediment supply along with the reservoir operations would dramatically alter the sediment transport and deposition conditions within the reservoir and compromise spawning habitat viability. The DEIS determines this would be a significant adverse impact; however, given the potential contribution of landslides, the impact will be much greater than was acknowledged in the DEIS.

Landslide Occurrence and Risk During Full Pool Is Discounted

Reservoir filling and drawdown are well documented to influence slope stability, and if not properly evaluated and engineered, can trigger large-scale landslides with severe consequences. Numerous studies have shown that changes in reservoir water levels alter pore-water pressures and stress conditions in adjacent slopes, increasing the likelihood of failure. The Vajont Dam disaster in Italy is a well-known example of this risk: during reservoir drawdown in 1963, a massive landslide entered the reservoir and generated an impulse displacement wave with a peak height of nearly 800 feet. The resulting overtopping wave devastated downstream communities, nearly obliterating the town of Longarone and causing approximately 2,000 fatalities, demonstrating the catastrophic potential of reservoir-induced slope failures and displacement waves.

The DEIS (Appendix C Environmental Health and Safety discipline report) concludes that significant and unavoidable adverse impacts would result from a catastrophic failure of the FRE facility and would pose a risk to the public. Within Appendix C, they present "*Breach modeling of the extreme case for a hypothetical breach predicted the breach peak outflow at the FRE facility to be 2,231,000 cubic feet per second (cfs) (WSE 2025)*" (page 19). For comparison, that peak outflow is approximately 10 times greater than the mean flow of the Mississippi River. A dam breach hazard with a flow of this significance does not exist under current, no dam, conditions. It is a hazard which would be exclusively created by the construction of a dam and would introduce significant risk to the downstream communities and environment.

Under DOE's Dam Safety Guidelines, the facility would be classified as High Hazard, Class 1A, and "*it is estimated that approximately 10,440 people would be impacted under the Proposed Action*" (page 20); therefore, it is justified to state that the project would create potential impacts that could include the significant loss of human life in the communities downstream of the dam.

Incorrect Conclusions Regarding Downstream Sediment Transport Effects

The DEIS (Appendix F) wrongly claims that there will be insignificant impacts to sediment transport downstream of the proposed FRE. This conclusion is based on a flawed analysis. Reservoir backwatering would trap coarse bedload upstream while fine sediment would accumulate throughout

the reservoir and be released during drawdown without bedload replenishment, creating "hungry water" conditions capable of scouring the downstream channel and adversely effecting aquatic habitats including critical spawning areas for Chinook and steelhead.

During reservoir draining, conduit flows may have sufficient transport capacity for coarse material, but the absence of upstream bedload supply would prevent bed material replacement, leading to channel incision and degradation of wetlands, riparian areas, and floodplain connectivity downstream of the dam. In addition, large pulses of fine sediment released during and after drawdown events, augmented by landslides and erosion derived inputs from the reservoir basin would likely overwhelm downstream reaches, increasing turbidity and burying salmon redds over long distances. These combined processes indicate a high likelihood of downstream channel instability and ecological harm, directly contradicting the DEIS sediment impact conclusions.

Incorrect Conclusions Regarding Free-Flowing Condition and Fish Passage

Claims of dam as 'free flowing' river condition

The FCZD indicates that backwatering upstream of the dam is expected "from flows greater than 9,500 cfs" but does not indicate if this flow volume is at the proposed FRE location, at the Grand Mound USGS gage site (12027500), or at another gage site. More information is needed to understand the expected frequency of backwatering and to determine how backwatering at that interval might influence hydrology, sediment transport, and aquatic habitat.

Appendix 1, Figure 1-3 of the DEIS is completely misleading and wrong. It shows an open channel moving through the dam structure not 5 concrete conduits. Washington state is undergoing significant habitat restoration efforts to restore fish passage per requirements in *U.S. v. Washington (affirmed 138 S. Ct. 735 2018)*, where culverts, not dissimilar to concrete conduits, are not considered natural flow. WDFW design requirements for fish passable culverts require the installation of streambed material within and on top of the culvert bottom. The project proposal is to use smooth bare concrete conduits at the height of the current riverbed, which is not sufficient to pass all fish at all life stages.

The DEIS also fails to fully analyze the potential effects of a high flow even during the bypass phase of construction to salmonids. Such events are not uncommon, with an atmospheric river event causing significant damage to active fish passage construction projects on the Washington Coast as recently as August 2025. There is very high uncertainty with the effectiveness of fish passage values presented in the DEIS and used to determine subsequent impacts to fish passage were the proposed project to proceed. While we agree with the statement on page 140 of Appendix E that these projected effectiveness values "would be a significant adverse impact to fish," the analysis to determine the effectiveness values in the DEIS are insufficient.

Furthermore, the DEIS acknowledges but fails to analyze the impacts of the proposed project's conduits on survival and passage of aquatic organisms when the reservoir is draining. For example, when the water surface elevation in the reservoir exceeds the height of the conduits, the flow velocities and turbulence through the conduits may create dangerous conditions for salmonids in the vicinity of the dam. However, these velocities and their associated hydraulic conditions in the reservoir and downstream when the reservoir is draining were not adequately assessed and documented in the DEIS. This is a gap in the impact analysis for fish and fish habitat that increases the likelihood of the DEIS underestimating impacts on salmonids.

The DEIS acknowledges that the trash rack can prevent fish passage and that fish mortality could occur due to a Howell Bunger flow control valve. However, insufficient operations and maintenance information is provided to understand the plan for debris removal from the trash rack during and after reservoir draining. The long-term presence of debris would prolong the duration of no fish passage far beyond the timeframes described for reservoir drainage. Furthermore, page 3-10 of Attachment 3 of Appendix E notes uncertainty about the maintenance of the trash rack which affects assumptions about fish passage survival rates. In addition, insufficient information is provided on the Howell

Bunger flow control valve, including operations and maintenance to help support assessment of how damaging it could be for fish. The evaluation of environmental impacts is incomplete without key information regarding the operations and maintenance of the proposed project that would affect fish, other aquatic species and their habitat.

The DEIS fails to describe trash rack cleaning, especially in the spring following winter storms, which is a critical life history stage for out-migrating juvenile salmon and steelhead. The amount and type of work being proposed during the spring outmigration period needs to be clearly described to determine if protection of the migrating smolts would even be feasible. In addition, pre-spawning adult Steelhead are migrating upstream throughout the year and post-spawn steelhead adults out-migrate during the spring, so impacts to adult outmigrants needs to be analyzed as well.

The analysis of fish habitat conditions in the bypass channel during construction in the DEIS is inadequate. The DEIS indicates that the hydraulic model was conducted up to the typical seasonal high flows (2,200 cfs) to estimate velocities from which fish passage suitability is inferred. Given the possibility of flows larger than statistical averages and the potential for a longer construction period, the effect of construction of the proposed project on salmon should have included examination of flow conditions higher than the 2-year flood recurrence interval event. The DEIS does not fully analyze, and thereby underestimates, the potential effects to salmonids associated with construction should higher flows occur than the bypass was designed for.

Continued Inadequate Representation of Direct and Indirect Impacts from Cascade of Connected Natural Processes

According to Washington State Code, SEPA must include analysis of "direct and indirect impacts caused by a proposal." WAC 197-11-060(4)(d). Failure to sufficiently analyze indirect impacts, particularly those emanating from disruption to the physical processes that create and sustain fluvial ecosystems renders the DEIS out of compliance. Indirect impacts are those impacts attributable to the project that are not immediate, perhaps induced by the project or an extension of the project.

Synchronous alteration of multiple, connected natural processes that sustain aquatic habitat sets up a positive feedback loop in which the overall impact to ecosystems is amplified relative to the alteration of any one process. Amplification is not addressed in the DEIS, and further, the DEIS significantly misrepresents the scale, intensity, and complexity of all ecosystem impacts, thus under-representing the significant and pervasive consequences for fish, and fisheries.

Inadequate Representation of Impacts on Aquatic Habitats and Fish

While the DEIS correctly concludes that the proposed project would have significant, unavoidable adverse impacts to salmon resources in the Chehalis River Basin, many parts of the analysis of impacts conducted for the 2025 DEIS are flawed. There are multiple gaps in the analysis of the proposed project due to incomplete descriptions, ambiguity in methods, and failure to consider important environmental factors outside the project area and their impacts to fisheries.
Such deficiencies include but are not limited to:

- Numerous modeling issues that affect the overall analyses on which conclusions are based
    - The modeling approach lacks adequate documentation and validation for the analysis
    - Important questions exist about how the outputs from the EDT Model were used in the integrated hybrid model
    - The modeling is seriously flawed given the many errors and inconsistencies found in key inputs to the model, and particularly in what appears to be a mismatch in how EDT outputs were used in the hybrid model
- Inadequate and flawed assessment of the habitat factors that would be impacted
- Highly uncertain assessment of fish passage effectiveness of the proposed project

- Incomplete and inadequate assessment of cumulative impacts that would occur
- The foreclosure of restoration opportunities in the upper river basin
- Impacts on treaty-protected fisheries not fully disclosed
- Failure to include a Mitigation Plan in the DEIS; and
- Underestimation of expected impacts from the proposed project

Most of the issues were identified in comments submitted during the 2020 DEIS and they remain relevant in the 2025 DEIS. The principal concerns with the proposed project remain, as the expected impacts would be significant and unavoidable. Despite the many findings of significant and unavoidable impacts, there are numerous uncertainties and multiple aspects of the analysis methods that suggest that the impacts to fish and fish habitat are even worse than described, which would result in larger declines in fish populations on a more accelerated timeline than described in the DEIS. It should be noted that salmon resources of the Chehalis Basin are a treaty protected right for the Quinault Indian Nation, and a shared resource between WDFW and the Confederated Tribes of the Chehalis, both which would be irreparably harmed by the proposed project. As discussed elsewhere in this document, impacts would be particularly severe for spring and fall Chinook, coho, and steelhead populations in the upper basin.

While the DEIS does characterize impacts from the proposed project on other aquatic resources like lamprey, mountain whitefish, freshwater mussels, amphibians, and macroinvertebrates as significant and adverse (e.g., Appendix E, page 139), the analysis is cursory and thus mechanisms of impact are likely underestimated. These species are important to the aquatic ecosystem of the upper basin and in the case of lamprey, impacts would occur to a culturally important species for area tribes.
The DEIS presents no projection of potential impacts from the proposed project on the Quinault Indian Nation, Confederated Tribes of the Chehalis Reservation or recreational fishers ability to harvest salmon and steelhead. The DEIS effectively ignored these impacts. The ability to harvest both naturally and artificially produced fish is central to the Quinault Indian Nation's ability to exercise Treaty-reserved rights, and on the Confederated Tribes of the Chehalis Reservation's ability to maintain human health and ensure cultural survival. The impacts and losses to these fisheries resources would be unmitigable.

Modeling Issues and Implications

Despite the comments received from a number of parties on the 2020 DEIS, the 2025 DEIS still does not provide sufficient information and data to permit thorough scientific evaluation of the modeling procedures used. As such, there are substantial uncertainties regarding both models, methods, and parameters employed in DEIS modeling.

Numerous inconsistencies and errors were identified in the EDT modeling process applied in the both the 2020 and 2025 DEIS, indicating a lack of adequate Quality Assurance/Quality Control (QA/QC) procedures in the modeling. For example, key attributes of fine sediment, seasonal flow characteristics, and bed scour were attributed incorrectly, resulting in an incorrect and overly high projection of salmon population performance being reflected in the DEIS. Additionally, data limitations and gaps, key assumptions, algorithms and relationships between fish populations and habitat conditions were not adequately described and disclosed. Procedures for parameterization and reach-specific parameter values were not provided or referenced.

Documentation regarding model validation procedures and information necessary to evaluate the effects and magnitude of uncertainties is not provided. Although many of these considerations were acknowledged in the DEIS, substantive analysis was missing. The presentation of modeling results is confusing and hard to follow, particularly with the many graphics shown with modeling results that are not adequately explained (Section 3.2.2, Appendix E.). The lack of documentation regarding model validation procedures and information necessary to evaluate the effects and magnitude of uncertainties is troubling. Although many of these considerations were acknowledged in the DEIS, substantive analysis was missing.

The presentation of modeling results focuses on population equilibrium abundance levels. It does not provide an adequate description of the significance and importance of other metrics of intrinsic productivity, diversity and spatial structure for evaluating resilience and sustainability of salmon populations (McElhany et al. 2000). While the consideration of these other metrics is more extensive than what was provided in the 2020 DEIS, it still lacks sufficient explanation to address the full importance of these metrics to the populations.

Because the modeling analyses did not address harvest-related issues, information on impacts to fisheries, such as Tribal treaty rights and harvest opportunities for in-river and marine fisheries is lacking. The significance of short- and long-term variability in survival in freshwater, estuarine, and marine environments was either entirely ignored or not adequately evaluated. Variability in survival is a critical aspect of evaluating population viability.

The incorporation of climate change effects into the modeling is overly simplistic and not reflective of current science. A more thorough evaluation of climate change is warranted, especially given that much of the modeling analyses were based on projected data.

Additionally, spatial extent of the modeling was limited to two areas that support spawning aggregations. The models were not used to evaluate impacts on spawning aggregations originating outside of these two spatial areas that would still be impacted by the proposed project.

Poor Analysis of Local Actions Alternative

In addition, the effects of the Local Actions Non Dam (LAND) alternative on fish and aquatic habitat were not evaluated using the integrated modeling approach that was used to evaluate other alternatives. LAND was only cursorily assessed and not in a way that supports a well-informed comparison to the proposed project. As discussed elsewhere in this document, given the significant impacts of the proposed project, the DEIS is required to provide a comparison to other alternatives that meet the objectives and may not be as impactful.

Inadequate Representation of Impacts on Plant and Wildlife Resources

Lack of Wildlife Field Surveys

The impact analysis for multiple wildlife species, including marbled murrelet, was not based on any specific surveys that would reflect the actual diversity and abundance of any special status wildlife species within the proposed project impact areas. The lack of key existing conditions surveys results in an inadequate analysis and gross underestimate of impacts on wildlife species, particularly less mobile species like amphibians and reptiles, including those on the WDFW Priority Habitat and Species List, and to especially sensitive ESA listed species like marbled murrelet and yellow-billed cuckoo, as well as to the multitude of bird species protected under the Migratory Bird Treaty Act. This is particularly relevant given that the DEIS notes that, "*An occupied marbled murrelet site was identified approximately one-half mile from the temporary reservoir inundation area* (Wildlife Survey Data Management Database 2024) (Appendix P, p. 48)." Thus, an ESA listed species is known to be present within the vicinity of the directly impacted areas and could be present within an area that would be affected by construction, including blasting to create the construction bypass channel.

Impacts would include direct permanent loss of habitat within the impact area of the proposed project; direct long-term loss of habitat in the quarry footprints; indirect permanent loss due to an increase in human presence as well as impacts from an influx of native and non-native species adapted to human presence including predator species (e.g., crows, ravens, jays); and potentially long term impacts that result from multiple consecutive years of noise disturbance.

Inappropriate Noise Buffer Used for ESA Listed Species Impacts

The use of a 660-foot buffer for analysis of noise impacts to marbled murrelets is inadequate. The 660-foot buffer is a visual and noise buffer used by USFWS for managing impacts to bald eagles. The DEIS correctly states that "*To protect marbled murrelets, DNR Forest Practices Rules require a 0.25-mile disturbance avoidance zone around occupied sites,"* (Appendix P, p. 67)." However, the DEIS fails to

mention that USFWS also uses this 0.25-mile distance. Inclusion of a 0.25-mile buffer around the FRE dam construction area, all developed and operated quarries, and constructed and used haul roads would more accurately capture the disturbance impacts resulting from noise. This would greatly expand the temporary impact acreage and more accurately describe the greater impact on marbled murrelet, Townsend's big-eared bat, and other bird and mammal species than is otherwise assessed. Further, because these impacts would span the duration of the construction period (5+ years) it is highly unlikely that mitigation in the form of seasonal restrictions to avoid the breeding period (April 1 through September 23rd for the marbled murrelet) could be adopted without prolonging the construction period considerably, resulting in additional impacts to all elements of the environment linked to construction duration, including costs.

Underestimated Noise Intensity for Impacts to ESA listed Species

Noise intensity from impact equipment and blasting is underestimated in the DEIS impact analysis and therefore the area directly impacted by impact equipment and blasting noise and thus the implications for all wildlife are under-estimated. The DEIS states that the impact area from noise is estimated to extend to 727.3 acres (Appendix P, Table P-13). This is an underestimation error resulting from an incorrect assessment of impact equipment and blasting noise generation. WSDOT's BA Preparation Manual Chapter 7, Construction Noise Impact Assessment (Revised 2020), states that, *"Noise levels at 50 feet from impact equipment, including pile drivers (Tables 7-5 and 7-6), jackhammers, and rock drills can range from 79 to 114 dBA."* This upper range exceeds the 101 A-weighted decibels (dBA) stated in the DEIS for impact (pile-driving) activities. The manual goes on to state, *"Blasting may be associated with impact equipment use and that noise can reach 126 dBA."* A maximum of 101-dBA is a gross underestimation of likely noise generation if the proposed project were to proceed to construction.

Impacts for ESA Listed Yellow-Billed Cuckoo Not Considered

The DEIS dismisses the potential for federally Threatened yellow-billed cuckoo to occur in the study area and to be affected by the proposed project without conducting any field surveys, and despite having quantified acres of potential habitat. This results in an erroneous DEIS conclusion that possible cuckoo habitat does not occur in the study area. This is despite itemization in the DEIS (Appendix P, Tables P-7 and P-8) of thousands of acres of deciduous forest downstream of the proposed dam location, including black cottonwood dominated forests which are a key component of riparian floodplain habitat favored by the yellow-billed cuckoo, and additional hundreds of acres of mixed forest that occur both downstream and upstream of the proposed project, any large tracts of which could support yellow-billed cuckoos and provide habitat for their recovery.

Poor Analysis of Potential Effects on Bald Eagles and Species Protected Under the Migratory Bird Treaty Act

The 2025 DEIS failed to adequately consider the potential for indirect effects on bald eagle populations downstream of the proposed FRE facility, focusing largely on impacts to eagle nests and nesting behaviors. The DEIS fails to evaluate the potential impacts of both cottonwood forest reduction and salmon declines on bald eagle habitat and prey requirements respectively. The flow alteration under the proposed FRE dam facility would, over time, reduce the extent of cottonwood forests in the Chehalis River floodplain by hundreds of acres and possibly eliminate the habitat elements essential for feeding and sheltering eagles. The DEIS also did not adequately address the potential for reduced prey availability for eagles if the proposed project is constructed. Declines in salmon runs, particularly during late winter, could force eagles to switch to more marginal prey sources (e.g., waterfowl) and thus reduce both adult survival and productivity.

In addition, DOE failed to acknowledge how extensively the proposed project would be inconsistent with the protection afforded by the Migratory Bird Treaty Act for take of birds, their eggs, parts, or nests during both construction and operation of the proposed project. This is most pointedly evident in the analysis of impacts to birds within the 536-846-acre reservoir that would be formed and held for a period of 27 to 34 (even up to 60 days) if the dam is constructed and operated during major to catastrophic flood events (DEIS Exhibit 2-4 page 15).

Cursory Analysis for Impacts to Rare and Culturally Important Plants

The DEIS analysis for the occurrence of rare plant species was insufficient given that the spatial scale used for assessment was done at the County level. This was despite the existence of the DNR Rare

Plants and High-Quality Ecosystems GIS data set and Rare Plant Field Guide available to determine and reference documented occurrences of rare plants within or adjacent to the proposed FRE dam reservoir inundation area, the associated slopes and riparian zones, or the thousands of acres of downstream habitat within the geographic study area. The DEIS similarly failed to conduct any field survey for rare plants within the areas of direct or indirect impacts at the proposed FRE dam site, or the Airport Levee site, despite WDNR providing specific guidance for such surveys and the available field guide with specific habitats, elevations, and occurrence within individual counties. The fact that the DEIS noted the occurrence of 60 rare plant species but failed to evaluate the topic any further proves that the analysis was wholly insufficient. It is unrealistic that any proposed mitigation measure could adequately compensate for impacts via the loss of populations of rare plants and their unique habitats.

The DEIS similarly fails to specifically consider impacts to plants with cultural importance to Tribes. DEIS Appendix Table L-7 presents numerous plants as species ethnographically reported as used by tribal communities, yet fails to analyze direct, indirect, or cumulative impacts from construction or operation of the FRE alternative to any native plant species of cultural importance. Rather Tribal Resources are addressed only in terms of Fish Species and Aquatic Habitats, Wildlife Species and Habitats, Water (e.g., Use and Water Rights), Cultural Resources, Transportation, and Visual Quality. Impacts to hunting practices are vaguely addressed; impacts to gathering practices are not addressed at all.

Poor Analysis of Local Actions Alternative

The DEIS provides an extraordinarily cursory consideration of the Local Actions Alternative, focusing only on the generalized effects of flooding and flows and effects on wildlife and habitats. The DEIS fails to evaluate benefits to wildlife and habitats of buyouts, relocations, flood proofing and related aspects of the Local Action Alternative which would substantially improve conditions for wildlife and habitats by moving human infrastructure out of the floodplain, expanding habitat restoration opportunities, and most significantly not constructing a FRE dam and thus not initiating the cascade of amplifying geomorphic and habitat impacts which would irrevocably alter the river and its floodplain.

Inadequate Analysis of Impacts from Quarries and Complexity of Permitting New Quarries

The FCZD states in Appendix 1 that approximately 2,355,000 cy of aggregate will be needed from quarries for the proposed project and that "*It is assumed that quarry operations would persist through the entire duration of the construction period. The quarry operations associated with the project would cease and the quarry sites would be restored after completion of facility construction*" (App 1, p. 37). However, there is no information provided on what 'restoration' of the quarry sites would entail. Notably, restoration of such large quarries within the basin is likely not feasible. Questions remain regarding quarry 'restoration,' including but not limited to:

- Would quarry sites be re-filled with roughly 2.4M cy of material? If so, what would the source of that material be and would it be treated to prevent the transport of invasive species into the basin?
- Once filled would the quarries be revegetated to pre-impact forest conditions?
- How would hydrology at the quarry sites change with such a large amount of excavation?
- What would the implications be for groundwater recharge and runoff in the Chehalis basin if the quarries were abandoned?
- What would be the anticipated bottom elevation of the proposed quarry sites relative to the river channel elevation?
- Would the quarries be excavated to a depth that would interfere with groundwater or hyporheic flow in the Chehalis River valley bottom?

Additional notable details (or lack thereof) regarding the quarries include:

- Three potential quarries were identified in the project proposal, all located along the Chehalis River, each estimated at approximately 65 acres. The previously considered quarry sites from the 2020 DEIS were removed from consideration due to not having enough suitable rock or for other impact considerations.
- The number of quarries used would be based on rock availability. The FCZD estimates the total disturbance to produce the required aggregate at 40 acres if all required materials are available at a single quarry or 80 acres if two quarries are required. Quarry operations during construction would include blasting, excavation, and crushing of aggregate.
- Up to 195.2 acres of habitats associated with the quarries and access roads, largely of unknown composition would be disturbed/destroyed to develop the quarries.
- Blasting would be used to mine the rock at the quarries, with adverse impacts to sensitive wildlife species.
- The FCZD states that blasting for the FRE facility foundation would occur as often as one to four times per week for approximately 12 months. Blasting would also take place at up to two of the three quarries over the 3-year construction period and would occur one to four times per week up to several times per day during active development of quarries.
- Additional geotechnical borings and surveys would need to be completed to select a quarry or quarries.
- A Surface Mining Reclamation Permit would be required from DNR for the establishment and reclamation of the proposed quarries. For the quarries and roads in managed forest areas, widening or construction would require additional Forest Practices Act permits.
- None of the proposed quarry sites are currently zoned as mineral resource areas; a rezoning or overlay process with associated complexity, time, and cost implications would be necessary to develop these areas as quarries.
- Based on the lack of analysis, the proposed quarries at this point are conceptual in the DEIS. Geotechnical and cultural resource information at the proposed quarries was not made available.

Continued Inadequate Representation of Climate Change

Deficiencies, errors and omissions in the methods employed to evaluate climate change impacts give ample cause for scientific skepticism regarding the reliability of findings and conclusions presented in the DEIS. Ambiguity is rampant, transparency and empirical evidence are lacking, and assumptions and selective bias lead to concerns for unsupported claims and normative science (Lackey 2005). The DEIS employs a siloed approach to discuss climate change considerations with the analysis of impacts limited to the immediate vicinity of the proposed project area. Consideration of cumulative impacts on various resources and consideration of changes in estuarine (including accelerating rates of sea level rise) and marine environments are lacking. Piecemeal considerations of climate change impacts on various resources and ecological processes result in an opaque technical basis for conclusions, anomalous outcomes, extreme uncertainty, and failure to evaluate cumulative impacts (additive, synergistic or antagonistic interactions between impacts and natural processes) across the Chehalis Basin. The DEIS isolates various types of impacts and obfuscates the combined and amplifying impacts of harmful alterations to multiple physical and biological processes.

Projected impacts of climate change are extremely uncertain due to several compounding factors, including:

- methods and outdated models and data used to project the magnitude and direction of change do not represent best available science
- the difficulty of predicting local, national, and global legal, political, economic, and technological developments in response to changing conditions

- the potential for breaching planetary boundary tipping points which are critical thresholds where small changes can lead to large, rapid, and potentially irreversible shifts in sustained feedback loops that disrupt ecological processes
- biophysical response to climate stresses; and
- preparation, adaptation, mitigation (prevention), and remediation (repair) under an accelerating pace of climate change (AR6).

Nonetheless, the DEIS acknowledges significant and unavoidable impacts of the proposed project that will adversely affect natural and cultural resources. The DEIS repeatedly and vaguely refers to mitigation plans that are not presented, but it is doubtful if mitigation could successfully mitigate or compensate for these adverse impacts of the proposed projects on the river ecosystem.

There are also significant deficiencies, errors and omissions in the methods employed to evaluate climate change impacts of alternatives presented in the DEIS, accompanying appendices, technical memos and reports. The DEIS does not contain a separate discipline report that describes the methods employed to project anticipated effects of climate change on the proposed project; instead, only brief descriptions and impacts are provided.

The analyses do not utilize best available science but rather rely on outdated models and socio-economic future scenarios, resulting in low confidence and high uncertainty in projected impacts with climate change, particularly in the considerations of climate change in the EDT modeling of impacts to fish and fisheries and in the hydraulic model projections for mid to late century.

Climate Assessment Methods Do Not Employ Current Best Science

The DEIS does not use best available, current climate science. Methods used for the analysis are based on median values and an ensemble of twelve 5th generation global climate models (GCMs), response scenarios, and dynamic downscaling, available since 2014. Major improvements that have since been incorporated into GCMs (more than 100 models utilized for the 6th phase of the Coupled Model Intercomparison Project (CMIP) have been available for several years, with greater resolution and improved representation of forcing mechanisms, downscaling methods, and response scenarios) but these were not considered or utilized. The 2023 report produced by Portland State University (PSU 2023), one of the main technical reports supporting climate change evaluation in the DEIS, relies on outdated models and prior analyses and fails to consider or evaluate other sources of information, technological developments, and observational data.

The DEIS also does not disclose the basis for selection of models to include in the GCM ensemble. Median values from the 12 GCM ensemble were used for climate projections, with no evaluation or explanation provided for the selection of the 12 GCMs employed in the ensemble from the over forty 5th generation GCMs that were available or the approximately one hundred 6th generation GCM that were utilized to produce the 2023 sixth IPCC Synthesis Report. The median values were derived from twelve GCMs with different representations of forcing mechanisms which were developed for different purposes; consequently, anomalous results appear in the DEIS for peak and low flows and water quality metrics.

Comparison of Alternatives Biased

Transparency is lacking and impacts are biased, overstating both benefits of the proposed project and potential risks of the No Action Alternative. Model projections reflect results from the ensemble of twelve 5th generation GCMs using RCP 8.5 (Representative Concentration Pathway). RCP 8.5 is a high-emissions climate change scenario that represents a future with rapidly increasing greenhouse gases, leading to significant warming (around 4-5°C by 2100) and severe impacts. The use of this RCP presents a best-case scenario for the assertion of potential benefits from flood protection under the proposed project and a worst-case scenario for adverse impacts on fish, wildlife, and cultural resources for the No Action Alternative. This results in an unfairly biased comparison with the proposed project (dam and airport levee) alternative. Neither the Local Action Alternative included in the DEIS, nor

the Local Actions Non Dam (LAND) alternative currently under development within the Chehalis Basin Strategy as part of the model comparative analysis initiative were substantively evaluated.

Inadequate Representation of Regulatory Approval Complexity

Forest Practices

The DEIS does not fully capture the complexity of regulatory approvals mandated by the Washington Forest Practices Act, resulting in omissions and oversimplifications that undermine the accuracy and completeness of the environmental review. Key issues include the failure to disclose the need for a Class IV-Special authorization under WAC 222-16-050(1)(d) for activities on potentially unstable slopes. The DEIS also omits critical analysis of potentially unstable slopes and site-specific mitigation measures. Furthermore, it relies on incomplete landslide mapping, resulting in inaccurate assessments of impacts to the Chehalis River and public safety, which is out of compliance with SEPA policies outlined in WAC 222-10-030.

Additionally, the DEIS ignores the requirement for an Alternate Plan under WAC 222-12-0401, which must provide protection to public resources at least equal to those in the Forest Practices Act. These deficiencies raise concerns about the accuracy and completeness of the environmental review, as well as potential risks to public resources, public safety, and treaty-protected resources.

Omission of Costs of Impacts to Public Services

The DEIS does not consider the costs of the proposed project on public services as is required by WAC 197-11-440(6)(e).

> *WAC 197-11-400 (6)(e) Discussion of significant impacts shall include the cost of and effects on public services, such as utilities, roads, fire, and police protection, that may result from a proposal. EISs shall also discuss significant environmental impacts upon land and shoreline use, which includes housing, physical blight, and significant impacts of projected population on environmental resources, as specified by RCW 43.21C.110 (1)(d) and (f), as listed in WAC 197-11-444.*

Opportunity Cost – Lost Time and Wasted Effort

Over fifteen years of effort and over $100 million state tax dollars have been spent to support advancement of studies and preliminary design of the FRE and airport levee improvements, the 2020 and the 2025 environmental impact statements, and the 2017 final Programmatic EIS for the Chehalis Basin Strategy. Despite this, the identified costs and technical feasibility of the proposed project make it no more likely to move forward than it was in 2008. As a result of funding being diverted to the proposed project, other Local Action Alternatives that could have had near term and immediate flood damage risk reduction benefits have made only modest progress to reduce flood damage risk.

The 2025 revised DEIS, like the 2020 DEIS, arrives at conclusions of probable significant adverse environmental impacts from both construction and operation of the FRE, in portions of the Chehalis Basin both upstream and downstream of the FRE. The levels of flood reduction as presented in the DEIS still leave most Chehalis Basin residents unprotected from major or catastrophic flood damage and do nothing to prevent flood damage from more frequent local flooding.

While we agree with many of the DEIS findings of significant and unmitigable impacts, we also believe that many impacts were underestimated or omitted and that costs have been significantly underestimated. As such, we believe that this project is not implementable. However, if the Office of the Chehalis Basin directed future funding for flood damage reduction to projects and activities that are implementable, they will provide flood damage reduction in the near term and finally be making investments that are in the best interest of both Chehalis Basin residents and Washington State taxpayers.

In examining how the money spent to date on the FRE project (using approximately $100 million in state dollars spent) could have been utilized to reduce flood damage in the Chehalis Basin, consider the

following:

- For properties that experience less than one foot of flooding, 5,000 homes or 3,300 commercial / agricultural properties could have been floodproofed (per structure cost from Office of Chehalis Basin, 2025) or
- For properties that experience 1-5 feet of flooding, 660 valuable structures could have been elevated (per structure cost from Office of Chehalis Basin, 2025) or
- For properties that experience more than 5 feet of flooding, 250 valuable structures could have been acquired (per structure cost from Office of Chehalis Basin, 2025) or
- The entire length of the LAND North Skookumchuck levee or approximately half of the South Skookumchuck levee could have been constructed using the high-end cost estimate (Moffat & Nichol, 2025) or
- Some combinations of the above could have been implemented.

According to the DEIS, the Community Flood Assistance and Resilience (CFAR) program, the Office of the Chehalis Basin's technical and financial assistance program for floodproofing, elevations, and buyouts, has had only modest success to date. The DEIS reported that 26 properties received technical assistance through CFAR in the 2021-2023 state biennium, that resulted in 12 home elevations and 2 buyouts (DEIS Appendix 1, Section 5.2.4, pg. 71). Elevation of four additional homes is currently planned or recently completed in the current biennium. Yet, the Chehalis Basin Board is still only funding the program at a $3 million level for the 2025-2027 biennium, which would only enable a similarly modest level of activity.

We encourage the Office of the Chehalis Basin and Chehalis Basin Board to refocus its efforts on these proven, cost effective flood damage reduction strategies that are implementable and will provide near term relief to basin residents rather than continued fixating on the FRE project, which, even if it is implemented on the timeframe estimated in the Chehalis Basin Strategy Comparative Analysis, would not be operational until 2042 (IEc,2025). Greater progress could be made in the years between now and 2042 to reduce the flood damage risk of current structures and to change the land use laws to prevent construction and development of structures in harm's way, providing relief to residents and properties in the basin.

Lack of Sufficient Cost Benefit Analysis

Continuing to funnel state resources into the analysis, and preliminary design, of the FRE dam and associated changes to the levee surrounding the Centralia-Chehalis Airport is inconsistent with statutory goals of the Chehalis Basin Strategy. The Strategy's goal is to facilitate basin-wide flood damage reduction and simultaneously accomplish aquatic species restoration in the Chehalis Basin.

Limited Benefit for Vast Consequence

The flood damage reduction provided by the FRE would be realized by only a small portion of the upper basin, yet the permanent alteration of the upper Chehalis River's physical, biological, and cultural systems will accelerate the decline of Chinook, coho, steelhead, and lamprey, all but ensuring eventual ESA listings for at least coastal Chinook and consequent regulatory ramifications to the entire basin. Both spring and fall Chinook would be expected to be extinct in the upper basin within several decades, if not sooner. These losses would also severely affect the sustainability of wild Chinook population in the upper half of the Chehalis Basin due to a loss of spatial distribution. Unique genetic spawning aggregations of coho and steelhead in the upper basin would also either be entirely lost by late century or severely jeopardized (pages 41 and 44, Appendix E). The loss of these species' genetics, that are unique to the upper Chehalis Basin, is a permanent impact that is unmitigable.

The DEIS promotes a false narrative centered on a *de minimis* baseline condition in the basin, the further degradation of which is proportionally smaller if not inevitable. This is particularly true when discussing the implications for populations and important spawning aggregations of spring Chinook

and Steelhead. Yet construction of the dam would foreclose on all opportunities for meaningful aquatic species and habitat restoration upstream of the dam, as well as in many areas downstream to be enacted in the near term which could continue to improve conditions and support population recovery.

The many findings of significant and unavoidable impacts to fish and fish habitat would require additional long-term costs for habitat restoration throughout the basin beyond any project-specific mitigation plan. An estimate of these costs should be factored into a cost benefit analysis to fully assess the financial and ecological costs and benefits of both the proposed project, the Local Actions Alternative, and the Local Actions Non Dam Alternatives.

While the proposed project would meet the FCZD's goal of removing 635 structures of value from flooding risk during a catastrophic flood, the range of valuable existing structures no longer inundated if the dam were built (from 993 mid-century median climate to 1,578 late century max climate) illustrates the small proportion of total valuable structures (10,154, per DEIS Appendix G Section 2.4.2) that would benefit from the dam despite its high economic and ecological cost to the state and the basin.

Land Use Development Implications

There is strong evidence that construction of the FRE would further promote development in the floodplain, and to-date local governments have not committed to preventing or even slowing down floodplain development. The DEIS correctly identifies that the FRE could promote development in the floodplain, however it equivocates on the certainty. We believe the DEIS analysis and determination should include more rigor to utilize the substantial information available on this topic.

First, considering likely population growth and development pressure, existing population projections point toward significant development pressure in the floodplain. In a 2022 presentation to the LAND Steering Group on Lewis County's Housing Initiative, the meeting summary notes that "Centralia and Chehalis could double their population in the coming years" and "outside of the urban areas, Doty and Dryad could see the highest areas of growth as bedroom communities to the fast-growing Winlock" (Ecology Office of Chehalis Basin, 2022). Projections for rapid growth in that area (also the main benefit area for the FRE) are also documented in Lewis County's 2024 Housing Needs Assessment which projects a 124.87% 20-year growth rate for Winlock. The same document projects a 133.62% 20-year growth rate for the City of Chehalis (Lewis County, 2024). These projections, developed by Lewis County itself, who is likely more knowledgeable about growth and development interest, should be considered by DOE in the DEIS.

Second, regarding industrial development in the floodplain, the DEIS fails to identify that the Port of Centralia has significant land holdings in the floodplain. To support industrial growth for the Port, development would have to occur in the floodplain unless the Port acquired or exchanged land for higher ground.

Third, existing floodplain maps and regulations will encourage continued floodplain development. Local governments have not updated their floodplain development regulations and maps to current state-of-practice standards, indicating that there is no commitment to limit floodplain development. Updating to current, more accurate flood inundation maps would increase the extent of the regulated floodplain, more accurately covering the flood risk zone.

With the additional perceived flood risk reduction from an FRE dam, plus unrestrictive floodplain development requirements, there is a high likelihood that floodplain development pressure will increase, and local governments will not deny the development from occurring. The practice of adding more floodable structures to the floodplain will decrease the realized benefits of the proposed project's goal overtime anyways, rendering the exorbitant state and local investment were the project to proceed, mute anyways.

Another way of looking at the development question is through the lens of justifying the significant investment needed to build and operate the FRE. According to the DEIS, the estimated cost to construct the FRE is up to $2.3 billion. While we believe this severely underestimates the cost, if the $2.3 billion FRE provides flood protection for 1,003 valuable structures (for a late-century flood under the median climate projection) that equates to $2.3 million per valuable structure protected, far exceeding the $400,000 per structure cost used by CFAR to buy out homes in flood risk areas. How could this cost be justified to achieve that level of benefit?

Yet, based on evidence from previous efforts across the United States, we know that the presence of a flood risk reduction structure exacerbates that scale and rate of additional floodplain development, and as such, we see no plausible future where the FRE is implemented, and floodplain development does not dramatically increase. Why did the DEIS not acknowledge that almost certain future in its impact analysis?

DOE has Authority and Should Deny

Based on the analyses included in the 2025 DEIS, a denial of the project by DOE is still supportable based on:

1. its own conclusions of significant and unavoidable adverse environmental impacts for which mitigation may not be feasible and/or economically practicable
2. the existence of a less environmentally damaging alternative (i.e., Local Actions Alternative albeit insufficiently considered in the DEIS), and
3. the scale, complexity, uncertainty, and infeasibility of the proposed project and the mitigation measures proposed by the FCZD (albeit not publicly disclosed or sufficiently analyzed in the DEIS).

DOE's project denial is supported by:

> *WAC 197-11-660 (1) Substantive authority and mitigation: (1) Any governmental action on public or private proposals that are not exempt may be conditioned or denied under SEPA to mitigate the environmental impact subject to the following limitations:*
>
> > *(a) Mitigation measures or denials shall be based on policies, plans, rules, or regulations formally designated by the agency (or appropriate legislative body, in the case of local government) as a basis for the exercise of substantive authority and in effect when the DNS or DEIS is issued.*
> > *(b) Mitigation measures shall be related to specific, adverse environmental impacts clearly identified in an environmental document on the proposal and shall be stated in writing by the decision maker. The decision maker shall cite the agency SEPA policy that is the basis of any condition or denial under this chapter (for proposals of applicants). After its decision, each agency shall make available to the public a document that states the decision. The document shall state the mitigation measures, if any, that will be implemented as part of the decision, including any monitoring of environmental impacts. Such a document may be the license itself, or may be combined with other agency documents, or may reference relevant portions of environmental documents.*
> > *(c) Mitigation measures shall be reasonable and capable of being accomplished.*
> > *(d) Responsibility for implementing mitigation measures may be imposed upon an applicant only to the extent attributable to the identified adverse impacts of its proposal. Voluntary additional mitigation may occur.*
> > *(e) Before requiring mitigation measures, agencies shall consider whether local, state, or federal requirements and enforcement would mitigate an identified significant impact.*
> > *(f) To deny a proposal under SEPA, an agency must find that:*
> > *(i) The proposal would be likely to result in significant adverse environmental impacts identified in a final or supplemental environmental impact statement prepared under this*

chapter; and
(ii) Reasonable mitigation measures are insufficient to mitigate the identified impact

The DEIS makes conclusions of significant adverse impacts to water, earth, fish and aquatic species, wildlife species and habitats, wetlands, recreation, tribal resources, cultural resources, environmental justice communities, land use, public services and utilities, recreation, environmental health and safety, thus undoubtedly meeting condition (f) of WAC 197-11-660(1).

Each conclusion of significance in the DEIS is accompanied by the statement "unless mitigation is feasible". The DEIS avoids making any definitive statements regarding the reasonableness, sufficiency, or feasibility of mitigation measures proposed by the FCZD, but it includes statements which belie the general insufficiency of the FCZD's mitigation plan, and the breadth and intensity of mitigation measures DOE considers necessary to reduce impact significance, for example from Section 5.17.3 *Agency-Proposed Mitigation Measures*, to mitigate impacts to fish species and habitats:

> *"The determination of the adequacy of the required mitigation will require use of a quantitative function-based assessment approach such as a Habitat Evaluation Procedure or Habitat Equivalency Analysis, rather than general mitigation ratios to evaluate both impacts and proposed mitigation. An accepted method for determining impacts and compensatory mitigation would need to be developed through a transparent, multi-agency process for coordination and analysis"* (DEIS page 239).
>
> *"To provide adequate long-term monitoring, adaptive management, and maintenance, mitigation is proposed for the Applicant to provide detailed, enforceable plans with Specific, Measurable, Achievable, Relevant, and Time-bound performance metrics. The intent is to monitor whether mitigation projects are functioning as designed and demonstrate whether fish are using the areas as intended. These should include triggers for corrective actions if habitat uplift targets are not met and require monitoring over the full operational duration of the FRE facility"* (DEIS page 239).
>
> *"To verify landowner willingness, funding certainty (including bonding mechanisms), site-specific technical feasibility, and appropriate mitigation scaling, mitigation is proposed for the Applicant to allow for* ***a*** *pre-permitting phase of approximately 5 years involving a multi-agency permitting team"* (DEIS page 240).
>
> *"To provide a comprehensive evaluation of cumulative impacts on aquatic species and habitat, including intergenerational loss of ecological productivity, mitigation is proposed for the Applicant to include strategies to address cumulative and recurring losses to support population persistence and habitat continuity"* (DEIS page 240).

And perhaps most significantly, regarding Tribal Resources, the DEIS states:

> *"The significance of impacts to Tribal resources is best understood from within the cultural context of an Affected Tribe, that is to say, the significance of impacts depends on the perspectives or varying rights associated with the Tribes. Statements provided by Tribes on the FRE facility, to date, indicate that mitigation of some impacts associated with the proposed project will not be acceptable and cannot be effectively mitigated as impacts to Tribal resources"* (DEIS page 241).
>
> *"There is uncertainty around whether mitigation is technically feasible or economically practicable, or would address impacts to Tribal resources. Therefore, the Proposed Action would have significant and unavoidable adverse environmental impacts, unless the Applicant develops plans that meet requirements and for which implementation is feasible* (DEIS Section 5.6.2.4, page 128).

Given that a mitigation plan was not made publicly available, we must rely on the blanket statements

included in the DEIS, that mitigation may not be technically feasible or economically practicable. Such statements support the obvious conclusion that the impacts cannot be reduced in scale or intensity to a less than significant level. The context of the proposed project, coupled with the intensity, scale and duration of the impacts as presented in the DEIS (albeit with many impact types and intensities omitted) are such that no mitigation is sufficiently assured nor ecologically meaningful enough to offset constructing a dam in the headwater of a river.

Throughout the Chehalis Basin Strategy process, comments from Tribal and environmental NGO entities have remained consistent. The state and OCB need to stop wasting time, money, and other state resources on a flood damage reduction alternative in the Chehalis Basin that would doom salmon, steelhead, and lamprey (particularly Spring Chinook), that destroys the environmental and culturally significant headwaters of the Chehalis River, and that fails to reduce the potential for flood damage throughout the basin.

- Immediately implementable, non-structural (Safe Structures under LAND) actions such as flood proofing, raising and relocating structures which already have existing programs within the Chehalis Basin Strategy, and some of the structural actions of which are within the scale that the Flood Authority already implements.
- Within the scope of existing, diverse funding sources including federal, state, local and private sources across a range of related and timely issues including flood damage reduction, climate change adaptation, and infrastructure investment.
- Comprehensive and inclusive, capable of reducing flood damage across diverse flood types and flooding scenarios for a broad range of communities and geographies throughout the Basin (as directed by the 2017 authorizing legislation establishing the Chehalis Basin Strategy and Office of Chehalis Basin).
- Generationally beneficial, without deferring costs and liabilities on to future generations (the dam would eventually need to be decommissioned or rebuilt at substantial risk and cost).
- Accountable, with more clear and transparent costs and liabilities and proven effectiveness.
- Compliant with Treaty rights, respectful of cultural resources.
- Politically Feasible in terms of fundability, clear and measurable costs versus benefits, best available science and social license.

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