Chehalis River Basin Flood Damage Reduction Project Revised Draft Environmental Impact Statement – Questions

Submitted by: Kim Figlar-Barnes
PO Box 1946, Elma, WA 98541
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Environmental and Ecological Impacts

1. How does the Draft EIS account for long-term impacts to salmon populations, including ESA-listed species, given alterations to river flow, sediment transport, and habitat?
2. What evidence supports the conclusion that the proposed project will not irreversibly damage riparian ecosystems and wetlands downstream?
3. How will increased sediment retention or release from project infrastructure affect water quality, spawning grounds, and aquatic life over time?
4. Does the Draft EIS adequately evaluate cumulative impacts to the Chehalis River watershed when combined with climate change, logging, and development pressures?
5. What mitigation measures are proposed if predicted ecological harms exceed current estimates, and are those measures enforceable?

Climate Change and Flood Risk

1. How does the Draft EIS address the likelihood that climate change will increase flood frequency and intensity beyond the project's design capacity?
2. What are the risks that the project could provide a false sense of security, encouraging development in flood-prone areas and increasing future harm?
3. Has the Draft EIS evaluated whether the project could worsen flooding or erosion in downstream or neighboring communities?

Community and Social Impacts

1. How were the concerns of affected Tribal Nations incorporated, and why does the Draft EIS not fully address impacts to treaty rights, cultural sites, and traditional fishing practices?
2. What analysis has been conducted on disproportionate impacts to rural, low-income, or historically marginalized communities?
3. How will construction noise, traffic, and land disturbance affect nearby residents, and why are these impacts characterized as temporary despite potential multi-year timelines?

Alternatives Analysis

1. Why were non-structural alternatives, such as floodplain restoration, buyouts, or land-use changes, dismissed or minimized in the Draft EIS?
2. Does the Draft EIS objectively compare the environmental harm of the proposed project against less damaging alternatives?

3. Were community-led or nature-based flood mitigation strategies given equal consideration?

Economic and Long-Term Accountability

1. How does the Draft EIS justify the project's cost given uncertainties about effectiveness and long-term maintenance?
2. Who bears responsibility if the project fails to prevent flooding or causes unforeseen environmental damage?
3. Are taxpayers exposed to ongoing financial liability for mitigation, repairs, or regulatory noncompliance?

Scientific Integrity and Transparency

1. What data gaps or uncertainties were identified in the Draft EIS, and why did the agency proceed despite those uncertainties?
2. How were peer-reviewed science and independent expert input incorporated into the analysis?
3. Why does the Draft EIS appear to downplay worst case environmental outcomes while emphasizing projected benefits?

Fish and Aquatic Species Impacts

1. How does the Draft EIS demonstrate that the project will not cause long-term or irreversible harm to ESA-listed salmon and steelhead species in the Chehalis River basin?
2. What modeling was used to assess changes in flow timing, temperature, and sediment transport, and how do those changes affect spawning, rearing, and migration success?
3. How will fish passage be ensured during both normal operations and flood-control events, particularly when gates or detention structures are actively managed?
4. Does the Draft EIS evaluate delayed mortality, sublethal stress, or cumulative life-cycle impacts to fish caused by altered hydrology and habitat fragmentation?
5. How will sediment trapping behind the proposed structure affect downstream gravel recruitment necessary for salmon spawning habitat?
6. What evidence supports the assumption that mitigation measures can fully offset losses of complex riverine and floodplain habitat?
7. How does the Draft EIS address impacts to lamprey, resident fish species, and aquatic invertebrates, which are often underrepresented but critical to ecosystem health?
8. Why does the Draft EIS not analyze worst-case operational scenarios for fish, such as prolonged detention, low-flow releases, or rapid drawdowns?

Dam Safety and Structural Risk

1. What is the probability and consequence analysis for dam or structure failure, including during extreme flood events exceeding historical records?

2. How does the Draft EIS account for increased risks from climate change, including larger storms, altered runoff patterns, and seismic vulnerability?
3. What independent dam safety reviews have been conducted, and why are their findings not fully disclosed or incorporated into the Draft EIS?
4. How will sediment accumulation affect long-term structural integrity and operational safety, and who is responsible for ongoing maintenance and dredging?
5. What emergency response plans are in place for downstream communities in the event of structural malfunction or failure?
6. Does the Draft EIS evaluate the environmental consequences of partial failure, gate malfunction, or operator error, rather than only complete failure scenarios?

Downstream Flooding and Hydrologic Impacts

1. How does the Draft EIS demonstrate that the project will not increase flood risk or flood duration for downstream communities?
2. What analysis has been conducted on backwater effects, altered flood peaks, and timing shifts that could worsen flooding outside the project area?
3. How does the Draft EIS address the risk that sediment starvation downstream could lead to channel incision, bank instability, and increased erosion?
4. Does the Draft EIS evaluate cumulative downstream impacts when combined with existing levees, channel modifications, and land-use changes?
5. How does the project affect floodplain connectivity downstream, and what are the ecological and flood-risk consequences of reduced overbank flows?
6. Why does the Draft EIS rely on modeled averages rather than clearly disclosing worst-case downstream flooding scenarios?

Fisheries Biology and Aquatic Ecology

1. What life-cycle modeling (e.g., population viability analysis or stage-structured models) was used to quantify impacts to ESA-listed salmonids, and how were uncertainty and sensitivity analyses incorporated?
2. How does the Draft EIS evaluate alterations to hydrographs (magnitude, frequency, duration, timing, and rate of change) relative to established environmental flow requirements for salmonid spawning, incubation, emergence, and juvenile rearing?
3. What thermal modeling was conducted to assess changes in water temperature downstream of detention operations, particularly during late summer and early fall low-flow periods critical to salmon migration?
4. How were sediment transport dynamics modeled, including changes to bedload supply, gravel recruitment, and substrate composition in downstream spawning reaches?
5. Does the Draft EIS quantify expected increases in fine sediment deposition and associated impacts on egg-to-fry survival rates?
6. How does the analysis address passage, entrainment, and injury risks for juvenile and adult fish during high-flow detention, rapid drawdown, or emergency releases?

7. What assessment methods were used to evaluate impacts to Pacific lamprey, resident fishes, and macroinvertebrate assemblages, and why are these taxa not more fully integrated into impact conclusions?
8. How does the Draft EIS address cumulative ecological impacts when combined with existing dams, levees, forest practices, and projected climate-driven hydrologic shifts?
9. What empirical evidence supports the assumption that proposed mitigation or habitat replacement will achieve functional equivalency to lost floodplain and mainstem habitats?
10. Why are worst-case operational scenarios, including prolonged detention or repeated high-flow events within a single season, not quantitatively analyzed for fisheries impacts?

Dam Safety, Engineering Design, and Risk Analysis

1. What hydrologic design standards (e.g., probable maximum flood, 500-year event) were used, and how were updated climate projections incorporated into inflow design flood estimates?
2. How does the Draft EIS address seismic risk, including fault proximity, liquefaction potential, and ground motion exceedance probabilities?
3. What failure mode and effects analysis (FMEA) or probabilistic risk assessment was conducted to evaluate overtopping, internal erosion, foundation failure, or gate malfunction?
4. How does sediment accumulation behind the structure affect long-term storage capacity, load assumptions, and hydraulic performance?
5. What inspection, monitoring, and maintenance protocols are assumed over the project lifespan, and how sensitive safety outcomes are to deferred or inadequate maintenance?
6. Why does the Draft EIS focus primarily on full failure scenarios rather than partial failure, operational error, or cascading system failures?
7. What assumptions were made regarding operator response time, warning systems, and emergency drawdown capability during extreme events?

Downstream Hydrology and Flood Risk

1. What hydraulic models (e.g., HEC-RAS 1D/2D) were used to simulate downstream flood stages, velocities, and durations, and how were model results validated?
2. How does the Draft EIS quantify changes in flood peak timing, attenuation, and recession rates for downstream communities under multiple storm sequences?
3. Does the analysis account for increased flood duration or delayed drainage that may increase damage even if peak stages are reduced?
4. How were backwater effects, levee interactions, and cumulative constraints on conveyance incorporated into downstream flood modeling?
5. What evaluation was conducted on downstream channel response, including incision, bank erosion, and loss of floodplain connectivity due to sediment starvation?

6. How does the Draft EIS address the potential for increased flood risk during events that exceed design capacity or occur in rapid succession?
7. Why are downstream worst-case flooding scenarios not clearly disclosed or mapped for affected communities?

Dam Safety and Structural Integrity

1. What inflow design flood was used, and how does it comply with FEMA Federal Guidelines for Dam Safety and Washington Administrative Code Chapter 173-175 for high-hazard dams?
2. How does the Draft EIS demonstrate that the structure can safely pass or store the Probable Maximum Flood (PMF), as required by FEMA and USACE dam safety criteria?
3. What seismic hazard analyses were conducted to meet FEMA and USACE requirements for maximum credible earthquake and operating basis earthquake conditions?
4. How does the Draft EIS address liquefaction, slope instability, and foundation failure risks consistent with FEMA's "Best Practices in Dam and Levee Safety Risk Analysis"?
5. What failure mode and effects analysis (FMEA) or quantitative risk assessment was performed, and why are the results not explicitly disclosed?
6. How does the Draft EIS evaluate gate reliability, power failure scenarios, and human-factor risks, consistent with USACE Engineering Regulation ER 1110-2-1156?
7. What assumptions are made regarding long-term sedimentation, and how do those assumptions align with FEMA requirements to maintain storage capacity and hydraulic performance over the dam's design life?
8. How does the Draft EIS address inspection, monitoring, and maintenance obligations required under Washington State dam safety regulations, and what are the consequences of deferred maintenance?
9. Why does the Draft EIS emphasize full failure scenarios while largely excluding partial failure or malfunction scenarios, contrary to modern risk-informed dam safety practice?

Downstream Flooding and Risk to Life and Property

1. What hydraulic modeling was conducted using HEC-RAS (1D or 2D), and how does the Draft EIS demonstrate compliance with FEMA flood hazard mapping and risk assessment standards?
2. How are downstream water surface elevations, velocities, and flood durations evaluated for events exceeding the design flood, as required by FEMA dam breach and inundation guidance?
3. How does the Draft EIS address residual risk, acknowledging that structural flood control projects do not eliminate flood hazards, consistent with FEMA flood risk communication principles?

4. What dam breach inundation mapping was prepared, and why is it not fully disclosed for downstream communities as required under FEMA and Washington State emergency planning standards?
6. How does the Draft EIS evaluate cumulative downstream effects when combined with existing levees and channel modifications, consistent with USACE cumulative impact guidance?
7. What analysis was conducted on delayed flood peaks or extended inundation durations that may increase economic damage even if peak stages are reduced?
8. Why does the Draft EIS not clearly evaluate downstream flood risk under sequential storm events, contrary to USACE and FEMA guidance on system performance under compound flooding scenarios?

Transparency, Risk Disclosure, and Public Safety

1. How does the Draft EIS comply with FEMA and SEPA requirements for transparent disclosure of uncertainty, assumptions, and confidence limits in risk modeling?
2. Why are probabilistic risk results, including annualized life-loss or economic risk metrics, not presented despite being standard practice in modern dam safety evaluations?
3. How are emergency action plans (EAPs) addressed in the Draft EIS, and why are they not evaluated as integral to dam safety and downstream risk reduction?