Action Agencies (Corps, Bonneville, Reclamation)

In addition to the Action Agency letter which provides comments on the DEIS regarding the proposed changes to the Water Quality Standards in the lower Snake and Columbia rivers, the following are also attached:
Attachment I: Action Agency Technical Comments on the Draft Environmental Impact Statement and Draft Rule Implementation Plan documents
Attachment II: Helmlinger, Brigadier General D. Peter. "Environmental Impact Statement scoping comments on the proposal to amend the Numeric Criteria for total dissolved gas (TDG) in the Snake and Columbia Rivers." 29 May 2019.
Attachment III: 2019-2021 Spill Operation Agreement and Attachment A

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, NORTHWESTERN DIVISION
PO BOX 2870
PORTLAND, OR 97208-2870

September 24, 2019

Ms. Susan Braley
Washington State Department of Ecology
Water Quality Program
P.O. Box 47600
Olympia, WA 98504-7600

Subject: Comments on the draft Environmental Impact Statement (DEIS) on the proposed changes to the Water Quality Standards for Surface Waters of the State of Washington – WAC 173-201A (Water Quality Standards)

Dear Ms. Braley:

On behalf of the U.S. Army Corps of Engineers (Corps), Bureau of Reclamation (Reclamation), and Bonneville Power Administration (Bonneville), collectively referred to as the Action Agencies (AAs), I submit the following comments on the DEIS regarding the proposed changes to the Water Quality Standards in the lower Snake and lower Columbia rivers. In addition to the comments made in this letter, the AAs are providing technical comments in an attachment (first attachment) in order to seek clarification regarding language in the DEIS and Draft Rule Implementation Plan documents. As stated in the AAs' comment letter submitted May 29, 2019 on the scope of the proposed rulemaking (second attachment), the AAs believe that Washington should align the proposed rulemaking with the scope of the *2019-2021 Spill Operation Agreement* (Agreement) for the reasons provided in that comment letter (third attachment). As described in the DEIS, Alternative 4 is the alternative that best aligns with the Agreement and is most responsive to the uncertainties of impacts of long term implementation of higher spill to aquatic species.

The AAs are committed to the principle underlying the Agreement – implementation of a flexible approach to providing spill intended to benefit salmonids while managing the fourteen dam and reservoir projects that make up the Columbia River System for multiple congressionally-authorized purposes, including hydropower generation – and appreciate Washington's efforts to facilitate continued implementation of the Agreement. The AAs have continued to work collaboratively with the other parties to the Agreement in line with this principle to develop Attachment A (third attachment), which describes spring spill operations for 2020 that incorporate spill up to 125 percent total dissolved gas (TDG) in the tailrace at certain projects for 16 hours per day during spring.

However, the AAs would like to make clear the Agreement does not contemplate 125% TDG spring spill on a 24-hour, 7-day basis simultaneously at all lower Columbia River projects and lower Snake River projects, as the proposed preferred alternative (Alternative 3) described in the DEIS does. Instead, the Agreement is aligned with Alternative 4, which provides for up to eight hours of performance standard spill in order

to balance the impacts to hydropower production from the higher levels of spill during the rest of the day. Because of this and the reasons described below, the AAs recommend Washington select Alternative 4 as the preferred alternative.

The AAs strongly support the inclusion of the requirement in the draft rule change that operations must be in accordance with "legally valid Endangered Species Act consultation documents on Columbia River System operations, including operations for fish passage." This language is important because of required Environmental Protection Agency reviews under the Clean Water Act and associated coordination with the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (the Services) under the Endangered Species Act (ESA) that accompany a permanent rule change. Without a legally valid consultation document on Washington's revised standards, Washington cannot ensure that promulgating the revised standards and attendant administration of the Clean Water Act complies with the ESA. Further, because the Services are the federal agencies designated as the experts on impacts to ESA-listed fish, it is imperative to have legally valid ESA consultation documents in place to ensure protectiveness to these species given the uncertainty of the potential impacts of long term implementation of this operation. Alternative 4 is subject to a legally valid ESA consultation document, i.e. the 2019 NMFS Columbia River System Biological Opinion.

In addition, the AAs recommend that Washington reconsider its conclusion that Alternative 4 only partially meets Recommendation 8 of the Southern Resident Orca Task Force Final Report (Final Report). In fact, all four bullets under Recommendation 8 align with Alternative 4. Recommendation 8 does not specify that spill levels must be 125% TDG on a 24-hour, 7-day basis, but instead seeks to "create flexibility to adjust spill regimes" that will be monitored and adaptively managed to minimize impacts to fish species. (*See* Recommendation 8, Bullet 1 and Implementation details). In addition, Recommendation 8 states that the Task Force should "[w]ork with tribes, salmon recovery regions, Ecology and WDFW to minimize revenue losses and impacts to other fish and wildlife program funds." (*See* Bullet 4). This bullet is aligned with the principle and objectives of the Agreement in that the Agreement also seeks to minimize revenue losses to Bonneville that could impact its future ability to fund fish and wildlife programs throughout the Pacific Northwest.

Recommendation 8 of the Final Report also emphasizes the need to minimize impacts to fish species and monitor the impacts of changes in spill levels. Given the various uncertainties of the impacts to aquatic species of operating to spill levels up to 125% TDG, the AAs believe that Washington should reconsider a long term change and select Alternative 4 until more information is available on potential impacts at higher levels of spill, especially when river flows are relatively low. This includes information available after completion of the Columbia River System Operations Environmental Impact Statement process and information gained through the implementation of the Agreement in 2020. The AAs acknowledge that Ecology is attempting to balance

different types of risk through consideration of this rule change, but all of the risks would be exacerbated by choosing an indefinite duration that is made permanent by selecting Alternative 3. Recommendation 8 of the Final Report does not preclude Washington from selecting Alternative 4.

Furthermore, the AAs support Washington's continued efforts to ensure consistency with the state of Oregon's calculation methodology for TDG in the Columbia River. Washington is proposing to calculate a maximum TDG saturation level as "an average of the two highest hourly TDG measures in a calendar day during spillage for fish passage", while Oregon's current standard modification for TDG in the Columbia River utilizes a different methodology. Having a consistent methodology between the two states would streamline implementation and reporting for the AAs.

Finally, regarding the biological monitoring associated with the proposed rule change, consistent with the Agreement, the AAs fully support appropriate monitoring performed by other parties, but have limitations on their ability to increase existing monitoring efforts or increase funding to support additional biological monitoring. The Agreement states that the Corps will continue current monitoring commitments, but cannot increase funding to conduct additional monitoring, while Bonneville is limited to its existing overall Fish and Wildlife Program budget for any additional monitoring. *See* Agreement, Section VII.E. In addition to these limitations, the AAs have concerns that the monitoring as described in the proposed rule change is not tailored to the species that may be affected by TDG; the existing structural configuration of the Columbia River System; and the potential for additional "take" of species listed under the ESA that may result from expanded monitoring. Washington should fully account for these considerations because the AA's cannot ensure prospective implementation of the revised standards that are dependent on the AA's implementation of new monitoring procedures. Also, the Corps expects that Washington would monitor, track, and inform the Corps if biological or Gas Bubble Trauma (GBT) thresholds identified in the rule were exceeded during spill operations up to 125% TDG as well as communicate modified TDG levels either system-wide or at specific projects to bring incidence of observed GBT back in compliance with the thresholds established in the rule. *See* attached Technical Comments.

The AAs have greatly appreciated Washington's participation in the CRSO EIS process as a cooperating agency, as well as our collaborations on many different issues impacting the Columbia River System. We look forward to continuing to work closely with Washington as we each complete our respective EIS processes.

Sincerely,

HELMLINGER.DARIEN.PETER.1161978988

Digitally signed by HELMLINGER.DARIEN.PETER.1161978988
Date: 2019.09.24 19:13:54 -07'00'

D. Peter Helmlinger, P.E.
Brigadier General, US Army
Division Commander

Cc: Guy Norman, Maia Bellon

Attached:
Attachment I: Action Agency Technical Comments on the Draft Environmental Impact Statement and Draft Rule Implementation Plan documents
Attachment II: Helmlinger, Brigadier General D. Peter. "Environmental Impact Statement scoping comments on the proposal to amend the Numeric Criteria for total dissolved gas (TDG) in the Snake and Columbia Rivers." 29 May 2019.
Attachment III: 2019-2021 Spill Operation Agreement and Attachment A

Susan Braley
Washington State Department of Ecology
Water Quality Program
P.O. Box 47600
Olympia, WA 98504-7600

Subject: Comments on the draft Environmental Impact Statement on the proposed changes to the Water Quality Standards for Surface Waters of the State of Washington – WAC 173-201A (Water Quality Standards)

Dear Ms. Braley,

The following Action Agency (AA) technical comments are in support of Washington's proposed TDG standards change to 125% TDG in the tailrace in order to facilitate the implementation of the *2019-2021 Spill Operation Agreement* (Agreement) as described in the AAs formal comment letter. Based on the AAs review of both the Draft Environmental Impact Statement (DEIS) and Draft Rule Implementation Plan documents (DRIP), the AAs believe that a long term change is not advised at this time. The AAs support Alternative 4 because it most closely aligns with the principles of the Agreement. The AAs are submitting the following technical comments which are grouped into three areas of concern: Biological, Real-time Implementation, and Document Clarifications. These technical comments are intended to provide clarity to both DEIS and DRIP and will assist the AAs in operating the Columbia River System consistently with any resulting rule change.

Biological:

1. DRIP, pg 7: It is important to keep the statement in 'Species Richness Requirement' Section that 'All gas bubble trauma observations must be reported regardless of meeting the minimum sample requirements to calculate the incidence of gas bubble trauma.'
2. DRIP, pg 7: See bottom, 'Gas Bubble Trauma Monitoring' section, Fish Passage Center is called out for establishing methods and protocols when FPC is a BPA contractor. Recommend that the language be updated to reflect that, for example: "Examination of fish for gas bubble trauma should follow the procedures similar to those detailed in the 2019 Gas Bubble Trauma Monitoring Protocol or as updated by the Action Agencies."
3. DEIS, pg. 7: Such a significant change to the standard should be based on additional sources rather than just the CSS model. We recommend including additional information such as results from COMPASS modeling and in-river GBT data from a limited period operation as described in Alternative 4.
4. DRIP, pg 8: Currently, the physical monitoring is performed and results are documented at each dam individually. The DRIP allows for the samples to be collected as a combination from the dams to make up "the sample" that week. Historical records show higher GBT levels at some dams compared to others, along with varying levels of TDG levels at certain dams, so this approach may not capture impacts across all projects. The minimum sample size listed in this document is only 20% of what is currently done and spreading that sample size over four dams gives the opportunity to miss the problem location.
5. DEIS, pg 17: The referenced "technical analysis" needs a citation.

6. DEIS, pg 30: The Fish Passage Center data related to instances of GBT observed when gas levels exceed 125% is misleading. The statistic in the following statement should be clarified: "In a historical analysis of data collected by the Fish Passage Center from 1995-2018, the 15% GBT criterion has been exceeded in only 37 instances of 2,870 samples and 28 instances occurred when TDG was greater than 125%." The projects were not operated at 125% for the years analyzed (the historic juvenile fish passage spill regime was lower spill levels, significantly below 125% TDG). The statement should clarify how many samples occurred when TDG was greater than 125% and what portion of those samples met the 15% GBT criterion as it would be a better representation of the GBT impacts from the proposed change in WQS.
7. DEIS, pg. 27: In the "Early Development" section, the document states that Chinook salmon are not known to spawn in the area encompassing the lower eight dams. However, historically there have been Chinook redds below Bonneville Dam on the Washington shore during winter and spring. Their emergence is later than Chum, so they are more likely to be impacted by high TDG in spill season, especially if the river is held low, as it was in April 2019. Chum, conversely, tend to out-migrate before spring spill season.
8. DEIS, pg. 35: With the overwhelming amount of information documenting the adverse impacts associated with TDG more research is needed before to verify aquatic species are protected at 125 % TDG. It is not clear that the proposed biological monitoring under the DRIP will cover all the species explored in the DEIS (invertebrates, lamprey, salmonids and resident fish).
9. DEIS, pg 36: WDOE's conclusion regarding effects on lamprey of 125% TDG spill appears to be based on one article (Colotelo et al. 2012) that discusses impacts from barotrauma not TDG (in fact all testing during the study was done at a TDG level of 102%). This analysis on lamprey appears lacking and more analysis seems appropriate in order to avoid putting a disproportionate amount of risk on lamprey. Significant adverse impacts to lamprey could result from decision-making without appropriate analysis.
10. DEIS, pg 36: States "...Colotelo et al (2012) notes the lack of swim bladder may account for the reduced sensitivity to TDG." This sentence is contextually inaccurate regarding the Colotelo et al 2012, please see https://www.sciencedirect.com/science/article/pii/S0165783612001737 Colotelo et al 2012 does not evaluate the effect of TDG on lamprey. In this research the only reference to TDG was in reference to TDG as a water quality parameter not in any relationship to effects on lamprey. Colotelo et al 2012 was about barotrauma associated with juveniles passing through turbines not effects of TDG on lamprey. The conclusions and statements made with respect to this citation should be examined.
11. DEIS, pg 36: This statement suggests high risk to daphnia magna by increasing TDG to 125%, is WDOE approving these types of impacts? "Daphnia magna were affected by supersaturated waters above 110%. The mean LC50 for Daphnia magna was 122.5% when fed and held in static water. When Daphnia were not fed in flowing water the 96 h LC50 was 114%. The 7-d LC50 was 120% and the 10-d LC50 was 117.5%." The potential negative impact on invertebrates, with several additional citations listed under "Aquatic Invertebrates" section of the DEIS, were not assessed for secondary impacts to the larger ecosystem if the invertebrate population is depleted due to high TDG exposure. Suggest this discussion be added to the DEIS.

12. DEIS, pg. 36: The DEIS should consider the effects of 125% TDG for the duration of the spring spill season (Apr 3 – Jun 20). The literature and studies cited to address effects in the DEIS generally contain observations obtained during shorter duration studies e.g., "2.7 days…" The significant duration of the proposed change in WQS to an unprecedented high saturation level has not been tested before. Consider if WDOE should conduct additional research, monitoring, and evaluation to evaluate the impacts on species with the proposed change in criteria.
13. DEIS, pg 37, Johnson et al (2005) cited on DEIS pg 37, states, "The authors concluded that there was minimal potential for GBT on adult spring and summer Chinook salmon under average river conditions, despite the fact that fish tissues were likely supersaturated with dissolved gases." This citation is problematic because it omits the following key finding from the research, "However, additional research over a broader range of dissolved gas conditions is needed to confirm that short, but frequent, exposure to conditions conducive to gas bubble formation does not affect survival and reproductive potential." Additionally the magnitude of the operation is not captured in this citation nor the vast majority of all the literature cited.
14. DEIS pg 43. The DEIS cites several documents that emphasize the uncertainty of repeated and chronic exposure to supersaturated water conditions. Reading the McGrath et al. (2006) citation directly emphasizes this point even more: "These areas of concern are 1) sensitive and vulnerable species or life stages, 2) long-term chronic or multiple exposure, 3) vulnerable habitats and reaches, 4) incubating fish in hyporheic habitats, and 5) community and ecosystem impacts." An additional quote from McGrath et al. (2006) is also informative: "Long-term chronic exposure to levels as low as 110 to 115% TDG may produce serious sublethal effects and signs of GBD (Lutz 1995; Mesa et al. 2000; Beeman et al. 2003)." Implementing Alternative 4 for 2 years would provide WDOE time to evaluate and assess biological impacts under the proposed WQS.
15. DEIS, pg 45 and 46: Research has indicated that fish not exhibiting signs of GBT may still die from acute toxicity. Monitoring for non-GBT impacts related to TDG is not outlined in the implementation plan. Consider how WDOE will assess potential impacts to aquatic species that may not be detected through proposed GBT monitoring.
16. DEIS, pg. 46. The DEIS states, "Finally, several studies have suggested that GBT may not be an appropriate metric to measure TDG related effects. Some researchers found poor relationships between GBT observations and elevated TDG conditions that result in mortality (Meekin and Allen 1974; Weitkamp et al. 2003b). This further brings in question, the efficacy of biological monitoring programs at hydropower projects and whether observations of GBT accurately depicts the health of aquatic life passing through dams or the resident species residing above or below dams." It is not clear with this statement how WDOE proposes to move forward with the given uncertainty. The DRIP proposes to use GBT monitoring solely as the mechanism for adjustment to the TDG levels in season.
17. DEIS pg 46 and 47. WDOE recognizes conflicting data regarding depth compensation. The DEIS (pg. 46) states "Several studies have demonstrated that depth compensation is a mechanism that protects aquatic life from TDG related effects. However, there is controversy whether fish can detect supersaturated waters and purposely depth compensate or if they move through the water column in a less intentional manner to a preferred foraging or migration depth. Moreover, some studies suggest that depth compensation is more efficient

for some fish than others. Significant differences in mortality for different fish at the same water depths and TDG levels, suggest that coping mechanisms for high TDG conditions may differ depending on the species." Despite this uncertainty regarding the ability of all species to depth compensate, the DEIS cites Aquatic Life Depth Compensation as a mitigation measure (pg. 47) for high TDG impacts. It is not clear in the DEIS or the DIP how biological monitoring will be used to reduce this uncertainty and verify this key assumption.

18. DEIS, pg 55: In the summary of Alternative 3, it should be clarified that there is an increased risk of GBT occurrence in aquatic species as described throughout the DEIS.

Real-Time Implementation:

1. General DRIP questions:
    a. Who is responsible for consolidating and evaluating the GBT data against thresholds and determining that a change in criteria has been triggered? How is this decision communicated?
    b. What are the reporting and data storage requirements for GBT data?
    c. Are there examples where a water quality criteria can change instantly based on a biological data trigger? For example, if the TDG target changes it will take approximately 1-day to evaluate appropriate spill levels, communicate to BPA and the projects and then see a change in TDG.
    d. How should monthly and annual reporting evaluate TDG data when a criteria changes? For example, it could take days for TDG to decrease to the appropriate level.
    e. Could the criteria be different for each of the eight projects, or, if high GBT rates are observed at one project, do the criteria change for all projects?
2. DRIP, general comment. As captured in the proposed rule change, potential monitoring falls into the following three categories: TDG monitoring, salmonid biological monitoring GBT, and resident species biological monitoring for GBT. The Corps intends to continue the existing TDG monitoring practices consistent with previous years that includes a system wide array of TDG monitoring sites with gages placed below and above each of the eight fish passage dams to monitor TDG levels 24 hours per day. Current GBT monitoring consists of monitoring of juvenile salmonids conducted as part of the Smolt Monitoring Program. This Program will continue into the future to satisfy the salmonid biological monitoring criteria described in the DEIS. Though the AAs are supportive of enhanced GBT monitoring for resident species, the AAs are not aware of existing monitoring of either TDG effects on resident species or the incidence of GBT in these species and do not have funding for creating such a program. This point was clearly stated in Section VII.E of the Agreement in that the Corps would only continue existing monitoring that has been occurring in conjunction with the juvenile fish passage spill program and that Bonneville is limited by its existing Fish and Wildlife budget for any additional monitoring. Current TDG monitoring and salmonid GBT monitoring will continue. If the Ecology rule change is contingent on increased monitoring, the AAs are not the appropriate funding source for these activities.
3. DRIP, pg 6: Clarify monitoring plan submission frequency requirement. Neither the DEIS or DRIP specify the party responsible for submitting the annual biological monitoring report to Ecology for review and approval. Clarification should specify whether or not this must be the AAs or whether one of our partners (i.e. WDFW) can compile necessary information and submit to WDOE.

4. DRIP, pg 7: Clarify whether sample quantity listed is total quantity or per age group.
5. DRIP, pg 8: Clarify what kind of biological monitoring they are looking for? "A department approved biological monitoring plan is required from each hydropower project that intends to utilize the adjusted 125% tailrace only criteria." Is the intent to have a plan for each project or can the AAs submit one plan for the entire Columbia River System?
6. DRIP, pg 8: The implementation of the approach suggested on pg 8 of the DRIP would be difficult in real time operations. Once additional monitoring demonstrates that the incidence of GBT is below biological thresholds, "Gas bubble trauma must be below biological thresholds over the next 7-day averaging period before the adjusted TDG criteria of 125% can be applied again." Could this technically continue in perpetuity (if the permanent adjustment is implemented)? The criteria used to set spill caps could change each week and would be dependent upon receipt of the previous week's biological monitoring results. The following are challenges in using a biological threshold as an operational trigger:
    a. The frequency of sampling (weekly) does not allow for incremental change, i.e. small increases or decreases in spill to test impact.
    b. The sampled species may differ week to week which may confuse a demonstration of "the incidence of gas bubble trauma is below biological thresholds".
    c. "If gas bubble trauma exceeds these biological thresholds for either salmonids or non-salmonids, additional monitoring must demonstrate the incidence of gas bubble trauma is below biological thresholds before the TDG criteria can be adjusted up to 125%." We would expect biological thresholds to be exceeded again with a return to 125%. Consider how WDOE will develop criteria once biological thresholds are reached to minimize future biological impacts from TDG.
    d. The sampling could occur at only some of the projects, so we would need to assume the sampling locations represent a reach.
7. DRIP, pg 14: "Ecology monitors surface waters across the state to determine whether water quality conditions meet the designated uses set in the standards." This statement is not consistent with the draft rule change language assigning biological monitoring to other entities.
8. DEIS, pg 5 and pg 12: Regarding Recommendation 8 from the SRKW Task Force "Governor Jay Inslee includes a recommendation encouraging testing the potential of higher TDG standards and attendant spill to improve salmon survival and abundance, while also considering ways to minimize impacts on the BPA's Fish and Wildlife Program." If the recommendation is a test, then Alternative 4 for a two year period TDG standard change is appropriate. Because this is a Washington recommendation for testing, the state should ensure that its monitoring of surface waters (DRIP, pg 14) is appropriate to capture the results of operations to this level.
9. DEIS, pg 7 and 53: Alternative 4 is titled "removal of the 115% forebay criterion…" but the description describes returning "to the more stringent forebay and tailrace…". This is inconsistent.
10. DEIS, pg 53: Alternative 4 states that the 125% criterion would be applied to approximately 16 hours per day and would return to the more stringent forebay and tailrace 12-hour average criteria for approximately 8 hours a day. It would be impossible to comply with a more stringent standard for 8 hours a day. A more stringent forebay criteria would be impossible to meet for only portions of each day as travel time is between projects is variable and degassing rates are dependent upon environmental factors. Also, this does not align with the

flex spill agreement, which does not specify a lower TDG during performance standard hours. Instead, it is anticipated that the same criteria will apply during the gas cap and performance standard hours and we recommend removing language regarding the more stringent standard for those 8 hours.

11. DEIS pg 56: Remove the phrase "and would ease spill operations" at the top of pg 56 as this is not true.

Document Clarifications:

1. DRIP, general comment: In the DRIP, all instances of Army Corp of Engineers need to be corrected to Army **Corps** of Engineers.
2. DEIS, general comment: Replace "voluntary spill" to "juvenile fish passage spill", which more accurately represents the purpose of the spill operations.
3. DEIS and DRIP, general comment: The DEIS and DRIP repeatedly refer to the dams as "hydropower projects" or the Columbia River System as "the hydrosystem." It would be worth clarifying that the DEIS and DRIP are referring to the 14 dams that are operated in a coordinated manner for multiple congressionally authorized purposes, including hydropower generation, but also for flood risk management, irrigation, navigation, municipal and industrial water supply, fish and wildlife conservation, recreation, etc. in order to provide a better context for all of the authorized purposes for these projects.
4. DEIS, p. 4 and 16: states that the Spill Agreement also intends to provide a pause in "litigation over the impact of the federal dams on ESA-listed salmon and steelhead…." The ongoing litigation is regarding the impacts of the *operations and maintenance of* the federal dams on ESA-listed salmon and steelhead.
5. DEIS, pg 5 and 16: Describes Flex Spill as applying to "times of peak energy demand (early morning and late afternoon/evening)…." And pg 16 talks about "early morning and late afternoon/evening" and a lot of detail on the "Duck Curve." Since the AAs are able to do 8 hour blocks at most projects during 2020 we would like this language to reflect that. *See* Attachment A to the Agreement.
6. DEIS, pg 7 and 53: States that July 1, 2021 is the end date for flex spill operations. Please revise the date to June 20.
7. DEIS pg 7 and 26: The DEIS states that "[t]he CSS model considers minimizing powerhouse encounters through measures such as spill or dam removal as critical to reducing 'delayed mortality' from hydro system passage and ultimately increasing adult salmon and steelhead returns." Since dam removal is not within the scope of the DEIS, Washington should explain how CSS results are being used for its conclusions on the impacts of higher levels spill.
8. DEIS pages 7 and 53: Clarify why the language "return to more stringent forebay" criteria is included on Alternative 4, if the alternatives all state removal of the 115% forebay criteria, or remove this language.
9. DEIS, pg 8: Language should be added to link the 125% criterion during spring spill to juvenile ESA-listed anadromous fish.
10. DEIS, pg 18: "Standard modification and criteria adjustment" should be reversed.
11. DEIS, pg 23: Replace "negative market" with "lack of market". Spilling due to lack of market does not necessarily present a negative market condition, consequently, we recommend revising the following sentence "Operational spills occur when the ability to pass water through the turbine is limited or in a negative market when power demand is low" to

read: "Operational spills occur when the ability to pass water through the turbines is limited or lack of market when power demand is low."

12. DEIS, pg 20: 3rd paragraph under "Proposed Rule change for Increased Spill" section, the 120% should be 125% so it reads "Given the dam and salmon managers have not previously provided voluntary (fish passage) spill to 125%...", not 120% because spill has occurred to 120% to date under the current TDG standard.
13. DEIS, pg 20: #2 identifies objectives of the EIS but focuses only on the Flex Spill agreement's fish benefit objective rather than the three objectives, power and operational feasibility. Recommend including all three objectives.
14. DEIS, pg 22: It would be beneficial to have results/references from NOAA Fisheries Compass modeling in addition to CSS modeled results. Washington could utilize analysis in the 2019 NOAA Fisheries Columbia River System Biological Opinion.
15. DEIS, pg 22: Should clarify that the modeled results were only for spring spill. Also, the modeled scenario differs from the spill regime outlined in the Spill Agreement for 2020-2021. The scenario modeled in the CSS included 24 hours of spill to the 125% gas cap. Improvements to the powerhouse encounter rate, if provided, should be based on the spill regime in the spill agreement.
16. DEIS, pg 23: Suggest removing language about involuntary spill as it is not related to the 125% criteria.
17. DEIS, pg 48: Change "since 2018" to "in 2018"
18. DEIS, pg 49: Change "hydropower spill season" to "juvenile fish passage spill season"
19. DEIS, pg 49: Change "hydropower operations" to "spill operations"
20. DEIS, pg 49 and 54: Change "The removal of the forebay criteria of 115% may slightly increase the risk of TDG related impacts to aquatic life by increasing the duration of exposure at 120% TDG level." to "The removal of the forebay criteria of 115% will slightly increase the risk of TDG related impacts to aquatic life by increasing the duration of exposure at 120% TDG level."
21. DEIS, pg 50: Change "The Spill Agreement calls for ramping down spill at each dam well below the spill levels creating 120% TDG for eight hours a day every day during the spring spill season" to "The Spill Agreement allows for ramping down spill at each dam well below the spill levels reducing TDG below 125% for up to eight hours a day during the spring spill season."
22. DEIS, pg 50: Define "prolonged" as it relates to exposure to higher TDG levels.
23. DEIS, pg 51: Clarify that Chum salmon spawn below Bonneville Dam prior to the early spill season, not during.
24. DEIS, pg 54: States "The removal of the forebay criteria may increase the duration of exposure to higher TDG levels but would not necessarily change the maximum allowable TDG level." This language is unclear. Spill levels did impact the maximum TDG at 5 out of the 8 projects (for those projects that the downstream forebay had the more restrictive criteria).
25. DEIS, pg 55: In the summary of Alternative 4 on, the alternative is qualified as "less desirable than a rule that provides flexibility on implementation of different spill configurations that is offered by Alternative 3." The subjective language "less desirable" should be removed from this statement.

Attachment II

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, NORTHWESTERN DIVISION
PO BOX 2870
PORTLAND, OR 97208-2870

May 29, 2019

SUBJECT: Environmental Impact Statement scoping comments on the proposal to amend the Numeric Criteria for total dissolved gas (TDG) in the Snake and Columbia Rivers

Heather Bartlett
Water Quality Program Manager
Washington State Department of Ecology
P.O. Box 47600
Olympia, WA 98504-7600

Dear Ms. Bartlett:

On behalf of the U.S. Army Corps of Engineers, Bureau of Reclamation, and Bonneville Power Administration, collectively referred to as the Action Agencies (AAs), I submit the following comments on the scope of the State of Washington's (Washington) proposed rulemaking related to amending the numeric criteria for total dissolved gas (TDG) in the lower Snake and lower Columbia rivers. The AAs believe that Washington should align the proposed rulemaking with the scope of the 2019-2021 Spill Operation Agreement (Agreement) (attached), to ensure that the parties to the Agreement can continue to implement the Agreement through the 2020 spring fish passage spill season. The Agreement, signed and endorsed by the AAs, the states of Oregon and Washington, and the Nez Perce Tribe, represents an innovative approach to managing the Columbia River System that balances and optimizes multiple important regional values. The AAs are committed to the principles underlying the Agreement – implementation of a flexible approach to providing spill intended to benefit salmonids while managing the Columbia River System for multiple congressionally-authorized purposes, including hydropower generation – and appreciate Washington's efforts to facilitate continued implementation of the Agreement. The Agreement expires upon the signature of the AAs Record of Decision on the Columbia River System Operations (CRSO) Environmental Impact Statement (EIS).

In December 2018, the states of Washington and Oregon, the AAs, and the Nez Perce Tribe collaboratively developed the Agreement with the following objectives in mind:

1. Provide fish benefits, with the understanding that (i) in 2019, overall juvenile fish benefits associated with dam and reservoir passage through the lower Snake and Columbia rivers during the spring fish passage season must be at least equal to 2018 spring fish passage spill operations ordered by the Court, and (ii) in 2020 and 2021,

these fish benefits are improved further (as estimated through indices listed in the Agreement);

2. Provide federal power system benefits as determined by Bonneville, with the understanding that Bonneville must, at a minimum, be no worse financially compared to the 2018 spring fish passage spill operations ordered by the Court; and

3. Provide operational feasibility for the Corps implementation that will allow the Corps to make appropriate modifications to planned spring fish passage spill operations.

The Agreement contemplates incorporating "spill up to and including 125% TDG as a tool for spring fish passage spill season" into 2020 operations, subject to state TDG water quality standard changes. See Agreement Section VI.C.1. However, the Agreement does not contemplate 125% TDG spill on a 24-hour, 7-day basis simultaneously at all lower Columbia River projects and lower Snake River projects. "Such an operation would be inconsistent with the flexible spill and power objectives that are central to this Agreement." See Agreement Section VI.C.1. To avoid this result, the Agreement utilizes flexible periods of spill, with the daily cumulative duration of spill to the state TDG water quality standard limited to 16 hours per day. See Agreement Attachment Table 1.1 Key points and Tables 1.3a and b. For consistency with the Agreement and its underlying objectives, Washington should align the proposed rulemaking to be limited to a change for only the spring fish passage spill season (generally April 3-June 20) and to limit any potential increase in the TDG criteria up to 16 hours per day.

Additionally, Washington should limit the duration of the proposed rulemaking to be consistent with the duration of the Agreement, which expires upon the signature of the AAs' Records of Decision on the CRSO EIS. Three main reasons support this point. First, the AAs – in conjunction with Washington, as a cooperating agency – are currently analyzing the impacts to affected resources from varying levels of spill. This analysis will help identify a long-term strategy for Columbia River System operations. Given the uncertainty surrounding future Columbia River System operations, making a change to Washington's TDG water quality standard that will continue to apply following the conclusion of the CRSO EIS process is premature. In particular, the AAs are concerned with making assumptions about future Columbia River System operations before the CRSO EIS analysis is complete. Second, a limited duration would enable lessons learned from implementation of higher levels of spring fish passage spill to be incorporated into a longer term rule change, if warranted. This factor is particularly important given the potential adverse effects of high TDG levels on aquatic species. Third, the AAs are concerned that Washington's proposed process for a permanent rule change – including required EPA reviews and associated coordination with the National Marine Fisheries Service and the U.S. Fish and Wildlife Service – realistically may not be completed in time to allow for federal implementation of the Agreement in 2020. Consistent with the Agreement, we request that Washington coordinate closely with the federal regulatory agencies to achieve the principles outlined in the Agreement.

The AAs have greatly appreciated Washington's participation in the CRSO EIS process as a cooperating agency, as well as our collaborations on many different issues impacting the Columbia River System. We look forward to continuing to work closely with Washington as we each complete our respective EIS processes.

Sincerely,

D. Peter Helmlinger, P.E.
Brigadier General, USA
Division Commander

Encls:
2019-2021 Spill Operation Agreement

cc:
Guy Norman, State of Washington Representative, Northwest Power and Conservation Council
Maia Bellon, Director, Washington Department of Ecology
Michael Garrity, Columbia River Water Policy Manager, Washington Department of Fish & Wildlife

2019-2021 Spill Operation Agreement

December 2018

I. PARTIES

For purposes of this 2019-2021 Spill Operation Agreement (Agreement), the "Parties" means the State of Oregon, the State of Washington, the Nez Perce Tribe, the U.S. Army Corps of Engineers (Corps), the U.S. Bureau of Reclamation (Reclamation), and the Bonneville Power Administration (Bonneville).

II. PURPOSE

This Agreement describes planned 2019-2021 spring fish passage spill operations, using the flexible spill and power principle and objectives described below, and is intended to avoid litigation until the National Environmental Policy Act remand process (commonly referred to as the Columbia River System Operations Environmental Impact Statement and associated Records of Decision) ordered by the United States District Court for the District of Oregon in *National Wildlife Federation v. National Marine Fisheries Service,* Case No. 3:01-cv-00640, (*NWF et al v. NMFS*) is completed.

The Parties have entered into this Agreement in the spirit of regional collaboration with the shared goal of meeting the principles and objectives described below. In order for this collaboration to be possible, the Parties emphasize that, when this Agreement is not in effect, this Agreement is not intended to be used in any litigation or other forum as precedent for, or an endorsement of, any operation, and this Agreement does not represent an endorsement of any biological opinion NOAA Fisheries issues regarding the Columbia River System.

III. FLEXIBLE SPILL AND POWER PRINCIPLE AND OBJECTIVES

A. The principle central to this Agreement is implementing a flexible approach to providing spill to benefit juvenile spring fish passage in concert with managing the Columbia River System for multiple congressionally-authorized purposes, including power generation to assure the Pacific Northwest of an adequate, efficient, economical, and reliable power supply.

B. To fulfill this principle, and solely for purposes of this Agreement, the Parties have adhered, and will continue to adhere, to the following objectives in establishing the planned fish passage spill operations described in this Agreement:

    1. Provide fish benefits, with the understanding that (i) in 2019, overall juvenile fish benefits associated with dam and reservoir passage through the lower Snake and Columbia rivers during the spring fish passage season must be at least equal to 2018 spring fish passage spill operations ordered by the Court, and (ii) in 2020 and 2021, these fish benefits are improved further (as estimated through indices of

improved smolt-to-adult returns, e.g., PITPH, reservoir reach survival, fish travel time); and

2. Provide federal power system benefits as determined by Bonneville, with the understanding that Bonneville must, at a minimum, be no worse financially compared to the 2018 spring fish passage spill operations ordered by the Court;[1] and

3. Provide operational feasibility for the Corps implementation that will allow the Corps to make appropriate modifications to planned spring fish passage spill operations.[2]

IV. DEFINITIONS

A. "Action Agencies" means the Corps, Reclamation, and Bonneville. These agencies jointly manage Columbia River System operations.

B. "Columbia River System" refers to the fourteen federal dam and reservoir projects within the Federal Columbia River Power System that are operated as a coordinated water management system for multiple congressionally-authorized project purposes.

C. "Fish" means salmon and steelhead species listed under the Endangered Species Act.

D. "Gas cap" refers to the applicable state Total Dissolved Gas (TDG) water quality standards (in percent TDG).

E. "Gas cap spill" means spill to the maximum spill level that meets, but does not exceed, the TDG criteria allowed under the applicable state water quality standard at the four Lower Snake River and four Lower Columbia River projects.

F. "Lower Columbia River projects" refers to McNary, John Day, The Dalles, and Bonneville dams.

G. "Lower Snake River projects" refers to Lower Granite, Little Goose, Lower Monumental and Ice Harbor dams.

H. "NEPA Remand Process" refers to development of the Columbia River System Operations Environmental Impact Statement. This Process will conclude upon the signature of Records of Decision by the Action Agencies.

[1] Bonneville shall have sole discretion over how it conducts its financial analysis. Bonneville measured the financial cost of the 2018 Court-ordered operations using the methodology in Bonneville's rate proceedings for calculating the estimated average annual cost of additional planned spring fish passage spill in excess of planned spill levels in the Corps' 2017 Fish Operations Plan.

[2] As described in Section VI.A.

I. "PITPH" is the calculated probability, based on Passive Integrated Transponder (PIT) tag detections, that a juvenile fish will pass through one or more powerhouse routes on its outmigration. A PITPH of 0 signifies the fish is projected to pass through 0 of 8 turbines/bypasses and a PITPH of 8 signifies the fish passed through 8 of 8 turbines/bypasses.

J. "Spill cap" means the spill level (flow through the spillway measured in kcfs) at each project that the Corps estimates will maximize spill to a level that meets, but does not exceed, the Gas cap.

K. "120% TDG spill" means planned juvenile fish passage spill targeting the maximum level that meets, but does not exceed, the Gas cap for 120% TDG in the tailrace, with Spill caps derived by the Corps using the procedures referenced in Section VI.A, below.

L. "125% TDG spill" means planned juvenile fish passage spill targeting the maximum level that meets, but does not exceed, the Gas cap for 125% TDG in the tailrace, with Spill caps derived by the Corps using the procedures referenced in Section VI.A, below.

V. STATE WATER QUALITY STANDARDS

A. The TDG standard for the states of Washington and Oregon is 110%. Both states have provided exceptions to the TDG standard for juvenile fish passage spill operations on the lower Snake River and lower Columbia River. Oregon and Washington intend to work to harmonize their respective methodologies for measuring TDG for the duration of this Agreement. To the extent standards and/or methodologies differ between the two states, the Corps will apply the more stringent standard and/or methodology when operating under all applicable state TDG water quality standards. Oregon and Washington are responsible for any modifications to water quality standards that result from the processes contemplated below.

B. <u>Washington</u>:

1. Washington's current criteria adjustment standard provides that TDG must not exceed an average of 115% as measured in the forebays of the next downstream dams and must not exceed an average of 120% as measured in the tailraces of each dam (these averages are measured as an average of the 12 highest consecutive hourly readings in any one day, relative to atmospheric pressure); and a maximum TDG one hour average of 125% must not be exceeded during spillage for fish passage. WAC § 173-201A-200(l)(f)(ii).

2. Washington Department of Ecology (Ecology) is in the process of considering a short-term modification that eliminates Washington's current forebay TDG standard at the Lower Snake River projects and Lower Columbia River projects

and aligns Washington's calculation methodology with Oregon's current methodology. Ecology acknowledges that there is a desire for this short-term modification to be in effect on or before April 3, 2019, and will work to render a timely decision.

3. Ecology also intends to consider whether to allow spring juvenile fish passage spill up to 125% TDG (as read in the tailrace) under certain conditions. Ecology expects to make a decision on the modification up to 125% TDG prior to the beginning of the 2020 spring juvenile fish passage spill season.

C. Oregon:

1. Oregon's current standard modification provides that spill must be reduced when the average TDG concentration of the 12 highest hourly measurements per calendar day exceeds 120% of saturation at monitoring stations in the tailraces of McNary, John Day, The Dalles, and Bonneville dams, and spill must be reduced when instantaneous TDG levels exceed 125% of saturation for any 2 hours during the 12 highest hourly measurements per calendar day at monitoring stations in the tailraces of McNary, John Day, The Dalles, and Bonneville dams. OR. ADMIN. R. 340-041-0031 and 340-041-104(3).

2. The Oregon Department of Environmental Quality (ODEQ) will ask the Oregon Environmental Quality Commission (EQC) to consider changing the current standard modification to allow spring juvenile fish passage spill up to 125% TDG (as read in the tailrace) at the four Lower Columbia River dams. This issue will be presented to the EQC in time for any potential modification to be in effect for the 2020 spring juvenile fish passage spill season.

VI. SPILL OPERATION

A. General Provisions for Implementing Planned Fish Passage Spill Operations

1. In implementing the planned fish passage spill operations, the Corps will use the process and procedures set forth in the annual Fish Operations Plan and Current Procedures for Setting Spill Caps to establish Spill caps and target spill levels.

2. In-Season Adjustments: In managing the Columbia River System for multiple congressionally-authorized project purposes, the Corps may adjust the planned fish passage spill operations to address conditions set forth in the section of the annual Fish Operations Plan entitled "Modifications to Planned Operations and In-Season Management."

B. 2019 Fish Passage Spill Operations

1. Spring Operations

a. To meet the flexible spill and power principle and objectives in Section III above, and if the conditions in Section IX.A and Section X are met, the Action Agencies will implement planned juvenile fish passage spring spill operations targeting the spill levels and times provided in **Attachment Table 1.1** in a manner consistent with the general spill implementation provisions in Section VI.A, above.

b. The Parties acknowledge that the 2019 spring spill operations set forth in this Agreement are contingent upon securing a modification to Washington's water quality standard as described in Section V.B, above.

2. Summer Operations

a. After implementing the juvenile fish passage spring spill operations in **Attachment Table 1.1**, the Action Agencies will then implement the 2019 planned juvenile fish passage summer operation shown in **Attachment Table 1.2**.

C. 2020 and 2021 Fish Passage Spill Operations

1. If the conditions in Sections V.B.3, V.C.2, IX.A, and X are met, and consistent with Section III, the Parties agree that 2020 and 2021 operations will incorporate spill up to and including 125% TDG as a tool for spring fish passage spill season. Collaborative technical work performed to date has identified representative spring spill operation scenarios. Preliminary analyses indicate these scenarios, which incorporate 125% TDG spill as a tool, meet the Section III principle and objectives (see **Attachment Tables 1.3a-b**).[3]

Building on further analysis of these representative scenarios and in consideration of 2019 results, the Parties will continue in good faith to evaluate the effect of different variables, such as project-specific spill levels and duration (both daily and seasonal), to refine 2020-2021 spring operations, and complete a final specific operations plan by September 1, 2019. If the Parties cannot agree on a refined operation, one of the two representative spring spill operations shown in **Attachment Tables 1.3.a-b** will be implemented in the 2020-2021 spill seasons

[3] Bonneville's analysis, in particular, is especially preliminary and has a high level of uncertainty. Bonneville's financial models were not designed to handle the data associated with daily changes in spill at 125% TDG spill. As a result, Bonneville does not yet have full confidence in the results of the models. Accordingly, the Parties recognize Bonneville will continue to revise its evaluation of the financial implications of any 125% TDG scenarios.

for such time as this Agreement remains in effect, or until the Parties can agree on refinements.

The representative operations shown in Attachment Tables 1.3.a-b do not incorporate 125% TDG spill on a 24-hour, 7-day basis simultaneously at all Lower Columbia River projects and Lower Snake River projects. Such an operation would be inconsistent with the flexible spill and power objectives that are central to this Agreement.

2. The Parties presume that adjustments to summer spill operations in 2020-2021 will likely be necessary to meet the power-cost objective in Section III.B.2. To that end, the Parties have developed the operation reflected in **Attachment Table 1.4**. This operation is designed to meet the power-cost objective, while limiting potential reductions in spill to the last two weeks of August. The Parties agree that, subject to the iterative process specified in Section VI.C.1 above, this operation represents the maximum reduction in summer spill that is compatible with the Section III principle and objectives.

3. The Parties commit to ensuring their analyses are transparent and collaborative. For example, the Parties will continue to share and explain the assumptions and outputs of the biological and financial models, as well as information on any structural or operational constraints that may affect implementation of this Agreement.

4. The Parties acknowledge that implementation of 2020-2021 spring spill operations is contingent upon securing a modification to Washington and Oregon's water quality standards to allow for spill up to 125% TDG as described in Section V above.

VII. MONITORING

With regard to monitoring associated with this Agreement, the Parties agree that:

A. Monitoring activities for juvenile and adult salmon and steelhead relative to mainstem hydrosystem operations and conditions are generally in place. In addition, the Parties support the installation of a PIT tag detection array on the Lower Granite Removable Spillway Weir as soon as feasible, currently anticipated for use in 2020.

B. No additional PIT tagging is needed for analyses for spring/summer Chinook and steelhead. Additional PIT tagging, above current levels, may be desired for summer migrating fall Chinook and sockeye.

C. Enhanced sampling of resident fish, invertebrates, and amphibians may be desirable in 2019. Enhanced sampling activities that meet monitoring needs may be required in 2020-

2021. Existing monitoring of TDG and Gas Bubble Trauma in salmonids will continue. TDG and Gas Bubble Trauma monitoring may be enhanced if deemed necessary and funded.

D. Validation of fish behavior assumptions inherent in the modeled fish benefits relative to Spill Passage Efficiency are important and may require additional evaluation.

E. Possible approaches, study designs and funding sources of any new monitoring activities discussed in this Section VII are being explored and discussed, but any additional monitoring Bonneville agrees to fund for the purposes of this Agreement must be within Bonneville's existing overall Fish and Wildlife Program budget. The Corps will continue current monitoring commitments in furtherance of this Agreement.

VIII. REPORTING

A. The Fish Operations Plans for 2019, 2020 and 2021 will include the same reporting provisions as those set forth in the 2018 Fish Operations Plans. The Corps will provide status updates at the regularly scheduled Technical Management Team (TMT) meetings about the spring fish passage spill operations including review of the project Spill caps and resultant TDG level during the relevant time period. The Corps will address clarifying questions of the status update at the TMT meeting. In the event that a dispute results from the Corps' status update of the project Spill caps and resultant TDG level, that dispute should be expeditiously elevated by the Party seeking resolution of the dispute to the Regional Implementation Oversight Group (RIOG) in accordance with the established Regional Forum process.

B. Parties to this Agreement agree to participate in the Regional Forum process in a manner that is consistent with the established processes of those groups and is respectful to all participants.

IX. EFFECTIVE DATE, WITHDRAWAL AND TERMINATION

A. Effective Date.

This Agreement shall become effective where the following two conditions are met:

1. Signatures by the Parties to this Agreement, and

2. The filing of a notice with the U.S. District Court for the District of Oregon in *NWF et al v. NMFS*, that contains representations by the Parties to this Agreement and the National Wildlife Federation, et al., plaintiffs that they do not intend to file or engage in any litigation in *NWF et al v. NMFS* while this Agreement is in effect.

B. Withdrawal.

Any Party may withdraw following conferral and notice pursuant to Section XI below, upon the occurrence of any of the following:

1. The Action Agencies do not continue to implement habitat, hatchery, and monitoring and evaluation actions that provide an equivalent level of protection to fish and wildlife as they are currently implementing under the Action Agencies' 2008 Records of Decision or Record of Consultation and Statement of Decision for the Columbia River System, as supplemented in 2010 and 2014, to the satisfaction of Oregon, Washington or the Nez Perce Tribe.

2. Failure to satisfy any of the conditions or commitments set forth in this Agreement.

3. A Reasonable and Prudent Alternative action providing a fish passage spill operation inconsistent with the provisions of this Agreement, which either U.S. Fish and Wildlife Service or NOAA Fisheries issues following an ESA consultation.

4. While this Agreement is in effect, the filing of any complaint or motion for declaratory, injunctive, or other relief in *NWF et al v. NMFS*, or the initiation of any new action in any court that relates to actions or operations addressed in NOAA Fisheries' 2008 Columbia River System biological opinion and the Action Agencies' 2008 Records of Decision or Record of Consultation and Statement of Decision, as supplemented in 2010 and 2014.

C. Termination.

1. The Agreement terminates automatically upon the completion of the NEPA Remand Process.

2. The Agreement terminates automatically should the Court in *NWF et al v. NMFS* modify the terms of this Agreement in any manner, including adopting some or all of the terms of the Agreement as a court order.

3. If modification of Washington or Oregon's water quality standards does not occur, any Party may terminate this Agreement.

4. If any Party withdraws from this Agreement pursuant to Section IX.B., above, the Agreement may be terminated by any Party following conferral and notice of termination pursuant to Section XI below.

X. FORBEARANCE, RESERVATION OF RIGHTS, NO PRECEDENTIAL EFFECT

A. While this Agreement is in effect, the State of Oregon and Nez Perce Tribe agree to forbear from filing motions or seeking relief (including declaratory or injunctive relief) in *NWF et al v. NMFS*, and from filing any new action in any court that relates to actions or operations addressed in NOAA Fisheries' 2008 Columbia River System biological opinion and the Action Agencies' 2008 Records of Decision or Record of Consultation and Statement of Decision, as supplemented in 2010 and 2014.

B. Nothing in this Agreement alters or modifies the Parties' rights (including any claims or defenses) in *NWF et al v. NMFS* or any other forum, and no Party makes any concessions regarding the legal validity, scientific validity, or economic cost/benefit of the spill operations contemplated in this Agreement, the Columbia River System Operations Environmental Impact Statement, or any biological opinion NOAA Fisheries issues on the Columbia River System.

C. The Parties agree that this Agreement is not intended to be construed as a consent decree enforceable as a court order in *NWF et al v. NMFS*, or otherwise cited or used as precedential on any legal or factual matter in *NWF et al v. NMFS*. The sole and exclusive remedy for any alleged breach or unresolved dispute under this Agreement (following good faith efforts by the Parties to resolve the dispute pursuant to Section XI below) is to withdraw from the Agreement.

D. Nothing in this Agreement shall be interpreted as or constitutes a commitment or requirement that Reclamation, the Corps, or Bonneville pay funds in contravention of the Anti-Deficiency Act, 31 U.S.C. § 1341.

E. Nothing in this Agreement shall be interpreted as limiting the authority granted to, or retained by, the State of Oregon or the State of Washington under the Federal Water Pollution Control Act (Clean Water Act) (33 U.S.C.§§ 1251-1387).

F. Nothing in this Agreement shall be construed as a waiver of any Party's sovereign immunity.

XI. MEET AND CONFER

A. The Parties agree to communicate the provisions of the Agreement to appropriate staff and work in good faith through existing RIOG coordination and adaptive management processes to implement the terms of this Agreement.

B. The Parties agree that a Party may exercise its withdrawal or termination options only after: (1) informing the Parties in writing of the issue to be addressed; (2) working in good faith with the Parties to resolve the issue; and (3), where the issue cannot be

resolved, provide written notice to the Parties that the Party is withdrawing from or terminating the Agreement.

C. As detailed in Section VIII, any disputes arising out of the Corps' status updates on project spill caps and resultant TDG level from spring fish passage spill operations at the regularly scheduled TMT meetings should be immediately elevated to the RIOG in accordance with the established Regional Forum process by the Party seeking resolution of a dispute. RIOG meetings to resolve any disputes will be conducted as appropriate under that established process.

XII. SIGNATURES

By signing below, the Parties represent they affirmatively support this Agreement and its implementation.

The signatures of the State of Oregon, the State of Washington, the Nez Perce Tribe, Reclamation, the Corps, and Bonneville appear on the following pages 11-16.

OREGON

December 13, 2018

Kate Brown
Governor
State of Oregon

Date

NEZ PERCE TRIBE

12-14-18

Shannon F. Wheeler
Chairman
Nez Perce Tribe

Date

12-14-18

Casey L. Mitchell
Secretary
Nez Perce Tribe

Date

WASHINGTON

Jay Inslee
Governor
State of Washington

Dec 12, 2018
Date

BUREAU OF RECLAMATION

Lorri Gray
Regional Director
Bureau of Reclamation

12/14/18
Date

U.S. ARMY CORPS OF ENGINEERS

12 Dec 2018

Brigadier General D. Peter Helmlinger
Commander, Northwestern Division
U.S. Army Corps of Engineers

Date

BONNEVILLE POWER ADMINISTRATION

12/14/18

Elliot Mainzer
Administrator
Bonneville Power Administration

Date

Attachment

Table 1.1.
Planned 2019 spring spill operation, applying estimated 120% mean total dissolved gas spill caps and performance standard spill[4] flex operations.

Location	COE Estimated Mean 120% Total Dissolved Gas Spill Cap (16 hours)	Performance Standard Spill (8 hours)
Lower Granite	45 kcfs	20 kcfs
Little Goose	52 kcfs	30%
Lower Monumental	44 kcfs	30 kcfs (bulk spill pattern)
Ice Harbor	87 kcfs	30%
McNary	180 kcfs	48%
John Day	146 kcfs	32%
The Dalles	135 kcfs	40%
Bonneville	122 kcfs	100 kcfs

Key points:

- Spring spill operations would be initiated April 3 and April 10th and transition to summer spill operations on June 21 and June 16 at Lower Snake River projects and at Lower Columbia River projects, respectively.
- The 8 hours of performance standard spill would occur with some flexibility. Only Little Goose would be set to at least 4 hours in the a.m. (beginning near dawn and not to exceed 5 hours in the a.m.) and no more than 4 hours in the p.m. (generally near dusk) to help with adult passage issues. All other projects could spill either 3 or 4 hours for the performance standard spill a.m. time period and then up to a max of 5 hours in the performance standard spill p.m. period (not to exceed 8 hours in the day).
- No ponding above current MOP assumptions: Snake River - MOP+1.5 ft (to provide 1 ft. of useable space); John Day - MIP+2 ft (to provide 1.5 ft. of useable space).
- Controlled spill at Bonneville Dam capped at 150 kcfs due to erosion concerns.
- Controlled spill at The Dalles contained between the walls (Bays 1-8) unless river flows were over 350 kcfs then spill outside the walls would be permitted.
- Existing adaptive management processes will be employed to help address any unintended consequences that may arise in-season as a result of implementing these proposed spill operations.
- Spill may be temporarily reduced at any project if necessary to ensure navigation safety or transmission reliability.

[4] "Performance standard" spill is a NOAA Fisheries term and refers to spill levels intended to meet NOAA's performance standard testing, as described in the 2008 Biological Opinion and accompanying administrative record.

Table 1.2.
Planned summer spill operations, starting June 21 at Lower Snake River projects and June 16 at the Lower Columbia River projects through August 31, 2019; no spill curtailment criteria. Table 1.1 key points apply.

Location	Summer Spill Operation: Volume/Percent of Total Flow Routed to Spillway (June 21/16 – Aug 31)
Lower Granite	18 kcfs
Little Goose	30%
Lower Monumental	17 kcfs
Ice Harbor	30%
McNary	57%
John Day	35%
The Dalles	40%
Bonneville	95 kcfs

Table 1.3.a.

Representative spring spill alternative one, for implementation in 2020 and 2021. Six projects using 125% TDG flexible spill, John Day (JDD) using 120% TDG flexible spill and The Dalles (TDA) using 24 hour performance standard spill. Table 1.1 key points apply.

Location	COE Estimated mean 125% Total Dissolved Gas Spill Cap (16 hours), with alternative operation at JDD and TDA.	Performance Standard Spill (8 hours).
Lower Granite (125 flex)	72 kcfs	20 kcfs
Little Goose (125 flex)	79 kcfs	30%
Lower Monumental (125 flex)	98 kcfs	30 kcfs (bulk spill pattern)
Ice Harbor (125 flex)	119 kcfs	30%
McNary (125 flex)	265 kcfs	48%
John Day (120 flex)	146 kcfs	32%
The Dalles (Performance Standard)	40%	40%
Bonneville (125 flex)	150 kcfs	100 kcfs

Table 1.3.b.

Representative spring spill alternative two, for implementation in 2020 and 2021. Six projects using 125% TDG flexible spill with JDD and TDA using 24-hour performance standard spill. Table 1.1 key points apply.

Location	COE Estimated mean 125% Total Dissolved Gas Spill Cap (16 hours), with alternative operation at JDD and TDA.	Performance Standard Spill (8 hours)
Lower Granite (125 flex)	72 kcfs	20 kcfs
Little Goose (125 flex)	79 kcfs	30%
Lower Monumental (125 flex)	98 kcfs	30 kcfs (bulk spill pattern)
Ice Harbor (125 flex)	119 kcfs	30%
McNary (125 flex)	265 kcfs	48%
John Day (Performance Standard)	32%	32%
The Dalles (Performance Standard)	40%	40%
Bonneville (125 flex)	150 kcfs	100 kcfs

Table 1.4.

Planned summer spill operations for 2020 and 2021. Cessation of juvenile transportation June 21 through August 14 with allowance for Technical Management Team adaptive management adjustments.

Location	Initial Summer Spill Operation: Volume/Percent of Total Flow Routed to Spillway (June 21/16 – August 14)	Late Summer Transitional Spill Operation: Volume/Percent of Total Flow Routed to Spillway (August 15 – August 31)
Lower Granite	18 kcfs	RSW or 7 kcfs
Little Goose	30%	ASW or 7 kcfs
Lower Monumental	17 kcfs	RSW or 7 kcfs
Ice Harbor	30%	RSW or 8.5 kcfs
McNary	57%	20 kcfs
John Day	35%	20 kcfs
The Dalles	40%	30%
Bonneville	95 kcfs	55 kcfs - includes 5k corner collector

Attachment A

2019 – 2021 Spill Operation Agreement Addendum

2020[1] Spring Spill Operation Refinement

Table 1.5 Planned (refined tables 1.3.a-b) 2020 spring spill operation, applying estimated 125% mean total dissolved gas (TDG) spill caps and performance standard spill[2] operations at six projects ("125 flex"), applying estimated 120% mean TDG spill caps and performance standard spill ("120 flex") at John Day Dam (JDA), and 24 hour performance standard spill (40%) at The Dalles Dam (TDA).

Location	Estimated mean 125% Total Dissolved Gas Spill Cap (16 hours), with alternative operation at JDA and TDA.	Performance Standard Spill (8 hours).
Lower Granite (125 flex)	72 kcfs	20 kcfs
Little Goose (125 flex)	79 kcfs	30%
Lower Monumental (125 flex)	98 kcfs	30 kcfs
Ice Harbor (125 flex)	119 kcfs	30%
McNary (125 flex)	265 kcfs	48%
John Day (120 flex)	146 kcfs	32%
The Dalles (Performance Standard)	40%	40%
Bonneville (125 flex with 150 kcfs spill constraint)	150 kcfs	100 kcfs

Key points:

- Spill may be temporarily reduced at any project if necessary to ensure navigation safety or transmission reliability.
- Spring spill operations will be initiated April 3 at Lower Snake River projects and April 10 at Lower Columbia River projects and transition to summer spill operations on June 21 at Lower Snake River projects and on June 16 at Lower Columbia River projects.
- The 8 hours of performance standard spill may occur with some flexibility (with the exception of Little Goose and Lower Granite operations described in the next key points). Other than at TDA, performance standard spill will occur in either a single 8-hour block or up to two separate blocks per calendar day. No more than 5 hours of performance standard spill may occur between sunset and sunrise, as defined in the Fish Passage Plan (FPP). Performance standard spill shall not be implemented between 2200 and 0300. No ponding above current MOP assumptions except as noted below.

[1] This operation will also be implemented if the Agreement remains in effect in 2021.

[2] "Performance standard" spill is a NOAA Fisheries term and refers to spill level intended to meet NOAA's performance standard testing, as described in the 2008 FCRPS Biological Opinion and accompanying administrative record.

- Little Goose Exception One – As soon as practicable (and, in any event, no more than 24 hours) after a cumulative total of 25 adult spring Chinook salmon (not including jacks) pass Lower Monumental Dam, operate Little Goose spill at 30% spill for 8 consecutive AM hours (April 1- 15 start at 5am; April 16 – June 20th start at 4am).
- Little Goose Exception Two – During periods of uncontrolled spill, spill at 30% for 8 hours/day (day light hours as defined in the Fish Passage Plan) and store additional inflows that exceed hydraulic capacity in the forebay above MOP if necessary. When it is necessary to pond water to achieve the lower spill levels due to high inflows, water stored above MOP should be drafted out over the remaining hours by increasing spill to pass inflow from 1200-1600 hours, then increasing spill as necessary from 1600-0400 to draft the pool back to MOP. If it is forecasted that the drafting spill will generate TDG levels in the tailrace in excess of 130% use all 16 hours to return the pool to MOP.
- Lower Granite Exception One – If adult passage delays are observed at Lower Granite Dam, the Corps may implement performance standard spill at Lower Granite Dam for at least 4 hours in the AM (beginning near dawn). Implementation of this modification may also trigger in-season reevaluation of options to balance power principle.
- Controlled Spill at Bonneville Dam capped at 150 kcfs due to erosion concerns.
- Controlled spill at TDA contained between the walls (Bays 1-8) unless river flows are over 350 kcfs, in which case spill outside the walls is permitted; TDG levels in TDA tailrace may fluctuate up to 125% TDG prior to reducing spill at upstream projects, subject to the 40% spill cap.
- Attempts should be made to minimize in-season changes to the proposed operations; however, if serious deleterious impacts are observed, existing adaptive management processes may be employed to help address serious issues that may arise in-season as a result of implementing these proposed spill operations.

Table 1.4 (content is unchanged from 2019-2021 Spill Operation Agreement). Planned summer spill operations for 2020. Cessation of juvenile transportation June 21 through August 14 with allowance for Technical Management Team adaptive management adjustments.

Location	Initial Summer Spill Operation: Volume/Percent of Total Flow Routed to Spillway (June 21/16 – August 14)	Late Summer Transition Spill Operation: Volume/Percent of Total Flow Routed to Spillway (August 15 – August 31)
Lower Granite	18 kcfs	RSW or 7 kcfs
Little Goose	30%	ASW or 7 kcfs
Lower Monumental	17 kcfs	RSW or 7 kcfs
Ice Harbor	30%	RSW or 8.5 kcfs
McNary	57%	20 kcfs
John Day	35%	20 kcfs
The Dalles	40%	30%
Bonneville	95 kcfs	55 kcfs - includes 5k corner collector