APR 11 2000

Potlatch

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March 30, 2000

U.S. Army Corps of Engineers
Walla Walla District
Attention: Lower Snake River Study
201 North Third Avenue
Walla Walla, WA 99362-1876

The following comments are addressed to the Corps' December 1999 Lower Snake River Juvenile Salmon Migration Draft Feasibility Report and Environmental Impact Statement (the "FR/EIS").

1 The unique structure of the decision process attached to the Corps' FR/EIS has created considerable uncertainty. We are told that the Federal Caucus' "All-H" paper, accompanied by the National Marine Fisheries Service's draft biological opinion for operation of the Federal Columbia River Power System, will be released in mid-May, and that a final All-H paper and biological opinion will be released in July. The Corps' action on this FR/EIS is scheduled to follow later in the year. One is led to believe, therefore, that a decision by the Corps from among the four FR/EIS alternatives will be largely determined by the All-H and FCRPS consultation process well before consideration is given to comments on the FR/EIS.

There are two areas of the FR/EIS in particular that we would like to address in these comments. Those areas are biology and economics.

We are struck by the desire of some to wrap up further scientific inquiry and announce that the science is all in on Snake River salmon survival. Not only is there continuing new data being produced by the Corps and other agencies studying this issue, there is also much new research from scientists elsewhere.

2 We urge, for example, that the Corps give attention to the considerable work of Dr. David Welch of the Department of Fisheries & Oceans in British Columbia, including in particular his findings addressing the impact that ocean feeding habitat has on Snake River species. Dr. Welch's findings raise important

2 questions about the unsubstantiated differential delayed mortality theory.

Insofar as science determines the Corps' selection of a preferred alternative, we associate ourselves with and incorporate the comments of the Northwest Irrigation Utilities, the Pacific Northwest Waterways Association and the Northwest Food Processors Association in strongly opposing dam breaching. We think it is critical that salmon recovery be addressed in a comprehensive framework, as done in the materials incorporated above.

Our comments on the economics of the FR/EIS address both general economic analysis and information relating specifically to Potlatch.

3 As a general matter, we question whether the standard of analysis followed by the Corps in the FR/EIS is consistent with the "economically and technologically feasible" language in the definition of "reasonable and prudent alternatives" under 50 CFR 402.02, or with the standard of review that is necessary to make a correct decision from among the FR/EIS' four alternatives.

In addition, in attachment 1 we include a comprehensive list of concerns with the Corps' analysis that we think must be addressed in the final product.

In attachments 2, 3 and 4, we set out information relating to impacts on Potlatch and the region that is not reflected in the FR/EIS.

To conclude, we register our strong opposition to a dam breaching alternative. We do not have to point out that some of the most powerful arguments against dam breaching have come from the Corps' own scientists. Borrowing from the Corps' December 21, 1999, Multi-Species Biological Assessment of the Federal Columbia River Power System, we believe that an adaptive management framework with measurable performance standards (the Corps' "Construct for Achieving Survival Improvements") offers a very solid approach to salmon recovery. It is the type of approach that offers our best chance of success.

Sincerely,

Hubert D. Travaille
Vice President, Public Affairs

HDT:mw

Enclosure

ATTACHMENT 1

A
POTLATCH CORPORATION
REVIEW OF
THE REPORT TITLED

Lower Snake River Juvenile
Salmon Migration Feasibility Report
Environmental Impact Statement

OVERVIEW

The report under review is, Lower Snake River Juvenile Salmon Migration Feasibility Report / Environmental Impact Statement. The report was prepared by the US Army Corps of Engineers, Walla Walla District, and bears the date December 1999. It is referred to in this review as FR/EIS.

This review emphasizes a number of inconsistencies that the FR/EIS has with Corps guidance. Many of the deviations appear to result from judgement on how to apply the concepts detailed in several official Corps manuals. Some of the deviations appear to create contradictions within the FR/EIS. These deviations lead to questions about the reliability and accuracy of the conclusions. We do feel that the report has provided the service of putting many of the basic economic issues relating to breaching the Lower Snake River dams in front of the public for consideration.

While we question the magnitude and interpretation of some figures and methods in the report, the overall effect of any corrections would be to increase the NED cost of dam removal. We have found no deficiencies that would tend to significantly reverse the implied conclusion that breaching the dams would result in huge annual economic losses and contribute little if anything to prospects for species survival. An overarching issue is that use of a 1998 PATH analysis has caused effectiveness of dam breaching alternatives to be characterized as being more effective than if a more up to date 1999 study had been used. This causes some concern because a key finding of the 1999 PATH analysis was that all of the alternatives are able to meet NMFS species survival thresholds. According to the 1999 Path analysis, all of the alternatives are also able to meet recovery thresholds under some sets of assumptions.

The review is parallel with the report to the maximum extent possible. It references specific pages and paragraphs, and when necessary to make clear the context of the comment, it will quote short passages of the report. Generally, there are comments in several broad review classes:

- Questionable assumptions and important unresolved issues
- Incomplete institutional information and analysis

Data inconsistencies
Use of incorrect procedures
Incomplete accounting of costs
Overstatement and understatement of certain positive and negative effects

The problems do not fall in any certain order, and some of them occur more than once in the report. Specific parts of the report are brought up for discussion one at a time. Since these review comments parallel the report, a review comment is made only the first time a problem occurs. If a similar problem occurs in later stages of the report, it is ignored unless it is in a different or extended context, circumstance, argument, or condition.

The various parts of the report include identification of numerous "unresolved issues". These review comments have not reiterated all of these concerns because we view them as the Corps' work in progress. We take the position that many of these concerns were raised during a formal IEAB review process and have not yet been addressed. We believe that time should be allowed for them to be resolved and presented in another review draft of the FR/EIS. The issues may remain as significant issues, be resolved, or perhaps become more problematic. We reserve the right to comment on their treatment later.

We have some stated concerns with hydropower, however the hydropower models appear to be generally well developed and properly applied. Many of the potential discrepancies could be credited to the draft nature of the report text rather than serious technical problems in the analysis. We have pointed out several specific areas where clarification would be beneficial.

Important changes are needed in the recreation analysis due to adjustments that are required to show recreation effects in the NED frame of reference, and to recognize constraints that were ignored in the benefit analysis. In addition, all of the fisheries analysis that is dependent on PATH inputs needs to be updated to reflect 1999 PATH results.

Of concern unique to the transportation analysis is that some important assumptions are left open to question. Also, the transportation analysis and the Economics Appendix overall is inconsistent in application of the associated cost concept and inconsistent with agency guidance on the subject. The FR/EIS used an expedited evaluation procedure that did not properly identify externalized delay effects, safety effects, or emissions effects. This lack of recognition of some costs may have caused potential diversion of commodities to non-Columbia River ports to be ignored. This oversight in export routings for some of the commodities caused other issues such as capacity and safety related traffic problems elsewhere to be un-addressed.

SPECIFIC REVIEW COMMENTS

4 Relation to Concurrent Studies - Some of the work in the Economics Appendix is closely tied to other ongoing studies. This review is of Appendix I Economics, however the Appendix overlaps and depends either directly or indirectly, on work done recently under the Cumulative Risk Initiative (CRI), Federal Caucus (All H Paper), Framework (FW), and other volumes of the FR/EIS. We are concerned that these ongoing studies need to be viewed somewhat as companion documents but find they are not even referenced or described in Appendix I. We are aware that the FW will draw heavily on FR/EIS data, and that it is intended to serve as a policy framework for fish and wildlife decision making. Therefore, it has the potential of becoming more important to the planning process as time goes on.

We are aware that the CRI is designed to make statements about extinction probabilities as they relate to dam breaching and other options. As extinction scenarios develop, they too could affect the institutional decision making environment of the FR/EIS. The CRI study and the Federal All H paper are mentioned in the FR/EIS summary document but not detailed in any of the Appendix material. This is important because CRI paints a different picture than PATH. PATH indicates all of the alternatives can meet survival thresholds while CRI describes impending extinction. CRI is absent from the appendix material. We were able to locate a copy of the CRI draft and we take exception to the analysis therein.

4

With regard to the FR/EIS, the importance of CRI to the study process is presented ambiguously. CRI is essentially absent from the FR/EIS, but it is of great presence in the Corps summary of effects in its announcement of public meetings[1]. In a recent newsletter announcing FR/EIS public meetings, a summary of effects for each alternative states that Alternatives 1, 2 and 3 show "Slight reductions in extinction risk for listed stocks". In the newsletter, the only beneficial gain from dam removal is "Moderate reduction in extinction risks for fall chinook and steelhead." The implication here is that any comprehensive solution could require a combination of dam removal and other strategies. We object to including summary statements about CRI findings, because CRI is contrary to PATH data which shows that NMFS thresholds for species survival will be met without dam removal. PATH findings are not summarized in the public meeting announcement.

The CRI paper is particularly troublesome because it is a major departure from the PATH data. CRI is presented as a statistical analysis and it seems to contain a major analysis problem. Application of data generated in the paper appears to be misleading.

The paper used historical numbers of spawners and recruits to generate a least squares regression. The regression line is extrapolated to predict the probability of extinction at year-10 and year-100. A single returning fish in any one year is said to be the "extinction" criteria. With this approach, the situation is presented as very grim. But there are some curiosities about the CRI analysis.

5

All salmon have multi-year life cycles. To get to a single returning fish in any year is not necessarily linked to a probability of species extinction. CRI recognized that fish could disappear in one year but have abundant returns for the years on either side. Even with zero returns some maturing fish would still be alive in the ocean while others would still be migrating to the sea, but CRI still adopted the single year standard. Also, there is the additional consideration that application of the concept of metapopulations could bring about[2]. Metapopulations are groups of local populations that are linked by individuals that stray among the populations. When local populations become extinct, they can be reestablished through a natural process of colonization by strays from neighboring local populations. The CRI definition of "extinction" is important because it causes a distortion in the probabilities.

The concept of time series and regression is well accepted among people who work with

[1] Lower Snake River juvenile Salmon Migration Feasibility Study, Newsletter N0.8, January 2000, Corps of Engineers Walla Walla District

[2] Return to the River, NPPC, ISG, 1996

statistics. If the time series least squares regression was properly applied the probabilities predicted by CRI would be difficult to question and the single year criteria might be more easily accepted[3]. However, the CRI time series analysis itself can be taken as a subject of deliberation. As an example, the time series of Figure 2, page 31 of the CRI report use data from 1980 – 1994. With this time span, CRI ignored the fact that major changes in fisheries management, dam operation, and passage have taken place in recent years. The 1999 fish related investments and system operation is very unlike what was installed and how it was operated in 1980. Different conclusions would have been indicated if the CRI analysis was limited to 1984 – 1994. For all of the figures, the slope of the regression would be changed significantly and "extinction" probabilities would change as well. But what is more important is that the growth rate needed to avoid the CRI "extinction" criteria would also take on a significant change. This would lead to a different assessment of future risk under any program scenario.

Another necessary modification to the analysis is that that data since 1994 should be added. With this done the series should then be regressed no further back than 1990. This would capture the positive effects of present day operations under the 1995 Biological Opinion (BIOP), and blend them in a balanced manner with returns in years immediately before the BIOP. Fish returning right after the BIOP would be the result of spawners that enjoyed conditions that were being
5 phased in before the official implementation of the BI-OP. With these modifications to the CRI, predictions of extinction and assessment of program effectiveness would be improved considerably.

We note an interesting series of anomalies in the report that causes some ambiguity in the interpretation of CRI. The example is in Table 6, which is tied to information in Tables 7, 9, and 10, and the accompanying text. The example is the percent change in population growth rate that is necessary to avoid "extinction". The average growth rates used to determine the probability of extinction are shown in Table 6. For all of the stocks the rates are positive. This is a problem because any predicted increase in probability of extinction would need to be demonstrated by a negative growth rate. Based on the positive growth rates we would conclude that none of the stocks are in jeopardy of extinction.

Economic Summary Needed- A presentation of major findings at the beginning of the study would be a valuable addition. The Economics Appendix could serve as a source for a summary in the main report volume. As it is now assembled, one must read the entire document to find the few important pages that compare performance of the four alternatives in economic terms.

6 The summary should state that the 1999 PATH results show:

- All alternatives meet the 24-year and 100-year survival standards.

All drawdown actions meet the 48-year recovery standard.

All non-breaching actions meet the 48-year recovery standard but they are not considered as robust considering the current level of uncertainty regarding transported fish.

Selection of Alternative 2 would save $11,000 - $18,000 per fish.

Selection of Alternative 3 would save $3,000 - $8,000 per fish.

[3] CRI uses the single returning fish in any year as the extinction threshold adopts the term quasi-extinction but

Selection of Alternative 4 would cost an additional $8,000 - $15,000 per fish.

6 This information is important because it reveals early that any of the plans can be effective but that they differ drastically in cost. Some of the NED review comments made in this review would have the effect of significantly increasing the cost per fish under dam breaching scenarios.

Plan Selection - All of these studies are being done for the ultimate purpose of aiding in plan selection regarding ESA related issues. A central theme in all of them is the present day problem with anadromous fish, and the need to focus on solutions in the very near future. We need to gather good information before making a decision. This is a complex set of problems and the solutions will overlap many jurisdictions. With all of the complexities, one thing that has slipped by all of the studies is that there has been no clear stipulation of plan selection guidelines. There is some recognition of planning objectives as in the All H Paper and there are alternatives and strategies as in Framework, and another set of alternatives in the Corps FR/EIS. However, none of the studies describes how one gets through all of these to a specific plan.

The key to this missing piece might be within the Appendix I, which set forth an Incremental Cost Analysis that could provide a rational basis for plan comparison. It draws on the available economic, biological and engineering studies to provide an explainable means of comparing the 7 options. It puts the many variables into an economic comparison that demonstrates dam breaching produces additional fish at a cost of up to $23,000 per fish. It also shows that non-dam breaching options provide almost the same numbers of fish at far less cost, and that they too meet survival thresholds.

We are supportive of the approach used in the cost effectiveness section of the report and urge that a summary of the cost effectiveness be included in an introduction to the Economics Appendix and also in an executive summary of the overall study.

Institutional Attributes – The FR/EIS does not address present day institutional aspects that are important in setting a frame of reference for a decision. There are other planning studies going on such as the FW, and Federal Agencies All H Report. Soon the Corps will need to identify a recommended alternative in the FR/EIS. In contrast, The FW was not charged with the mission of plan selection for the Corps. It was originally envisioned as a policy framework for the region. With those limitations however, it is still appropriate to expect the FW to describe a policy action process. Therefore, the Framework is part of the institutional/policy future the Corps must identify in an EQ evaluation. [4]

8 The Federal agencies have gotten together to present their point of view in the "All H" format. They have summarized the potential actions without identifying their specific responsibility for action. The All H paper gives this appearance by avoiding a presentation of the specific decision procedure they will follow except for some stated generalities about future public involvement. If there is an agreement that incremental cost effectiveness analysis will be used, it should be explicit in the All H paper and the FR/EIS, and in related policy documents that describe the institutional environment basic to the FR/EIS. The P&G is a guiding document for all major Federal water

[4] Economic and Environmental principles and Guidelines for Water and Related Land Resource Implementation Studies, aka P&G as presented in Corps of Engineers Engineer Regulation ER 1105-2-100, paragraph 7-14, a., (c)

resource agencies[5]. Other Corps guidance is specific about the role of incremental cost analysis, and the NED objective[6]. There is no statement of commitment to these specific policies and procedures in the FR/EIS leaving the reviewer to wonder what the plan selection criteria will be?

8 Also of concern to the stakeholders is that none of the above studies has developed a decision model. The studies have not even begun to venture into application of Decision Analysis tools despite most of the time and funds having been used up. The stakeholders could be equipping themselves to participate if they were informed of the procedure that will be used.

9 Recreation, Table ES-3 - This table summarizes the results of recreation surveys. It reduces the data to annual benefits on an individual user basis. According to P&G, [7] variable travel costs are to be divided by number of persons per vehicle, usually about 2.7. There being no indication that this has been done, the adjustment could reduce the benefit to about 37% of the claimed value.

10 Recreation, Table ES-4 - The table shows $31,600,000 as the amount of reservoir recreation lost because of dam breaching. Table ES-3 shows the components of the loss and they add up to $38,524,000 on that table. An explanation or correction is needed.

11 Another concern with the table and general discussion is that there seems to be no recognition of site development costs that will be necessary to accommodate the new visitors. The amount of cost needs to be disclosed so it can be tracked through the analysis either as an implementation cost or associated cost. This applies to capital cost as well as operation and maintenance.

12 Regional Economic Development, para ES 5 - This discussion maintains that eight input-output models were used. In paragraph 1.3.3 an equally good case is made that four models were developed.

13 Project Purposes, para 2.1.3 - Here fish and wildlife is identified as a purpose. We believe this to be an error. The Lower Snake River Fish and Wildlife Compensation Plan was separately authorized as a mitigation program. The distinction between mitigation and fish and wildlife as a purpose is important because without fish and wildlife as a purpose, costs can only be incurred as they relate to mitigating the effects of the projects. By definition that has limited any expenditure to correction of damages caused by the projects. This is the main reason why alternatives in this particular FR/EIS were not scoped to look beyond juvenile fish migration options.

14 Power System Impacts para 3.1.1 - This discussion incorrectly defines secondary energy as being excess over average conditions. Secondary energy is generally defined to be energy that is excess over generation during a critical period. A critical period is a historic period of several months of low flows when energy generation is critical with respect to load requirements. This is usually the low water year of 1936 – 37. There is ordinarily a significant energy difference between generation in an average year and generation of a critical year.

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[5] As of 8 July 1983 the P&G are applicable to The Corps, TVA, Soil Conservation Service, and Bureau of Reclamation having standing as Administrative Guidelines.

[6] P&G as presented in ER 1105-2-100 sec 7-35

[7] P&G as presented in Corps ER 1105-2-100, paragraph 6-105, f., (e),

Future Production Costs Leave a Deficit, page I3-19 - "To be justified a new power unit must produce enough energy in that year at the marginal cost to equal the fixed and variable cost of the new resource." This seems to be another way of stating marginal cost needs to equal marginal revenue. If so, it is an appropriate procedure for determining economic justification of new resources. However re-balancing the system this way might increase instances of load shedding.

With long-term load growth as part of every scenario, there would always be some unmet needs. Since economies of scale are necessary to justify adding a unit (for example, we cannot justify adding a unit if we can sell only 5% of the output) there will always be some unmet load. Some users expecting to be supplied therefore will experience curtailment, and the economic losses associated with a shut down or a cut back in production. The hydro part of the power system has historically scaled capacity additions based on producing firm energy and selling it at average
15 costs. In economic terms, the system capacity probably exceeds the optimum. Introduction of a procedure to evaluate capacity based on marginal cost and marginal revenue will tend to scale back excess capacity in the future. Regardless of whether it has been the most efficient scale, users who have scaled their operations based on availability of capacity will incur some costly adjustments. This redistribution impact caused by less available generating capacity has not been included.

Replacement Capacity for Alternative 4 is Understated, page I3-20 - The statement on page I3-20 is, "...with the BPA model the 820 aMW of new capacity under Alternative 4...was added up to year 2010 over the base condition." However, the four dams that are taken out in Alternative 4 will cause a loss of 3486 MW of installed capacity. At this point in the study, the difference between 820 and 3486 is given zero value. The amount of replacement capacity seems to have been estimated based on average energy ignoring the value that peak hydro capacity can bring to
16 the system. This becomes an important consideration when one considers ongoing improvements in fish passage through turbines. Current turbine survival ranges from 89%-94%. The '95 BIOP goal is 95%[8]. It is possible that research could verify that survival through the turbines is higher than survival through fish bypass facilities. A consequence of attaining the BIOP goal or of finding that turbine passage is less hazardous, would be that more water could be run through the turbines in the base case and hydro generation would increase. In the base condition hydro capacity in excess of the 820MW would be used more frequently causing system energy cost to be lower. In such a scenario replacement capacity required under Alternative 4 has been understated. Later in the Appendix an adjustment is made but it does not recognize the potential for increased run time of hydro units if the dams are not breached.

Economics of Unserved Load Improperly Estimated, page I3-29 - Appropriate value for curtailment was not known so the study settled on an arbitrary determination that the cost of
17 serving the load could be up to 5,000 mills/kWH. With this high cost of unserved load inserted, the models will add more resources. When dams are removed, the result is that capacity costs increase due to new thermal plant substitutes, but the variable cost goes down because the newly added plants are more efficient.

[8] FR/EIS Appendix E, Annex /C, page 1-1

An estimate of WTP is essential to determine the NED effect of unserved load. The amount of new resources is very sensitive to assumptions about the cost (or value) of unserved load. Assumptions in the report valued unserved load from 50 up to 5,000 mills. It is doubtful that the value of one unit of electricity would have a marginal value product approaching the 1,000 – 5,000 mill range. Market data from the Energy Market Report[9] indicates a high use value based on WTP at the margin, could be expected to be in the 60 mill range. For example, June futures for NYMEX were quoted at 60 mills in January 2000.

17 Electricity is bought and sold in a daily market. With competition determining the price, WTP is defined by the transactions, and the transactions are at long run marginal cost (LRMC). Any unserved load would therefore be indicated as having a marginal value product equal to or less than marginal cost. An alternative treatment would have been to value unserved load at a value no greater than LRMC. The result would have been fewer capacity additions, but higher variable operating costs due to more use of less efficient plants.

If resources are priced at LRMC, and the system is optimized, there is no NED cost for any residual unserved load. There might be firms desiring electricity but their need would not be an economic one if they are unable to pay LRMC and use the electricity profitable. Therefore, it appears there was no need to make the model serve all of the load. If load projections in the analysis had captured the concept that users will buy electricity only as long as the marginal user can pay the marginal cost, there would be no need to evaluate unserved load in NED terms.

18 Summary of Effects, page I3-41 - Effects of thermal, noise, and hydrocarbon pollution of additional gas turbines have been left out of the summary. One possible explanation that could crop up is that the gas turbines will meet all air standards. This would be an unfortunate statement because standards could still be met while contributing to the degradation of the environment. The cost of bringing the environment back to the base condition (condition with dams in place) should be included as the essence of the NED analysis is a with-project, without-project comparison. There are probably some identifiable environmental effects but one would expect this appendix to report on the unintended economic effects. One reason is that cost of mitigating noise, thermal and air pollution are NED effects

19 Techniques to Measure Visitor Benefits, para 3.2.1.1 - This section on recreation describes the basic methods of estimating WTP. We are familiar with these procedures but from the data displayed and the work descriptions cannot tell if they were properly applied. For example, we are unable to verify that the TCM application is net of all without-project conditions. We can see that reservoir use in the without-project condition was accounted for, but we see no adjustment beyond that. For, example many of the visitors will be traveling long distances and enjoying more than one destination on a single trip. If some visitors have more than one destination, or if data cannot support that there is only one destination, TCM is not allowed.[10] We are unable to verify that the basic data or the application of it to determine WTP ruled out this set of unqualified user days.

[9] Energy Market Report, Economic Insight Inc, Portland OR

[10] P&G as presented in Corps ER 1105-2-100, para 6-98, a., (c)

With either the CVM or TCM, or unit day value method, the intention is to use the techniques to approximate WTP for a project related recreation experience. Therefore, a with-project and without-project comparison must be made to identify the amount of use, and the WTP that is associated with a project related experience. To some extent, this netting out of the without-project condition seems addressed by evaluation of the reservoir losses although another necessary adjustment has not been mentioned and it is not clear that it has been made. In particular, there are many more users after the dams are breached, and the cost of their pre-dam breaching recreation experiences may not have been totally netted out. Many of the recreation related transactions might be taking place elsewhere even if the dams are left untouched. Some of these expenditures would happen at a different place or different time so they are not NED effects[11]. Only the area under the demand curve between the old and new supply represents WTP.

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Payment for equipment, food, or lodging associated with recreation activity are expenditures that take place even without the project. Effects of that nature belong in the regional analysis as redistribution but in this report they do not appear there either. For that reason, a with-project and without-project comparison is essential to identify these effects, net them out of the NED, and present them in the proper place. This should be done as a side by side comparison to reveal the components that make up the increment of travel cost with a project and without it.

Benefits Overstated Due to Lack of Facilities, page I3-47 - This statement that the number of developed campsites will more than double by the end of the first decade, causes one to ask where the costs have been included. They are not in the engineering and implementation costs, but they will need to be included as NED costs. Searching Appendix E, Major System Improvements and Engineering, we are unable to identify any capital costs for the necessary capacity expansion under dam breaching options. Data in section 2.3, Project Summary Spreadsheets indicates the capacity expansion costs have been left out. We also note that identical figures have been used for operation and maintenance of parks under all options including dam breaching, indicating incremental operation and maintenance cost has been left out as well.

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We conclude that since there is inadequate capacity for the increased number of visitors anticipated after dam breaching that benefits are an overstatement. Page I3-47 states that a doubling of campsite capacity would be needed, so at least half the benefits claimed are unsupportable. In addition to this, we note that 30% of existing facilities will actually be closed because of problems cause by the dam breaching. Therefore, capacity will be present to accommodate only .5 x .7 of the projected use or 35%. Benefits have been overstated by 65% on those grounds alone.

Willingness to Pay Calculation, Table 3.2.1 - This table summarizes the results of recreation surveys. It reduces the data to annual benefits on an individual user basis. According to ER 1105-2-100, paragraph 6-105, f., (e), variable travel costs are to be divided by number of persons per vehicle, usually about 2.7. This would reduce the recreation benefit to about 37% of the claimed value. This may have been done but it is not possible to verify from what is in the report.

21

[11] P&G in ER 1105-2-100, para 6-90,a., (1).

An apparent error exists in calculation of existing recreation benefits in Table 5.12-4. The Table shows benefits calculated based on willingness to pay (WTP) per trip multiplied times number of trips. WTP is appropriate as a basis for estimating the value of a user day so it should be
21 multiplied times number of user days, not the number of trips. In addition, the user days must include any growth expected during the 100-year plan evaluation period. The benefit evaluation appears to be based on use estimates of a a single year with no growth in the future.

Site Suitability - When recreation benefit-cost studies are undertaken it is usually necessary to graphically show the projected use with the project and without it. This is a means of illustrating where the benefits come from in terms of net change. It also shows the use projections and supports the calculations needed to turn the projections into equivalent annual values. A site capacity analysis is important in explaining how the use projections fit constraints of the various plans. That type of comparison and display of projections needs to be included in the Economics Appendix or the EIS.

Where site capacity is an issue, there is an accompanying concern of site suitability. When sites are not suitable, use that depends on them will not develop. In the Economics Appendix, Table
22 3.2-2, there is a display that shows some sites will not be fully suitable for up to 20 years. Site unsuitability for up to 20 years, is bound to have an impact on use and user day values. In the EIS page 5.12-16 unsuitability is explained as even more serious. There it is expected to take 30 years for sites to be optimally suitable for jet boating, skiing, rafting, kayaking, and canoeing.

Therefore, we conclude that even if recreation capacity is not added, or if it is reduced by 30%, the remaining sites will develop to their optimal potential over a very long period. Unsuitability will reduce use of the sites and it will also tend to reduce the user day values. Neither one of these adverse impacts has been fully accounted for in the benefit calculation which appears to have peaked at 1,756,193 user days by the 10th year based on a statement on page 5.12-8.

In addition, The EIS Table 5.14-1 describes aesthetic problems that may not have been recognized in the river recreation user day values and use estimates. The river shoreline with a bare river bottom will be visually unappealing for about 3 years. In addition, paragraph 5.14.1.4 describes a turbidity problem. Even of these effects are short-term they can be very important in the benefit evaluation. The reason is that discounting will result in early year use losses being given a much higher value. For example, present worth of a loss in year 2, is 5 times greater than a loss of equal magnitude in year 25.

Passive Use Values (PUV) are Inappropriate for Plan Comparison, Table 8-3 - The subject of
23 PUV is treated incompletely in the FR/EIS, nevertheless we are supportive of the final decision to leave PUV out of the NED evaluation in the FR/EIS. We note that the PUV discussion was taken from the FW and that the FW also stipulated reasons for not using PUV. In addition, we
24 feel the FR/EIS discussion of PUV is ambiguous unless PUV is also removed from the Risk and Uncertainty analysis of Table 8-3. In that table presentation of various scales of PUV estimates along with other NED effects gives the appearance that PUV and NED values are enough alike that they possibly could be added together when they in fact the FR/EIS recognizes elsewhere that

they are not comparable.

23 Indeed, even if they were comparable we would still object to their presentation because the existence of a federally funded program is itself evidence that judgment of PUV has already been applied once. In this case of non-market outputs (ESA listed species), a public decision to
24 provide resources to support a public program considered the value of the non-market outputs that could be realized. In that sense, the PUV concept has been applied to create the programs we now have. We have already decided by recognizing PUV that the resource is worth saving.

Misleading Statements About PUV, page I-18 ,I-19 - Some statements are made in the risk and uncertainty section (see page I-18 ,I-19) explaining how inclusion of PUV would put dam
25 breaching at the top of an array based on economic effects and we urge that this discussion be removed. In contrast to this identification of an array based on PUV, other parts of the report properly explain that PUV are not equivalent to NED benefits (see page I4-8 and I10-5).
26 Nevertheless, a statement is made on page I8-19, "In other words, whether breaching the four lower Snake River dams will give a positive or negative net NED benefit is unknown because of the current level of uncertainty about the value of recreational passive use values." We object to reliance on status of PUV as a basis for making remarks about uncertainty of the NED values.

PUV are Not Accepted in Benefit-Cost Decision Making - Application of principles of benefit – cost do not ordinarily include PUV for several reasons. It has been said that the Corps does not use them because they are not prescribed by the Water Resources Council (WRC) guidelines. That could be viewed as one reason, but there are actually other driving reasons within the existing, required framework of benefit – cost analysis that render them invalid as benefit - cost analysis tools. Corps and WRC administrative guidelines include procedures for obtaining permission to use non-traditional evaluation techniques. If a PUV estimate could be demonstrated as being applicable to benefit – cost analysis issues within the NED framework, the
27 WRC and Corps guidelines do not necessarily rule them out. There are other good reasons why they cannot be used.

28 The PUV studies that were referenced in this FR/EIS were done at different times when public perceptions of fishery problems were evolving (ESA listings increased during the 1991 – 1999 period). For example work by Olsen, Richards, and Scott preceded ESA listings of anadromous stocks on the Snake and Columbia Rivers. Dates of the various studies are given, but changes in public perceptions between 1991 and 1999 could indicate that the different studies actually attempted to measure WTP for significantly different public outputs. The trend toward increased ESA listings may provide a conservative bias to the PUV estimates, but another point of view is that the studies are not comparable because they attempted to evaluate significantly different outputs and therefore may not be valid as support for one another.

Within the WRC and Corps guidelines for benefit-cost analysis there are specific requirements to establish and compare conditions with a plan, and without a plan, over a common planning period (100-years in the FR/EIS). The reason of course is that conditions can be expected to change over time. Expected changes not attributable to a proposed action therefore need to be stipulated to not confuse them with project effects either in the sense of benefits or costs. None of the PUV

studies attempted to deal with planning periods comparable to the 100-year time horizon applicable to the Snake River dam removal issue.

29 30 PUV Improperly Treat Risk and Uncertainty - Treatment of risk and uncertainty is an important concern in benefit-cost analysis. PUV respondents may not have properly understood that the results they were asked to evaluate (for example, doubling of fish numbers) may not have been attainable, or at least highly uncertain. Specific goals such as a doubling of the runs have been officially announced but never attained even though $100s of millions are being spent each year to increase Columbia-Snake fish populations. An individual's WTP for doubling the runs might be different if she is made aware that prospects for success are slim. This uncertainty surrounding program success is not accounted for by seeking WTP estimates for lesser scales of increase because the lesser scales also bear an unstated uncertainty. It is this unrevealed uncertainty that is of concern. This uncertainty of the outcome is not reasonably accounted for by presenting uncertainty about the future baseline, or by varying the baseline, neither is this particular uncertainty issue addressed by the measurement of confidence intervals of WTP responses. An implication is that WTP and hence PUV might be substantially different if the respondents realize that uncertainty is so great that the specified outcome may never be realized.

31 32 PUV Double Counts - Application of PUV to benefit – cost analysis increases the prospect of double counting. This is because the outputs are non-market outputs and therefore more difficult to identify and consistently separate from other aspects of benefit quantification. For example, a strategy to increase the population of native anadromous fish will very likely rely to some extent on habitat improvements. Some analysts believe that the habitat improvement itself has a PUV regardless of impact on populations of anadromous fish. So if one study estimates WTP for increased fish populations and another study estimates WTP for lush stream corridors, another for fencing of streams, another for creation of pools and riffles, another for expansion of wetlands, another for willows and shade, etc. there will be some serious amount of overlap. This risk of double counting is not present in market based evaluations because the market works for ancillary products. This unexplainable overlap is a sound reason why PUV are not considered with the same reliability as traditional NED benefits.

33 34 Unintended Effects are not Netted Out - There is also the problem that PUV does not net out unintended effects. In application of PUV there is no reliable way to be sure the respondents consistently recognize and evaluate the social cost of tradeoffs beyond a personal WTP. For example, does she realize that a doubling of the population of native fish may require electric fences to keep out domestic cattle? As barriers the fences could have the undesired effect of shrinking the feeding area, and cover, available to deer and elk. A personal WTP might have been based on a desired first result without having adequate knowledge, or skill to discern an awareness of the second. An implication in this example is that it is possible an awareness of the second result (unstated impact on deer and elk) could be so important as to nullify WTP for the first.

35 36 PUV is an Incomplete Evaluation - PUV evaluations may be inappropriate for economic decision making when they present an incomplete picture of resource tradeoffs. For example, dam removal surrenders Snake River lakes, the Lake Ecosystems, and species populations. As input to

35 dam removal decisions, a PUV has been estimated for outputs related to a creation of a normative river but the PUV losses associated with loss of the lakes has been treated as having zero PUV. We object that the FR/EIS assumed a zero PUV for the existing lakes. This fails to recognize that
36 an ecosystem of a different kind exists in the lakes and along the shore. PUV evaluations are distortions that capture only part of the non-market effects of dam removal actions, and as a partial evaluation they are not valid as a component of NED analysis.

Annualized costs incorrect, Table 9-3 - Annualized NED costs are shown in Table 9-3, and implementation costs in Table 3.8-4. Table 3.8-4 shows implementation cost of Alt 4 and 6.875%
37 as $64,169. But in Table 13-2, implementation cost for Alt 4 is $48,787. None of the numbers in either table seem to match up with the official cost estimate on Annex X. This could be due to time period adjustments, but a reason needs to be given or the numbers made to agree.

Associated Cost of Shifted Tonnage, para 3.3.5.6. - For the NED analysis, the Corps is supposed to be estimating the difference in cost of delivering a commodity.[12] One way to do this is to add up all of the costs, and another way is to rely on rates where rates are equal to long run marginal costs [13] (LRMC). If we elect to add up the costs, we will need to include all costs needed over and above project measures to achieve the benefits.[14] This includes cost of new capacity where there is specific evidence that capacity is not adequate.[15]

38 Associated costs are frequently overlooked when they do not have to be paid by either the Federal government or the non-Federal partner. When private industry and individuals must incur some cost to be able to consume or make use of project outputs, these are NED costs.[16] For example, associated costs of a navigation project may include new docks and terminals needed for with-project but not without-project conditions.[17] The associated costs which have been left out of the FR/EIS NED evaluation are the costs of rail and truck infrastructure necessary to carry tonnage displaced from the waterway.

There are two ways to treat associated costs. They can be "netted out" in the treatment of benefits, or they can be shown separately as a cost. If they are accounted for in the benefit calculation, they are to be shown as a part of the transportation cost comparison with and without the project. Alternatively, they may be shown as costs in the presentation of NED costs. It is

[12] P&G, as presented in ER 1105-2-100, para 6-71, b.
[13] P&G, as presented in ER 1105-2-100, para 6-66 b.
[14] P&G as presented in ER 1105-2-100, para 6-145
[15] See P&G as presented in ER 1105-2-100, para 6-68 for guidance, also see FR/EIS page 13-80 for infrastructure requirement
[16] National Economic Development Procedures Manual NED Costs, IWR Report 91-R-13, IWR Report 93-R-12, June 1993, page 60
[17] National Economic Development Procedures manual, Overview Manual for Conducting National Economic Development Analysis, IWR Report 91-R-11, October 19921, page42
[18] P&G, as in ER 1105-2-100, para 6-153, b.
[19] National Economic Development Procedures Manual Deep Draft Navigation, IWR Report 91-R-13, November 1991, page 13
[20] National Economic Development Procedures Manual NED Costs, IWR Report 91-R-13, IWR Report 93-R-12, June 1993, page 13

preferred they be shown as costs.[18] [19] [20]

38 In the FR/EIS page I9-6, the second indented bullet indicates that associated costs of infrastructure necessary in order to shift tonnage to other modes have been included in NED costs. The report represents that these associated costs are included in the rate structure, but the rate structure is not used, reconstructed costs are used. For other reasons, what is presented in the report appears to be impossible. By itself, the annualized value of the just the associated costs that would be needed to make rail and truck viable alternatives, exceed the total increment of costs claimed in the report. Obviously total costs have not been presented.

39 Cost is Understated, Table 3.3-19 - In the event of dam breaching some of the tonnage will be transferred to truck and some to rail. New rail movements are estimated at 1.1 million tons.[21] Added cost of rail infrastructure for this 1.1 million tons is estimated at $50 million[22] using the low estimate in the report. The $50 million has an annualized value of about $3.5 million. This annualized infrastructure cost is the increment of fixed costs needed to service the 1.1 million tons. Marginal costs measure the real increase in costs that the shipper should consider in order to encourage responsible and efficient transportation use[23]. As the capital cost portion of long run incremental cost, it represents only about 30% of the total LRIC of shipping the added 1.1 million tons by rail[24]. So, the total annual LRIC would therefore be estimated by ($3.5 million / .30) = $11.7 million. [25] This equates to an LRIC of $10.64 per ton including incremental fixed and incremental variable cost.

If one uses the higher rail numbers out of table 3.3-19, the annual infrastructure requirement WITHOUT adjusting for incremental variable cost comes out to be $79 million or about $5 per ton. Add in the estimated increment of variable cost and the high end of the LRIC per ton becomes $16.76.

Just the associated cost of the new rail infrastructure by itself (without truck related infrastructure) exceeds the total increase in all truck and rail cost illustrated in Table 3.3-20 ($3.45 - $6.46 per ton). It is impossible that the associated costs could have been included in the analysis contrary to the claim on page I9-6.

To construct an extreme example to make the point more clear, total rail and truck related infrastructure added because of dam breaching is estimated to be as high as $531,703,000 in the

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[18] P&G, as in ER 1105-2-100, para 6-153, b.
[19] National Economic Development Procedures Manual Deep Draft Navigation, IWR Report 91-R-13, November 1991, page 13
[20] National Economic Development Procedures Manual NED Costs, IWR Report 91-R-13, IWR Report 93-R-12, June 1993, page 13
[21] FR/EIS page I3-78
[22] Selected line items from FR/EIS page I3-80, table 3.3-19
[23] Paying Our Way: Estimating Marginal Social Costs of Freight Transportation, Special Report 246, TRB,/NRC, National Academy Press, 1996
[24] Uniform Rail Costing Model components from Reebie Associates RCAM V6.2 Copyright (C) 1989
[25] Paying Our Way, Estimating Marginal Social Costs of Freight Transportation Special Report 246, TRB,/NRC, National Academy Press, 1996

FR/EIS. At 6 7/8% this has a 100-year annual value of $36.6million. Divide the $36.6 million by the increment of 3.8 million total tons displaced to rail and truck and the incremental capital cost per ton is $9.63. This $9.63 is higher than any of the costs shown in Table 3.3-20, but even at $9.63 per ton, the incremental variable cost has yet to be added in. This is a significant concern because variable costs of truck and rail operations ordinarily make up about 60% of total cost[26]. If we add in the variable cost, the cost per ton will triple.

The major flaw in the analysis is that the entire associated cost of infrastructure has been left out of the opportunity cost analysis. The opportunity cost of losing the river transportation provided by the four Snake River dams may have been understated by $36.6 million annually.

With all of the costs included, shipping would be so costly that:

- Shippers could not afford the rates.

Some tonnage would be displaced to other ports.[27]

39 If costs cannot be recovered some infrastructure might not be constructed causing the transportation systems to experience congestion thereby driving up costs.

Some of the tonnage could probably be shipped through non-Columbia River ports at less cost. This potential displacement to other ports was not addressed in the FR/EIS. Actually an assumption stated on page I3-61 ruled out the possibility of analyzing alternative out-of-region export terminals before the analysis got underway. The statement is, "...the assumption is that current and projected levels of exports form the region will be maintained."

This results in a serious understatement of NED costs. The magnitude of the understatement of NED cost (potential $36.6 million annually) is larger than the claimed totals for $24 million navigation opportunity costs, $15.4 million irrigation costs, $20.7 million for Fish and Wildlife mitigation costs, and $4.9 million cultural resources mitigation costs. It is within 24% of the total annual cost of breaching the four dams.

Capacity Analysis in Question - The FR/EIS refers to a study done by TVA /Marshall University [28]as justification for not including associated cost of capacity expansion. The conclusion drawn in

40 the report is misleading because of differences between the data in the report and the FR/EIS. This is further complicated by the TVA concentration on identification of impacts on average rates instead of on the increased cost specifically for the increased tonnage. By averaging increased cost over a larger number of tons, the fact that revenue from the increment of traffic does not justify the incremental cost, is not revealed.

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[26] Mark Berwick and Frank Dooley, Upper Great Plains Transportation Institute, North Dakota State University, MPC Report 97-81, October, 1997, 53 pp

[27] Breaching the Lower Snake River Dams: Transportation Impacts in Oregon, February 2000, prepared for the Port of Portland, Oregon Department of Agriculture, Oregon Economic and Community Development Department, Oregon Department of Transportation; prepared by HDR Engineering Inc., Ogden Beeman & Assoc Inc., TW Environmental inc., Summary Vol, page 2. Up to 9,000 loaded containers could be diverted to Puget Sound, the Gulf of Mexico or the East Coast. Four of six ocean carriers could stop calling at Portland.

[28] Freight Railroading: An Application to The Snake River Basin, The Tennessee Valley Authority Knoxville, Tennessee and The Center For Business and Economic Research Lewis College of Business Marshall University Huntington, West Virginia July, 1998

The TVA/Marshall University report, used an algorithm based on average rail system data to estimate maximum capacity and to present a capacity analysis. In the case of rail, just because a rail link is installed and is theoretically capable of averaging X trains a day, does not mean that it will always do so. TVA recognized that trains might have varied origins and destinations hundreds of miles from the link in question but did not address this with a simulation. Trains have to travel on other segments and make stops at other locations. They will have schedules, requirements, and events, which might make use of the link in question somewhat of a random
40 event.

When there is more than one train, you cannot reliably schedule use of a rail link based on the average duration of a preceding link. Sometimes a link will be ready early when the next link is not yet available, and sometimes it will be ready late, when the downstream process is no longer available. Thus, you cannot use average task duration to estimate capacity for complicated transportation systems when there is randomness and uncertainty in the duration of activities. Uncertainties elsewhere in the system must be taken into account.

Queuing Analysis Desired - Queuing theory suggests an alternative. You determine the optimum amount of capacity by looking at the economics. In complex systems this is usually done with simulations. Personal Computer based tools exist which are designed to assist in the solution of this type of problem.[29] With proper tools, capacity can actually be viewed as an economic concept.

41

In economic terms, the cost of capacity is incurred in the form of decreased efficiency, or as an investment to preserve the level of efficiency. The appropriate test to determine whether an investment in capacity should be made is not based on the impact it will have on average rates, but an analysis of incremental cost compared to incremental revenues. The TVA analysis draws conclusions based on average rate impacts and is silent on the real economic efficiency criteria. This is very important because costs were elected to be used by the Corps, not rates. It is also important because a fundamental purpose of NED analysis is to seek efficiency.

42 Delay Effects and Emissions Ignored - Delay itself has unmentioned external costs not captured in how much the operator has to pay because his equipment is delayed, rerouted or is in gridlock.
43 These non-quantified external costs occur in the form of noise, increased hydrocarbon emissions and increased risk to public safety. Since the Corps didn't estimate these externalities for the
44 Snake River dam breaching we referred to another TVA report, referred to here as the Bray – Burton study[30]. It used a sample of 51 origination-destination combinations on the Tennessee
45 River, to estimate the pollution abatement expenditure that would be required if each tow stayed on the river and compared it to the pollution abatement expenditure that would be required if the

[29] MultiRail®' s users include a majority of the North American Class I freight railroads. Licensees include railroads such as BNSF, BC Rail, Canadian National, Canadian Pacific, Consolidated Rail Corporation, CSX, Kansas City Southern, Norfolk Southern, Transportacion Ferroviaria Mexicana, FerroMex and Union Pacific. Smaller railroads have also benefited from MultiRails capabilities.

[16] The Undervalued Social Benefits of Water Transportation, Tennessee Valley Authority, River Operations,

cargo shifted to the next least costly overland routing. [31] This analysis was based on actual 1996 traffic flows and incorporated any truck hauls that were required from the actual shipment origins or to actual destinations.

A common notion in the area served by the Snake Waterway has been that a comparison of emissions between barge and rail would be an acceptable rule of thumb basis for estimating a net change in emissions relating to drawdown. This may be due in part to a non-Corps study of the
42 Snake River dam breaching[32] in 1998 which concluded most of the tonnage displaced from barge would be moved by rail as the most likely least cost choice. However, after completion of the EWITS report, the Corps and others found that the most likely alternative mode for most of the
43 displaced tonnage would be truck haul to a more distant barge loading point. Therefore, given this new information the reasonable comparison for estimating emission effects would be truck-barge to truck-barge with longer truck links in the post drawdown case.

44 The TVA Bray – Burton study estimated that the average net pollution abatement savings attributable to shipment by barge were $1.05 cents per ton. The analysis documented that the average barge routing resulted in significantly less fuel consumption and pollutant emissions than
45 an overland route. Thus, when commercial navigation is used, the magnitude of expenditures necessary to comply with nationally mandated air quality standards is reduced. We conclude that not only has the cost of delay been ignored in the FR/EIS, but the pollution cost of it has as well.

Our concerns with limitations of the Corps study extend also to issues of public safety. The EIS erroneously states rail and barge accident rates are almost identical[33]. Our objection is directly supported by a recent report by the Transportation Research Board of the National Research Council[34]. That report referenced national data available for 1991 which showed 1,194 rail related fatalities compared to 8 for barge. There were 149 times more fatalities for rail while rail tonnage was 8% less. Regarding the combined total of fatal and non-fatal injuries, there were 23,460 for rail and 23 for barge, about 1,000 times more for rail. The 1991 data indicates that with increased rail tonnage associated with dam breaching that one could expect and increase of 1 fatality and 22 injury accidents annually.

In the referenced National Transportation Safety Board report, there is a discussion of a study by the Federal Highway Administration[35]. The study evaluated deaths and injuries based on how much people are willing to pay to protect themselves. Average costs were as follows:

Navigation and Structures Engineering, Larry G. Bray, Ph. D., Mark Burton, Ph. D., Chrisman Dager, M.B.A., Ron Henry, M.A., M. Carolyn Koroa, M.S., June 1998

[32] Impacts of Snake River Drawdown on Energy Consumption and Environmental Emissions in Transporting Eastern Washington Wheat and Barley, WSU, EWITS Research Report #23, April 1998

[33] EIS page 5.8-14

[34] Paying Our Way: Estimating Marginal Social Costs of Freight Transportation, Report No 246 TRB NRC, National Academy Press, Washington DC 1996.

[35] The Costs of Highway Crashes, FHWA, US DOT, 1991

- Cost per fatality $2,300,000

Cost per non-fatal injury $ 46,000

42 One additional fatality per year and 22 non-fatal accidents would cause an increased expenditure of $3.3 million annually. As now presented, the draft FR/EIS treats the increased public risk of
43 rail transportation is an uncounted cost.

Another inaccurately reported economic consequence of dam breaching is increased threat to
44 public safety caused by highway congestion from increased truck traffic. Our concern is that loading of existing routes with 71,265 added truck trips per year will cause traffic flow to be
45 slower. The EIS maintains highway congestion will not increase if highways are improved, but they left out the cost of doing anything. A longer time in route also means an overall increase in emissions. The magnitude of the potential economic cost associated with the increased risk to public safety is worthy of study and needs to be addressed in the FR/EIS. We suggest that the EIS will not be complete until the Corps includes the necessary infrastructure costs, or estimates the public safety and economic consequences if improvements are not made.

Inconsistency in Tons Displaced - The capacity cost used in the TVA/Marshall University report was $71.6 million including interest at 8%. This is about 42% higher than the cost on the Corps FR/EIS. It would appear based on this, that the TVA/Marshall University calculation of
46 incremental cost expressed on a cost per ton or cost per ton-mile basis would have been overstated. However, this did not happen because the TVA/Marshall University calculation used a higher ton-mile adjustment which was inconsistent with the FR/EIS. Specifically, the TVA/Marshall University report used 2.7 million tons displaced to rail while the FR/EIS used 1.1 million.

Incremental Costs Incomplete - Perhaps the most significant caution in use of the TVA/Marshall University findings is that the TVA/Marshall University report estimated impact on average rates instead of analyzing the increased cost per ton and allocating it to just the increment of new tons. An incremental analysis may have led them to conclude that some of the capacity expansion is irrational thereby limiting throughput and causing them to conclude that some of the tonnage would be diverted elsewhere.

47

Some possible implications drawn from review of the TV/Marshall University study are:

- TVA capacity estimates based on an algorithm representing the average maximum load of system components is questionable.

Leaving associated cost of infrastructure out of NED effects may have caused displacement of some tonnage to alternative routes not to be recognized.

NED economic opportunity cost of losing the navigation system has been underestimated in companion DREW studies and in the FR/EIS.

Associated Cost Treatment Inconsistent - In contrast to the transportation analysis the approach used for hydropower and irrigation both include the associated non-federal cost as part of the
48 NED effect. In both cases, the associated costs are explicit. In the case of hydropower they are represented by increased operational cost of non-federally owned generation facilities as shown in Table 3.1-11. In the case of irrigation the associated costs are represented by loss of irrigated

48 | farmland value, cost of municipal and industrial pump stations, and cost of privately owned wells.

49 | Implementation and O&M Cost, Table 3.8-3 - This table and Table 3.8-4 should be in agreement for the O&M items. The difference does not seem to be due to discounting and annualizing as the amounts in Table 3.8-3 do not come out in agreement with 3.8-4 when converted to annualized amounts.

50 | Avoided Costs, Table 3.8-5 - The non-project related costs ($58,955 in row 1) are not described in the text. It is not possible to determine what is included or if everything was accounted for.

CONCLUSION

The FR/EIS makes an appropriate use of cost-effectiveness in comparing the various plans, however, the finding that dam breaching will be at a cost per fish of up to $23,000 is seriously underestimated.

Transportation effects have been understated because of errors in treatment of infrastructure cost necessary to make alternative modes fully useable. Related to the treatment of infrastructure cost, are a questionable analysis of capacity, congestion, safety, and other externalized costs.

Recreation makes up the largest benefit from dam breaching but the analysis is clouded with contradictions, errors, and omissions. So significant are the problems that their correction will result in recreation benefits being reduced to a small fraction of what has been claimed.

Passive Use Values (PUV) have been improperly applied in an array of plans. PUV are not comparable to other Ned benefits and costs and must be excluded from any plan comparison.

Numerous "unresolved issues" are in need of attention prior to publication of a redraft of this document. With or without the unresolved issues the FR/EIS must make some specific statement regarding plan selection criteria and the process by which the decision will be made. The institutional environment of the FR/EIS did not deal with other parallel planning efforts such as Cumulative Risk Initiative, Framework, and the All H document. These other documents are related to the Corps planning process and that relationship and interdependence must be incorporated in the FR/EIS, and in the description of the Corps process.

The above summary discloses points so significant that major portions of the analysis must be redone.

ATTACHMENT 2

Economic Impacts of Dam Breaching on Potlatch

First and foremost, in contrast to the statement on page I7-38 of the Economic Appendix, Potlatch cannot pass along additional costs to customers. Potlatch sells its products (lumber, panels, pulp, and paper) in highly competitive domestic and international markets. All additional costs must be absorbed by the operations. Lost international markets very likely will be supplied by foreign competitors. Lost domestic markets likely will be supplied by out of region competitors. Do not believe that passing costs on to customers is possible in competitive economic markets.

On page I6-5 there is a similar thought expressed about other industries. From an economic perspective there are three kinds of activities in which costs may be passed on:

51

1) regulated entities, such as those companies regulated by a state utility commission,
2) local businesses, whose competitors are affected by the same cost factors, and
3) government

All other activities should be presumed unable to pass costs on and likely must absorb them. For the three exceptions identified, the entities to whom the costs are passed are all within the region except for the federal government and other government entities such as BPA, which receive either some revenue or taxes from outside the region. From the above analysis, with few exceptions all additional costs are absorbed within the region.

The direct economic impacts at Potlatch of breaching the four Lower Snake dams fall into five general cost categories:

1) Increased transportation costs from loss of barge service
2) Changes to the water intake at Lewiston
3) Changes to the wastewater discharge at Lewiston
4) Increased power costs from loss of hydroelectric generation and addition of replacement power generation from natural gas
5) Increased natural gas costs from increased demand for gas for new power plants
6) Silting of irrigation systems at the Boardman, Oregon, tree farm

There are also several indirect costs, which are not quantified but could be significant, discussed herein.

52

Transportation Cost Increases. Replacement of barge transportation with rail and truck for finished goods is expected to increase costs by five to nine million dollars annually. The higher figure includes an estimated rate increase that likely will come from the railroad once the

low cost barge competition disappears. If wood fuel and chips were to move from Potlatch's Boardman tree farm when harvesting begins, loss of barging to Lewiston adds another $1.6 million in cost annually. With loss of barging the cost and difficulty of bringing large pieces of equipment, such as Yankee dryers for a tissue machine, to Lewiston will increase significantly.
52 Loss of barging eliminates obtaining chips, sawdust, and pulp from west of the Cascades and also eliminates sale of logs and chips from the Clearwater Valley to western pulp mills. Rail cost increases will raise inbound delivery costs for materials, such as chemicals and clay. No cost effect on Potlatch for the latter cases has been estimated.

Water Intake and Discharge. The estimates of capital cost for Potlatch Corporation for the water intake and discharge are shown on page I6-15 of the Economic Appendix. The range in capital costs is dependent on whether there are further treatment requirements beyond those
53 performed presently. The lower figure in the range represents a new water intake and moving the discharge point, but no further treatment. If there is further treatment required, there will be significant additional power and chemical costs.

55 Power Costs. Assuming a five-mill increase in power costs for all of present Potlatch electric purchases, there will be an additional cost of about three million dollars annually.

Natural Gas Costs. Assuming that natural gas costs increase of $0.10/MMBTU because
56 of additional gas demand from natural gas fired power plants, purchase gas costs will increase about $600,000 annually.

Silting Drip Irrigation Systems. Removal of the four Lower Snake River dams will increase the silt content of the Columbia and Snake Rivers for several years. The silt will clog the
57 drip irrigation system at Boardman. Costs to keep the system clean are unknown, but could be significant.

Summary of Quantified Costs to Potlatch of Breaching the Four Lower Snake River Dams. The direct costs to Potlatch identified in the above text are summarized in the following table:

58

	Capital Costs MM$	Annual Operating Costs MM$/yr
Transportation		5.0 to 9.0
Water Supply and Waste Water Discharge	10.8 to 54.5	1.0 to 5.0
Power Costs		3.0
	Natural Gas	0.6
Total	10.8 to 54.5	9.6 to 17.6

There are many potential indirect costs that are difficult to identify quantitatively. They include the transportation issues identified but not quantified above, a variety of costs of goods and services, and additional infrastructure costs.

59 No conclusions have been drawn about the economic viability of the Potlatch operations, particularly the pulp and paper mill at Lewiston, if absorption of these costs is required. Clearly, the economic competitiveness of the operations will be less. The pulp and paper mill uses large quantities residual chips and sawdust and waste wood and bark from many sawmills in northern Idaho. Were operations to decrease or be discontinued, there would be significant economic impact on the northern Idaho lumber industry and the value of timber in northern Idaho as there is no readily available market for the bark and waste wood and the nearest large chip and sawdust market is west of the Cascade Mountains.

ATTACHMENT 3

Navigation and Transportation. The discussion of navigation barely touches the implications of a cessation of barge transportation in the Snake River. Elimination of barge traffic from Lewiston is expected to have a devastating effect on the Port of Portland. The viability of a port is dependent on producing sufficient shipments to justify ocean-going ships to make calls at the port. In Portland's case the economics of rail and truck transport will divert traffic to Puget Sound ports, effectively making Portland non-competitive. For Portland there will be a loss of jobs and a loss of utilization of facilities with all the related impacts that ricochet through a community. To the extent that the shipments continue at a Puget Sound port, there will be some transfer of jobs and there may be additional investment required for storage, loading and unloading.

The reasons that the Port of Portland will lose its attractiveness to shippers without barges from the Columbia and Snake Rivers include the following:

60

1) Ships calling at Portland also call in Puget Sound, and avoiding a call at Portland saves several additional days per trip. Ships going to the Far East use the Great Circle route, which entails sailing north from the Straits of Juan de Fuca. Avoiding Portland from the shipping company perspective saves sailing south to Portland and back, bar and river pilot costs, and time in port. Over a year the time saving associated with not stopping in Portland provides for an additional round trip across the Pacific Ocean for a ship with all the associated economic benefits.

61

2) In Puget Sound many more ships call, and direct service to the desired port in the Far East is much more likely. From Portland the likelihood of transfer of goods to another vessel in a foreign port is much higher. With more handling in transit comes more damage to products, but more importantly, transshipment increases the risk of not connecting with feeder vessels, which imperils promised delivery dates to customers.

62

3) In Puget Sound ports the availability of more ships and shipping companies from which to choose enhances competition and keeps costs lower.

The reason Portland remains a viable port in the face of the above disadvantages is the existence of the barging system on the Columbia and Snake Rivers. This inland barge transportation system is low cost, damage free, efficient and reliable. Its loss will mark the end of Portland as a significant seaport. From Potlatch's perspective, without barge availability in Lewiston, products will go to Puget Sound ports for shipment overseas because costs would be lower and choice of shipper greater. They will not be trucked to the Tri Cities for barge shipment to Portland.

Transportation is a major cost for most products, particularly commodities like grain. In the forest products industry transportation is the third largest cost component, following wood and labor. When a large cost component increases significantly, the economic viability of that product in a competitive market may be in question. The products barged on the river – grain, forest products, oil, etc. – are in competitive markets; increased costs cannot be passed on to

60 customers. The effects of increased costs are lower margins, less competitiveness, lower market
61,62 share, and additional job loss if activities decline or cease. When customers are lost by US firms, the firms that get them very often are foreign competitors, not other US firms.

Another area seemingly not addressed in the study is the environmental and human safety implications of a shift from barge to rail or truck. Rail cars and trucks carry less weight of goods than barges and thus many more engines, rail cars, and trucks will be needed to move the goods displaced from barges. Trains and trucks are far less fuel efficient on a weight transported per distance basis than barges.

63 The following data on fuel efficiency taken from a recent Port of Portland report
64 (Container on Barge 2000, Port of Portland, 2000) summarizes the differences between barge, rail, and truck clearly.

Miles One Ton of Cargo Moved Per Gallon of Fuel:

Barge	514 miles
Rail	202 miles
Truck	59 miles

65 Beyond the economic costs of more trains, more trucks, highway improvements, rail improvements and more loading and unloading facilities, a train and truck based system will use much larger amounts of petroleum based fuel, a drain on natural resources. Combustion of the fuel will create increased air emissions of nitrogen oxides, sulfur dioxide, and carbon monoxide and dioxide. Carbon dioxide from the combustion of fossil fuel adds to the greenhouse gas effect.

66 The human safety aspect of a transfer of goods by train and truck instead of barge relates to the number of traffic accidents and related deaths and injuries as well as property damage. Barge accidents and related deaths and injuries are few relative to train and truck. The truck alternative for goods of raw materials shipped from Lewiston, Idaho, to the west or to Lewiston from the west is particularly unattractive because the highway west, Highway 12, is a winding two-lane road that goes through the center of a number of small towns. Among other facilities on Highway 12 are grammar schools and children across the highway going to and from school. The very frequent truck movements, both full and empty, add considerably to the likelihood of adverse human health effects through traffic accidents. Additionally the wildlife kill on Highway 12 in southeastern Washington is rather high; more trucks will lead to more wildlife deaths and injuries.

67 The economic effects on Potlatch Corporation of loss of barge transport on the Columbia and Snake River systems is estimated at five to nine million dollars annually solely for finished goods shipped from Lewiston. This estimate includes the present rate differences between rail and barge and an allowance for rate increases by rail when barge competition no longer exists. Rail rates are sure to rise when low cost barge competition is gone. In addition for the Lewiston operations the opportunities for raw material delivery by barge from the west, an important competitive factor, will disappear. These raw materials have included chips, petroleum, pulp for tissue manufacture, chemicals, etc. Deliveries of large equipment, such as a Yankee drier for a

tissue paper manufacturing machine, will be made more difficult and more costly.

67 From the perspective of Potlatch's Boardman tree farm the anticipated transportation costs for product are also increased by loss of barging. One of the alternatives considered is shipment of fuel (70,000 tons per year) and chips (95,000 tons per year) to Lewiston. The present difference in barge and truck costs is about $10 per ton or $1.6 million per year.

68 An additional impact of shifting to rail and truck transport for Potlatch operations will be employment losses in the Port of Lewiston because loading and receipt will all be done at the facilities. The same result should occur with other shippers now using barges.

69 The six to ten million dollar annual costs identified for Potlatch and the recognition that materials and goods shipped to or from Potlatch operations are a small portion of all barge movements currently on the Columbia and Snake Rivers leads to the conclusion that the transportation cost increase of $43.8 million annually identified on page 25 of the summary may be well understated.

70 POWER SYSTEM IMPACTS. The Economic Appendix discussion of power system impacts and the associated material in the summary document are inadequate in that they do not address completely some significant power system changes and contexts and completely do not address other related issues. The areas incompletely or not discussed include but are not limited
71 to area of analysis, current power shortages, power plant siting, electric transmission systems, natural gas supply and cost, natural gas pipeline development, and environmental impact of replacement power.

Area of Analysis. The Western Systems Coordinating Council (WSCC) is too large an area for the power impact analysis. While there is a relation between California and the Southwest and the Pacific Northwest, that relation is limited by transmission capacity, which on a
72 seasonal basis, at least, is highly used. The more useful context for discussion is the Pacific Northwest and the impacts there. Replacement power plants will have to be built in the region and most of the impacts will be in the region. Where appropriate the larger context of the WSCC should be brought forward, but keep the focus on the Pacific Northwest.

Current Power Shortages. The Northwest Power Planning Council in a December, 1999, report identified electric reliability problems in the region. According to the report, there is a 24% probability of power system failure in the next few years; the probability of large failures and extended blackouts is less, but far above any reasonable or acceptable probability. The cure to this reliability problem identified in the report is construction of 3000 MW of power generation, probably gas fired units. These plants and associated gas supplies and pipeline and transmission
73 construction must be addressed before replacement power plants for lost hydroelectric plants can be addressed. Note that California is not a general source of power for the Pacific Northwest electric reliability issues as recent testimony by the Energy Commission before the California State Senate identified a similar reliability issue in California, although not to the same extent.

Power Plant Siting. Power plant siting and construction is far from a trivial environmental issue. After significant struggle, one gas fired plant has been constructed at Klamath Falls, OR. Other failures in construction or siting are well known. There is a need in the region for six 500 MW plants in the near term before any lost hydropower is replaced and only one large plant has been built in recent years. Clearly, the difficulties associated with the plant siting and construction
74 must be identified and considered in the evaluation.

From an economic efficiency perspective power plants should be built near load centers in highly populated areas if the fuel can be delivered by pipeline. Siting plants at dam sites where the only infrastructure available is access to transmission lines is probably not a good idea for economic reasons. The EIS needs to address how, where, and what effects replacement power plants will have and be.

75 Transmission Systems. Inserting 3000 MW of gas fired power generation in the next few years followed by replacement power for any lost hydropower generation will make a significant shift in need for electric transmission. Some existing transmission near hydroelectric sites may be

used less, and there probably will be need for additional transmission. Siting a transmission line in a new corridor is nearly impossible and even adding to an existing line is extremely difficult.

75 While additional power and related infrastructure for addressing reliability problems is not within the study area, it has a significant effect on the analysis and must be addressed before addressing issues related to the replacement generation for lost hydropower.

Natural Gas Supply and Cost. The natural gas costs found in Table 3.1-6 of the Economic Appendix are serious understatements of present and future expected gas prices. Present gas costs on a wholesale basis are about one dollar per million BTUs higher with prospects for even higher costs long term. These costs are driven by increased demand for natural gas for power plants as well as many other uses, higher costs for development of gas in new areas, and a rise in alternative fuel (oil) costs. From the perspective of the Pacific Northwest, the recent greater access by gas pipeline of British Columbia and Alberta to Midwestern markets, and restrictions in
76 gas transportation capacity from the Rocky Mountains only make gas in the Pacific Northwest more costly. The availability of gas may also come into question if demand in the Pacific Northwest outstrips supply or pipeline capacity. These gas supply and cost perspectives should be incorporated in a revised EIS.

Similarly, the oil costs shown in Table 3.1-8 in the Economic Appendix should be revised to reflect present and expected higher oil costs.

Natural Gas Pipeline Development. Like electric transmission lines, natural gas pipelines are very difficult to site if in a new location, and somewhat less difficult if the capacity of existing lines is increased by greater compression or more line looping. Where natural gas pipeline capacity must be increased is dependent on where the natural gas fired power plants are sited. Since most of them probably should go near load centers west of the Cascade Mountains, most of the expansion of pipeline capacity is likely there also. Any need for pipeline expansion in British
77 Columbia and Alberta should also be considered.

While not all new pipeline development will serve power plants replacing lost hydroelectric generation, the entire system of pipeline development should be considered for the analysis. Like electric transmission, the complete system must be analyzed before assigning the appropriate portion to this EIS.

Environmental Impacts of the Power System. The environmental impacts of the power system on the Pacific Northwest and adjoining supply regions is not adequately addressed in the EIS. These impacts include emissions of nitrogen oxides, carbon monoxide, and carbon dioxide from transporting gas through the pipelines and burning it in power plants, lost methane from gas
78 development and transmission, the use of natural gas (a fossil resource) and the environmental disruptions of pipeline and transmission line expansions as well as power plant construction. The analysis should go beyond listing quantities of emissions, looking into actual impacts, such as
79 smog and greenhouse gas effects. This analysis should be done as part of a revision to the draft EIS and again submitted for public review.

Timing. In order to avoid a major economic impact in the region, the replacement power plants for lost hydroelectric power generation need to be in place and in operation before any hydropower generation is removed from the system. The analysis should lay out time tables and related activities to accomplish the development of replacement power generation, construction of expanded pipelines and transmission lines, and development of adequate natural gas supply. These timetables should address permitting and environmental review for each facility, financing in a competitive environment, in addition to construction. In developing these timetables full consideration should be given to the extreme difficulties the region has experienced in power plant siting. This consideration should be explicitly defined in the next edition of the EIS, which should be another draft for public review.

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Conclusion On Power Supply Impacts. The replacement power supply for lost hydroelectric generation is not adequately discussed in the present draft EIS. Further work incorporating the above considerations should be done and be presented again for public review in a draft EIS.