Lower Snake River Programmatic Sedimentation Management Plan and Draft Environmental Impact Statement

Final IEPR Panel Comments, Final Evaluator Responses, and Final IEPR Panel Backcheck Comments

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noblis

For the best of reasons

Lower Snake River Final IEPR Comments, Evaluator Responses, and Backcheck Comments

Noblis conducted an Independent External Peer Review (IEPR) of the Lower Snake River Programmatic Sedimentation Management Plan and Draft Environmental Impact Statement for the U.S. Army Corps of Engineers (USACE). Noblis delivered the final IEPR comments to USACE on 24 May 2013. Noblis received the final evaluator responses from USACE on 1 July 2013. This document is the final comment-response dialog for the Lower Snake River IEPR that includes the final IEPR panel backcheck comments.

Each comment is formatted into four parts that include the following: (1) a clear statement of the concern, (2) the basis for the concern, (3) the significance of the concern (the importance of the concern with regard to project implementability), and (4) the recommended actions necessary to resolve the concern to include a description of any additional research that would appreciably influence the conclusions. Comments are rated as “high,” “medium,” or “low” to indicate the general significance the comment has to the project implementability. The significance ratings are applied using the following criteria:

- High = Comment describes a problem fundamental to the overall goals and objectives of the project study that could affect the ability to implement aspects of the project that the documentation supports.
- Medium = Comment describes a problem that affects the completeness or overall understanding of the project study and its conclusions.
- Low = Comment relates to the technical quality and presentation of technical information in the documentation that could confuse the reader or be considered misleading, but there is limited affect on the overall project conclusions.

After the IEPR review period ended and comments were developed, Noblis consolidated and collated the final panel comments. The comments are arranged in order of significance. Of the final 19 comments, 3 were identified as having high significance, 14 were identified as having medium significance, and 2 were identified as having a low level of significance.

Each USACE evaluator response notes whether the USACE ‘will adopt,’ ‘adopt in part,’ ‘adopt in the future,’ or ‘not adopting’ and where applicable includes an explanation. Please note that all decisions to adopt or adopt in the future are dependent on future resources, authorizations, and funding. Any changes to these potential constraints could impact the ability to adopt the recommendation.

Each IEPR Panel backcheck comment identifies whether the course of action stated in the USACE response is acceptable for addressing the stated concern (“Concur”), or if other actions are necessary to adequately address the concern (“Non-Concur”). The backcheck comment also identifies any other considerations that USACE should be mindful as they proceed with the project.

Minor editorial comments were provided to USACE under a separate cover letter.

Comment #1
Post-construction monitoring of the constructed habitat needs additional discussion and clarification.
Basis for Comment:
Several sections of the PSMP note elements of post-construction monitoring that would be conducted “pending funding.” For example, Appendix J section 3.3 states, “*The hydrographic surveys would be performed each year for at least 2-3 years to determine if the embankment has sloughed, settled, or moved, and to verify that the desired physical structure determining rearing habitat suitability have been achieved and maintained… Biological surveys would be performed twice over 10 years, if funding is available, to assess the use of the disposal area by target fish species and to document changes in several parameters such as use by juvenile salmonids, sediment grain size, food organisms, and water temperature.*” The funding structure for these monitoring elements is not clear in the DEIS, nor is it clear whether the habitat creation associated with the dredge material placement is considered mitigation for project impacts under the Clean Water Act (or whether mitigation is proposed at all). Appendix A section 1.5 notes that the Record of Decision (ROD) would include a summary with implementation, mitigation, and monitoring plans, but that is not yet complete. It also notes the importance of monitoring to the PSMP. The 404(b)(1) evaluation (Appendix L, section 4.7.1) notes the USACE expects that project impacts will be offset by habitat creation. Approval of construction activities, specifically dredge material placement and habitat creation, should be contingent on providing for post-construction monitoring over a biologically relevant timeframe sufficient to ensure project success (minimally 5 years). From a technical point of view, it does not make sense to have the construction component developed without monitoring it to determine success. It appears from the DEIS that the beneficial uses (habitat creation) of dredge placement might be considered mitigation for impacts covered under the Clean Water Act. Monitoring associated with these activities is required under 40 CFR 230 and 33 CFR 332. Criteria for monitoring periods, ecologic performance standards, and management are specified therein.
Significance: High
This omission represents a fundamental problem with the project that could affect the recommendation or justification of the project alternatives.
Recommendation for Resolution:
Develop monitoring and performance criteria for inclusion in the DEIS consistent with the requirements of 40 CFR 230 and 33 CFR 332.
USACE Evaluator Response:
Adopted: The Walla Walla District Corps of Engineers (Corps) and National Marine Fisheries Service (NMFS) have agreed, for the proposed immediate need dredging and disposal action, the use of the dredged material to create a shallow-water bench is not mitigation. Lower Granite reservoir lacks the shallow-water habitat needed by juvenile salmonids, primarily fall Chinook,

for resting and rearing as they migrate to the ocean. The material that would be dredged through this specific immediate need action presents an opportunity to create some of this habitat. This habitat creation could also help offset any negative effects that the proposed dredging action might have on Endangered Species Act-listed salmonids and their habitat. Both the Corps and NMFS view this as a conservation measure. The Corps and NMFS are using the Endangered Species Act (ESA) consultation to finalize what level of monitoring the Corps will pursue for the immediate need action. The only monitoring action proposed in the DEIS at this time is a follow-on to implementation of the proposed 2013/2014 immediate need action. No specific monitoring is proposed for any other action as the Corps is not pre-determining what those actions would be. The Corps would identify appropriate monitoring for future actions once the trigger for taking an action has been hit and the Corps performs an analysis of measures to determine the best measure(s) to implement at that time. This monitoring would need to meet any appropriate environmental requirements identified through the Endangered Species Act consultation, Clean Water Act compliance, National Historic Preservation Act consultation, etc. The Corps will revise Appendix A of the DEIS to clarify how post-action monitoring will be identified. This monitoring should not be confused with the condition monitoring the Corps proposes to use to identify when a trigger to take action has been hit. Regarding funding, the Corps Civil Works actions are project funded and actions (including monitoring) planned in the future are dependent on future Congressional appropriations and identified as “subject to availability of funding.” The Corps will submit budget requests for all actions included in mitigation/monitoring plans and the DEIS will be updated to reflect this information. The mitigation and monitoring requirements identified in 33 CFR 332 do not apply to the Corps Civil Works projects. The requirements apply only to actions requiring a Clean Water Act Section 404 permit from the Corps’ Regulatory program.
IEPR Panel Backcheck Comment:
Concur.

Comment #2
Need to clarify the selected alternative – is it the toolbox or the Programmatic Sediment Management Plan (PSMP).
Basis for Comment:
It appears that no specific actions are proposed, except for the immediate action. Specific actions to be defined in the future will require new environmental impact analyses.
Significance: High
It is important to specify that the selected alternative is a set of future options to be selected based on monitoring results, and not any action plan at this time.
Recommendation for Resolution:
Throughout the documents as well as the Executive Summary, please state explicitly that no specific action items are proposed—except for the immediate dredging plan—and that any future plan of action will be based on results of on-going monitoring. And that any of the potential actions listed under Alternative 7 could be used to address the concern at that time.
USACE Evaluator Response:
Adopted: Each of the alternatives considered in the EIS has a different "toolbox" of measures that could be implemented under that alternative. The measures are based on the management approach proposed for that alternative. For example, Alternative 4 is Structural Sediment Management Measures, therefore the only measures or tools considered for that alternative are those based on installing structures. The PSMP is based on the preferred alternative No. 7 – Comprehensive (Full System and Sediment Management Measures) and includes the largest "toolbox" of measures to address sediment that interferes with authorized project purposes. The PSMP and EIS are being updated and should better clarify this information. The Corps is not proposing any specific actions under the proposed plan except for the 2013/2014 immediate need action. The Corps will clarify in the EIS and the PSMP that the Corps would not be taking any action in the future until monitoring indicates a trigger has been hit. The Corps would then follow the planning process discussed in the PSMP to determine which measure or measures (from the toolbox in Alternative 7) are the most appropriate ones to implement at that time. The EIS and PSMP will also be revised to indicate several locations have already hit the triggers for either immediate need or future actions. These locations and the trigger level will be listed. The text will also state the Corps plans to seek funding for the tier-off analyses for these locations once the Record of Decision is signed.
IEPR Panel Backcheck Comment:
Concur.

Comment #3
Sediment source reduction studies must be more fully discussed. Consideration of sediment reduction studies should be comparable to other measures considered as part of Alternative 7.
Basis for Comment:
Differentiate between naturally occurring and human caused sediment production, and how ecosystem benefits would accrue in upstream watershed areas from reduced sediment production. Watershed based and upstream in-channel sediment controls, particularly in cooperation with other land management agencies, should be emphasized as part of the overall strategies in Alternative 7. Alternative 7 (Full System and Sediment Management Measures), lists among the considered measures "*Continued upland sediment reduction measures by the Corps, other land managers/owners (at current levels of implementation).*" This management option would ostensibly benefit habitat throughout the LSR watershed, particularly for many of the fish species of concern (i.e., Chinook). Riparian re-vegetation efforts might also provide dual benefits for sediment reduction and increased habitat corridors for endangered/threatened species (i.e., Yellow-billed cuckoos p 3–31), and may address issues regarding tributary habitat effects noted in the NOAA/NMFS biological opinion (BiOp). However, this management measure is really not further explored in the DEIS, and begs the question whether it is truly a relevant component of the alternatives analysis. Section 2 of the DEIS states, "*Agencies responsible for land management in the basins that drain into the LSRP would continue to implement existing sediment reduction measures, consistent with their current authorizations and funding.*" Many of the management methods (i.e., forest vegetation management p2–21) are clearly outside of the jurisdiction of the USACE, and it is not clear if there is significant USACE coordination or Memorandums of Understanding (MOUs) with the appropriate entities to make these options viable. The DEIS does mention coordination with land management agencies and consultation on research with other agencies/universities, but the discussion is non-specific. Since many of the efforts are ostensibly dependent on other federal programs (Forest Service and BLM, for example – see Appendix B 3.3), presumably these programs are operated independently of the USACE project, and could be altered or changed without regard to the USACE. Appendix E suggests that much of the sediment load is attributable to farming practices that still follow traditional methods, and notes that efforts to curb this are likely to be dependent on future incentive programs; it is unlikely that these efforts could be counted on to the degree necessary to include as part of an alternative considered for the proposed project. If MOUs are not currently in place or seriously considered for development should the preferred alternative be selected, it is unlikely that the USACE could consider this as a relevant component of the future action. Upland sediment reduction measures merit substantive consideration and development within the relevant sections of the DEIS and appendices (i.e., Section 4 Environmental Effects of Alternatives). In the event that sediment reduction measures are not currently a viable management method, but could develop to be so at some point in the foreseeable future, this rationale should be discussed in greater depth. In the event that the data indicates that sediment

reduction measures would not further the project goals, then that should be thoroughly discussed and the measure removed from the alternative. Its inclusion to the limited degree that it is currently developed within the DEIS suggests that it is an "add-on" to make Alternative 7 appear more comprehensive in scope than it would otherwise appear.
Significance: High
Inclusion of this management measure to its current level of development represents a fundamental problem with the project that could affect the recommendation or justification of the project alternatives.
Recommendation for Resolution:
Revise or further develop this sediment management method to evaluate its importance relative to the other methods included under this alternative. Recommendations to conduct future detailed studies of upstream controls, especially on the Salmon River, should be strongly promoted.
USACE Evaluator Response:
Adopted: The Corps will modify the text to better describe the role sediment reduction in the watershed is expected to have in addressing the purpose and need. Sedimentation activity involves many physical processes acting at several physical scales including the soil size pore scale, the experimental test-plot scale, the farm scale, the watershed scale, and the river basin scale. Some of the physical processes, such as concentrated flow erosion and stream channel flow, only emerge at the larger physical scales. It is extremely difficult to tie specific individual 'sources of sediment' to specific individual 'sediment deposition locations' and also difficult to separate out, by deposition location, sediment produced by 'natural causes' from sediment produced by 'anthropogenic causes.' Part I of Appendix F states on Page 236 that 'preliminary sediment transport modeling with approximate channel geometries suggests that not all the suspended sediment that passes the Salmon River at Whitebird is transported past the Anatone gage in a single season. Sediment loads measured at Anatone are higher in subsequent years because of the transient sediment temporarily stored in the 70 miles of river channel between Whitebird and Anatone. In many years the computed suspended sediment load of the Salmon River exceeds the computed suspended load of the Snake River.' This illustrates the complexity of sediment transport analysis within a large river basin system. The 'primary areas of interest' with respect to problematic sediment deposition are located in the vicinity of the confluence of the Snake and Clearwater Rivers, located near the important population centers of Lewiston, Idaho; and Clarkston, Washington. Problematic sediments at this location are generally 'sand sized' particles. Appendix E of the PSMP EIS, titled 'Evaluation of Sediment Yield Reduction Potential in Agricultural and Mixed-Use Watersheds of the Lower Snake River Basin,' states on Page 47 that 'overall it is clear that the agricultural areas contribute mostly silts and clays to the Snake River.' On Page 69 of Appendix E, as part of the Summary and Recommendations section, it states that 'however, while there are important ecological and sustainability reasons that efforts to expand agricultural BMPs should continue (Montgomery

2007), the impacts on US Army Corps of Engineers dredging frequency near the confluence of the Snake and Clearwater Rivers would likely be quite small. The grain size fractions found in the USGS core data from the confluence area are considerably larger than most of the agricultural lands. Furthermore, results of the WEPP modeling included in this report indicate very little of the sand sized particles reach the stream.'

In Appendix B of the PSMP EIS, titled 'Investigation of Sediment Source and Yield, Management, and Restoration Opportunities within the Lower Snake River Basin,' Tetra-Tech concluded that agricultural and forest management in the Clearwater, South Fork Clearwater, and Middle Fork Clearwater watersheds are most promising for sediment reductions. Tetra-Tech also identified the Lemhi watershed as having a rating of high hydrologic disturbance.

Part I of Appendix F on Page 236 states that 'the Salmon River basin contributes the largest proportion of sediment load to Lower Granite, both as total suspended sediment and suspended sand.' Since sand sized materials are being deposited in the Confluence and Port areas, the Salmon River Basin would be a logical area to pursue future sediment reduction measures. However, implementing sediment reduction measures in the Salmon basin would not have a measureable effect on the deposition in the LSRP. In Appendix D USFS indicated that fire and associated landslides are the major contributors in the Salmon basin. USFS concluded "episodic erosional events (massive debris flows) that dominate post-fire sediment yields are impractical to mitigate, leaving road restoration as the most viable management opportunity for offsetting climate-related increases in sediment yield. …road restoration would provide a relatively minor reduction in sediment loads at the basin-scale."

On Page 11 of the PSMP Appendix C, titled 'Upland Erosion Processes in Northern Idaho Forests,' United States Forest Service researchers concluded that 'the greatest amounts of erosion are associated with infrequent wildfires. Sediment from these fires is gradually routed through the stream system, with the greatest amounts of sediment transport associated with infrequent periods of stream flows. The forest road network is the second greatest source of sediment, generating sediment annually.' Also on Page 11 of Appendix C it states that 'if watershed managers wish to reduce sediment generated from upland areas in Northern Idaho forests, the most useful steps that can be taken are to stabilize or remove roads and to carry out forest management activities to minimize the risk of a high severity wildfire.' On Page 12 of Appendix C it states that 'one area that would benefit from additional research is to increase our understanding of sediment processes between the road and the stream. Information is scarce on the fate of detached sediment leaving roads, and the conditions that can cause erosion in road buffer areas.'

On Page 28 of the PSMP Appendix D, titled 'Enhanced Sediment Delivery in a Changing Climate in Semi-Arid Mountain Basins: Implications for Water Resource Management and Aquatic Habitat in the Northern Rocky Mountains,' Goode et al state that 'because downstream aquatic ecosystems and water resource infrastructure may be sensitive to these changes in sediment yield, there is interest in the potential benefits of large-scale landscape restoration practices to reduce sediment, either through reduction of fire-related sediment or road decommissioning and improvement. Improved grazing management may be a potential option to reduce sediment, but a lack of discussion of grazing related sediment yields in the literature

suggests a limited potential when compared to road management.’ On Page 29 of Appendix D it states that ‘a growing body of literature is discouraging further interference in natural landscape disturbance processes, such as fire and post-fire erosion, because the dynamic response to such disturbances may help maintain more diverse ecosystems that are more resilient to changed climates. There is also substantial uncertainty about the efficacy of pre- and post-fire treatments for vegetation and hillslope erosion in forested mountain basins. In contrast, road decommissioning is recognized as being largely successful. Unfortunately a comparison of sediment inputs from roads contrasted to both the short- and long-term regional sediment yields expected from fire suggest that road decommissioning would do little to decrease the total supply.’
IEPR Panel Backcheck Comment:
Concur, but in describing the role sediment reduction measures are expected to have in addressing the purpose and need, some viable method or plan for the USACE to accomplish any relevant sediment reduction goals should be included in the PSMP EIS if upland sediment reduction measures are to be retained in Alternative 7.

Comment #4
The EIS should discuss climate change in the context of a reasonable foreseeable future condition which could cause increased sedimentation in the basin. See Appendix D of the EIS, which states that climate change could alter sediment yields primarily through changes in temperature and hydrology that promote vegetation disturbances (e.g., wildfire, insect/pathogen outbreak, drought-related die off), which effectively reduce hillslope stability and alter the styles and rates of geomorphic processes that cause erosion.
Basis for Comment:
Given the significance of climate change, this should be considered in the EIS.
Significance: Medium
Not adequately considering the reasonable foreseeable future condition in regards to climate change weakens the analysis overall.
Recommendation for Resolution:
Update the analysis to include the USACE assumptions regarding the future condition.
USACE Evaluator Response:
Adopted: Text of EIS (sections 3.7, 4.7 and 4.11) will be revised to include more information on climate change, including incorporating more detail from appendices D and F and providing greater context regarding the potential for changes to watershed sediment loading and transport due to climate change. Guidance from the Council on Environmental Quality (Draft NEPA Guidance on Consideration of Effects of Climate Change and Greenhouse Gas Emissions [Feb 2010]) and Federal water management agencies (see Brekke, L.D. et al. 2009) indicates that changing climate should be considered a reasonably foreseeable future condition. However characterizing future changes in sediment loading and transport that may result from climate change as a “reasonable foreseeable future condition” would not be appropriate for the PSMP EIS. That is, while climate trends indicate warmer and drier future conditions that could result in more wildfire in large portions of the study area, accurately predicting how those future conditions affect sediment accumulation in the Lower Snake River system is not currently realistic or feasible. However, the Corps and land management agencies can continue to gain a fuller understanding of the implications of climate change with respect to managing sediment that interferes with the authorized purposes of the LSRP through long-term monitoring (i.e., channel condition surveys, sediment range surveys, channel impediment reports from commercial and recreational river users) and analysis of changing conditions. In Appendix D, Goode et al. present potential scenarios of future conditions that could result in increased sediment loading to watersheds within the lower Snake River Basin (particularly the mountainous, semi-arid watersheds that make up a substantial portion of the study area), primarily due to an increase in conditions favorable to wildfires, which typically result in increased erosion and sediment loading from burned areas. How these conditions would affect sediment transport and accumulation that interferes with the authorized purposes of the lower

Snake River cannot be reasonably predicted at this time. In addition, the Corps' hydrologic and hydraulic studies (Appendix F) present how climate change was considered in the assessment of future sedimentation in Lower Granite Reservoir. Appendix F concludes: "According to the [Geophysical Fluid Dynamics Laboratory] model, total annual precipitation in the Lower Granite sediment yield watershed will not change substantially. With the warming trend, proportionally more precipitation will occur as rainfall upon a land surface that is less protected by vegetative cover and snowpack resulting in increased sediment yield. Snowpack and snowmelt regimes will change as a result of both climate warming and loss of vegetative cover. Simulation of these changes will require refined meteorological parameterization and more detailed subbasin parameters than those currently in the initial subbasin models [documented in Appendix F]". Ultimately, long-term monitoring and analysis, subject to the availability of funding, will be necessary to assess changing conditions, estimate changes in sediment yield and transport, and adaptively manage the lower Snake River reservoirs. USGS Climate Change and Water Resources Management: A Federal Perspective (Brekke et al (2009)) recommends monitoring and adaptive management to address changing conditions, and the Corps' Climate Change Adaptation Policy Statement and 2012 Climate Change Adaptation Plan and Report provide direction on climate change adaptation for water resources management. The intent of the PSMP (Appendix A) is to systematically monitor conditions and take proactive steps to plan sediment management in the most environmentally sound and cost-effective manner consistent with limits of our authorities and available funding.
IEPR Panel Backcheck Comment:
Concur.

Comment #5
The geotechnical appendix of the DEIS should be included in the final published document.
Basis for Comment:
The geotechnical report is a critical element necessary to assess USACE risk studies of the Lewiston-Clarkston levee system. The overall risk of levee failure is a combination of hydraulic, geotechnical, and operational conditions.
Significance: Medium
Affects the results and overall conclusions of the report.
Recommendation for Resolution:
Include the geotechnical appendix in the final published EIS.
USACE Evaluator Response:
Adopt – The Corps will include the geotechnical appendix in the Final EIS. The Corps also intends to include the IEPR comments and responses in an appendix in the Final EIS.
IEPR Panel Backcheck Comment:
Concur.

Comment #6
The alternative screening logic is flawed.
Basis for Comment:
DEIS, Page 2-32, Section 2.2.6. The alternative screening logic links immediate and future project needs explicitly. This means that only alternatives that can *"remedy sediment deposition that interferes with authorized purposes of the LSRP, for both future and immediate needs"* are retained. It seems that considering them for future *or* immediate needs would be better and permit a larger array of alternatives to be carried forward.
Significance: Medium
The logic affects the recommendations and conclusions of the DEIS.
Recommendation for Resolution:
Alternative screening should be reconsidered so that alternatives that satisfy either immediate or future needs are retained.
USACE Evaluator Response:
Adopted: The Corps will clarify in the purpose and need statement that the Programmatic Sediment Management Plan must meet the long-term and the immediate needs. The Corps will also clarify in Section 2 that to be viable, an alternative must meet both of these needs. Since each alternative is comprised of a set of measures that could be implemented, the Corps will also clarify that the individual measures do not have to meet both of these needs. Some measures may address only the immediate need, while others may address the long-term or future need.
IEPR Panel Backcheck Comment:
Concur.

Comment #7
Further supporting discussion and evidence should be provided to support elimination of several measures considered for sediment management in the DEIS.
Basis for Comment:
DEIS, Page 2-8, Table 2-3. Three measures (bubble curtains, agitation, reduce navigation depth) that were eliminated from further consideration lack adequate technical, environmental, or economic justification supporting their deletion. The discussion regarding the elimination of bubble curtains and agitation to prevent settling contains very little supporting evidence to justify measure elimination. Also, although the measure of agitation to prevent settling is supposedly eliminated from consideration in sediment management alternatives, it actually does appear under the description of Alternatives 4, 6, and 7. The measure to maintain the navigation channel at less than 14 feet was dismissed from further consideration because it did not meet the project purpose and need since the channel depth of 14 feet is Congressionally authorized. While this is true, many USACE projects have modified, added, or deleted project features. Based upon the likely increasing sediment load in the future (Figure 1-7) with its associated sediment management cost, the economic justification of a 14-foot navigation channel may change. Besides the increasing sediment load, the actual tonnage shipped through the project has been decreasing over time (DEIS, Figure 3-2). It is clear that such a Post Authorization Change Report is a long process, so this measure should have to be grouped with those relevant to the future, but the USACE reasoning for outright dismissal of this measure is poorly supported. The constraint is mainly an institutional issue not an engineering or environmental issue.
Significance: Medium
This affects the overall DEIS recommendations and conclusions.
Recommendation for Resolution:
Provide additional supporting evidence and discussion regarding the elimination of these various measures. The justification should be based upon engineering, environmental, economic, or institutional considerations. For those measures eliminated, ensure that they do not appear as part of later alternatives.
USACE Evaluator Response:
Adopted: The Corps agrees that Table 2-3 could be followed by an expanded discussion on the justification for removal of those measures. The EIS and PSMP will be modified accordingly. The Corps will also modify the description of the measures in Table 2-1 to better differentiate between the measure “Agitation to re-suspend” and “Agitation to prevent settling”. The measure in Table 2-3 that was dismissed was “Agitation to prevent settling”. The measure “Agitation to re-suspend” was not dismissed and was carried forward into Alternatives 4, 6, and 7. This EIS evaluates alternatives to manage sediment that interferes with the Corps ability to operate and maintain ***existing*** authorized project purposes of the Lower Snake River Projects (LSRP). Consideration of alternatives that would require Congressionally authorized changes to deviate from existing authorized project purposes is outside the scope of this NEPA review and

the associated purpose and need for the proposed action. The purpose and need statement in the DEIS is appropriately focused on consideration of alternatives that effectively manage sediment that interferes with *current* LSRP authorized purposes, including the 14-foot navigation channel established by Congress. The Corps is not (in this EIS) analyzing the feasibility of reducing/increasing the authorized level (or availability) of commercial navigation, recreation, fish and wildlife mitigation or flood risk reduction at Lewiston-Clarkston. In other words, an alternative that changes, or completely eliminates, a Congressionally established authorized project purpose (e.g., 14-foot deep navigation channel, required fish and wildlife mitigation, or flood risk reduction provided to Lewiston-Clarkston), would be outside the reasonable range of alternatives required by NEPA, given the stated purpose and need of the proposed action. Such an alternative (or variation thereof), however, is not within the reasonable range of alternatives for this proposed action. The EIS (Section 1) will be modified to better explain the focus of the proposed action
IEPR Panel Backcheck Comment:
Concur.

Comment #8
It is not clear why System Management – Modify Flows measure is not applicable to navigation.
Basis for Comment:
DEIS, Page 2-9, Table 2-4 and Table 2-5. Modifying the operation of Lower Granite Dam to permit large-scale flushing events is feasible (H&H Appendix) and was tested with some success in 1992. The flushing activity removes sediments intruding into the navigation channel. Therefore, it is difficult to understand why this measure was rated as "no" for navigation in Table 2-4. Also, there are no ratings under recreation or fish/wildlife although presumably these might be improved also since "natural" sediment removal may be preferable to dredging. In addition, Table 2-5 shows a "no" in the second column in a similar fashion. Unfortunately, this prevented the alternative from being considered further.
Significance: Medium
This discrepancy affects the DEIS recommendations and conclusions.
Recommendation for Resolution:
Provide further explanation and justification for the rating of this measure on Table 2-4.
USACE Evaluator Response:
Adopted: The Corps will modify Section 2 to include "flushing" as a measure to at least partially address sediment deposition in the navigation channel. Because Lower Granite is a reservoir environment created by a 100 foot high dam, the flow velocities experienced within the reservoir are much lower than the flow velocities noted upstream within the natural riverine reaches of the Snake and Clearwater Rivers. Flow velocities within the reservoir may be increased by lowering the reservoir surface elevation, thus decreasing the available flow area with a corresponding increase in flow velocity. In March 1992, a 'drawdown test' was performed within Lower Granite and Little Goose projects. The results of this test are documented in a Walla Walla District, Corps of Engineers report titled '1992 Reservoir Drawdown Test, Lower Granite and Little Goose Dams,' dated December 1993. This report consists of a Main Drawdown Report and twenty-four appendices which provide background of the test and results noted. On Page 111 of the Main Report's text, this statement is made: "while large amounts of sediment were picked up and removed, redeposition occurred within short distances. Future reservoir drawdowns would not eliminate the need for regular dredging in the Snake and Clearwater confluence area." The Main Drawdown Report text also states on Page 110 that "although sediment transport increased from 1,000 to nearly 5,000 tons per day at River Mile 132.05 just above Silcott Island, these low transport rates indicate that nearly all of the sediment was picked up and then redeposited in the portion of Lower Granite reservoir upstream of Silcott Island." In the vicinity of the Confluence area, approximately seven (7) miles upstream, much greater sediment

transport rates were measured and are given in the Main Drawdown Report and appendices.

Based on prior numerical modeling studies which have been performed since the early 1980s, it has been determined that sediment must be transported and re-deposited downstream of River Mile 120, in order to not adversely affect the conveyance capacity through Lower Granite Reservoir during high flows. IF sediments are deposited upstream of River Mile 120, they will have an adverse affect on the ability of the Lewiston Levee system to safely contain high flow events.

Figure 129, found on Page 112 of the Main Drawdown Report, shows the areas of sediment erosion and deposition resulting from the development of a free-flowing river stretch during the March 1992 drawdown test. Even during drawdown conditions, some portions of the Navigation Channel and Port Areas would likely not be eroded to re-establish the required navigation depth.

There are ‘costs’ associated with drawing down the reservoirs. On Page 132 of the Main Drawdown Report text it states that “costs for preparation, implementation, and reporting of the March 1992 drawdown test exceeded $4 million. The cost of power loss during the month of March (due to reduced project capacity and completion of spill tests) was estimated to be approximately $1.0 million to $1.6 million (it is not possible to determine precise loss).” Also on Page 132 it states that “preparation of the ‘1992 Options Analysis/Environmental Impact Statement for Columbia River Salmon Flow Implementation Measures ‘ cost an additional $2 million.” Also on Page 132 it states that “costs of damages to port and private facilities incurred during the drawdown test were estimated to be approximately $1.3 million” and that “the costs do not include economic losses, such as lost use of facilities, business opportunities, earnings, and wages, or inspection and monitoring.” The facilities incurring damage included ports, parks, boat ramps, marinas, roads, highways, railroads, levees, and a municipal sewer outfall. Damage estimates were calculated in 1992 dollars.

Figure 72, on Page 78 of the Main Drawdown Report, shows the confluence of the Snake and Clearwater Rivers during the lowest point of the drawdown test on March 25, 1992. It shows the Port of Clarkston area and suggests that the drawdown might not have provided sufficient and complete restoration of the navigation depths at the Port location.

Figures 73 and 74 on Page 79; Figures 75 and 76 on Page 80; and Figures 77, 78, and 79 on Page 81 of the Main Drawdown Report collectively illustrate some of the damages noted during the March 1992 Drawdown Test. Also Figure 135 on Page 117 and Figure 147 on Page 125 of the Main Drawdown Report illustrate fish mortalities noted during the 1992 Drawdown Test. Also on Page 125 of the Main Drawdown Report it states that “juvenile lamprey (Lampetra tridentate) were also found in exposed mudflats.”

Levee integrity issues were noted after the 1992 Drawdown Test along the West Lewiston Levee. On 22 September 2000 a Memorandum for the Deputy Commander, Northwestern Division (CENWD-DD) was prepared by the Walla Walla District Engineer, subject: Lower Granite Reservoir Operation, Lower Granite Dam, Clearwater and Snake Rivers, Washington and Idaho; which requested that Lower Granite Reservoir pool elevation be held at or below elevation 735 at the confluence until levee repair was completed. The request stated that ‘seepage and intermittent piping along an approximate 500 foot section of the West Lewiston

Levee significantly worsened between winter 1998 and winter 1999' and that 'seepage has been occurring in this area since the 1992 test drawdown of Lower Granite Reservoir. Although NWW has made attempts to alleviate the seepage and piping during the time since the 1992 drawdown, the seepage has not only continued but has increased.' The seepage was likely triggered by lowering the phreatic surface on the river side of the levee resulting in hydraulical fracturing of the levee. The hydraulic fractures would result in increased permeability and subsequent seepage (Shannon & Wilson Inc., report Lewiston Levee Seepage Analysis dated October 2000). Levee repairs were completed in April 2001. It is possible the future drawdowns could result in similar damage. This can be mitigated by better drawdown control (i.e., slower lowering) but that would negate the desired velocities to move sediment. Otherwise, additional repair would likely be required. Based on the evidence available from the 1992 Drawdown Report and Appendices, it can be concluded that this particular drawdown, and likely future drawdowns, did not fully restore the Navigation Channels to their authorized depths and resulted in negative impacts to other uses. This is the justification for the rating given this measure on Table 2-4. Drawdown does not provide the level of control to target removal of problem sediments and where they migrate to that other alternatives can provide.
IEPR Panel Backcheck Comment:
Concur.

Comment #9

The presentation regarding cumulative effects should be more robust in the DEIS.

Basis for Comment:

The EIS in Section 4.11 states "*This section presents the Corps' evaluation of the potential cumulative effects of its actions as part of programmatic alternatives for managing sediment in the LSRP reservoirs. The Corps' cumulative effects analysis focuses on actions that are within the Corps' authority to implement and are described as components of all three PSMP alternatives. Potential effects from other agencies' actions are addressed in Alternative 3 only.*" The section further states "*The Corps used public scoping input (see Section 2 and Appendix G), as well as technical analysis conducted for this EIS, to focus this analysis on cumulative effects that are "truly meaningful" in terms of local, regional, or national significance (CEQ 1997).*" While this is technically adequate, most EISs present more robust cumulative effects analyses for all resources that would be affected by the project, especially on projects that are subject to legal proceedings or intense public scrutiny.

For example, the cumulative effects discussions do not appear to fully consider economic growth over time and the effect on activity/use of the industrialized areas of the project footprint. Discussions regarding cumulative effects (specifically Appendix K, section 6.7) should present a more robust discussion of reasonably foreseeable increases in activity within the shipping/berthing areas of the reservoirs over time, specifically those at Port Clarkson and the confluence of the Snake and Clearwater rivers. Increases in site use at these facilities would create additional development pressure on adjacent land, potential for contaminant introductions, pressure to dredge these locations, navigation within the SR, etc.

As the proposed action serves to maintain (and arguably, improve) access to the facilities along the harbor compared to the no action alternative, and increases in materials transport and other commercial activity associated with long-term economic growth are likely, it seems plausible that activities at these sites would increase over time with the preferred action. Even given flat economic setting, the Idaho Economic Forecast published in April 2013 expects to see real gross domestic product (GDP) growth exceed 2.0% and approach 3.2 % over the next 5 years. Real GDP growth for Washington and Oregon is expected to be similar. The 2008 NOAA BiOp notes that projects including dock and boat launch construction, maintenance dredging, and embankment repair could have short- and long-term adverse effects on Snake River fall Chinook and other salmonid populations.

Additionally, consideration of the full range of measures considered under Alternatives 5 and 7 do not appear to be well considered under cumulative effects. Many of the measures actionable under Alternative 7, including upland sediment reduction measures, dredging, dikes and weirs, and others listed in 2.2.5.7 of the DEIS would have a range of either beneficial or adverse effects. Even though this is proposed as a programmatic EIS (and thus has a broad consideration of future actions), the consideration of these reasonably foreseeable future actions are too broad and brief to be meaningful. While the DEIS states that the USACE anticipates cumulative effects analyses of actions proposed pursuant to this EIS will conduct cumulative effects analysis at a project-specific level of detail through a tiered NEPA process, the consideration of cumulative

effects of proposed alternatives should be considered more fully in the DEIS.
Significance: Medium
This affects the overall recommendations and conclusions.
Recommendation for Resolution:
Further develop the discussion regarding cumulative effects to address the issues noted.
USACE Evaluator Response:
Adopted: Both NEPA and ESA require considering cumulative effects of proposed actions, but the two laws define cumulative effects differently. Appendix K (Biological Assessment) addresses cumulative effects consistent with the ESA. The remainder of this response addresses the EIS cumulative effects analysis. Section 4.11.2.4 does identify (in broad, regional terms) reasonably foreseeable future actions. Local economic development was captured under the "Urban Land Uses" category in Table 4-2. Given the geographic and temporal scope of the cumulative effects analysis, the Corps did not attempt to identify specific permitted local developments as part of this analysis. EIS text will be augmented to more thoroughly describe how the Corps identified reasonably foreseeable future actions by others. Regarding the comment that "…the proposed action serves to maintain (and arguably, improve) access to the facilities…compared to the no action….": The no action alternative would result in the progressive reduction of access to existing facilities by *not* reestablishing the Federal navigation channel to its authorized dimensions, or the areas access channels between the Federal channel and the port facilities, so proposed action alternatives would improve that condition. However, neither action alternative would add capacity to the established authorized navigation system that would directly enable increases in materials transport nor other commercial activity associated with long-term economic growth. The proposed dock extension at the Port of Lewiston also would not increase the capacity of that facility, but rather improve its operational efficiency. Shipment of commodities on the lower Snake River has varied over the years based on a variety of factors including markets, crop yields, etc.. The Federal navigation channel is just one component of the transportation system that accommodates economic activity and growth. While economic development in the study area is reasonably foreseeable (and would be a component of the statewide growth projections cited), this should have been captured in the identification of future actions in Table 4-2 and discussed in Section 4.11. Text will be added to the EIS to clarify this matter. Regarding the last point made in the comment regarding level of detail of the cumulative effects analysis for the full range of measures, more detail will be added to sections 4.11.3.2 and 4.11.3.3 to account for the anticipated effects of the measures included in alternatives 5 and 7.
IEPR Panel Backcheck Comment:
Concur.

Comment #10
Provide further discussion and consideration of system operational changes as a measure for sediment management.
Basis for Comment:
DEIS, Page 2-17 and 3-7. There are a number of system operational changes that were mentioned by the USACE but not really considered in detail. These include raising the maximum operating pool within Lower Granite reservoir and/or operating the navigation system at temporally varying depths. The panel feels that these operational changes are worthy of additional discussion and consideration. It is understood that any operational changes would require an Environmental Assessment (EA), EIS, or Post Authorization Change Report; however, these options may actually represent the least cost sediment management option over the long-term. The overall feasibility of any of these measures should be discussed further by the USACE in the DEIS with the focus of the discussion on engineering, environmental, economic, and institutional considerations that would constrain any proposed operational changes. Some type of hybrid navigation depth schedule may provide many benefits with limited overall costs or impacts if such a measure is feasible. For example, juvenile salmon species in the river system are in Lower Granite reservoir from about April to September each year. During this time, fisheries managers desire to keep the operational pool within 1 foot of minimum operating pool (MOP) (H&H Appendix). At other times of the year, higher pool levels may be feasible. Therefore, “navigation windows” similar to how many tidally-influenced navigation systems operate in the United States may be useful.
Significance: Medium
This affects the overall DEIS recommendations and conclusions.
Recommendation for Resolution:
Provide further narrative discussion regarding operational changes as a sediment management measure. If such changes are not feasible, provide supporting evidence to that effect. If such changes are feasible, provide discussion of how such changes could be included in the future as part of long-term management measures or alternatives.
USACE Evaluator Response:
Adopted: The Corps will augment the text of Section 2.2.4.3 in the EIS to better explain the appropriate role of system/reservoir operation as a sediment management measure. The Corps will explain that each reservoir has a three- or five-foot operating range and that the navigation and hydropower features of each dam were designed around that operating range. The Corps adjusts the reservoir level within that range on sometimes a daily basis to address such things as hydropower needs, maintenance issues, or special events. When sediment deposition is encroaching into the 14-foot depth of the navigation channel, the Corps can keep the reservoir level at the upper end of the operating range to maintain a 14-foot depth. However, during the spring and summer months (April – August) the Corps is to operate the reservoirs at or near the minimum operating pool (MOP) level in an attempt to reduce the cross-section of the reservoir and speed the flow of the river, which in turn may help move outmigrating juvenile salmon

downstream faster. This MOP operation is part of the Federal Columbia River Power System Biological Opinion (Bi-Op). The Bi-Op does have a provision that the Corps can deviate from this MOP operation if the reservoir levels need to be raised to provide for safe navigation. Operating the reservoirs at the upper end of their operating range alone, however, would not provide total rectification of the problems caused by sediment deposition as eventually the sediment deposition will be great enough that operating at maximum pool elevation will not provide a 14-foot channel. The DEIS and draft PSMP currently include a measure that includes raising pool elevation within Lower Granite reservoir to provide safe/continuing commercial navigation. That measure, however, is appropriately described as a "temporary" measure until other measures can be employed to re-establish the Congressionally established navigation channel dimensions. In fact, the Corps has (for the past two years) operated the Lower Granite Reservoir up to 1-2 feet above MOP, depending on flow conditions, for the purpose of navigation. Such operation, however, is still considered temporary until the navigation channel dimensions can be reestablished. Additionally, the operational range for the Lower Granite Reservoir is only between 733 and 738 feet MSL, which does not provide for much variation. The purpose and need (P&N) statement in the DEIS appropriately describes a need to maintain the navigation channel at the Congressionally established dimension (i.e., 14 feet deep by 250 feet wide at MOP). Based on the authorizing legislation (PL 87-874) and associated Congressional documents, the Corps interprets that Congress intended for the Corps to maintain the lower Snake River navigation channel at the dimensions specifically designated by Congress and the Corps lacks discretion to designate alternative channel dimensions when it plans for, or engages in, channel maintenance actions. An alternative/measure that includes raising the maximum operating pool within Lower Granite reservoir and/or operating the navigation system at temporally varying depths, without regard to the need to maintain the navigation channel at Congressionally established dimensions, is not within the reasonable range of alternatives required by NEPA. It is for that reason the Corps removed from consideration "System Operations" alone as a viable alternative. Such an alternative does not satisfy the purpose and need of the proposed action. Additionally, if the reasonable alternatives considered satisfy the need to maintain a 14' x 250' navigation channel at MOP, a measure that includes raising/varying the pool elevation can only be viewed as a partial/temporary measure, as currently described in the PSMP and EIS. The Corps intends to provide additional clarification in the EIS concerning the need to maintain the lower Snake River navigation channel and Congressionally established dimensions. The Corps intends to add a "partial drawdown" measure to the final PSMP and EIS as a measure that could be used (after appropriate study) with other measures (e.g., dredging) to manage sediment that interferes with commercial navigation.
IEPR Panel Backcheck Comment:
Concur.

Comment #11

In-reservoir dredge material disposal may not be a fully reliable solution. Need a more detailed discussion of sediment distribution in the reservoir, because typical underwater sand slopes, or angles of repose, are much lower than proposed. Also, additional proactive measures may benefit the management of suspended solids migration and turbidity associated with sediment removal and placement.

Basis for Comment:

It is not clear what happens to the migration of the headwaters delta downstream from the ADH modeling. How stable will the sediment disposal areas be in response to flow circulation, wind induced and temperature gradients, and wind and shipping generated waves in the reservoir? The resulting sand slopes would be much flatter than a 1V:10H slope. Were silt curtains or similar technologies evaluated for sediment removal and placement activities; if so, why were they rejected? It would be good to cite examples of the most probable construction BMPs that would be required.

Significance: Medium

The DEIS does not provide a full understanding of the rationale behind the selected approach.

Recommendation for Resolution:

Please clarify if reservoir currents would re-distribute the sediments throughout the reservoir, or how significant is this concern. Confirm that the final angle of repose will be as expected, and which BMPs and proactive sediment management may reduce turbidity and migration of sediments.

USACE Evaluator Response:

Adopted: The Corps will augment the text to provide more information on the actual results of previous dredged material disposal. These results show in-water disposal can be a reliable option.

The Snake River transitions from a free-flowing river upstream of Asotin, Washington (approximately River Mile 148); to a run-of-the-river reservoir impounded by Lower Granite Dam, located at approximately River Mile 107.5. Lower Granite Dam is approximately 100 feet high. Since the project became operational in early 1975, experience has shown that the majority of the sand-sized sediments deposit generally between Silcott Island (approximately River Mile 131) and the Snake River's confluence with the Clearwater River (approximately River Mile 139.5). Section 4.6 of Appendix F discusses the 'channel characterization' of the Snake River in the vicinity of Lower Granite Reservoir. On Page 90 of Part I of Appendix F it states that 'below Silcott Island, the bed material changes from sand to mostly silt as the reservoir becomes wider and deeper.' Also, Section 8 of Appendix F discusses 'Lower Granite Reservoir Bed Material' and on Page 159 of Part I of Appendix F it states that 'previous characterizations of bed sediment indicated that sand dominates the bed in the upper reach of Lower Granite Reservoir and that deposits below about RM 130 are mostly silt.' Section 8.4 of Appendix F discusses 'Spatial Variation of Grain Size.'

Various Hydraulic Models were utilized in the analyses of Lower Granite Reservoir's physical characteristics and all are described in sufficient detail within Appendix F. The models developed utilized the HEC-RAS (one dimensional) and ADH (two dimensional) modeling systems.

On Page 128 of Part III of Appendix F it states that 'at present there is insufficient water surface elevation and velocity data to fully calibrate two-dimensional models of Lower Granite Reservoir.'

In March 1992, a 'drawdown test' was performed within Lower Granite and Little Goose projects. The results of this test are documented in a Walla Walla District, Corps of Engineers report titled '1992 Reservoir Drawdown Test, Lower Granite and Little Goose Dams,' dated December 1993. This report consists of a main report and twenty-four appendices which provide background of the test and results noted. On Page 111 of the Main Report's text, this statement is made:

"while large amounts of sediment were picked up and removed, redeposition occurred within short distances."

The Main Drawdown Report text also states on Page 110 that "although sediment transport increased from 1,000 to nearly 5,000 tons per day at River Mile 132.05 just above Silcott Island, these low transport rates indicate that nearly all of the sediment was picked up and then redeposited in the portion of Lower Granite reservoir upstream of Silcott Island." Also on Page 110 the Main Report states that 'the Snake River transport probably increased to at least 68,000 tons per day below the confluence on the 18th since the Clearwater River was discharging 50,000 tons per day.'

The following general discussion is provided regarding the Snake River's hydraulic characteristics from a point just upstream of its confluence with the Clearwater River downstream to Lower Granite Dam. On Page 86 of Part I of Appendix F, a 'flood period' for the Snake River at Lower Granite Reservoir is defined as a period when Lower Granite inflow is greater than 120,000 cubic feet per second (CFS). Plate 4-7 of Lower Granite Project's Water Control Manual, titled 'Summary Hydrographs,' shows that discharges of this magnitude are exceeded less than ten (10) percent of the time. At River Mile 139.64, about 0.2 miles upstream of the Clearwater River confluence, the Snake River's channel bottom elevation is approximately 695 ft MSL and its available flow area between this elevation and Normal Pool elevation is approximately 28,600 square feet. Flood Period discharges at River Mile 139.64 are likely to have velocities in excess of four (4) feet per second. At River Mile 139.22, about 0.2 miles downstream of the Clearwater River confluence, the Snake River's channel bottom elevation is approximately 692 ft MSL and its available flow area between this elevation and Normal Pool elevation is approximately 61,900 square feet. For the 'flood period' discharge of 120,000 CFS, average flow velocities at River Mile 139.22 will be on the order of two (2) feet per second; approximately half of that experienced upstream at River Mile 139.64. At River Mile 137.69, about 2 miles downstream of the Clearwater River confluence, the Snake River's channel bottom elevation is approximately 681 ft MSL and its available flow area between this elevation and Normal Pool elevation is approximately 44,500 square feet. For the 'flood period' discharge of 120,000 CFS, the average flow velocities at River Mile 137.69 will be on the order of 2.8 feet per second. At River Mile 129.27, about 1 mile downstream of Silcott Island, the Snake River's channel bottom elevation is approximately 656 ft MSL and its available flow area between this elevation and Normal Pool elevation is approximately 67,400 square feet. For the 'flood period' discharge of 120,000 CFS, the average flow velocities at River Mile 129.27 will be on the order of 1.8 feet per second. At River Mile 119.56, about 10 miles downstream of Silcott Island, the Snake River's channel bottom elevation is approximately 642 ft MSL and its available flow area between this elevation and Normal Pool elevation is approximately 122,600 square feet. For the 'flood period' discharge of 120,000 CFS, the average flow velocities at River Mile 119.56 will be slightly less than one (1) foot per second. At River Mile 116.76, in the vicinity of the proposed In-water Disposal Site, the Snake River's channel bottom elevation is approximately 638 and its available flow area between this elevation and Normal Pool elevation is approximately 126,600 square feet. For the 'flood period' discharge of 120,000 CFS, the average flow velocities in the vicinity of the In-Water Disposal Site will be slightly less than one (1) foot per second. At River Mile 114.92, about 15 miles downstream of Silcott Island, the Snake River's channel bottom elevation is approximately 629 ft MSL and its available flow area between this elevation and Normal Pool elevation is approximately 187,200 square feet. For the 'flood period' discharge of 120,000 CFS, the average flow velocities will be approximately 0.6 feet per second. At River Mile 107.43, about 22 miles downstream of Silcott Island and just upstream of Lower Granite Dam, the Snake River's channel bottom elevation is approximately 610 ft MSL and its available flow area between this elevation and Normal Pool elevation is approximately 295,000 square feet. For the 'flood period' discharge of 120,000 CFS, the average flow velocities at this location will be approximately 0.4 feet per second.

From the above hydraulic information, it can be determined that the 'available flow area' at Lower Granite Dam is approximately five (5) times as great as the 'available flow area' in the vicinity of the Clearwater Confluence and therefore the flow velocities at the dam will be only one-fifth of that experienced at the confluence. The Snake River's average flow velocities for a 'flood period' discharge progressively decrease from greater than four (4) feet per second upstream of the Clearwater confluence to approximately 0.4 feet per second within the reservoir in the vicinity of Lower Granite Dam.

Figure 2.46 on Page 102 of the book 'Sedimentation Engineering,' edited by Vito A. Vanoni and published in 1975, presents information regarding Critical Water Velocities for Quartz Sediment as Function of Mean Grain Size. A paper titled 'Design of Stable Channels' by Emory W. Lane, published in the 1955 American Society of Civil Engineers Transactions, also presents Permissible Velocities for Noncohesive Soils in its Table 2, on Page 1239 of the 1955 ASCE Transactions. Figure 5, on Page 1247 of Lane's paper, presents information regarding 'Angle of Repose of Noncohesive Material.' This figure shows the variability of angle of repose values, with values generally being within 20 to 40 degrees, and dependent upon material grain size (from 0.2 to 4.0 inches) and degree of roundness (from very rounded to very angular). A surface slope of 10(h) to 1(v) is approximately 6 degrees.

Hydrographic surveys performed in 2011 at the Knoxway Canyon (River Mile 116) in-water disposal site used in 2005/2006 showed the slopes on the upper surface of the embankment had an overall average of 2.48% (1V:40.25H), while the side slopes of the embankment (from the break at the top to the toe) had an overall average of 1V:8.82H. Both of these dimensions are

reasonably close to the target dimensions. The surveys were performed five years after the disposal action was completed and showed the material maintains the original design slope without slumping or eroding, even after 5-6 years of seasonal high water. The Corps of Engineers Engineering Research and Development Center (ERDC) has published Technical Note ERDC-TN-DOER-E21, dated September 2005, and titled 'Silt Curtains as a Dredging Project Management Practice;' as part of its Dredging Operations and Environmental Research (DOER) program. This Technical Note defines Silt Curtains as 'devices that control suspended solids and turbidity in the water column generated by dredging and disposal of dredged material.' The Technical Note makes this comment that 'with respect to overall effectiveness and deployment considerations, a current velocity of approximately one (1) Knot appears to be a practical limiting condition for silt curtain use.' One (1) Knot is approximately 1.7 feet per second. The silt curtains have a potential use at the Inwater Disposal Site location, since the flow velocities at this location will likely be less than 1.7 feet per second. However, at the Confluence area where the majority of the dredging activities will occur, this velocity will likely be exceeded which might make their use here questionable. The Technical Note also contains a statement that 'the St Lawrence Centre (1993) advises against the use of Silt Curtains in water deeper than 6.5 meters (21.3 feet) or in currents greater than 50 centimeters per second (1.64 feet per second) (USEPA 1994).' Although no known published information is available with respect to disposal site stability, survey data at the Inwater Disposal Site has occasionally been gathered and no known significant adverse material movement has been noted. This suggests that flow circulation issues, wind induced and temperature gradients, and wind and shipping generated waves in the reservoir are likely negligible and of a 'de minimus' nature. Section 12.8 of Appendix F further discusses 'Stability of Dredge Material Placement' and it states that 'velocities over the shallow water habitat are less than 1.5 feet per second. This velocity is high enough to initiate motion in fine sand, but not sufficient to cause general upset and movement of the mass of the placement.' Section 12.8 also states on Page 141 of Part II Appendix F that 'the wind fetch at this location is about 1 mile, so orbital velocities induced by wind motion should not significantly contribute to erosion of the placement.'
IEPR Panel Backcheck Comment:
Concur.

Comment # 12
The 2009 Sediment Evaluation Framework (SEF) used as the primary reference in the LSR PSMP for determining sediment contaminant (HTRW) screening thresholds does not specify freshwater dry weight screening levels for contaminants.
Basis for Comment:
The 2009 SEF does not have freshwater dry weight screening levels (SLs) for the contaminants listed in Appendix I, table B-2, B-3, B-6, or B-7 (p 24 of Appendix B, laboratory results); the levels referred to in the DEIS are specified for marine (salt water) sediments. This may be important, as some toxicants exhibit different bioavailability in saline v. freshwater conditions (metals screening levels are often magnitudes of order lower). It is good that the USACE is referencing the 2012 Washington SMS draft guidelines, but those guidelines refer to WAC 173-204-340 (Freshwater sediment quality standards), which state that *"The department shall determine on a case-by-case basis the criteria, methods, and procedures necessary to meet the intent of this chapter."* It might be valuable to also refer in the DEIS and/or appendices to the interim *Bulk Sediment Screening Levels for SEF Chemicals of Concern* values used by the USACE Portland District, which include the freshwater benthic toxicity screening levels from Table 7-1 of the 2006 Interim Final Northwest Regional Sediment Evaluation Framework: (http://www.nwp.usace.army.mil/Missions/Environment/DMM.aspx) or the February 2013 updated Seattle District *DMMP Chemicals of Concern* list: (http://www.nws.usace.army.mil/Missions/CivilWorks/Dredging/UsersManual.aspx). Adopting these recommendations may not appear to change the outcomes of the plan alternatives (as many of the values would still fall below the freshwater screening levels [FWSL]), but it is important to note any uncertainty involved in FWSLs from a practical risk-determination sense and to fully understand the potential environmental effects of the plan alternatives in light of the best available information applicable to the onsite environmental conditions. Some of the analyzed values would approach the FWSLs more closely than the marine screening levels. In regard to the importance of using FWSLs, research show that chronic toxicity tests conducted with freshwater sediments demonstrate biologic responses in ranges below those where an empirical sediment quality guideline would predict toxicity using acute 10-day toxicity tests; these differences are 6-fold lower for the chronic responses in freshwater toxicity tests (SETAC Pellston Workshop 2002). Also, the scientific literature has suggested that water quality standards may frequently fail to reflect the importance of combined aqueous *and* dietary exposures to some contaminants (specifically metals), typically resulting in feeding inhibition through avoidance response (Wilding and Maltby, 2006).
Significance: Medium
The information provided in the DEIS could be misleading to the reviewer and does not provide a fully accurate basis for determining risk.
Recommendation for Resolution:
The panel recommends that the Lower Snake River PSMP be revised to fully reflect available

guidance on freshwater screening levels for the Pacific Northwest.
USACE Evaluator Response:
Adopted: The sediment evaluation report included in the DEIS as Appendix I has been replaced with a revised evaluation of the 2011 sediment sampling and analysis. The Corps is performing additional sediment sampling and analysis this summer and will include the summary report from that effort in Appendix I, also. Freshwater sediment screening criteria are currently not available for all chemicals of concern in the Pacific Northwest. One of the purposes of the 2009 Sediment Evaluation Framework (SEF) was to develop these guidelines, but due to a combination of the relatively limited amount of available data, the variability within the dataset, the statistical procedures used to analyze the information, and the lack of agreement among state and federal agencies this goal was not achieved. Progress is being made towards developing freshwater screening levels, but until they are established the available screening limits presented in the 2006 SEF, along with the February 2013 Dredged Material Management Plan (DMMP) marine guidelines, are followed. The 2012 Washington SMS draft guidelines have been adopted by the state but they are targeted at cleanup and their use for routine dredging decisions has not been established. Appendix I in the draft EIS has been extensively revised using the current screening limits provided by the DMMP. The revised screening limits were provided by the DMMP and uses freshwater values when they are available and marine guidelines for the remainder. The updated report was reviewed by the members of the DMMP and will replace Appendix I in the Final EIS. The DMMP also recommended that the Corps complete additional sediment sampling and chemical analyses to determine suitability for in-water disposal. The Corps intends to complete this task during summer 2013 and include the results in the final EIS.
IEPR Panel Backcheck Comment:
Concur.

Comment #13
Dredge material proposed for beneficial uses for salmonid habitat should have specific composition targets to ensure suitability for the proposed purpose.
Basis for Comment:
Appendix L, Section 2.6 notes that "*… about 85 percent of the material is expected to be sands (grains greater than 0.0024 inch in diameter) and gravels and cobbles; while about 15 percent of the material is expected to be silts and finer-grained material*" (p 15). There is some suggestion in the literature that silt concentrations exceeding 20% in Snake River Basin sediments result in substantially reduced survival to emergence for Chinook salmon. Other data suggest target values of as low as 11% fine sediments due to alteration of the habitat and direct effects on egg survival and developing embryos. However, the literature also notes that local criteria should not be generalized, and suggests that specific targets relevant to the created habitat be established as a benchmark (EPA 910-R-99-014, p 47). It is recommended that the proposed placement and habitat creation plan clearly specify targets for sediment composition in the text to ensure optimal habitat suitability and a benchmark for monitoring efforts required under 40 CFR 230 and 33 CFR 332. It is critical to have these targets in the DEIS, as this placement is part of an immediate action and would not require another EIS (under the tiered programmatic EIS).
Significance: Medium
This is important to ensure project success and toward developing specific benchmarks related to monitoring and performance criteria.
Recommendation for Resolution:
Specify sediment composition targets in the text as noted.
USACE Evaluator Response:
Adopted: The Corps will modify the EIS, in particular Appendix H, to more explicitly describe the target composition for the embankment as part of creating shallow water habitat for juvenile Chinook. The Corps will indicate dredged material composition targets for the base of the embankment are sand, gravels, and cobble with no more than 30% silt and the target for the surfaces within the upper ten feet of the water column would be material no less than 80% sand (grains greater than 0.2 mm in diameter). The Corps has already performed sediment sampling at the areas proposed to be dredged for the proposed immediate need action and found that the majority of the material is sand. The Corps' civil engineers have determined the embankment is likely to be stable if it contains no more than 30% silts and the most recent sediment sampling indicates the material does not exceed that criteria. The biological criteria for the surface material are on biological studies conducted by Dr. David Bennett. Dr. Bennett's studies of the effects of in-water disposal of dredged material in Lower Granite reservoir indicated that juvenile fall Chinook preferred an open sand substrate (at least 80% sand greater than 0.2 mm in diameter) with a 3-5% slope (D. H. Bennett and C. A. Pinney. 2000. Development of a Dredged Material Management Plan for the Lower Snake River, Appendix L, Aquatic Resources, Alternative

Ranking Matrix. Prepared for U.S. Army Corps of Engineers, Walla Walla, Washington. November 2000. 41 pp.). For the side slope, sand is desired as the surface for the upper ten feet of the water column as this is within the photic zone and is the area of most use by rearing juvenile fall Chinook). Salmon spawning habitat is not expected to be impacted by the proposed placement and habitat creation plan. Fall Chinook spawning habitat in the immediate vicinity of the lower Snake River dam tailraces are the only known spawning areas in the lower Snake River reservoirs. It is expected that any silt mobilized by the proposed dredging and disposal activities in the Lower Granite Reservoir, including those at RM 116, will settle out prior to reaching the potential salmon spawning areas below the Snake River dams several miles downstream. The dredging work at the Ice Harbor lock approach does not contain significant amounts of silt and with implementation of the monitoring plan in Appendix J, impacts to any potentially present redds are not expected. The mitigation and monitoring requirements identified in 33 CFR 332 does not apply to the Corps Civil Works projects. The requirements apply only to actions requiring a Clean Water Act Section 404 permit from the Corps' Regulatory program.
IEPR Panel Backcheck Comment:
Concur.

Comment #14
The discussion regarding juvenile lamprey presence/absence within the project footprint should be more robust in the text.
Basis for Comment:
Appendix J, section 3.1.2 (P 5): The failure of the electroshocking method to detect juvenile lamprey indicates that the method may not have been fully applicable or developed for the site circumstances as noted in the text: "*It is plausible that juvenile lamprey were present but not observed with this electroshocking sled as it was recently developed for this specific objective and had a limited testing period prior to deployment.*" The text then notes: "… *while juvenile lamprey are often found in silt/sand substrate (Artzen et al 2012), it is unlikely that juveniles are present in moderate or high numbers in the proposed templates.*" Why is this the case? While ostensibly due to sediment compositions within the project area, this conclusion needs clear reasoning to accompany this statement. The text also states, "*Juvenile lamprey typically have a patchy distribution related to other environmental variables such as water depth and velocity, light level, organic content, chlorophyll concentration, proximity to spawning area and riparian canopy (Moser et al. 2007).*" This is good information, but again, the text does not clearly link its relevance to the site conditions or predictions regarding lamprey populations within the LSR. Lamprey are an important component within the resident biologic community, and impacts to this species as a result of project activities could affect salmonid populations negatively. More detailed information regarding the rationale supporting this conclusion regarding lamprey populations with such limited onsite data should be readily evident in the text of the PSMP.
Significance: Medium
The omissions could affect the DEIS recommendation and conclusions.
Recommendation for Resolution:
Provide a more robust discussion on lamprey presence/absence and on site conditions supporting the USACE rationale.
USACE Evaluator Response:
Adopted. The EIS (Section 3.1.XX) and Appendix J will be revised to incorporate additional information regarding Pacific lamprey including information on presence/absence and sampling methodologies. Lamprey typically migrate up the Snake River during summer and spawn the following spring with juvenile lamprey (ammoecetes) spending 3-7 years rearing in freshwater before beginning their outmigration to the ocean where they spend 1-2 years as an adult (Luzier, C.W., H.A. Schaller, J.K. Brostrom, C. Cook-Taboer, D.H. Goodman, R.D. Nelle, K. Ostrand and B. Streif. 2011. Pacific Lamprey (Entosphenus tridenatus) Assessment and Template for Conservation Measures. U.S. Fish and Wildlife Service, Portland, Oregon. 282). Juvenile lamprey are known to rear in sandy substrate in tributary streams and at the confluences of stream/river systems where suitable rearing conditions exist. As noted in the text, "*Juvenile lamprey typically have a patchy distribution related to other environmental variables such as*

water depth and velocity, light level, organic content, chlorophyll concentration, proximity to spawning area and riparian canopy (Moser et al. 2007)." Additionally, juvenile lamprey are believed to move downriver during their freshwater rearing as a result of high flow scoring events and/or volitionally for a variety of potential reasons Luzier, et al, 2011). As a result, lamprey may be present at an individual location such as the Snake River and Clearwater confluence seasonally and/or at least during sporadic periods such as after high flow events. Juvenile lamprey therefore may be impacted during the proposed near term action. It is anticipated that juveniles may have opportunity to be flushed or swim from the barge if captured during dredging activities. By placing dredged materials in shallow water, any juvenile lamprey that remain in the materials may have the opportunity to escape and/or continue to utilize the area. Impacts to juvenile lamprey as part of future actions will be evaluated as part of each tiered action based on the most recent information available. The EIS and Appendix J text will be revised to indicate that while sampling did not indicate juvenile lamprey are present at the confluence of the Snake and Clearwater Rivers where suitable rearing habitat is present for ammoecetes, it is possible they may be present and could be impacted by the proposed actions. While the sampling methods utilized were experimental, they were based on the best available science at the time and utilized electrofishing techniques, a sampling method that has successfully located juvenile lamprey in the lower Columbia River. As a result of having only one year of habitat sampling information regarding juvenile lamprey presence/absence in the lower Snake River and no established sampling technologies, information from the lower Columbia River and general Pacific Lamprey life history information will be utilized to inform the EIS regarding potential impacts to this species within the project area. It is agreed that lamprey are an important component of the biotic community, impacts to this species as a result of project activities are likely largely independent of salmonid populations. Pacific lamprey while in freshwater are not highly dependent on salmonids, nor have salmonids been shown to utilize lamprey as a significant food source. Therefore, any potential impacts to lamprey are not expected to have subsequent direct impacts on salmonid populations as a result of the proposed immediate need action.
IEPR Panel Backcheck Comment:
Concur.

Comment #15
The rationale for effects on benthos and subsequent recolonization need additional justification in the Lower Snake River PSMP.
Basis for Comment:
The discussion in section 3.1.2 of the DEIS (Affected Environment) regarding the effects on benthos needs to be more robust. Different sections of the PSMP state different expectations for recolonization; in section 3.1.4 the text states the USACE expects recolonization to occur within six months, whereas in 3.7 it states the recolonization is expected to take 6 months to 1 year. Are these estimates based on referenced studies? Why are they not consistent throughout the documents? The 2011 Synthesis Report on Use of Shallow-Water Dredge Spoil on Aquatic Habitat Availability and Use by Salmonids and other Aquatic Organisms in Lower Granite Reservoir, WA. 1983-2010 (Contract No. W912EF-11-P-5008) states, "*…some differences between reference and disposal stations are evident for both shallow (Figure 5) and mid-depth (Figure 6) disposal sites. Although BMI recolonization followed soon after, standing crop remained lower at disposal than at reference sites (4, 5, 29). Indeed, although Bennett et al. (4) documented recolonization four months after deposition of spoil, BMI densities were only one-third of what they had been prior to disposal. After initial disposal in 1988 and 1989, Bennett et al. (1993) documented a trend of increasing biomass at one disposal site; however, this trend was not significant statistically, and data from 1991 showed that all three disposal sites had significantly lower biomass of Oligochaetes and Dipteras than reference sites (7).*" (P 27-30) Delayed recolonization of benthic organisms could be important from a secondary and cumulative effects perspective as it applies to threatened and endangered species through community interactions (predator/prey relationships). Additionally, section 3.1.2 Affected Environment states "*Freshwater mussels (e.g., Mollusca: Unionoida) are vital components of intact salmonid ecosystems and are culturally important to Native Americans. Historically, at least seven mussel species occurred in Oregon and Washington (NWPCC 2004a). However, due to their sensitivity to ambient pollutants such as metals and pesticides, freshwater mussels are one of the most endangered faunal groups in North America (NWPCC 2004a). A recent study found that during the fall and spring, mollusks were the dominant macroinvertebrate community in the majority of sampled locations in the LSRP (Seybold and Bennett 2010).*" The PSMP does not appear to specify what the bivalve composition of the affected biologic community might be, nor does it further address impacts to this community. The USFWS and others identify vulnerable species of freshwater mussels common to the Snake River, including the Western Ridged Mussel (*Gonidea angulata*), that have been found within the LSR (i.e., the Lower Granite Reservoir). The PSMP should specify if the bivalves in these areas are primarily native or introduced, and bivalve species present should be better described in the DEIS. FWS lists a few that have distributions within the watershed and project river systems. Some of these mussels require fish for part of their lifecycle; any impacts to fish (i.e., no action) should include this potential impact to mussels if they are native species. This may need to be addressed in section 4.1 of the DEIS.

Impacts to these species could also present community level effects on other organisms, including threatened and endangered species, through reduced ecologic niche fulfillment.
Significance: Medium
This affects the overall understanding, recommendations, and conclusions of the DEIS.
Recommendation for Resolution:
Revise the discussion regarding benthos to better describe and justify recolonization expectations, and provide additional information on the benthic biologic community, including bivalve community composition.
USACE Evaluator Response:
Adopted: -Text will be revised as follows: the following is from **Appendix M of Corps 2000 FCRPS EIS and Frest TJ and EJ Johannes. 1992. Effects of the March 1992 Drawdown on the Freshwater Mollusks of the Lower Granite Lake Area, Snake River, SE WA& W ID. Deixis Consultants, Seattle, Washington.** 3.1.2 Mollusc diversity has been greatly reduced by the impoundment of the Snake River. Prior to impoundment, the lower Snake River likely supported 34 species of molluscs, 33 of which were native to the river (Frest and Johannes, 1992). Sampling done during the test drawdown in the early 1990s produced only seven mollusc species (Frest and Johannes, 1992). The current mollusc fauna is dominated by the non-native Asian clam (*Corbicula fluminea*), which became established in the Columbia River in the 1940s (Frest and Johannes, 1992). Species observed in in small numbers with limited distributions included the California floater (*Anodonta californiensis*) (a species of concern for the USFWS), the shortface lanx (*Fisherola nuttallii*), the western floater (*A. kennerlyi)(* a species of concern for the USFWS), knobby rams horn (*Vorticifex effuse),* creeping ancylid (*Ferrissia rivularis*), and the bivalve, western ridged mussel (*Gonidea angulata*) (a species of concern for the USFWS). Frest and Johannes (1992) reported that *A. californiensis*, *A. kennerlyi*, and *G. angulata*, now appear to be extirpated from the Lower Granite Dam Reservoir. Pool and Ledgerwood (1997) described the relative composition of major benthic taxa found in three soft-substrate, shallow-water sampling areas (pooled data) of Lower Granite Reservoir from 1994-1995 comprised 80% *Oligochaeta*, 11% *Insecta* (Including chironomids), 2% *Bivalvia*, 1% *Crustacea*, and 6% other taxa. **Pool, S. S., R. D. Ledgerwood. 1997. Benthic invertebrates in soft-substrate, shallow-water habitats in Lower Granite Reservoir, 1994-95. Report to the U.S. Army Corps of Engineers, Contract E86940115, 96 p.** 3.1.4 Text will be revised to state recolonization is dependent on the time of year with short time to recolinization during periods of higher productivity. The USACE expects recolonization to occur between 6 months to a year but may occur sooner dependent on water temperatures and productivity. Delayed recolonization of benthic organisms could be important from a secondary and cumulative effects perspective as it applies to threatened and endangered species through community interactions (predator/prey relationships) although these are likely to be minimal

with localized effects since the impacted area is relatively small compared to the available undisturbed habitat.
IEPR Panel Backcheck Comment:
Concur.

Comment #16
Clarify if the not-yet-defined structural measures will result in permanent definable benefits or impacts.
Basis for Comment:
Structural improvements may result in channelization and improved flow conveyance, including higher flow velocities and sediment transport. It is not clear if future Environmental Analyses will be conducted to evaluate these impacts.
Significance: Medium
This will clarify the circumstances under which structural measures are selected, and how the individual structure benefits/impacts are defined for the PSMP.
Recommendation for Resolution:
It appears that each structural measure will have to be evaluated for its own merits, if and when it is considered. And that evaluation may determine how useful that structure may be in terms of sediment transport and habitat creation. Based on the present information, it appears that both ports will require structural protections, which are not yet defined; unless continued dredging will be the long-term option.
USACE Evaluator Response:
Adopted: The Corps will clarify that implementation of any of the measures, including structural measures, would require additional engineering and environmental analysis in a document tiered off the EIS. Once a trigger is hit, the Corps would identify the measures that could be used to address the problem. The Corps would perform an analysis of the measures and would consider effectiveness, environmental effects, cost, and public/agency comments when determining which measure to implement.
IEPR Panel Backcheck Comment:
Concur.

Comment #17
It is not clear if there is an optimum approach to the viability of the Lewiston/Clarkston levees.
Basis for Comment:
It is important to indicate if the FEMA criteria are met under the various potential actions listed, even if SPF protection will not be available. For example, would increasing flow velocities along the Lewiston levee using structural features cause scour at the toe of the levee?
Significance: Medium
The flood risk must be assessed in relation to any of the options included under the selected alternative.
Recommendation for Resolution:
The actual flood control benefits to both communities will probably be defined when the specific actions are implemented. But a general discussion in the PSMP is warranted, to show that navigation and flood control benefits will be complementary with some of the toolbox options. Also, a general assessment of O&M requirements for each type of structure would be helpful in the decision to include these structures.
USACE Evaluator Response:
Adopted: For riverine levees, the FEMA base flood requirements include: • A minimum freeboard of three feet above the water-surface level • No appreciable erosion of the levee embankment can be expected (scour) • Adequate levee embankment stability (slope stability and seepage & piping) • Embankment settlement will not jeopardize the freeboard (settlement) In the geotechnical appendix, the levees were shown to have adequate slope stability, not prone to seepage induced piping, and are scour resistant to full bank flows. Since the levee was constructed over 40 years ago and is constructed on generally granular material, all settlement should have occurred by now: this failure mode was not investigated. Therefore, the design of the levees complies with the FEMA requirements. O&M requirements include formal plans documenting operation plans for closures, a flood warning system (and what to do when activated), and provisions for periodic operation – all in accordance with an O&M manual. The O&M manual must be provided to FEMA when system recognition is sought. The Corps will modify the text to show some of the measures may have navigation and flood risk reduction benefits (e.g., dredging the navigation channel at the Snake/Clearwater confluence would provide some benefit for flood risk reduction). The Corps will revise the structural measure descriptions and add general statements about O&M as appropriate. Elevations in this discussion are given in the NGVD1929 datum. As given on Page 87 of Part I

of Appendix F, the conversion factor to convert from the NGVD1929 datum to the NAVD88 datum is the addition of 3.40 feet to the NGVD1929 elevation. This value was computed using CorpsCon software; assuming the location of Lower Granite Dam as the point of computation. As given on Page 138 of Part I of Appendix F, the conversion factor at the confluence is 3.24 feet. The Lewiston Levee system is described in detail within these four (4) Lower Granite Lock and Dam Design Memorandums:

1. Design Memorandum 29, Lewiston Levee Operation and Maintenance Facilities, dated 3 December 1968

2. Design Memorandum 29.1, East Lewiston Levee, dated 4 August 1972

3. Design Memorandum 29.2, West Lewiston Levee, dated 28 April 1972

4. Design Memorandum 29.3, North Lewiston Levee, dated 18 September 1970

The Water Control Manual for Lower Granite Lock and Dam, Snake River, Oregon, Washington, Idaho; dated May 1987; also provides information regarding the Lewiston Levees as well as operational procedures for the Lower Granite Project under varying hydrological/meteorological conditions.

The Lewiston Levees were originally designed to allow the conveyance of the Standard Project Flood through the Snake River/Clearwater River Confluence area, around which the population centers of Lewiston, Idaho; and Clarkston, Washington; have been developed; and maintain five (5) feet of freeboard above the Standard Project Flood's water surface. The Snake River's Standard Project Flood discharge downstream of the Clearwater River confluence is 420,000 cubic feet per second (CFS). The Clearwater River's Standard Project Flood discharge is 150,000 CFS. The Snake River's Standard Project Flood discharge upstream of the Clearwater River confluence is 295,000 CFS. Because of differing basin physical characteristics, the peak discharges of the Standard Project Flood for the Snake and Clearwater Rivers do not occur simultaneously and thus their peak discharges upstream of the confluence are not directly additive to compute the Standard Project Flood downstream of the confluence.

Lower Granite Project's normal pool elevation is 738 ft MSL (NGVD 1929 datum), and one operational objective is to maintain a maximum elevation at the Snake and Clearwater River's confluence of 738 ft MSL; through a range of discharges up to the Standard Project Flood discharge of 420,000 CFS. To accomplish this operation, Lower Granite Reservoir's pool elevation at the dam may be lowered down to an elevation of 724 MSL and a pool elevation of 738 simultaneously maintained at the confluence. The design capacity of Lower Granite Dam's spillway is 850,000 CFS; which is passed at a pool elevation of 746.5 ft MSL, measured at the dam. At Normal Pool Elevation of 738 ft MSL, Lower Granite Dam's spillway will pass 678,000 CFS. At the peak discharge of the Standard Project Flood, the upper reaches of Lower Granite Reservoir are essentially in a 'free flowing river' condition, and the Lewiston Levees have been designed to withstand these flow velocities.

As per Table 4 (PSMP Appendix F, Part 2, Page 88) the one (1) percent annual exceedance probability discharge for the Snake River downstream of the Clearwater River is approximately 331,600 CFS, the one (1) percent annual exceedance probability discharge for the Snake River

upstream of the Clearwater River is approximately 229,400 CFS, and the one (1) percent annual exceedance probability discharge for the Clearwater River is approximately 102,200 CFS. The one (1) percent annual exceedance probability is the preferred technical terminology for the phrase '100 year event.' Lower Granite Project, including the Lewiston Levee system, should be able to meet the Federal Emergency Management Agency's (FEMA) criteria under the various potential actions listed; assuming that the one (1) percent annual exceedance probability remains the basis of the applicable criteria. Lower Granite Dam's spillways can easily pass discharges which are more than two (2) times the magnitude of the FEMA Standard one (1) percent annual exceedance probability discharge.
IEPR Panel Backcheck Comment:
Concur.

Comment #18
A more detailed description of baseline and its place in the analysis would be useful to gear the public toward what to expect in the analysis (i.e., difference between baseline and effects of the project as implemented).
Basis for Comment:
This is an overarching comment to clarify public expectation/the limits of analysis. The USACE does not have an explicit explanation of what baseline is and therefore when reading the effects analysis it is easy to stray away from what action the USACE is taking (i.e., developing and implementing an O&M Program for which some activities have already been occurring) and to think of all the proposed activities as "new" activities. If baseline/existing environment/activities are defined more succinctly, it would make the limited scope of the analysis and alternatives more understandable to the reader.
Significance: Low
This confuses the overall understanding of the document and its conclusions.
Recommendation for Resolution:
Provide an explanation of baseline and its use in the NEPA analysis.
USACE Evaluator Response:
Adopted: The baseline is the "No Action (Continue Current Practices)" alternative. The Corps will modify appropriate text in the DEIS, including the description of the "No Action (Continue Current Practices)" alternative in Section 2 and the effects of that alternative in Section 4, to better reflect the current sediment management situation and what effects would be expected if this current management continues into the future. The baseline condition is also identified in sections 2.13 and 5 of the Biological Assessment (Appendix K) to the DEIS.
IEPR Panel Backcheck Comment:
Concur.

Comment #19
The Ice Harbor Navigation Lock sediment sample locations do not appear to include samples from the highest sediment accumulation areas likely to be dredged (Appendix I, Section 3.1.4, Fig 5).
Basis for Comment:
The sediment sample locations at Ice Harbor Navigation Lock approach do not include any of the highest sediment accretion areas, which differentiates this site from the other sites targeted for dredging in the LSR PSMP. The other sites (i.e., Port of Lewiston, etc.) included representative samples from the high accretion areas most likely to be dredged. Sediment samples taken outside of the high accretion areas may not be representative of the sediment characteristics within the high accretion areas. Additional data or discussion (perhaps from prior dredging or sampling events) specifically addressing these high accretion areas would benefit the rationale and findings of the PSMP, and further demonstrate consistency with the 2009 SEF.
Significance: Low
The data provided does not allow for a full technical understanding of the report.
Recommendation for Resolution:
Provided additional data or a more robust discussion regarding the sample selection and discrepancy of sample locations at the Ice Harbor Navigation Lock relative to the other sites.
USACE Evaluator Response:
Adopted: The tailwater region of Ice Harbor Dam is a high energy environment that's conducive to relocating substrate material. When the sampling locations were selected in 2011 the most recent bathymetric survey maps available at that time, along with information from the navigation industry, were used to identify the high points of concern. Subsequent high-flow events repositioned the bed material slightly. A more recent bathymetric map was used to prepare Figure 5 in Appendix I which consequently indicates that the sampling sites do not line up with the high point identified in the 2012 survey but the sediment is expected to be similar. The area within the Ice Harbor downstream navigation lock approach does not experience appreciable deposition of new sediment material since the majority is blocked by the dam. The area has been sampled and dredged since the project was put into operation in 1961 and has consistently yielded cobbles and rock ranging from one to ten inches, or more, in diameter along with some sands. Any suspended fine material that is transported through the navigation lock or the project spillway/powerhouse is transported downstream by the relatively high velocity flows.
IEPR Panel Backcheck Comment:
Concur.