APPENDIX A
Response to Comments After the Public Notice Period

Comment Provided By:	**Comment/Response Nos.:**
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1	UNITED STATES ENVIRONMENTAL PROTECTION AGENCY REGION 8 1595 Wynkoop Street DENVER, CO 80202-1129 Phone 800-227-8917 http://www.epa.gov/region08 RECEIVED NOV. 2010 Ref: EPR-N NOV 23 2010 Carlie Ronca U.S. Bureau of Reclamation Eastern Colorado Area Office 11056 W. County Rd 18 E Loveland, CO 80537-9711 Tim Carey U.S. Army Corps of Engineers Denver Regulatory Office 9307 South Wadsworth Boulevard Littleton, CO 80128 Re: EPA's Response to October 27, 2010 Mitigation Plan and Environmental Commitments for the Proposed Action, Windy Gap Firming Project Dear Ms. Ronca and Mr. Carey: We appreciate the opportunity to review the October 27, 2010, draft Mitigation Plan and Environmental Commitments for the Proposed Action document (mitigation table) provided to the U.S. Environmental Protection Agency (EPA) Region 8 by the Bureau of Reclamation (BOR). EPA understands that this is an evolving document and that there may be additional changes prior to publication in the Final Environmental Impact Statement (EIS) projected for January 2011. As you are aware, mitigation is an essential tool for agencies and other decision makers to use to avoid, minimize, rectify, reduce, or compensate for any adverse environmental impacts associated with their actions. Through the National Environmental Policy Act (NEPA) process, adequate mitigation measures should be transparent and consider future environmental impacts so that monitoring activities are designed and implemented to measure effectiveness. Based on the draft content of the mitigation table, it is evident that EPA's concerns previously outlined in the May 21, 2010 correspondence (copy enclosed) to BOR and the US Army Corps of Engineers (COE) have not been addressed yet, and it appears subsequent EPA recommendations have not been considered. To reiterate, EPA is primarily concerned about the mitigation details for water quality impacts associated with temperature and nutrient loading, as well as impacts to aquatic life and stream morphology. The May 2010 letter includes specifics related to these topics, as well as comments on compliance with the Clean Water Act (CWA) for both evaluating purpose and need and the analysis of alternatives. The mitigation table lacks sufficient detail for many of the identified resource impacts and EPA continues to advocate that BOR include a more detailed description of mitigation measures, including monitoring and adaptive management plans, in the EIS. Because a CWA Section 404 permit is needed for this	1. The U.S. Army Corps of Engineers (Corps) agrees with the Bureau of Reclamation (BOR's) responses provided in Appendix F of the final Environmental Impact Statement (FEIS) and Appendix E of BOR's Record of Decision (ROD). In addition, the Corps feels the Environmental Protection Agency's (EPA's) concerns were also addressed and answered through the Clean Water Act (CWA) Section 401 Certification process and subsequent 401Water Quality Certification for the Windy Gap Firming Project. As required by regulation, the Corps has incorporated the terms and conditions of Colorado Water Quality Control Division's 401Water Quality Certification assessment and proposed mitigation, which includes a more detailed monitoring and an adaptive management plan. The Corps had the benefit of being able to consider and review the Water Quality Certification and technical reports in making its determination. These have informed its mitigation requirements and overall permit decision.

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2	project, mitigation is required for unavoidable impacts and sufficient detail is necessary to avoid supplemental NEPA documentation by the COE. Regrettably, EPA did not receive any response regarding its concerns outlined in the May 2010 letter. Based on the gravity of our concerns on analyses, impacts, and the lack of mitigation information disclosed at this late stage of the EIS process, it is difficult to foresee how these deficiencies will be adequately addressed given the lack of meaningful discussion and remaining timeframe. EPA would welcome feedback on outstanding issues raised and would be amenable to the opportunity to work with BOR and the COE towards the development of a more conclusive mitigation plan. If there is interest in further discussing details identified in the May 2010 letter and October 2010 draft mitigation table to ensure a mutually acceptable path forward towards resolving these significant issues within the NEPA process, please contact me at 303-312-6004, or coordinate with Melanie Wasco of my staff at 303-312-6540. Sincerely, Larry Svoboda Director, NEPA Compliance and Review Program Ecosystems Protection and Remediation Enclosure cc: Will Tully, U.S. Bureau of Reclamation, Eastern Colorado Area Office Scott Franklin, U.S. Army Corps of Engineers, Denver Regulatory Office 2	2. The BOR addressed the EPA's comments in Appendix F of the FEIS and Appendix E of BOR's ROD. The Corps agrees with the BOR's comment responses. A cooperating agency may adopt without recirculating an EIS of a lead agency when, after an independent review of the statement, the cooperating agency concludes that its comments and suggestions have been satisfied. 40 C.F.R. § 1506.3(c). Further, a district commander will normally adopt another Federal agency's EIS and consider it to be adequate unless he finds substantial doubt as to technical or procedural adequacy or omission of factors important to the Corps decision. The Corps participated in the development of the EIS as a cooperating agency. The Corps' comments and suggestions have been satisfied. Additionally, the Corps fails to find the requisite circumstances as described in 40 CFR 1502.9 (c)(1) necessary to supplement the existing the National Environmental Policy Act (NEPA). In 2012, Reclamation completed a supplemental information report (SIR) to evaluate the necessity of doing additional NEPA. Since that time the Corps has completed its own analysis as to the technical and procedural accuracy of existing NEPA documentation and the Corps finds that the purposes of this Act as defined in 40 CFR 1500.1, would not be furthered through supplementation. Also, please see Comment 1.

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Ref: EPR-EP

FEB 06 2012

Tim Carey
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Re: EPA's Remaining Concerns on Windy Gap Firming Project following FEIS release

Dear Mr. Carey:

In response to your request that we coordinate with you in the Clean Water Act (CWA) Section 404 review of the Windy Gap Firming Project (WGFP, PN# 200380523), we are providing the following detailed comments to articulate our remaining concerns following the release of the Bureau of Reclamation's (BOR) Final Environmental Impact Statement (FEIS). The EPA has reviewed the FEIS and provided comments to the BOR on February 6, 2012 (incorporated herein by reference). The letter to the BOR outlines our general areas of concern, articulates why these concerns are significant to the aquatic resources affected by the project, and recommends adoption of specific monitoring and mitigation measures in the Record of Decision (ROD). In this letter, we are providing specific comments about additional data collection and analysis that we feel are necessary to identify critical adverse impacts for your consideration of compliance with the CWA Section 404 (b)(1) Guidelines (Guidelines). In addition, we recommend that the monitoring and mitigation components identified in the letter to the BOR, and any additional monitoring and mitigation identified in a revised impact analysis, be incorporated as CWA Section 404 Permit Conditions, should a permit be issued. We look forward to working with the Corps as this process progresses.

Although not a Cooperating Agency, the EPA has worked over the last several years in close coordination with the BOR to jointly address key technical issues based on the review of the Draft EIS pursuant to the National Environmental Policy Act (NEPA). Workgroups were formed to facilitate numerous inter-agency technical discussions that focused on four main areas of concern: temperature, nutrients, stream morphology and aquatic resources. These discussions and efforts to resolve the technical issues were productive and bounded by the BOR's NEPA schedule and available funding. As such, BOR provided additional information to address the EPA's concerns using existing data The EPA and BOR agreed that remaining technical issues would be addressed during the CWA permitting process for WGFP.

We understand that following release of the BOR's Record of Decision (ROD), the Corps may rely, in part, on the FEIS to meet their obligations under the Guidelines, and as a result we are

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3	concerned that determinations provided in the Preliminary Draft Section 404(b)(1) Effects Analysis (Appendix C) predicated on the FEIS need to be supplemented. In particular, we recommend the following: 1) further analysis regarding potential violation of State water quality standards from the proposed project, including temperature and aquatic life standards in the Colorado River, and dissolved oxygen, methyl mercury and manganese standards in the affected lakes and reservoirs (40 CFR 230.10(b)); 2) revision to the existing analysis and additional analysis to accurately determine the current baseline and potential for the proposed action to cause or contribute to significant degradation of waters of the U.S. (40 CFR 230.10(c)); and 3) a more robust monitoring and mitigation plan to offset any significant adverse effects anticipated from the proposed project (40 CFR 230.10(d)). We recommend that the Corps make this supplemental information available for public comment and review. We have enclosed detailed comments on our outstanding concerns and recommendations for your consideration. We look forward to meeting with you to discuss our concerns in greater detail. If you have any questions regarding our comments, please contact me at (303) 312-6670, or you may contact Julia McCarthy at (303) 312-6153. Sincerely, Humberto L. Garcia, Jr. Director, Ecosystem Protection Program Office of Ecosystems Protection and Remediation CC: Martha Chieply, USACE Rena Brand, USACE Enclosures: Detailed Comments Temperature Impact Analysis Memo; April 29, 2011 Comment letter to BOR on the FEIS; February 6, 2012 2	3. Please see comments 1 and 2. Additionally, These comments are addressed in more detail below.

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4 5 6 7 8	**EPA Detailed Comments** **Analysis of Impaired Waterbodies Potentially Impacted by the Proposed Project:** Many of the lakes and reservoirs that will be used to move project water to the Front Range (*i.e.* Granby Reservoir, Shadow Mountain Reservoir, Horsetooth Reservoir and Carter Lake) are on Colorado's Clean Water Act §303(d) List of Impaired Waters (303(d) List). These lakes and reservoirs, and Grand Lake, are all experiencing water quality problems related to excess nutrient loads. The WGFP is projected to increase nutrient loading to these waterbodies, and would be expected to exacerbate exceedance of the water quality standards (WQS), and the levels of impairment. Further, portions of the Colorado River below Windy Gap Diversion (WGD) are on the 303(d) List for temperature, and on the Monitoring and Evaluation List (M&E List) for aquatic life. For the tables comparing existing conditions to water quality standards (e.g. Table 3-40) the FEIS does not appear to use recent, more representative data; does not explain how the analyses establish thermal stratification, and how the presented results are calculated. The EPA is concerned that values presented in these tables appear to differ from those used by the Colorado WQCC in making assessment determinations. These tables may overstate the existing condition of these waterbodies. Nutrients can stimulate increased growth of free floating and attached vegetation in streams, rivers, lakes and reservoirs. High concentrations of phytoplankton (microscopic plants) or large plants are known to result in undesirable changes in water quality on a daily or seasonal basis. For example, excessive vegetation may result in decreased water clarity, or very low levels of dissolved oxygen during dark hours when photosynthesis does not occur but respiration continues. High nutrient levels can also encourage a shift in the species of phytoplankton, encouraging the bluegreen algae typical of eutrophic (over-enriched) waterbodies. This may result in seasonally low dissolved oxygen concentrations and production of plant toxins that can lead to fish mortality and harm to livestock and other animals. Plant toxins may affect recreational uses of the water as well. Granby Reservoir, Carter Lake and Horsetooth Reservoir are listed as impaired for their aquatic life use due to high levels of methyl mercury found in fish tissue which poses human health and fishery management concerns. The methylation of mercury in Colorado reservoirs has been associated with nutrient enrichment and reduced oxygen or anoxic environments, where conditions foster mercury methylation, which is subsequently biomagnified in the food web (Lepak & Johnson 2010). These reservoirs already experience seasonal dissolved oxygen problems, with thermocline- and hypolimnion-depths showing extremely low oxygen levels (or fully anoxic conditions). The WGFP FEIS predicts increased nutrient loading to these waterbodies as a result of the proposed project and would be expected to exacerbate these problems. Granby Reservoir, Shadow Mountain Reservoir, Grand Lake and Horsetooth Reservoir are exceeding the dissolved manganese WQS. Seasonally depleted oxygen in deep water can also mobilize metals such as manganese. The WGFP could further decrease dissolved oxygen levels in these reservoirs that serve as public water supplies. Increased dissolved manganese can raise	4. The Corps agrees with the BOR response provided to the EPA, as follows: *The water quality problems of Granby Reservoir, Shadow Mountain Reservoir, Grand Lake, Horsetooth Reservoir, and Carter Lake are described in the Affected Environment sections of the FEIS and the Lake and Reservoir Water Quality Technical Report.* *Increases in nutrient loads and the potential impacts (including all listed by the EPA with the exception of mercury) are described in Section 7 of the Lake and Reservoir Water Quality Technical Report – Eutrophication and Trophic Status. Note that mercury dynamics in western reservoirs are complicated (there are competing factors) and one cannot automatically assume that lower DO will result in increases in fish tissue.* *The four reservoirs on the state 303(d) list are noted in the FEIS (Table 3-55). According to the computations conducted for the FEIS, three of the reservoirs have exceeded manganese standards for drinking water supply. This is described in the FEIS. Note that none of the reservoirs are on the state 303(d) list or the M&E list for manganese.* *EPA notes that WGFP loads could reduce oxygen concentrations. This is true. Decreases in DO concentrations for Granby Reservoir, Grand Lake, Shadow Mountain Reservoir, Carter Lake, and Horsetooth Reservoir are predicted to occur and are described in the FEIS. The FEIS identifies mitigation measures so that DO levels would not be degraded.* In order to obtain a CWA 401 Water Quality Certification from the Colorado Department of Public Health and Environment (CDPHE), the *Windy Gap Firming Project, 401 Water Quality Certification Technical Report* was prepared by the Northern Colorado Water Conservancy District to analyze potential impacts on impaired waters. This report utilized and modeled data from at least 1975 through 2014, and incorporated the physical data collected from at least 2008 through 2012. Because no water quality data are available for the proposed Chimney Hollow Reservoir (Alternative 2), it was determined this reservoir would function similarly to Carter Lake because they share the same water source. Detailed analysis of potential impacts to impaired waters, and the supporting data, methodology, and determinations may be found within this report. Copies of the aforementioned report can be made available for review and the conclusions of the report are reflected in the Conditional 401 Certification. Please see comment 2 above and refer to the responses below for further detail regarding the water quality standards.

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		5. The Corps agrees with the BOR responses provided to the EPA, as follows: *The EIS has tried to accurately portray existing conditions in the discussion of affected environment for all of the various resources. On a project of this nature, which began in 2003, it is impossible to continually update data sources and model runs every time new information becomes available. Because of the importance of the Colorado River stream temperature issue, Reclamation did pursue development of a new dynamic temperature model using recently collected stream temperature data to better predict impacts to stream temperature. EPA provided input and review throughout model development and Reclamation consultants spent time sharing information and educating EPA staff on model operation. In some cases, it appears EPA has not properly understood the use of modeled hydrologic data using historic streamflows to represent the future for effects analysis comparisons between alternatives.* *In addition, there continues to be an underlying misunderstanding in the overarching and specific comments as to the approach taken to define "existing conditions" for the purposes of assessment of water quality modeling results of the alternatives. The comparisons to standards for each water body, using recent data, were the focus of many of EPA's comments on baseline conditions. These comparisons were not the direct basis for assessing existing conditions. Comparison of a five-year window of data to the standards was included in the FEIS and supporting documents to give the reader/reviewer a look at the ranges of observed data and how they compare to standards, as well as to support discussion of specific water quality concerns in each water body, as further supported by the 2010 303(d) and M&E listings.* *Existing water quality conditions were defined through application of the calibrated models. A 15-year period of hydrologic record was used to simulate "existing conditions." This same 15-year period of hydrologic record was also used to simulate no action and the action alternatives. Development of the flows associated with existing conditions and with the alternatives is described in the FEIS. This approach allowed for assessment of a very wide range of hydrologic conditions and allowed for a direct comparison of simulated existing conditions to simulated altered conditions.* *With regard to the comment* [below] *that "much of the post-2007 data differ from pre-2007 data and are likely to be more representative of current conditions for some water bodies," the foundation of this comment, for the lake and reservoir section of EPA's comments, appears to be related to Horsetooth Reservoir. However, EPA's assertion is unsupported by the*

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		data. A subsequent review of post-2007 data for Horsetooth Reservoir dissolved oxygen (DO) has been conducted. DO is a primary constituent of concern for Horsetooth Reservoir. This review found that data from the period considered in the FEIS for Horsetooth Reservoir (2004-2007) do not differ from data from post-2007. *An EIS by nature is a summary of reams of data output, model runs, and numerous calculations that are documented in various technical reports. The EIS is written for the decision-maker and public, so averages are used at times to summarize information and provide an understandable comparison of the alternatives. Appendices and technical reports were referenced that provide more detailed information on the various analyses that were conducted. With respect to the presentation of water quality data, EPA fails to acknowledge all presentations of the results in the FEIS. In all cases where averaging of model results occurs in the FEIS, the model output used to generate the averages are also presented. For Grand Lake, Granby Reservoir, and Shadow Mountain Reservoir, these daily data show shorter-term variations. The FEIS provides average values and the range of values for nitrogen, phosphorus, chlorophyll a, Secchi disk depth, and other parameters (e.g., Table 3-71) and graphs plotting daily data for these parameters (e.g., Figures 3-68 to 3-72). Reclamation included this information at EPA's request.* *As stated in the FEIS and in the supporting Lakes and Reservoirs Water Quality Technical Report (2008), the comparisons to water quality standards presented in the FEIS were made using assessment methods consistent with those used by the WQCD at the time of development. The extensive Colorado Water Quality Regulation guidelines considered were not restated in the FEIS, but include direction as to which stratigraphic levels to include and general direction to review thermal profiles to determine those levels.* *According to the 2008 Listing Methodology (WQCD 2007):* *"Assessment of profile data begins by defining the "mixed layer," which is that part of a lake that is well-mixed by wind action and can be expected to have relatively homogenous physical and chemical conditions. In a thermally stratified lake, the mixed layer corresponds to the epilimnion; in an unstratified lake the mixed layer extends to the bottom. The vertical extent of the mixed layer is determined by inspection of a vertical profile of temperature measurements."* *Since this description is somewhat vague and relies on professional judgment, the WQCD was asked (via email) in late 2007 specifically how they determined the depths of lake strata for standards assessment purposes. The*

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		response (via email) to the inquiry was that WQCD did not have the time and resources to provide an answer. *Regarding the definition of lake strata for comparisons to standard, it is true that detailed temperature profiles are required when conducting stratification analyses. Two hundred ninety-four detailed temperature profiles were obtained and considered for the FEIS.* *To proceed with the EIS, it was decided to plot all of the temperature data versus depth, analyze the profiles, and choose depths for each water body that best captured the majority of events, based on professional judgment. These depths were not temporally varied.* *This decision was based on:* *• It was known at the time that the state's 2006 Horsetooth Reservoir DO assessment did not consider a variable mixed layer thickness through the summer season.* *• The guidance in the 2008 Listing Methodology relied on professional judgment.* *• Development of a time-varying stratification pattern for the five-year period was not considered necessary, given the intended purpose of this information presented in the EIS (to provide information combined with 303(d) Listing to support discussion of water quality in the water bodies). Again, this comparison of observed data to standards was not the basis for existing conditions.* *Note that current aquatic life use standards assessment methods (WQCD 2011) for DO are based on a fixed vertical distance in the reservoir (0 to 2 meters for the "upper layer").* *• These methods are not based on analyst-defined strata delineations.* *• These methods do not assume a variable layer thickness.* *Regarding Three Lakes Model stratification assumptions, as described in the FEIS, the Technical Report, and the model documentation, the Three Lakes Model simulates Granby Reservoir and Grand Lake as one-dimensional systems consisting of three vertical layers (Shadow Mountain Reservoir is assumed to be well mixed). There are no assumptions made as to the thermocline depth. Assumptions were made as to the thickness of the epilimnion and the thickness of the metalimnion. The hypolimnion thickness varies over time for Granby Reservoir as the surface water elevation changes. (Water levels vary insignificantly for Grand Lake and Shadow Mountain*

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		Reservoir.) The thicknesses of the epilimnion and metalimnion were determined based on several years of temperature profile data. *It is acknowledged that the epilimnion and metalimnion thicknesses are often not constant over the summer season. Accounting for variable thicknesses of the epilimnion and/or metalimnion would require a one-dimensional model with much finer resolution or a two- or three-dimensional model. The Three Lakes Water Quality Model was the best tool available for assessing this complicated system in an integrated fashion.* *Note that this approach does not result in the removal of data from consideration and analysis. Therefore, the statement that there is increased uncertainty due to the removal of data is unfounded.* *While Reclamation believes the analysis is defensible and there are no concerns that conditions are misrepresented by the approach, the approach could have been further discussed with EPA if they had presented it during any of the multiple comment rounds in the year prior to FEIS completion.* [As stated previously,] *EPA notes that WGFP loads could reduce oxygen concentrations. This is true. Decreases in DO concentrations for Granby Reservoir, Grand Lake, Shadow Mountain Reservoir, Carter Lake, and Horsetooth Reservoir are predicted to occur and are described in the FEIS. The FEIS identifies mitigation measures so that DO levels would not be degraded.* *The FEIS describes how the addition of nutrients from the proposed action is predicted to result in increases in phosphorus, nitrogen, and chlorophyll a, and decreases in DO. EPA's statement is overly general. For example, one would not expect existing conditions to worsen if a small amount of nitrogen were added to a phosphorus-limited system.* *Reclamation agrees that it is important to have an accurate baseline. EPA's stated concerns about baseline are addressed in specific comment responses. Reclamation also agrees that it is important to have an accurate projection of nutrient loads caused by the project. One needs to understand the system well and be able to isolate the impacts from the WGFP to be able to assess the effectiveness of mitigation.* As stated previously, the Corps had the benefit of both the EIS documentation described above and the technical analysis of the WQC before it made its determination. Please see comments 2 and 4 above. 6. Please refer to Comment 5.

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9 10 11	pretreatment costs and citizen complaints in municipal water supplies. EPA is concerned about the potential for this project to exacerbate existing water quality impairments and the cumulative effects from such increases. Some of these impacts could be difficult to remedy, whether through point source controls alone or with a mix of nonpoint source reductions. Further, any worsening of these conditions potentially increases the future required efforts and costs associated with remediation and restoration. Because any addition of nutrients to impaired lakes would be expected to worsen the existing conditions, the assessment of baseline conditions and the projection of nutrient loads caused by the project must be accurate, and the nutrient reductions through mitigation must be measurable and conservative. **Recommendation:** Confirm the data and methodology used by CDPHE and the WQCC in making impairment determinations for all project waterbodies. Ensure that these data sets are considered in establishing the existing water quality conditions for all 303(d)-Listed project waterbodies. *Nutrient Neutral Operation* To assure that the project protects these lakes from additional impact, the BOR intends to implement WGFP as a "nutrient neutral" project. The EPA supports nutrient neutral operation as critical to assuring the project will not cause water quality problems or add to existing problems. The nutrient neutral concept is also critical to avoiding further exceedance of WQS. The EPA's letter to the BOR on the FEIS identified several areas of concern about documenting baseline water quality conditions, documenting baseline nutrient loads, modeling nutrient dynamics and effects, and in calculating the benefits of mitigation. The EPA remains concerned regarding the nutrient loading estimates into the Three Lakes System (Grand Lake, Granby Reservoir and Shadow Mountain Reservoir) projected in Table 3-68 of the FEIS. The FEIS did not disclose the data or the methodology used to develop these loading estimates for the 11 sources identified. Further, the EPA is concerned that many of these nutrient sources may not be adequately characterized by existing data, and that any data gaps where estimates were necessary is not presented for public review. This may lead to an unacceptable level of uncertainty in these estimated nutrient loads. These estimates establish the baseline of nutrient loading into the Three Lakes System, documenting the current existing conditions and driving model projections of present and future dynamics. Consequently, the estimated nutrient loading is an important component of the project analysis. These details have not been made available for public review and input. Similarly, Tables 3-69 and 3-70 of the FEIS provide estimates of the additional loading of total phosphorus and nitrogen, respectively. While the BOR did recently share some data and methodology used to calculate these additional loads with the EPA, that information has not been made available for public review and input. As a result of our review, we are concerned that the FEIS underestimates the amount of mitigation that will be necessary to assure nutrient neutral operation (details of which are listed below and in the EPA's letter to the BOR). Further verification of the existing nutrient loading into the system, and of the projected increased nutrient loads as a result of the project would help address these concerns. 2	7. Please refer to Comments 4 and 5, and Appendix B of the Corps' ROD. 8. Please refer to Comment 5 and Appendix B of the Corps' ROD. 9. Please refer to comments 2, 4 and 5. 10. The Corps agree with the responses to comments provided by BOR, as follows: *The fate and transport of nutrients in the Three Lakes system is modeled in detail (see Three Lakes Water Quality Model documentation). Uptake, dissolution, settling, internal loading, external loading, outflows, and diffusion are considered in each layer of Grand Lake, Granby Reservoir, and Shadow Mountain Reservoir. Baseline conditions were developed from calibrated model simulation results from 15 years of input hydrology representing the existing conditions. There cannot be the expectation that the baseline loads in FEIS Table 3-68 can be verified by monitoring. One needs to fully understand that the numbers in the table represent an average over a 15-year period and are based on a specific assumed daily hydrology (for more than a dozen locations). This was done to be able to compute the additional annual loading predicted to occur using the modeled hydrology for each of the alternatives.* In addition, please refer to Comments 4 and 5 above and Appendix B of the Corps ROD. 11. The Corps agrees with the responses to comments provided by the BOR, as follows: *The FEIS contains a mitigation measure that would require the Subdistrict to develop a nutrient mitigation plan and submit it to Reclamation and the Corps for approval. The plan must firm-up and implement mitigation projects to achieve a 1:1 credit for nutrient loading from the project compared to existing conditions. These measures and documented mitigation would have to be in place prior to completion of construction and operation of the WGFP. If 1:1 mitigation cannot be documented, the Subdistrict must take additional measure to ensure the project is nutrient neutral (FEIS, pp. 3-200 to 3-203, 3-413).* *The mitigation measure for nutrients would require that nutrient reductions be documented through monitoring (FEIS, p. 3-202).*

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12	*Three Lakes and CB-T System Modeling and Assessment:* The FEIS includes analysis of a dynamic model capable of simulating thermally stratified 3-layer lakes for evaluating projected impacts to the Three Lakes System. The FEIS predicts impacts to Carter Lake and Horsetooth Reservoir using annual outputs from the steady-state BATHTUB model. Due to problems identified below with some model inputs, model assumptions, and with the capabilities of the models themselves, the model results indicate a level of uncertainty as to how these lakes process, respond to, and export nutrients.	*Reclamation believes the proposed mitigation is appropriate and sufficient. In addition, the FEIS states that if 1:1 mitigation of nutrient loading cannot be documented, additional measures would be required (p. 3-413).* Additionally, the 401 Water Quality Certification requires robust mitigation, monitoring and an adaptive management approach to nutrient and water quality concerns associated with this project. Including a nutrient reduction plan to be approved by all cooperating agencies.
13	The FEIS and supporting technical reports do not identify the data used to establish baseline nutrient conditions or used in loading calculations (see above). The EPA is also concerned that the analyses did not use more recent data (post-2007) which may be more indicative of waterbody impairments, and consequently presented results could project a healthier existing condition than is actually occurring. For the tables comparing existing conditions to water quality standards (e.g. Table 3-40) the FEIS does not appear to use recent, representative data. Further, the FEIS does not explain how the analyses establish thermal stratification, and how the presented results are calculated. The EPA is concerned that values presented in these tables appear to differ from those used by the Colorado WQCC in making assessment determinations. Further, the simulated daily existing conditions shown for 1975-1989 model runs do not appear to match the USGS data shown in the appendices (see e.g., minimum hypolimnion dissolved oxygen shown in Figures 3-77 and 3-82 compared to Lakes and Reservoirs Technical Report Appendix A-3 and A-2, respectively). The EPA's letter to the BOR discusses concerns about the lack of disclosure and discussion of increasing nutrients that are stored in sediments. All of these concerns create additional uncertainty for the Three Lakes Model results.	12. The Corps agrees with the responses provided by the BOR, as follows: *The BATHTUB model also accounts for the fate and transport of nutrients in a reservoir. It accounts for advection, diffusive transport, and nutrient sedimentation (Corps 2012). We acknowledge that BATHTUB provides output on an annual average basis.* Please refer to comment 4 above, comment 16 below and Appendix B of the Corps ROD
14	It does not appear that the City of Fort Collins' Horsetooth Reservoir data were used in these comparisons or as model inputs. The Horsetooth Reservoir data included in the FEIS were from the time period immediately following draining down and refilling the Reservoir for repairs and may not be representative of the typical long-term conditions. These omissions may prevent the model and analyses from accurately reflecting current conditions.	13. Please refer to Comments 4 and 5 above. In addition, the Corps agree with the response to comments provided by the BOR, as follows: *With regard to the comment that loading calculations are not identified in the FEIS, on July 15, 2011, the methodology and complete raw datasets were provided to EPA for detailed review of the post-DEIS updated approach to estimating additional nutrient loads expected for each alternative. This methodology focused on Windy Gap pumping and Willow Creek pumping, since these are the inflows into the Three Lakes System that would change with the alternatives. Other sources of nutrients (e.g., North Fork and Stillwater Creek) would not change with the project. The method for the calculation of additional nutrient loading was presented in person to EPA. EPA concurred with the approach and calculation methods for establishing nutrient loading estimates from these data. In fact, the lead EPA water quality reviewer said "that's exactly how I would do it." In an email from EPA regarding the in-person presentation of approach and full disclosure of datasets used, (Melanie Wasco) to BOR (Will Tully) on August 11, 2011, EPA stated that they "are not suggesting BOR modify the methodology or recalculate loading estimates since you've taken a reasonable approach in your analysis."* *In summary, EPA 1) expressed support for the approach and 2) had complete access to the full dataset (provided July 15, 2011), so suggesting*
15	The model results are in some cases averaged over an entire year, in effect averaging out and obscuring the events that may represent project impacts and impairment. The FEIS frequently uses annual averages to characterize certain water quality parameters (e.g., dissolved oxygen or chlorophyll *a* concentrations) that can vary significantly over short scales of time and space.	
16	Providing an annual average value of these parameters does not allow for the characterization of variability on smaller time scales or capture the magnitude of shorter-term events. Consequently, limited inference can be drawn about the potential impacts to parameters that vary over small time scales or for shorter-term events, particularly from the BATHTUB model results. In some cases, averaging can remove the actual "signal" of a measured event, obscuring a significant message contained within the original data (e.g., see TSI calculation based on 6-month to 1-year averages of average daily chlorophyll *a* values p. 3-138, par. 1). Also, the BATHTUB model dissolved oxygen levels were indirectly interpolated from other model results, without a clear translator, increasing uncertainty in the output. Given the omission of City of Fort Collins data and the above model concerns, the EPA remains concerned that the BATHTUB model results 3	

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		unacceptable uncertainty due to lack of data disclosure is misleading and inaccurate. Please refer to comment 4 above and Appendix B of the Corps ROD. 14. The Corps agree with the response to comments provided by the BOR, as follows: *Regarding the comment that Horsetooth Reservoir profiles were omitted and the period considered for Horsetooth Reservoir is not representative, as shown in Table 1 of the Lake and Reservoir Water Quality Technical Report (2008), data from Fort Collins were not obtained. These data were not identified at the time of data collection. It is unfortunate that EPA did not make Reclamation aware of this missing data source during the nine months of collaborative work between the agencies and waited until after the FEIS was published in late 2011.* *Subsequent assessment of Horsetooth Reservoir DO for aquatic life, per the current Colorado standards assessment methodologies, indicates that inclusion of the 2004-2007 Fort Collins dataset does not change the conclusions that standards are met. The City of Fort Collins data cover similar date ranges from 2004-2007 as the Northern Water and USGS datasets, as shown in Appendix B.* *The FEIS focuses on the period 2004-2007 for Horsetooth Reservoir data analysis and EPA purports that this period is not representative because it is immediately following the drawdown/refill. No justification for this statement is provided. Subsequent review of post-2007 data does not support this claim.* *Looking at the Horsetooth Reservoir dissolved oxygen (DO) profile data, using the minimum DO for the hypolimnion and for the epi/metalimnion, the 2008-2010 data ranges and medians are very close to the 2004-2007 data. As shown in the box plots in Appendix B, for both the hypolimnion and the metalimnion, minimum DO concentrations show very similar distributions, and the median values across the two time periods exhibit overlapping 95 percent confidence intervals (notched areas on the boxes). If anything, the data suggest a possible increase in median hypolimnetic DO after 2007. Note that this analysis included all profile data collected by the City of Fort Collins, USGS, and Northern Water at Spring Canyon, Dixon Canyon, and Soldier Canyon; n refers to the number of profiles reviewed for minimum DO values.*

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		Thus: *• The omission of the Fort Collins data does not impact the analysis.* *• Data from the period considered in the FEIS for Horsetooth Reservoir (2004-2007) do not differ from post-2007 data.* *• This review of more recent data in Horsetooth Reservoir shows no indication that existing conditions are being overstated (a stated EPA concern, p. 4 paragraph 1* [of the letter to the BOR in April 2011]*).* Please see Comment 4. 15. The Corps agree with the response to comments provided by the BOR, as follows: *The comment on averaging pertains to the Three Lakes Model results since this is the only time model results are averaged over an entire year. This statement and the corresponding specific comments fail to acknowledge all presentations of the Three Lakes Model results in the FEIS. Results for Granby Reservoir, Grand Lake, and Shadow Mountain Reservoir are presented in several ways over the 15-year period considered:* *• Daily Results* *• Average Annual Concentrations (including minimum and maximum) for total phosphorous, total nitrogen, Secchi disk, and chlorophyll a in the epilimnion* *• Average Annual Peak Values (including minimum and maximum) for chlorophyll a* *• Average Annual Minimum Values (including minimum and maximum) for dissolved oxygen* *Note that the daily time series presentation shows the results in full detail. The reader is able to note all of the variation and "signals" predicted on a daily basis. There is no statistical summarizing of these data. Thus, although it is true that annual averages are presented, they are presented along with detailed daily averages. The presentation of annual averages in addition to the direct, daily model output should not be viewed as "inappropriate," as EPA states.* **Reminder: The BATHTUB model results have not been averaged over an entire year. The model results, themselves, are an annual average.* Please see Comment 12 above.

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		16. The Corps agree with the responses to comments provided by BOR, as follows: *The BATHTUB model was used to assess water quality impacts on Carter Lake and Horsetooth Reservoir. The model is well established and was developed by a "nationally recognized water-quality modeling expert" (EPA 2011). The model has been applied across the country for a variety of purposes including environmental assessments (e.g., Duck River Reservoir [CH2MHill 2005]), TMDLs (e.g., Lake Champlain [VTDEC and NYSDEC 2002], Moon Lake [Cadmus Group 2007]), and general lake management studies (e.g., Red Cedar Lakes [Robertson et al. 2003] and West Point Lake [Kennedy 1995]). BATHTUB is a primary model used by the Minnesota Pollution Control Agency in lake and reservoir assessment and lake nutrient TMDL development (MPCA 2012). It has also been run concurrently with WASP for Lake Pepin, providing comparable results (EPA 2000).* *Further, as noted in EPA 2011:* *EPA's Protocol for Developing Nutrient TMDLs (EPA 1999) listed the BATHTUB program among the simulation models recommended for lake nutrient TMDLs, and noted that a review by Ernst et al. (1994) cited BATHTUB as an effective tool for lake water quality assessment and management.* *The BATHTUB model is used as a predictor of annual average conditions and cannot produce information on a finer timescale. Variations that take place on a subannual basis cannot be explicitly evaluated. The BATHTUB model cannot produce higher resolution output and, therefore, no higher resolution model output was excluded from the report. The decision to use BATHTUB was made early in the project and subsequent decisions were made to not develop a more detailed mechanistic model for Carter Lake and Horsetooth Reservoir. EPA was made aware of this and agreed that rather than pursue additional analysis or modeling additional information on mitigation should be provided in the FEIS, which Reclamation did. (see Issue Resolution Table, 10/18/11)* *It is true that BATHTUB model results do not include predicted DO concentrations. Other model output variables (metalimnetic oxygen demand [MOD] and hypolimnetic oxygen demand [HOD]) provide an indication of the additional oxygen demand in these two strata. A useful translator to relate BATHTUB model simulated HOD and MOD to DO could not be developed, making it difficult to quantify specific magnitudes of change of DO concentrations using this tool. This does not invalidate the results or findings of the BATHTUB model.*

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		Regarding the TSI calculation, EPA uses the computation of the Trophic State Index as an example where averaging can remove an actual short-term "signal". *As described in the Lake and Reservoir Water Quality Technical Report, trophic state indices for Grand Lake, Shadow Mountain, and Granby Reservoir were computed using Carlson's Trophic State Index (TSI). Carlson (1977) recommends computing the TSI using an average of data from the summer stratification season if using chlorophyll a data (which was done for the WGFP). To compute the TSI for the WGFP EIS, the average predicted 'stratification period' chlorophyll a (assumed as May 1 to November 15) was used in the equation for TSI. This is consistent with Carlson's guidance. Based on comments received early in the development of the WGFP EIS, average monthly TSIs were also computed and displayed.* *Thus:* *• TSIs were computed in a manner consistent with the TSI author's intended use; and* *• EPA is incorrect to claim that the methodology used to compute TSI is an example of "inappropriate" averaging.* *Note also that Trophic State Indices (TSIs) are computed within the BATHTUB model and are provided as output from that model. Thus, TSI values reported in the FEIS for Carter Lake and Horsetooth Reservoir reflect BATHTUB model output.*

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17 18 19 20 21	may not adequately disclose existing conditions nor adequately project future impacts. While the best modeled results include inherent uncertainty, the issues identified through our review of the FEIS add significant uncertainty regarding the effect of diversions on nutrient transport, stream and reservoir nutrient dynamics and cycling, and nutrient-related water quality changes throughout the water column. As a result, we believe there is significant uncertainty in the load predictions from WGFP on which mitigation commitments will be predicated. **Recommendation:** Review and verify the data and methods used for estimating nutrient loading and projected nutrient increases to determine whether the project will contribute to, or exacerbate existing, exceedance of WQS. Additional water quality sampling may be important to reduce the level of uncertainty in the estimated nutrient loading. Additional recommendations for monitoring and mitigation presented in our FEIS comment letter should be incorporated as CWA Section 404 permit conditions. **Causing or contributing to significant degradation:** As noted in the cover letter, we recommend that further analysis be conducted to determine the current baseline condition and to determine the potential for the proposed action to cause or contribute to significant degradation of waters of the U.S. Surface Hydrology The Surface Hydrology section and subsequent resource sections do not include an analysis of impacts for the "Colorado River immediately below Granby Reservoir" reach, which is a 4+mile stretch of river between Granby Reservoir and the confluence with the Fraser (see FEIS comment letter). **Recommendation:** The EPA recommends that a detailed analysis and discussion of the segment characterized as "Colorado River below Granby Reservoir" be completed for all affected resources, and appropriate mitigation to offset any impacts be proposed. Stream Morphology The EPA is concerned that due, in part to mathematical errors presented in this section, and because an incomplete sediment transport analysis was conducted for the river below Windy Gap Diversion(WGD), the morphology analyses and conclusions may need to be revised. Additionally, assumptions were made regarding the morphological stability of the river without supporting data (see our FEIS comments). The FEIS incorporates additional references, as we requested, including the Grand County Stream Management Plan (SMP). However, we are concerned that the information from the SMP has been used to support a mitigation proposal that is not consistent with the SMP. Specifically, the FEIS references the SMP's flushing flow recommendations of 600cfs for the Windy Gap to Williams Fork reach and 800-850 cfs for the Williams Fork to Blue River Reach, for a minimum duration of 3 days during 50% of all years. This flow recommendation reflects a minimum threshold flow at which spawning gravel mobilization is initiated, and was not 4	17. The Corps agree with the response to comments provided by the BOR, as follows: *Mitigation commitments for nutrients are based on numbers listed in Table 3-69 and 3-70 in the FEIS. The data and methodology used to develop these numbers were discussed at length with EPA and concurrence was received* [see response to Comment No. 13]. *As described in the methodology, the numbers are based on 1) the flows for existing conditions and for the alternatives, 2) the concentrations at the Windy Gap pump canal and the Willow Creek pump canal, and 3) mass balance computations above Windy Gap Reservoir. Although a separate check was made to account for potential concentration increases at Windy Gap (using the Three Lakes Model), this additional step did not result in significant changes (since Windy Gap nutrient loads originating from Granby Reservoir are insignificant compared to those from the Fraser River and Willow Creek). Therefore, the development of the numbers in Tables 3-39 and 3-70 is predominantly independent of the Three Lakes Model and the assumptions upon which the model is based. They are based on observed concentrations and flows from the water resources model.* *EPA's acknowledgement that all model results contain uncertainty is accurate. It is unclear the level at which EPA is setting as unacceptable uncertainty or "significant" uncertainty. In this case, the reasons cited for believing there is "significant uncertainty" appear to be based on misinterpretations of the information provided. As such, EPA's conclusion seems to be general and unsubstantiated.* 18. Additionally, the 401 WQC requires robust mitigation, monitoring and an adaptive management approach to nutrient and water quality concerns associated with this project. Including a nutrient reduction plan to be approved by all cooperating agencies. 19. Please refer to comments above. 20. The stretch of the Colorado River immediately below the Granby Reservoir was analyzed for potential further impairment within the *Windy Gap Firming Project, 401 Water Quality Certification Technical Report*, prepared by the Northern Colorado Water Conservancy District report. The section of stream modeled for possible temperature impairment (currently not listed on the 303(d) list for temperature) by the project below the Granby

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21 (cont'd)	intended to reflect an absolute "flushing flow" value. In fact, the SMP explicitly states that this recommendation is intended to reflect the minimum flushing flow for a broad range of necessary channel maintenance flows, of which an upper limit was not defined because the authors believed an upper limit should not be set on flows to maintain the ecosystem (SMP, ES 8-9). Higher flows are necessary to assure longer-term channel maintenance functions, and as such, mitigation proposals should consider more than just flows necessary to flush fine sediments. **Recommendation:** Review and revise the stream morphology analysis to ensure that the appropriate analysis is informing conclusions in the document, and that all inferences are reflective of the constraints of the analysis. Additionally, we recommend that the Corps correct the error associated with the relative change in frequency of channel maintenance flows and use these corrected results to draw inference on impacts. Any revision should also accurately represent the recommendations from Grand County's SMP.	Reservoir, started at 578 Bridge Road, and continued downstream to the confluence with the William Fork. Results of the quantitative assessment of the Granby Reservoir to the Fraser River do not indicate river temperature anti-degradation concerns in the reach upstream of the Fraser River. In addition, please refer to Comment 21 below.
22	*Effects to Sediment Transport:* The EPA is concerned that the sediment transport analysis was limited to only smaller sized sediments, from fine sediments to coarse gravel, and does not consider larger sediments, including cobbles and boulders. Thus, limited inference can be drawn about the project effects on larger-sized sediment transport and the potential impacts to long-term aquatic habitat maintenance within the system. Additionally, we remain concerned with the assumption in the FEIS that the 1981 study (Ward and Eckhardt) reflects the current geomorphic conditions in the Colorado River below WGD. Specifically, EPA is concerned that the sediment supply and transport relationships presented in the report may not be consistent with existing conditions, especially since no current data were collected from the reach immediately below WGD to support this assumption. According to the Colorado Parks and Wildlife (CPW, previously Colorado Division of Wildlife) Nehring et al. (2011) report, losses of macroinvertebrate taxa immediately downstream of the WGD are attributable, in part, to sediment deposition and armoring of the channel, which has been greatly exacerbated over the last 10-20 years from extended droughts, impoundment and storage of spring flushing flows, and depletions from trans-mountain diversions. Additionally, the report notes that when Windy Gap Reservoir has been drained in mid to late summer in recent years, sediments have been flushed downstream long after spring flushing flows were available to transport the sediment, leading to sediment deposition and armoring of existing substrate within the first few miles below the dam. The conclusions presented in this report are inconsistent with the assumptions in the FEIS that sediment transport capacity far exceeds supply in this reach of the Colorado River. It is likely that the discrepancy is due, in part, to the fact that the data for existing conditions used to validate assumptions in the FEIS are from sites located 8-10 miles downstream of the WGD. Because no data were presented to indicate the Breeze site is representative of the morphology and current condition more immediately below the diversion, we are concerned that the analysis presented in the FEIS may not accurately characterize the potential impacts to sediment transport immediately below the WGD. **Recommendation:** EPA recommends that the Corps expand the analysis of shear stress versus streamflow relationships to include larger sediment classes including cobbles and boulders. This 5	21. The Corps agree with the responses to comments provided by the BOR, as follows: *Section 3.5.1.4 and Figures 3-3 and 3-4 of the FEIS describe how the flow of the Colorado River has changed since recordkeeping began at Hot Sulphur Springs in 1904. Despite major flow changes due to numerous diversions and water projects (including construction of Granby Reservoir), the Colorado River channel has remained stable even with changes in the timing and quantity of flows. The form and structure of the channel, banks, and floodplain have changed very little, as evident in aerial photos taken between 1938 and 2005 below Granby Reservoir and below Windy Gap Reservoir. In addition, river cross-sectional analyses completed for the aquatic resource analysis (MEC 2010), located 8 to 10 miles downstream of Windy Gap Reservoir, show no evidence of recent changes to stream morphology, sediment deposition, or scouring in the Colorado River near Parshall. The aerial photos, Ward and Eckhardt's 1981 study, and the recent study near Parshall show that the river continues to convey sediment without aggradation or degradation of the stream channel. The transport capacity of the Colorado River even at relatively low flows exceeds the volume of available sediment.* *The values provided in Tables 3-32 and 3-35 for Hot Sulphur Springs were derived from the 47-year hydrology model. In Table 3-32, the bankfull discharge (estimated to be from 510 to 1,240 cubic feet/second (cfs)) would occur in 29 out of the 47 years under existing conditions (EC), and would occur in 24 out of 47 years under the preferred alternative (PA). This is a reduction of 5 out of 47 years. While this is an 18 percent reduction in the number of years when bankfull flows would occur during the 47-year model period, the full magnitude of channel maintenance flows would still occur and the duration of bankfull flows would decrease by only 3 days (23 to 20 days) during years when bankfull flows occur. Under cumulative effects, the bankfull flows would occur in 22 out of 47 years under the PA, or a reduction of 7 out of 47 years. This is a 24 percent reduction in the number of years when bankfull flows would occur during the 47-year model period.*

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The duration of such flows would decrease by 2 days (from 23 to 21 days) during years when bankfull flows occur.

The changes in channel maintenance flows can also be looked at in terms of a change in the number of days rather than number of years such flows occur (see the new tables below, which provide a calculation similar to Tables 3-32 and 3-35 in the FEIS, but looks at the number of days when various flow ranges occur rather than the number of years). For example, while the number of years that 10- to 25-year flows would occur would decrease from 6 years under EC to 3 years under PA (out of 47 years) – a 50 percent decrease – the number of days would decrease from 24 to 18 days (a 25 percent decrease). EPA states that these changes "will exacerbate the effects cited above," but does not provide any evidence that the Colorado River is degraded, such as being morphologically unstable, channel maintenance functions are not occurring, or that sediment aggradation or degradation is occurring in a river where sediment transport capacity greatly exceeds sediment supply.

Table 3-32a. Changes in Colorado River channel maintenance flows at Hot Sulphur Springs (1950-1996 model hydrology).

Recurrence Interval	Percent of Days in 47-Year Model Period when Flow Range Occurred			
	Range in Flows (cfs)	Existing Conditions	No Action	Proposed Action
0.8 x 1.5-yr to 2-yr flow	510 to 1,240	3.9%	3.1%	2.9%
2- to 5-yr flow	1,240 to 3,160	2.5%	2.1%	2.1%
5- to 10-yr flow	3,160 to 4,600	0.8%	0.69%	0.48%
10- to 25-yr flow	4,600 to 6,520	0.14%	0.12%	0.1%

Table 3-35a. Colorado River at Hot Sulphur Springs channel maintenance flows, cumulative effects (1950-1996).

Recurrence Interval	Percent of Days in 47-Year Model Period when Flow Range Occurred			
	Range in Flows (cfs)	Existing Conditions	No Action	Proposed Action
0.8x1.5-yr to 2-yr flow	510 cfs to 1,240	3.9%	2.6%	2.5%
2-yr to 5-yr flow	1,240 to 3,160	2.5%	1.9%	1.8%
5-yr to 10-yr flow	3,160 to 4,600	0.8%	0.6%	0.4%
10-yr to 25-yr flow	4,600 to 6,520	0.14%	0.09%	0.09%

It is agreed that a change in the percentage of years when the 10- to 25-year flow at Hot Sulphur Springs would occur from 6 years to 3 years in the 47-year model period is a 50 percent reduction in the percentage of years when such flows would occur. The statement in the paragraph above Table 3-32 that "the percent of years with flows in the 10- to 25-year recurrence interval would occur about 7 percent less under the action alternatives compared to existing conditions" is incorrect, as are similar sentences in

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		this paragraph about the 2- to 5-year and 5- to 10-year flow ranges; however, these are simply errors, not "methods…inconsistent with scientific protocol." Because the frequency of higher flows is naturally lower, a small change in the number of years results in a large percentage change. However, see response to the previous comment; in terms of changes in the total days such flows would occur, this would be a 25 percent reduction, from 24 days to 18 days. An errata to the FEIS includes corrections to the language on percent changes in years discussed on pages 3-97, 3-99, and 3-103 of the FEIS, but the values in Tables 3-32, 3-33, 3-35, and 3-36 are correct. *The Kremmling site was used in the EIS for analyses because cumulative effects would be greater below the Blue River than they would be farther upstream at Hot Sulphur Springs or Windy Gap. The Hot Sulphur Springs site was used in the EIS for analyses because there is a much longer period of record at that USGS gage (1904 to 1994) than at Windy Gap (1981 to present). For the EIS, it was determined that flows at Hot Sulphur Springs are nearly identical to flows at Windy Gap (r-sqrd = 99 percent), so the evaluation of stream morphology effects would be nearly identical for Windy Gap as that shown for Hot Sulphur Springs (Boyle 2005). The recent (ERC) river cross-sectional analyses completed for the aquatic resource analysis, located at the Breeze site 8 to 10 miles downstream of Windy Gap Reservoir, showed no evidence of recent changes to stream morphology, sediment deposition, or scouring in the Colorado River near Parshall. This site was selected for the aquatic habitat analysis in conjunction with Colorado Parks and Wildlife (CPW) at a location biologists determined representative of the river. The site was selected with CPW after nearly a full-day site visit to the river with stops at multiple locations from the Windy Gap Dam downstream to the Blue River.* *Nehring (2011) states that "sediment deposition and armoring of the Colorado River below Windy Gap Dam has been greatly exacerbated over the past 10-20 years, due to extended droughts, impoundment and storage of spring flushing flows in Willow Creek and Granby Reservoir, and depletions from transmountain diversions," and "it is our conclusion that chronic sedimentation and clogging of the interstitial spaces in the cobble-rubble dominated riffles areas of the upper Colorado River below WGD is the overarching problem that has increasingly compromised the biotic integrity and proper function of the river over the past 25 years." However, the CPW study discussed in the two Nehring reports (2010 and 2011) does not mention any measurement of channel embeddedness, collection of sediment or other stream channel data, evaluation of sediment movement/deposition, or changes in stream morphology in the Colorado River below the Windy*

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		Gap Dam or elsewhere from which to base these statements. In addition, the 2011 Nehring report statement that "at least twice since 2001, Windy Gap Dam has been drained and untold tons of sediment has been flushed into the Colorado River in mid to late summer, long after spring flushing flows were available to transport the sediment downstream" is incorrect. Only once during this period (2010) did the NCWCD release some sediment from the Windy Gap Dam after obtaining a 404 permit from the Corps of Engineers and after coordinating with Grand County. This release was related to a dredging operation to remove sediment deposited in Windy Gap Reservoir near the pumping plant. Dredging of the reservoir was only practicable during low flows and most of the sediment was contained within the reservoir. The sediment discharge was followed by a flushing flow release of water from Granby Reservoir to transport sediment downstream. This discharge and flush of sediment was conducted in coordination and agreement with CPW. *The Breeze site was chosen near Parshall as described in the previous response, and the focus of the study was on aquatic habitat substrate for flows up to 1,250 cfs. Flows ranging from 50 cfs needed to move fine sediment (<2 mm) up to 1,150 cfs needed to move very coarse gravels (64 mm, 2.5 inches) were evaluated because these are the flows critical for aquatic life at this location. Figure 3-31 shows that at this location, the transport capacity of the Colorado River far exceeds the sediment supply. As noted in Figure 3-31 of the FEIS, at a flow of about 200 cfs, sediment supply is the same as the transport capacity of the river, and at flows greater than 200 cfs, the capacity of the river to transport sediment exceeds sediment supply.* *Sediment transport can occur in two phases. In Phase 1, finer materials are transported from within the channel bed armor at a relatively low flow rate, and transport is typically limited by sediment supply (Schmidt and Potyondy 2004). During Phase 2 transport, the rate of sediment transport becomes much greater as the channel bed is disrupted by higher flows and the channel itself is mobilized. This is the flow required to rejuvenate the channel bed and achieve channel maintenance objectives (Schmidt and Potyondy 2004). When Phase 2 sediment transport begins in gravel bed rivers such as the Colorado River, larger particles (medium gravel up to boulders) begin to move (Ryan et al. 2002). This occurs at approximately 80 percent of the bankfull flow (not at 5- to 50-year flows). From a material size standpoint, research indicates that Phase 2 transport is initiated with flows that are large enough to transport D16-sized particles (Ryan et al. 2002). At the Breeze site, the D16 particle size was measured by ERC as being 22 mm (Moffat DEIS), so the flow needed to begin Phase 2 sediment*

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		transport at that location would be about 510 cfs. In summary, a flow of about 510 cfs would be needed at the Breeze site to begin disrupting the streambed and begin moving larger particles in the river. *There is no supporting information in the 2011 Nehring report that demonstrates that channel armoring or sediment deposition is occurring below Windy Gap Reservoir. The Nehring report does not provide documentation to substantiate the report's conclusions regarding the magnitude or duration of flows required to clean cobble-boulder substrates. The study was limited to the collection of biological data. It did not measure, analyze, or model any physical parameter. In contrast, the FEIS presents data on sediment transport for a range of substrate sizes up to coarse gravel (FEIS page 3-96). The sediment transport evaluation used physical data collected in the Colorado River downstream of Windy Gap Reservoir. The evaluation of impacts on aquatic life was based on the hydrologic, stream morphology, water quality, and habitat modeling data in the FEIS. Consequently, Reclamation did not find the conclusions in Nehring's 2011 report useful in determining the environmental consequences in the FEIS. However, the new macroinvertebrate field data presented in the report was reviewed and considered in concert with the other data sources cited in the FEIS to determine if there was any significant new information relevant to the analysis being presented.* *Likewise, it is unclear from the Nehring report how a flushing flow of 1,000 cfs was derived. It is important to note that the intent of the original 450 cfs flushing flows and the increased flushing flows of 600 cfs in the Fish and Wildlife Mitigation Plan (FWMP) is to provide a minimal amount of guaranteed flushing flows, recognizing that a larger range of channel maintenance flows are still needed to support river ecological functions. Thus, the minimum flushing flow requirement operates similarly to the minimum bypass flows developed for the original Windy Gap Project. If flushing flows are less than those specified, Windy Gap must curtail diversions, with the exception that the project cannot be required to bypass more than the natural inflow. This 600 cfs flushing flow is a minimum value and Reclamation recognizes that higher channel maintenance flows are needed and would continue to occur with the WGFP. The channel maintenance flow analysis indicates that although the frequency of larger flows would decrease with the WGFP, there would still be a reasonable distribution of higher flows to maintain the condition of the channel and aquatic habitat.* *EPA indicates the 600 cfs flushing flow in the FWMP would only be required when there is more than 60,000 acre feet in storage in Granby*

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		Reservoir and Chimney Hollow Reservoir. This is incorrect. The FWMP includes a 600 cfs flushing flow without limits on reservoir storage. When storage is more than 60,000 acre feet, then all WGFP pumping would cease for 50 hours (FEIS, page 3-105). *Changes in Colorado River flow below Granby Reservoir primarily reflect reduced spill of Windy Gap water previously stored in Granby Reservoir that would be stored in Chimney Hollow Reservoir under the preferred alternative. There also would be a change in Willow Creek flows from changes in Willow Creek Feeder Canal diversions. Colorado River average annual flows below Granby Reservoir would decrease 15 percent and above Windy Gap Reservoir would decrease about 6 percent under the preferred alternative compared to existing conditions (Table 3-6, FEIS). Minimum flow releases from Granby Reservoir would not change. A spill of Windy Gap water stored in Granby Reservoir is water that is diverted from the Colorado River that would otherwise not be present in this reach. Lack of a forecasting function in the WGFP model may increase Windy Gap diversions, and consequently spills, in some wet years under existing conditions. Flows in this reach may see less change than predicted in the model because of additional Windy Gap spills in June through August under existing conditions. Thus, the impact analysis for this reach is conservative. Spills from Granby Reservoir would remain primarily a wet year event, when flows are sufficient to maintain channel capacity, transport sediment, and provide periodic scouring.* Additionally, please see Appendix B of the Corps ROD as this is further discussed in the 401 WQC. 22. Please refer to Comment 21.

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23 24	expanded analysis would provide data on the flow magnitudes needed to mobilize larger sediment classes, and when combined with the channel maintenance flow results, would indicate whether the project would have adverse impacts to the long-term aquatic habitat maintenance in the system. Results of these analyses should be used to analyze aquatic resource impacts and determine appropriate mitigation. With regard to the 1981 study, the EPA recommends that additional sediment data be collected and analyzed in the reach immediately downstream of WGD to validate the assumption that the 1981 study remains relevant under existing conditions for this reach of the Colorado River. If the sediment data do not support the validity of the 1981 study, we recommend that additional analyses be conducted. Aquatic Life The EPA is concerned that the existing condition of aquatic resources are overstated and project impacts are understated and that a revised analysis may illustrate that additional mitigation may be required to offset the potential adverse impacts to the biological characteristics of the Colorado River and Willow Creek (see FEIS comment letter to BOR). Important new information is available from a CPW report (Nehring et al. 2011) to characterize the current condition of aquatic communities immediately below WGD. Furthermore, the conclusions from Nehring et al. (2011) are inconsistent with the conclusions presented in the WGFP FEIS, specifically related to the magnitude of potential impacts from the proposed project. Based upon these new data, we are concerned that the analysis presented in the FEIS may not accurately characterize the potential secondary impacts to aquatic life in the segment immediately below the WGD. **Recommendation:** EPA recommends that the Corps incorporate the data from the CPW report into their impact analysis, and provide mitigation to offset the potential impacts to aquatic life. Inclusion of other data sources for this reach of river immediately below the WGD should also be considered. *Macroinvertebrate analyses:* The EPA is concerned that the macroinvertebrate data under existing conditions are not supportive of the conclusion that the current aquatic condition is excellent, particularly the results and conclusions based on Ephemeroptera, Plecoptera and Tricoptera taxa (% EPT) and the Multi Metric Index (MMI) scores (see FEIS comment letter to BOR). **Recommendation:** The results and conclusions about the existing condition and potential impacts to macroinvertebrate communities should be revised to accurately reflect the current condition of the resource. These revisions should include additional data from Nehring et al. (2011), and verification of the validity of the MMI scores presented in the EIS. Once these have occurred, the resultant MMI scores should be critically evaluated in conjunction with all additional information relevant to the condition of the aquatic ecosystem in the Colorado River below WGD (i.e. Nehring 2010; Nehring 2011; CWQCD 2011). Because Nehring et al. (2011) conclude that the WGFP and Moffat diversions will likely further exacerbate the compromised biotic integrity and functioning in the river below WGD, we expect impacts from the proposed project. Therefore, mitigation measures should be proposed to offset any incremental impacts to 6	23. The Corps agrees with the response to comments provided by the BOR, as follows: *The Lone Buck and Breeze study sites were selected in spring 2004 in conjunction with CPW as representative of the reaches of river from Windy Gap dam downstream to the Williams Fork River and from the Williams Fork River downstream to the Blue River, respectively. In addition, the site selection followed the guidelines for study sites used in the Instream Flow Incremental Methodology (IFIM).* *EPA states "significant effects of the original Windy Gap project may be occurring within the first few miles downstream of the diversion and the proposed project is likely to exacerbate these effects." The effects EPA refers to are the decline of certain benthic macroinvertebrate species downstream from Windy Gap dam. The changes to macroinvertebrate species downstream from reservoirs is well documented in peer-reviewed literature for more than 30 years (Ward and Stanford 1979; Zimmerman and Ward 1982). This is due to a variety of causes including nutrients, water temperature, and flow regime. These same characteristics of a different faunal community downstream from reservoirs compared to undammed river reaches are also evident downstream from natural lakes (Harding 1992) with the faunal communities more similar to the upstream communities with increased distance downstream from the dam.* *The baseline aquatic conditions for the WGFP were the present-day system in the Colorado River at Windy Gap Dam. The conditions prior to construction of Windy Gap Dam and the effects of that project were evaluated in the Windy Gap Project EIS in the early 1980s. It is also not appropriate to evaluate the project as compared with native stream conditions. The data used in the analysis were appropriate based on NEPA guidelines. The new data presented in the Nehring et al. (2011) report does not result in a different conclusion than what was reached in the FEIS.* *The conclusions in the 2011 Nehring Report regarding sedimentation and clogging of interstitial spaces or mats of rooted aquatic vegetation are not documented by data collected during the study or by reference to other physical studies at their study sites. Nehring et al. (2011) did not collect data on streambed armoring and algae accumulation. The Nehring et al. (2011) data collection was limited to macroinvertebrate data and fish data. We concurred with Nehring et al. (2010) and Nehring et al. (2011) that there is a reduction in some taxa of invertebrates and mottled sculpin downstream from Windy Gap Reservoir in the FEIS.*

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		The main limitation to trout populations in the Colorado River in the early 1980s was listed as angler harvest. Nehring (1987b), with respect to the size of fish and angler harvest, states "However, at the Lone Buck and Paul Glibert study sites (public access) most of the increase in numbers of rainbow and brown trout 14 inches or 35 cm or larger has been in the 14-16 inch size range with very few fish larger than 16 inches or 40 cm being retained in the population, even though the Colorado River has the biotic potential to produce large numbers of rainbow and brown trout in the 16-20 inch (40-50 cm) size categories." The trout populations during those years were in the same range as reported in the FEIS. The composition of the population has changed from a rainbow trout-dominated river in the 1980s to a brown trout-dominated river today for a number of reasons. However, we note that as late as fall 2011, CPW states that the trout populations in the Colorado River downstream of Windy Gap are "consistently excellent" (Ewert 2011). *Nehring (1987a) also showed predominance of the large stonefly Pteronarcys californica (Pc) in the diet of trout in this reach of river. Nehring et al. (2011) reports a decline in both Pc stoneflies and mottled sculpin since the 1980s. The decline in these two species was stated in the FEIS based on the Nehring et al. 2010 report. The Nehring et al. (2011) report does not provide documentation or data as to the cause of the decline, rather the report provides hypotheses and conclusions for the cause of decline but no documentation or data.* Additionally, please see Appendix B of the Corps ROD as this is further discussed in the 401 Water Quality Certification. 24. The Corps agree with the response to comments provided by the BOR, as follows: *The Multi Metric Index (MMI) values reported in the FEIS were calculated using an outdated version of MMI. The Colorado Department of Public Health and Environment (CDPHE) has revised the methodology for the calculations and new values were calculated. The values reported in the FEIS were valid for the older MMI version; however, the new methodology resulted in different MMI values. The change in the methodology the state uses to calculate the score involves limiting a kick sample to no more than 300, regardless of whether thousands of insects are collected. An errata sheet has been prepared to correct this error in the FEIS. In addition, a supplemental information report (SIR) was prepared to determine if the revised MMI values, which were calculated using the updated CDPHE methodology and previously collected aquatic invertebrate data, presented*

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		significant new information relevant to the analysis that would change the effects determination of the FEIS. The revised MMI values are lower than those presented in the FEIS, but are still above the impairment threshold. The MMI values are only one of the metrics used in the evaluation of the aquatic invertebrates. Other traditional macroinvertebrate metrics that were used to evaluate existing conditions based on the original sampling data included -- diversity, evenness, Hilsenhoff biotic index (HBI), functional feeding groups, density, and biomass. This data indicates a healthy aquatic invertebrate population. The changed MMI scores provided another metric to assess existing conditions, but did not provide significant new information relevant to the analysis that would change the effects determination in the FEIS and thus a supplemental EIS is not warranted. *The newer methodology is generally as follows:* *• The samples are collected in the stream using a kick-net method for approximately 1 m2 streambed in 1 minute, preserved and returned to the lab for analysis.* *• In the lab, the samples are sorted using a random grid selection process and picked to a fixed count of 300 individual specimens.* *• A single subsample is used for each site without replication.* *• The sorted specimens are identified and logged into the EDAS database.* *• The EDAS database software is used to determine ecoregion, slope, and elevation based on the GPS coordinates of the sample location.* *• The EDAS software then calculates the MMI using the equations appropriate for the biotype shown in Policy Statement 10-1, Appendix D (CDPHE 2010).* *Miller Ecological Consultant (MEC) samples were collected as replicate samples using a modified Hess sampler for the WGFP analysis (MEC 2010). This method collects a quantitative sample as compared to the qualitative sample collected using the kick-net technique listed in Policy Statement 10-1 (Aquatic Life Use Attainment, Methodology to Determine Use Attainment for Rivers and Streams, CDPHE October 12, 2010). MEC used a whole sample count to get a complete description of the invertebrates in their samples. The three replicate samples allowed calculation of statistics for each location sampled. The methodology in Policy Statement 10-1 results in a single value from a subsample of the entire sample collected. No statistical analysis can be completed on the value since there are no replicated samples.* *There is a long record in the literature of the implications from fixed count subsampling. One of the main reasons for using subsampling is the ability to*

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		provide a metric in a cost- and time-efficient manner when compared to whole sample counts (Barbour and Gerritsen 1996; Courtemach 1996). There is also discussion of how many samples or how much area to sample. Vinson and Hawkins (1996) recommend pooled small area samples rather than a single sample of the same total area. The overall objective of subsampling for biomonitoring is twofold: 1) to distinguish when an actual change to the stream biota occurs and 2) to conduct the sampling on a large number of streams in a cost-and time-effective manner. The first objective is not easy to achieve and several researchers have investigated the effect of subsampling. Doberstein et al. (2000) found that subsampling reduced the ability to differentiate between stream classes for some levels of subsampling. They concluded that for subsamples of 100 to 300 individuals the discriminatory power was low enough to mislead water resource decision makers. However, rapid bioassessment protocols and regulatory agencies rely heavily on subsampling in the protocols developed for evaluation of stream aquatic life (CDPHE 2010; Nichols et al. 2006; Nichols and Norris 2006; Baker and Huggins 2005; Environment Canada 2002; Russell 2008). *MEC recalculated the MMI values using the 300 fixed count from whole count samples, but have concerns similar to those expressed by Doberstein et al. (2000) – that the results are misleading to the regulatory decision makers.* ***Colorado's Ecological Data Application System (EDAS) program*** *The EDAS program was developed by CDPHE for use in the MMI protocol. The database will calculate the slope, ecoregion, and elevation of each sample site based on the geographic coordinates. These physical data are needed to determine the biotype for the stream sample and apply the appropriate equations to compute the MMI value.* *EDAS classified the sample sites on the Colorado River collected by MEC in 2004 as biotype 1. This biotype is characterized as "transitional" between mountains and plains. Ecoregion designation and the stream slope mainly determine the classification. MEC notes that the biotype includes the metric for "Sensitive Plains taxa," since the study sites for both the MEC study and Nehring et al. (2011) are on the western slope; this metric may produce inaccurate results due to lack of sensitive eastern plains taxa. MEC also tested data that they recently collected on Castle and Maroon creeks near Aspen. MEC has a total of six sites on Castle and Maroon creeks – three are placed in biotype 1 and three in biotype 2 (mountain) due to the boundary on the ecoregion maps. Again, this would be an inaccuracy that would bias the result.*

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		CDPHE aquatic life thresholds for biotype 1 (transition) have an attainment threshold MMI value of 52 and an impairment MMI value of 42. Between these two values auxiliary metric thresholds are used to supplement MMI values. Auxiliary metrics for biotype 1 include a Hilsenhoff Biotic Index (HBI) value of less than 5.4 and a Shannon Diversity Index greater than 2.4. *The data from MEC samples were formatted for the EDAS database and imported into the database. Once imported the various metrics used by the program were calculated using the EDAS software. One step in that process is to subsample the MEC data whole count samples to construct a 300-count subsample consistent with CDPHE (2010) protocols. This subsample was constructed using the software supplied with EDAS.* ***Subsampling to 300 fixed count from whole count*** *MEC composited their three replicate samples collected with a modified Hess sampler for the subsampling procedure to compute the 300-count subsample. The subsample was then used in EDAS to calculate the intermediate values used in calculation of the MMI. To test the repeatability of the MMI value, they ran the subsampling three times to generate three random samples. MEC expected to get a different dataset each time due to the random sampling technique but were concerned at the difference in the resulting MMI calculated for each subsample. The three runs show that depending on the subsample, the same dataset can generate a MMI that shows impairment, a MMI that shows attainment, and a MMI in the gray zone (Table 1 and Table 2). The secondary metrics for all runs and the whole count meet or exceed the values for HBI and Shannon diversity showing that the sites are not impaired. MEC are concerned that the method has a fatal flaw in its current version and should not be used to evaluate stream health until the flaws in the protocol are corrected. Because MMI values do not provide a reliable indicator of macroinvertebrate health, they should not be relied on as the sole indicator of aquatic life health.*

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Table 1. MMI calculations for Colorado River at Breeze site using EDAS software 300 fixed count compared to whole count samples.

Biotype 1	EDAS Run #1	EDAS Run #2	EDAS Run #3	MEC Whole Count Data
(Sub)sample size	345	328	320	6,908
S-W Diversity	3.57	3.57	3.47	3.68
HBI	3.67	3.8	3.69	2.4
MMI	42.9	52.5	40.4	68.3

Table 2. MMI calculations for Colorado River at Lone Buck site using EDAS software 300 fixed count compared to whole count samples.

Biotype 1	EDAS Run #1	EDAS Run #2	EDAS Run #3	MEC Whole Count Data
(Sub)sample size	343	301	346	1,978
S-W Diversity	3.84	3.72	3.94	3.90
HBI	3.72	4.01	3.76	3.52
MMI	52.7	41.4	51.5	68.8

MEC conducted additional analysis on the data from Nehring et al. (2011) for the sites closest to Windy Gap dam to compare to the results from MEC studies. The results for those data also were variable by subsample. MEC increased the subsample runs to five to better understand the range of conditions that would be projected by the software. The results were similar to the results for the MEC data. The EDAS database software can produce results that have a large difference in MMI score, at times greater than 14 points (Table 3) that range from impairment to attainment. These simple tests of the software show the results are neither accurate nor precise in the calculations based on a 300 fixed count method. We are presenting the results but would caution the use of the results until the CDPHE can rectify the errors in the program. Given this information, we feel the stronger dataset for interpretation of aquatic life conditions are the traditional metrics such as EPT taxa, diversity, evenness, HBI, density, biomass, and functional feeding groups. MEC used those metrics in their original interpretation of the benthic macroinvertebrate data and continues to rely on the traditional metrics rather than the MMI until such time the EDAS database is shown to be reliable and representative based on an outside peer review of the methodology and thorough testing of the database calculations. These traditional metrics were used for all three replicate samples at each of the WGFP study sites, and use more data in the interpretation of aquatic invertebrates than the limited subsampling used for calculation of MMI.

MEC has continued to work with EDAS MMI calculations to better understand the database and its functions and has several unresolved issues

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		that were discussed with CDPHE personnel to determine the source of the discrepancies. The main concern is the difference in the resulting MMI value when calculated by hand and the EDAS with the same input data set. These two methods should produce identical results. The hand calculation uses the equations listed in Policy Statement 10-1 and the intermediate metrics from EDAS subsampling. This should produce identical results as the EDAS calculation. The EDAS calculation is not identical to the hand calculation as it should be. This leads one to conclude that there are additional calculations or errors in calculations in EDAS that are not specified in Policy Statement 10-1. Additional specific issues with the EDAS calculations are described in a Miller Ecological Technical Memo (2012).

Table 3. MMI calculations for Colorado River sites and data from Nehring et al. (2011).

Location				
COL NEW WG11	**Run #1**	**Run #2**	**Run #3**	**Full Sample**
MMI	42.4	34.5	41.7	73.8
S-W Diversity	2.65	2.79	2.83	2.87
HBI	4.62	4.64	4.58	4.54
COL WG12	**Run #1**	**Run #2**	**Run #3**	**Full Sample**
MMI	53.6	39.5	47.1	68.5
S-W Diversity	3.21	3.27	3.20	3.31
HBI	4.76	4.87	4.80	4.75
COL HWY40 BR	**Run #1**	**Run #2**	**Run #3**	**Full Sample**
MMI	72.4	65.8	66.4	79.7
S-W Diversity	3.54	3.65	3.58	3.67
HBI	3.88	3.89	3.88	3.75
COL WG13	**Run #1**	**Run #2**	**Run #3**	**Full Sample**
MMI	56.1	56.3	64.7	61.5
S-W Diversity	3.24	3.27	3.25	3.31
HBI	2.98	2.85	2.85	2.82

[Note, in the REBUTTAL STATEMENT OF THE COLORADO WATER QUALITY CONTROL DIVISION IN THE MATTER OF THE 2012 LIST OF WATER-QUALITY-LIMITED SEGMENTS REQUIRING TOTAL MAXIMUM DAILY LOADS AND 2012 MONITORING AND EVALUATION LIST (REGULATION NO. 93) (November 30, 2011), with regard to the Colorado River below Windy Gap to the Blue River, the "Division recognizes that samples taken below water impoundments may not be reflective of the health of the aquatic community throughout the entire segment. The Division would also like to clarify its intent for a study of an alternate threshold for portions of segments below reservoirs." In addition, the EPA in their rebuttal statement for the same matter (November 30, 2011), indicated that "a tail water sample should not be used as being representative of the downstream portion of the segment." EPA also

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25 26	this community caused by additional withdrawals from WGFP. Dynamic Water Temperature Model: We are concerned that the effects analysis is limited by the results of the dynamic temperature modeling presented in the FEIS. Specifically, our concerns are that 1) the FEIS provides detailed information of model results for only 1975; 2) the temperature modeling analysis generally focuses on the months of July and August to analyze simulated temperature increases; and 3) it is biologically important to evaluate the magnitude of project-related temperature changes in months such as June. **1) The FEIS provides detailed information of model results for only 1975.** Although model results for the other years modeled are summarized in Tables 3-64 through 3-66, the detailed focus on 1975 minimizes the potential impact of the proposed project in other months (e.g., August) when WGFP is able to divert water. The decision to provide detailed information of model results solely for the hydrologic model year 1975 is problematic, as there is effectively no difference in August 1975 pumping totals between existing conditions and any of the modeled alternatives (DEIS Table 3-60). As such, conclusions that are drawn from the August 1975 comparison impact the effects analysis for the WGFP project. For example, "average July WAT temperatures were up to 1.5°C above existing condition, but there was only a 0.1°C difference in average August WAT temperatures for the Proposed Action over existing conditions (p. 3-144)" is predictable, as there is no difference in modeled August pumping. A similar predictable outcome is evident, where "the highest MWAT for the entire study period, relative to existing conditions was 0.1°C at WGD for the No Action and Proposed Action (p. 3-142)", as pumping is modeled to be the same in August 1975 under all modeled scenarios. In contrast, if we evaluate the temperature effects in August 1979, where a 1,638 AF/month increase above existing conditions is modeled for all future scenarios (Hydros 2011, Table 9), the result is a larger modeled increase in August temperatures (Hydros 2011, Table 11). This is important because significant increases in water temperature during August, when temperatures often reach their annual peak, can result in additional exceedances of water temperature standards designed to protect resident aquatic life. For example, again using this 1979 example, an increase of five August exceedances of the acute water temperature standard is predicted at the CR-HSU location (Hydros 2011, Table 10). 2) **The temperature modeling analysis generally focuses on the months of July and August for its analysis of simulated temperature increases (FEIS Tables 3-62 and 3-63).** This approach assumes that increased exceedances of the acute and/or chronic temperature WQS are the only temperature-related impacts that may be experienced as a result of increased pumping by the WGFP. This assumption is further evidenced by the statement in the FEIS that "water temperatures lower than the MWAT would not adversely impact the species" (FEIS, pg. 3-226). A detailed look at Colorado's WQS for water temperature (Regulation 31, 5-CFR-1002-31) reveals that there are both numeric criteria (MWAT and DM) as well as narrative criteria (in footnote 5 to Table 1), to protect aquatic life uses (CWQCC 2010). Specifically, the narrative portion of the standard states: *"Temperature shall maintain a normal pattern of diel and seasonal fluctuations and* 7	*indicates that it "…does not consider waters on the State's M&E list for aquatic life as impaired." Thus, as EPA indicates, use of MMI values below a reservoir may not be comparable to stream segments not influenced by a reservoir and further study is needed.]* 25. The Corps agrees with the response to comments provided by the BOR, as follows: *The dynamic water temperature model results were used in the preparation of the FEIS. Those model results included the month of June in the evaluation for the modeled years. For both the direct effects evaluation and the cumulative effects evaluation, there are no exceedances in June of the maximum weekly average temperature (MWAT) or the daily maximum (DM) thresholds. The graphs in the dynamic model report include June. Since the telephone conferences with EPA staff in late January and early February 2012, historical data on water temperature, macroinvertebrate studies, and fish populations conducted by CPW in the early to mid 1980s were reviewed to provide additional context for aquatic life in the study area. These studies include data on maximum daily June water temperatures, which occurred upstream and downstream of the present day Windy Gap Reservoir both before and after completion of the dam. No data on mean weekly average temperature was included in those reports, which precludes discussion of the rate of change to directly address the narrative standard or the MWAT. The Colorado River in the early 1980s supported a reproducing population of rainbow trout. The number of trout was similar to the latest population data from CPW, which shows the river is predominantly brown trout habitat (Figure 1). Water temperature data from that same period were in the same range as those predicted by the dynamic temperature model for the existing conditions and direct effects analysis for WGFP. The maximum daily June water temperatures upstream of the reservoir exceed 16°C (Figure 2). The longitudinal water temperatures show a decline in water temperature close to the dam and an increase with distance downstream from the dam.* *We do not see a change in water temperature in either magnitude or absolute value that would indicate the WGFP would not be in compliance with the narrative standard. The dynamic water temperature model results show an increase in water temperature as distance increases downstream to the William Fork. The dynamic model shows a daily rate of change for specific locations that are gradual with no abrupt changes in magnitude. The magnitude of hourly changes (delta T) in June is less than 0.5°C for most of the years for the proposed action and the maximum hourly temperature is in the range of the existing conditions in the early 1980s.*

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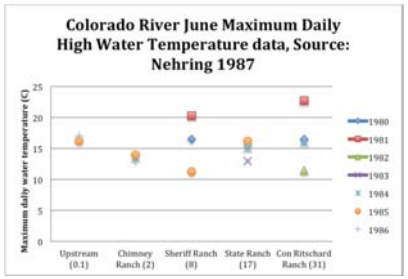
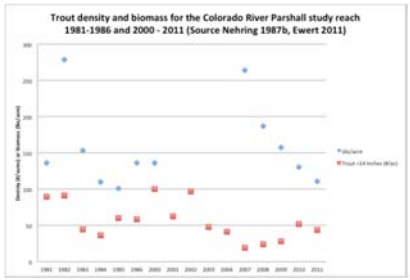
		The mitigation proposed by EPA regarding the baseline monitoring of effects of June water temperature on thermally sensitive life stages of rainbow trout to evaluate compliance of the narrative WQS is not needed. The dynamic water temperature model shows that the magnitude and rate of change is similar to the existing conditions. Further, the maximum daily June water temperatures are in the same range as in the early to mid-1980s when reproducing populations of rainbow trout were present in the Colorado River, prior to the major impacts of whirling disease. Numerous confounding factors would preclude determination of a direct cause-and-effect relationship between water temperature and effect to thermally sensitive life stages. Miller (1988) reported successful survival to emergence for rainbow trout at temperatures from 11.9°C to 15.2°C. This temperature range is similar to the current June maximum water temperature regime downstream of Windy Gap Dam.  *Figure 1. June Maximum Daily Water Temperature for the Colorado River upstream and downstream of Windy Gap Reservoir location 1980 – 1986, numbers in parenthesis are distance upstream or downstream from WGD. Source: Nehring 1987a.*  *Figure 2. Colorado River trout density for trout 14 inches or larger and biomass for trout 6 inches and larger for the Parshall study reach, 1981 – 2011*

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26 (cont'd) 27	*spatial diversity with no abrupt changes and shall have no increase in temperature of a magnitude, rate, and duration deleterious to the resident aquatic life."* While the FEIS provides a qualitative analysis of the proposed project's adherence to the narrative standard (FEIS pg. 3-226-227), including consideration of the diel and seasonal thermal cycles, the analysis does not evaluate the significance of modeled increases in water temperatures during months other than July and August. Specifically, there is no quantification or discussion of temperature increases that are modeled to occur in June as a result of the projects, a month when significant volumes of water are planned to be diverted as a result of the WGFP. For example, in modeling the year 1988, the difference in modeled pumping volumes between existing conditions and the proposed alternative is 21,915 AF. This change in flow volume may have a significant impact on modeled June instream water temperatures (e.g. Hydros 2011; Figures 110, 114, 118), however, this impact is dismissed because there are no exceedances of either water temperature standard. As such, we are concerned that this analysis is incomplete in its evaluation of the potential impact of an elevated water temperature profile on resident aquatic life because it does not consider potential thermal impacts on resident aquatic life below those acute and chronic thresholds, as is required under the narrative portion of the standard. **3) It is biologically important to evaluate the magnitude of project-related temperature changes in months such as June.** In recent years, CPW has regularly indicated that reestablishment of naturally reproducing rainbow trout populations in coldwater streams and rivers is a high priority for the state of Colorado. CPW has taken specific management interest in the Colorado River in Grand County, as it "historically supported one of the most productive wild rainbow trout fisheries in the world" (Ewert 2010). Following the appearance of whirling disease in 1987, "the proliferation of this parasite ended virtually all successful reproduction of rainbow trout, and in the following years, the brown trout population exploded to fill the habitat that was being vacated due to lack of successful reproduction in the rainbow trout population" (Ewert 2010). Successful reestablishment of wild rainbow trout populations in the upper Colorado River faces diverse challenges moving forward, including the maintenance of suitable water temperature regimes for all life stages of the rainbow trout at the appropriate times of year. According to researchers from the CPW, the critical, site-specific time periods for brown and rainbow trout spawning within the Colorado River is October 15-November 15 and April 20-May 10, respectively (Nehring 1988). In order to adequately evaluate the potential impacts of increased water temperatures resulting from the WGFP, the thermal requirements and limits of specific life stages should be compared with modeled, post-project water temperatures during the appropriate, site-specific times of year presented in Nehring (1988). Specifically, because the proposed project is forecast to divert water May through August (the bulk of which is in June and July), the potential aquatic life impacts resulting from thermal shifts caused by these diversions should be evaluated across this entire time period. While comparison with Colorado's acute and chronic summertime water temperature criteria is appropriate, these comparisons are most relevant during July and August where water temperature regimes reach their peaks and have the potential to approach these thresholds. During shoulder-season months (e.g. June), comparison with life-stage-specific thermal requirements is essential to fully evaluate the potential temperature impacts of the project on resident fish. A technical memo on temperature 8	*The State of Colorado, as the entity with jurisdictional responsibility for managing the fish and wildlife of the state, developed and approved the actions to be implemented, including the acute and chronic temperature mitigations, as part of the FWMP, which were incorporated into the FEIS. In addition, the U.S. Fish and Wildlife Service approved of the findings in the Fish and Wildlife Coordination Act Report on March 9, 2012, which included the temperature mitigations identified in the FWMP, and agreed that the measures to avoid, minimize, and mitigate impacts to fish and wildlife resources from implementation of the Preferred Alternative adequately addressed identified effects.* *Reclamation believes the two temperature monitoring stations proposed to be installed downstream of the Windy Gap Project are sufficient to meet the purpose for the stream temperature mitigation. The mitigation would require pumping to be reduced or curtailed as stream temperatures approach or reach the State of Colorado's acute and chronic temperature standards. The two downstream temperature monitoring stations would be expected to provide the data necessary to determine when the mitigation measures need to be implemented.* In addition, please refer to Comment 5 above and Appendix B of the Corps ROD 26. Please refer to Comments 5 and 25 above. 27. Please refer to Comments 5 and 25 above.

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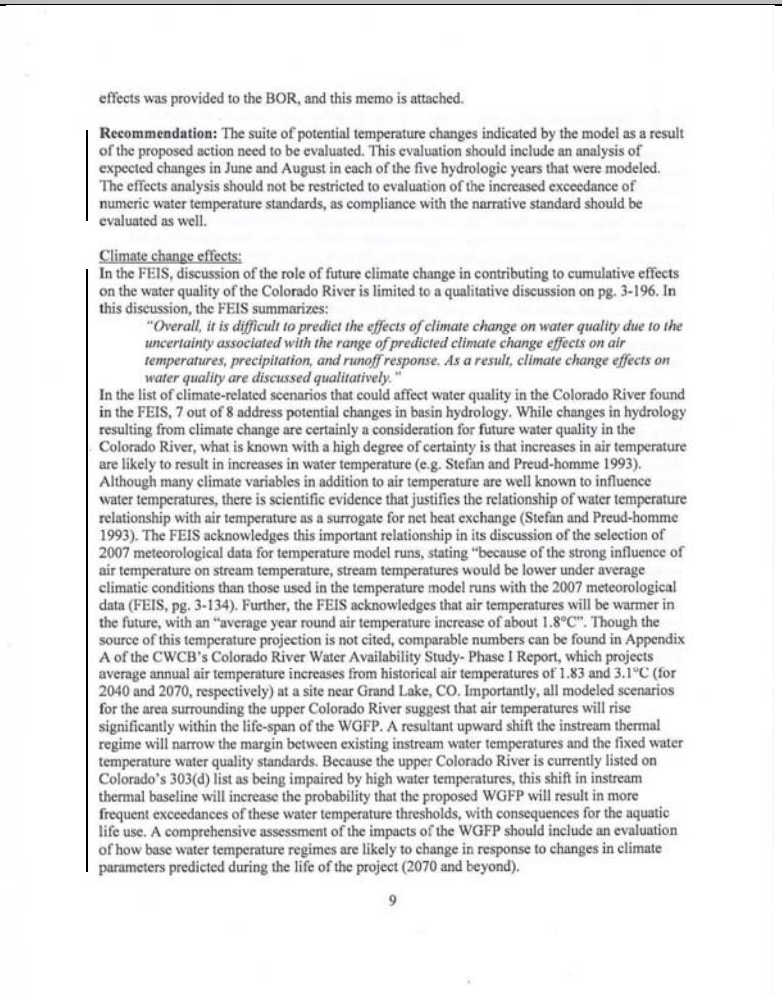
28 29		28. Please refer to Comments 5 and 25 above. 29. The Corps agrees with the response to comments provided by the BOR, as follows: *The use of more recent data for Windy Gap diversions is due to the increasing demand that Windy Gap Participants have for Windy Gap water as their populations have increased. Given future demand projections, it is realistic to expect this demand will continue to increase. In contrast, the use of a 1950-1996 period for hydrologic modeling provides a broad range of average, wet, and dry flow conditions for evaluating hydrologic impacts. The potential of extending the study period and/or using additional periods for comparative analyses was considered in relation to whether these alternative hydrologic inputs would change conclusions regarding the yield of the Windy Gap Firming Project and/or change conclusions related to effects on hydrologic and other resource areas. With regard to inclusion of more recent hydrology, Windy Gap would not divert additional water due to the proposed WGFP in drought years like 2002 because the Windy Gap water rights would not be in priority as was the case in 2002. The period from 1997 through 2003 was analyzed in a spreadsheet exercise using Microsoft Excel. A copy of the technical memorandum, Significance of 2002 Hydrology to WGFP Modeling (Meg Frantz September 27, 2004), which summarizes that analysis, was provided to Grand County and Bishop-Brogden Associates, Inc. (Grand County's water consultants) at a meeting on March 4, 2005. Results of that analysis show that for the Windy Gap Firming Project Participants, other dry periods during the 1950 through 1996 study period were more critical than the recent drought. The model study period used also addresses the carryover and recovery effects of additional Windy Gap diversions in wet years following dry years like 2002 and 2003. The study period includes several series of dry years followed by wet years, which illustrate the effects of increased diversions to refill storage. For example, the study period includes the mid-1950's drought followed by 1957 (a wet year), 1963 and 1964 (dry years) followed by 1965 (wet year), 1977 (dry year) followed by 1978 (wet year), and 1981 (dry year) followed by several wet years in the mid-1980s. These sequences of years allow for an evaluation of impacts associated with diverting*

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29 (cont'd)	The FEIS addresses this issue qualitatively. The use of 2007 data as "some of the warmest July and August temperatures on record (comparable to predicted climate change temperature increases)" is emphasized as the meteorological inputs for its present-day "worst-case" water temperature modeling effort (FEIS, pg. 3-196). While we agree that use of 2007 meteorological data was an appropriate selection for modeling the upper range of temperature impacts under present day conditions, this analysis cannot also predict the upper range of impacts of warmer air temperatures in a warmer future. The 2007 meteorological data in the climate change effects section of FEIS represent an average climate scenario in the future, but variability above and below that new, higher average scenario would still be expected. As such, water quality impacts modeled as a part of the present day effects analysis (increase in regulatory exceedances in 3 of 15 years considered) could be expected in an average year, with additional and more extreme exceedances expected in the "worst-case" years of the future. In summary, the use of present-day "worst-case" climate conditions in water temperature modeling efforts does not represent a complete evaluation of potential climate change effects on water temperature means and extremes in the future. **Recommendation:** We recommend a more complete evaluation of the potential project impacts on instream water temperature under future climate scenarios within the proposed project time-frame (2050 and beyond). The dynamic temperature model is an adequate tool to conduct such an exercise in a semi-quantitative manner, primarily through the modification of the meteorological inputs to reflect future climate scenarios (i.e. increased air temperatures) to generate a new, "existing conditions" water temperature baseline for the future.	*additional water in wet years following dry years. The model study period is suitable for estimating hydrologic effects associated with the EIS alternatives because it includes a broad range of average, wet, and dry years, and sequences of years that include dry years followed by wet years. The FEIS includes information for years that are reflective of some of the driest and wettest conditions that have occurred in the past. The study period does not have to include all of the five driest and wettest years at each location in the study area to accurately characterize hydrologic effects in dry and wet years. Extension of the modeling period to include additional dry and wet years would not substantially change the predicted impacts to flows as a result of the proposed Windy Gap Firming Project.* *Climate change may alter temperature and precipitation in the Upper Colorado River basin. Potential environmental impacts from climate change are qualitatively evaluated as part of the cumulative effects evaluation. A qualitative assessment of potential impacts due to climate change is reasonable given the uncertainty associated with the data and methodologies typically used to quantitatively evaluate hydrologic effects associated with climate change. For example, Global Climate Change Models contain a significant amount of uncertainty and routinely fail to represent regional climate phenomena, including the southwestern U.S. monsoon. Both climate and hydrologic models use datasets that are interpolated across large spatial and temporal scales, which likely introduces significant uncertainty in terms of how accurately they predict future runoff.*
30	**Mitigation (40 CFR 230.10(d)):** Additional mitigation and monitoring should be proposed in order to offset potential significant adverse effects anticipated from the proposed project. Detailed mitigation recommendations were provided to the BOR in our FEIS comment letter, and include the recommendations outlined in Nehring et al. (2011). We recommend that the Corps also consider these mitigation proposals when determining compliance with CWA Section 404. In addition to the mitigation proposed in our FEIS comment letter, a revised impact analysis for water quality, stream morphology and aquatic life may indicate that additional mitigation is necessary for any newly disclosed impacts that cause or contribute to significant degradation of the aquatic ecosystem. 10	30. The objective of compensatory mitigation is to offset environmental losses resulting from unavoidable impacts to jurisdictional wetlands and other Waters of the U.S. (40 CFR §230.93(a)(1)). Compensatory mitigation is determined by identifying the aquatic resource functions that would be lost as a result of a permitted activity, and then identifying appropriate environmentally preferable measures capable of compensating for those lost functions. As stated in 33 CFR 320.4 (r), "All compensatory mitigation will be for significant resource losses which are specifically identifiable, reasonably likely to occur, and of importance to the human or aquatic environment. Also, all mitigation will be directly related to the impacts of the proposal, appropriate to the scope and degree of those impacts, and reasonably enforceable." The Corps details its requirements for mitigation as required by its aforementioned regulation in its ROD and Appendix F of the FEIS. Additionally, the 401 WQC requires robust mitigation, monitoring and an adaptive management approach to nutrient and water quality concerns

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		associated with this project. The EPA has designated the State as the proper authority to address water quality concerns. Thus mitigation for those particular concerns are within their authority to directly address.

Comment	Mr. Jeff Thompson Email – February 25, 2014	Response
31	**From:** Brand, Rena J NWO **To:** Downing, Kiel G NWO **Subject:** Fw: Windy Gap Firming Project Contract Negotiations (UNCLASSIFIED) **Date:** Tuesday, February 25, 2014 1:13:00 PM **Attachments:** Windy Gap EPA FEIS.pdf Classification: UNCLASSIFIED Caveats: NONE Kiel, FYI. (This might also come up during your manager call on Wed Afternoon). -----Original Message----- From: Carey, Timothy T NWO Sent: Tuesday, February 25, 2014 8:06 AM To: Brand, Rena J NWO Subject: FW: [EXTERNAL] Fw: Windy Gap Firming Project Contract Negotiations (UNCLASSIFIED) Classification: UNCLASSIFIED Caveats: NONE FYI -----Original Message----- From: Jeff Thompson [mailto:jeffthompson2011@hotmail.com] Sent: Friday, February 21, 2014 1:52 PM To: Carey, Timothy T NWO Cc: Bohan.Suzanne@epamail.epa.gov; Melanie Wasco Subject: [EXTERNAL] Fw: Windy Gap Firming Project Contract Negotiations Dear Mr. Carey, Because the Army Corps plays an important part in decisions regarding the NEPA process related to the Windy Gap Firming Project and the Moffat Project, I am forwarding my e-mail message to Mr. Ryan of the Bureau of Reclamation and others to you. Apparently, the Bureau of Reclamation is in the process of deciding how to proceed from this point forward. As explained in the forwarded message, I believe there is a serious misunderstanding on the part of both the Bureau and the Corps as to the mitigation recommendations of the Colorado Wildlife Commission which appear in Sections 3.7.4 and 3.8.4.2 of the Windy Gap Firming Project FEIS. I believe that, if you investigate this matter and get to the bottom of it, you will find that the Wildlife Commission's recommendations were based on promises from both the Municipal Sub-district and Denver Water to fund and cooperatively manage a channel reconfiguration project on the Colorado River below the Windy Gap Dam. I think you will find that the FEIS does not disclose an essential element of the planned mitigation, without which the planned mitigation disclosed in the FEIS simply makes no sense. Also, as I explained to Mr. Ryan in the forwarded message, the NEPA regulations clearly require the the publication and circulation of a Draft Supplemental FEIS which discloses both the important controversy concerning the current condition of the aquatic ecosystem below the Windy Gap Dam and either the channel reconfiguration element of the mitigation plans or an analysis as to how the mitigation plans could possibly be of benefit without channel reconfiguration. Thank you very much for your help and attention on this matter. Jeff Thompson	31. The Corps has incorporated the mitigation requirements of the FWMP as a special condition of its permit. The mitigation measures in the FWMP adequately address the impacts to wildlife. The 401 WQC also requires mitigation measures believed to improve conditions for the aquatic ecosystem and other considerations discussed in Section 3.7.4 of the FEIS. The Corps is requiring mitigation for impacts under its Section 404 authority that should also benefit the aquatic ecosystem. Please see the comments above for additional information on these subjects, comment 2 and comment 30 in particular.

Comment	Save the Colorado, Waterkeeper Alliance, Wildearth Guardians, Living Rivers, and Save the Poudre Comments – April 20, 2015	Response
32	SAVE THE COLORADO * WATERKEEPER ALLIANCE WILDEARTH GUARDIANS * LIVING RIVERS * SAVE THE POUDRE April 20, 2015 Mr. Kiel Downing U S Army Corps of Engineers Omaha District Denver Regulatory Office 9307 S. Wadsworth Blvd. Littleton, Colorado 80128 *The Windy Gap Firming Project FEIS is fatally flawed and must be supplemented, and the Army Corps must provide an additional public comment period before issuing a 404 Permit.* Dear Mr. Downing, The Upper Colorado River is an over-depleted and stressed aquatic ecosystem. The proposed Windy Gap Firming Project (WGFP) would divert additional water from the river, resulting in further harm. Scores of plants, fish, and other wildlife—in addition to a growing and diverse recreational economy—depend on a healthy Colorado River to survive and thrive. We are extremely concerned about the impacts of WGFP and additional transbasin diversions on the remaining native flows of the Colorado River's headwaters. A century of wanton depletion of this prized waterway has pushed it to the brink of irreversible loss, and purported mitigation and restoration efforts offered to offset the draining of the Colorado River headwaters would not adequately protect critical resource values.	32. Thank you for your comment please see comment 2. Additionally, BOR has previously reviewed and addressed comments related to the flaws within the DEIS and FEIS, and have issued an errata sheet and supplemental information report (SIR). With the SIR, it was determined that a supplemental EIS was not warranted. The Corps in its own independent review confirmed these findings.
33	In addition, the entire Colorado River ecosystem—from Grand County, Colorado to San Luis Rio Colorado, Mexico—is severely depleted and further endangered. The extended drought in the Colorado River basin has lowered flows in the river and lowered the levels of reservoirs along its path. The Central Arizona Project is predicting a shortage of Colorado River water in 2017[1], and Las Vegas is planning for continued falling levels of Lake Mead, including a potential "Dead Pool."[2] Fish species listed by the Endangered Species Act continue to struggle for survival and have remained on the endangered [1] http://www.cap-az.com/index.php/public/blog?start=4 [2] http://www.reviewjournal.com/news/water-environment/panel-recommends-650-million-lake-mead-project-rate-hike	33. Please see Section V (c) of the Corps ROD which references ESA Section 7 Consultation with the USFWS.

Comment	Save the Colorado, Waterkeeper Alliance, Wildearth Guardians, Living Rivers, and Save the Poudre Comments – April 20, 2015	Response
33 (cont'd)	and threatened lists for decades.[3] The Grand Canyon continues to degrade due to low water levels, water temperatures, and a lack of sediment, all caused by the construction of dams and the diversion of water upstream.[4] And finally, farther downstream the Colorado River continues to be 100% drained dry and does not reach the Sea of Cortez. Remarkably, all ~5 trillion gallons/year of the Colorado River's waters are diverted for human use and consumption.[5]	
34	The proposed WGFP would drain an additional tens-of-thousands of acre feet of water out of the very top of the Colorado River system in Grand County, Colorado. In wet years, well over 30,000 acre feet would be diverted. This proposal would continue the environmentally devastating history of further draining and destroying the Colorado River and its tributaries, and would likely worsen all of the downstream environmental impacts noted above. If built, the WGFP would push the Upper Colorado River over the brink.	34. Thank you for your comment. The EIS and its supporting and subsequent analysis do not confirm this assertion.
	The Army Corps Cannot Rely on the FEIS's Flawed Analysis To Issue a Section 404 Permit	
35	The U.S. Army Corps of Engineers must issue a Clean Water Act section 404 permit before the Windy Gap Firming Project can be constructed. The Corps cannot issue a 404 permit for a project "if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem." 40 C.F.R. § 230.10(a). When the Corps analyzes the WGFP 404 permit application, it intends to rely on the U.S. Bureau of Reclamation's Final Environmental Impact Statement (FEIS) for the project. However, as summarized below, the FEIS for WGFP is fatally flawed and does not comply with the National Environmental Policy Act (NEPA) or the Clean Water Act for numerous reasons. Accordingly, neither Reclamation nor the Army Corps can rely on the inadequate FEIS to identify the environmental and socio-economic impacts of the WGFP, as required by NEPA. In addition, when deciding whether to issue a Clean Water Act section 404 permit for the project, the Army Corps cannot rely on the flawed FEIS to identify reasonable alternatives to the WGFP or to consider whether its adverse effects could be mitigated. Because the Windy Gap Firming Project FEIS is fatally flawed, the Army Corps must conduct additional analysis before issuing a 404 permit for the project.	35. See comment 2.
	[3] http://cpluhna.nau.edu/Biota/fishes.htm [4] http://www.glencanyon.org/glen_canyon/grand-canyon [5] http://www.smithsonianmag.com/science-nature/the-colorado-river-runs-dry-61427169/?no-ist	

Comment	Save the Colorado, Waterkeeper Alliance, Wildearth Guardians, Living Rivers, and Save the Poudre Comments – April 20, 2015	Response
36 37 38 39 40 41	Specifically, the FEIS for the Windy Gap Firming Project is fatally flawed for the following reasons:[6] 1. The "Purpose and Need" described in the FEIS is flawed and too narrow to satisfy the statutory requirements of the National Environmental Policy Act, the Clean Water Act, the Endangered Species Act, and Council for Environmental Quality regulations.[7] 2. The FEIS fails to adequately analyze and address water conservation and efficiency alternatives.[8] 3. The FEIS fails to adequately analyze and address cumulative, direct, indirect, and connected impacts.[9] 4. The FEIS fails to adequately analyze and address construction costs.[10] 5. The FEIS fails to adequately analyze and address the impacts to hydrology, water quality, and stream morphology.[11] 6. The FEIS fails to adequately consider and analyze a full range of alternatives.[12] [6] Save The Colorado incorporates the comments that have been raised by other commenters and that are summarized below in numbers 1-22. Save The Colorado would also like to adopt the comments, letters, reports, and memos regarding the Windy Gap Firming Project FEIS in the footnotes for numbers 1-22 below. *See Wyo. Lodging & Rest. Ass'n v. U.S. Dep't of Interior*, 398 F. Supp. 2d 1197, 1208-11 (D. Wyo. 2005) (allowing parties to raise issues regarding a NEPA Environmental Assessment that were previously brought to the agency's attention by other commenters); *Portland Gen. Elec. Co. v. Bonneville Power Admin.*, 501 F.3d 1009, 1024 (9th Cir. 2007) (similar). [7] See "Letter #1138," and "Letter #883": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_organizations_groups_businesses.pdf and "Letter 1075": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_cooperating_agencies.pdf and "Letter 1062": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_government_agencies.pdf and "Letter 1141": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_government_agencies.pdf. [8] See "Letter #1138," and "Letter #883": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_organizations_groups_businesses.pdf and "Letter 1062": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_government_agencies.pdf and "Letter 1141": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_government_agencies.pdf. [9] "Letter #1138" and "Letter #1059 and "Letter #1060 and "Letter #883" and "Letter #1126": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_organizations_groups_businesses.pdf and "Letter 1075": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_cooperating_agencies.pdf and "Letter 1141": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_government_agencies.pdf. [10] See "Letter #1138": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_organizations_groups_businesses.pdf. [11] See "Letter #1138"and "Letter #1126": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_organizations_groups_businesses.pdf and see "Letter 1075" http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_cooperating_agencies.pdf and "Letter 1141": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_government_agencies.pdf. [12] See "Letter #1138" and "Letter #1059": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_organizations_groups_businesses.pdf and "Letter 1141": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_government_agencies.pdf.	36. The Corps respectfully disagrees with your comment. We feel that the updated Purpose and Need statement in Chapter 1 of the FEIS is appropriate for this project and is compliant with NEPA regulations. 37. The Corps agree with the rationale described by the BOR in the response to comments provided in Appendix F of the FEIS, as well as the updated Section 3.25 of the FEIS. Water conservation and efficiency alternatives were not specifically used in the alternatives screening process because the WGFP participants are required to maintain a state-approved water conservation plan in accordance with the Water Conservation Act of 2004, as amended (Colorado House Bill 04-1365). In addition, the majority of the participants also have plans to incorporate additional conservation measures into their own conservation programs. 38. The Corps agrees with the rationale described by the BOR in the response to comments provided in Appendix F of the FEIS. 39. The Corps agrees with the response to comments provided in Appendix F of the FEIS. 40. The Corps agrees with the responses provided by the BOR included in Appendix F of the FEIS. In addition, please refer to Comments 1 and 4 above. 41. The Corps and BOR objectively evaluated all reasonable alternatives to meet the project Purpose and Need, and are in agreement with the response to comments provided by the BOR in Appendix F in the FEIS.

Comment	Save the Colorado, Waterkeeper Alliance, Wildearth Guardians, Living Rivers, and Save the Poudre Comments – April 20, 2015	Response
42 43 44 45 46 47 48	7. The FEIS fails to adequately analyze and address aquatic and environmental impacts.[13] 8. The FEIS fails to adequately analyze and address impacts to the recreational economy of Grand Lake, the Colorado River, and tributary streams of the Colorado River in Grand County.[14] 9. The FEIS fails to adequately analyze and address the likely environmental impact of the preferred alternative in light of the most recent period of record.[15] 10. The FEIS fails to adequately analyze and address the likely environmental impacts of the alternatives in light of the best-available science on climate change.[16] 11. The FEIS fails to adequately analyze and address the environmental impacts to Grand Lake.[17] 12. The FEIS fails to adequately analyze and address stream temperature impacts to the Colorado River and streams in Grand County that are tributaries to the Colorado River.[18] 13. The FEIS fails to adequately analyze and address impacts to federally listed Endangered Species under the Endangered Species Act.[19] [13] See "Letter #1138" and "Letter #1060" and "Letter #883" and "Letter #1110": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_organizations_groups_businesses and "Letter 1141": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_government_agencies.pdf. [14] See "Letter #1052": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_organizations_groups_businesses.pdf and "Letter 1075": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_cooperating_agencies.pdf and "Letter 1141": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_government_agencies.pdf. [15] See "Letter #1059": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_organizations_groups_businesses.pdf and "Letter 1062": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_government_agencies.pdf and "Letter 1141": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_government_agencies.pdf [16] See "Letter #1059" and "Letter #1126": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_organizations_groups_businesses.pdf and "Letter 1141": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_government_agencies.pdf [17] See "Letter #58" and "Letter #1103": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_organizations_groups_businesses.pdf and "Letter 1141": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_government_agencies.pdf [18] See "Letter #1126": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_organizations_groups_businesses.pdf and "Letter 1141": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_government_agencies.pdf [19] See "Letter 1126": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_organizations_groups_businesses.pdf and "Letter 1141": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_government_agencies.pdf	42. The Corps agrees with the responses provided by the BOR included in Appendix F of the FEIS. In addition, please refer to Comments above. 43. The Corps respectfully disagrees with the comment provided. Please refer to Sections 3.19.2.3 and 3.19.2.4 of the FEIS, as well as the response to comments provided by BOR in Appendix F of the FEIS. 44. Please refer to Comment 21 above. Additionally, that Water Quality Certification analyzed and evaluated an expanded period of record before the State issued its determination. 45. Please refer to Comment 29 above. 46. Please refer comments above including 10-15. The FEIS has been updated to include the analysis and address the potential environmental impacts to Grand Lake. The Corps is in agreement with the updates noted in Sections 3.8.1.3 and 3.8.4, as well as the responses to comments provided by BOR in Appendix F of the FEIS. 47. Please refer to comments above, including 1, 4 and 5. 48. Please see comment 33. The Corps respectfully disagrees with your comment. Consultation with the U.S. Fish and Wildlife Service concerning the proposed adverse effect on fish species was initiated and resulted in a biological opinion (2010) and Wildlife Mitigation Plan (2011). The Corps agrees with the responses to comments provided by the BOR included in Appendix F of the FEIS, as well as feels the BOR has adequately analyzed and addressed impacts to federally listed species (threatened, endangered, candidate, and final designated critical habitat) under the Endangered Species Act.

Comment	Save the Colorado, Waterkeeper Alliance, Wildearth Guardians, Living Rivers, and Save the Poudre Comments – April 20, 2015	Response
49 50 51 52 53 54 55 56	14. The FEIS fails to adequately analyze and address cumulative impacts with the proposed Northern Integrated Supply Project.[20,21] 15. The "No Action Alternative" in the FEIS is misleading, speculative, and does not represent a true "no action" alternative.[22] 16. The FEIS fails to analyze the capability of individual WGFP participants, including but not limited to the Platte River Power Authority, to meet their water needs by other means.[23] 17. The FEIS fails to address the impacts of climate change from providing water to the coal-fired power plant at the Platte River Power Authority.[24] 18. The FEIS fails to analyze and address the water used for fracking in the Purpose and Need.[25] 19. The FEIS fails to analyze and address the climate change impacts of using and/or leasing or selling WGFP water for fracking of oil and gas in Colorado by WGFP participants, including but not limited to the City of Greeley and the Platte River Power Authority.[26] 20. The FEIS fails to adequately analyze and address the impact of climate change on water supplies proposed to be used by the WGFP.[27] 21. The FEIS fails to address the impacts of climate change resulting from oil and gas development and consumption that is made possible or supported by WGFP water. It is known that the [20] See "Letter 1126," and "Letter #1117": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_organizations_groups_businesses.pdf [21] See Save The Poudre letter, April 10, 2011: http://poudreriver.home.comcast.net/~poudreriver/STP_letter_to_Corps_Bureau_EPA_NISP-Impacts-On-Colorado-River-4-10-2001.pdf [22] See "Letter 1126": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_organizations_groups_businesses.pdf and "Letter 1075": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_cooperating_agencies.pdf and "Letter 1141": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_government_agencies.pdf [23] See Save The Poudre letter, April 19, 2012: http://poudreriver.home.comcast.net/~poudreriver/STP-letter-to-BOR-ACE-PRPA-WGFP-FEIS-4-19-2012.pdf and "Letter 1141": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_government_agencies.pdf [24] http://www.nwf.org/pdf/Global-Warming/ghg%20co%20fact%20sheet.pdf. [25] See Save The Poudre letter, October 4, 2011: http://poudreriver.home.comcast.net/~poudreriver/STP_letter-to-BuRec-WGFP-Water-For-Fracking-10-4-2011.pdf. [26] See Save The Poudre letter, April 19, 2012: http://poudreriver.home.comcast.net/~poudreriver/STP-letter-to-BOR-ACE-PRPA-WGFP-FEIS-4-19-2012.pdf. [27] See Save The Poudre letter, March 13, 2012: http://poudreriver.home.comcast.net/~poudreriver/STP-letter-to-ACE-WGFP-FEIS-3-13-2012.pdf and "Letter 1141": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_government_agencies.pdf.	49. The Corps agree with the response provided by the BOR included in Appendix F of the FEIS. There are no substantial overlapping impacts between NISP and WGFP that would warrant cumulative impact analyses. 50. The Corps agree with the response provided by the BOR included in Appendix F of the FEIS. 51. Please see Section III (a) of the Corps ROD. If this project were not constructed, the individual WGFP participants would fall under the no action alternative (Section 2.2.2 of the FEIS) analysis. Under the no action alternative, the participants would continue their current allotted usage from the respective locations, and in the long term, they would seek other storage options, individually, or jointly. The City of Longmont is the only participant with reasonably foreseeable plans develop reservoir storage independently. The City would likely enlarge the Ralph Price Reservoir by 13,000 acre feet. Analysis of foreseeable impacts from the no action alternative have been addressed throughout the FEIS. 55. The impacts of climate change from providing water to the coal-fired plant at the Platte River Power Authority is out of the scope of this study. 53. Analysis of the amount of water used for the purposes of fracking is out of the scope of this study. 54. The impacts of climate change from providing water for oil and gas operations (i.e. fracking) is out of the scope of this study. 55. See Comment 29. The Corps agree with the response provided by BOR, included in Appendix F of the FEIS. 56. Please refer to the other comments with regard to oil and gas and climate change above.

Comment	Save the Colorado, Waterkeeper Alliance, Wildearth Guardians, Living Rivers, and Save the Poudre Comments – April 20, 2015	Response
57	process of extraction and distribution of oil and gas includes significant methane leaks which significantly contribute to climate change.[28] 22. The FEIS fails to address the impact on salinity as required by the Clean Water Act. The first reference of the detriment of trans-basin diversions was mentioned by John Wesley Powell. He noted the pristine quality of the headwater streams, and how that quality was lost once the river received the sediment and salt loads of the Colorado Plateau Province. For example, saline water enters the Colorado River in large quantities near Glenwood Springs, CO on the Roaring Fork River, and the Dolores River near Bedrock, CO. Taking more water out of the headwaters will increase the salt loading of the Colorado River for downstream users in the lower basin and Mexico. This cumulative impact must be analyzed in the EIS. The cost of mitigating Colorado's contribution to salt loading in the Colorado River must also be assessed. As the upper basin states prepare for more trans-basin diversions, eventually a negative water quality threshold will be surpassed and the consequence will be a federal lawsuit against the upper basin states.	57. Thank you for your comment. Please refer to the previous responses to comments regarding water quality, including comment 1 and the 401 WQC. In addition, Grand County has committed to performing a saline study on the west slope.
58	23. In addition, as enumerated in the its comments[29], the U.S. Environmental Protection Agency has stated that the FEIS: a. has "issues with data, methodologies, and conclusions" b. does not account for important new information from the Colorado Division of Wildlife c. needs to be "supplemented" (i.e., a Supplemental Environmental Impact Statement needs to be created).	58. Please refer to the previous responses to EPA comments above, specifically comments 1-30.
59	The Army Corps Must Supplement the WGFP FEIS As noted above, EPA commented that the FEIS needs to be supplemented due to its numerous flaws. We agree with the EPA and we ask that the Army Corps, at a minimum, supplement the FEIS and conduct additional data collection and analysis, as requested by EPA. The NEPA regulations state it is "essential" that an FEIS contains "high quality" and "accurate scientific analysis." 40 C.F.R. § 1500.1(b); *see also id.* § 1502.24 ("Agencies shall insure the professional integrity, including scientific integrity, of the discussions and analyses" in an EIS). An agency must supplement an FEIS if there are "significant new circumstances or information" relevant to a project. *Id.* § 1502.9(c)(1)(ii). Moreover, the Clean	59. Please refer to Comment 2 above.

[28] http://www.pnas.org/content/111/17/6237.abstract and see the studies linked to in this news report: http://www.climatecentral.org/news/huge-methane-leaks-add-doubt-on-natural-gas-as-a-bridge-fuel-17309.

[29] http://www.savethecolorado.org/blog/wp-content/uploads/2014/11/EPA-comments-WGFP-FEIS-2-6-2012.pdf

Comment	Save the Colorado, Waterkeeper Alliance, Wildearth Guardians, Living Rivers, and Save the Poudre Comments – April 20, 2015	Response
59 (cont'd)	Water Act Section 404(b)(1) Guidelines recognize that there may be cases when the Army Corps must supplement NEPA documents in order to meet the independent requirements of Clean Water Act section 404. *Id.* § 230.10(a)(4). Because the FEIS for the WGFP does not include the up-to-date and accurate analysis required by NEPA and the Clean Water Act, the Army Corps must collect additional data and supplement the FEIS. The Army Corps Should Provide an Additional Public Comment Period	
60	Even if the Army Corps fails to supplement the FEIS, we request that the Corps open up its review of the WGFP FEIS to a new public comment period. EPA recommended that the Corps make all supplemental information available for public comment, and we agree with EPA. EPA Letter to Corps at 2. Because the FEIS contains significant new information, and because the WGFP is extremely controversial, opening up a new public comment period would be in the public's interest and in accordance with the Clean Water Act. *See* 40 C.F.R. § 1500.1(b) ("Accurate scientific analysis, expert agency comments, and public scrutiny are essential to implementing NEPA."); 33 C.F.R. § 325.2(d) (Corps may extend public comment period for Section 404 permits).	60. Please refer to Section IV of the ROD.
61	We would like to thank the Army Corps for considering these comments before it makes a decision on whether to issue a Section 404 permit for the Windy Gap Firming Project. In addition, thank you for inserting these comments into the legal, public record for the Section 404 and Environmental Impact Statement processes for the Windy Gap Firming Project. Respectfully, Gary Wockner, PhD Save The Colorado PO Box 1066 Fort Collins, CO 80522 Mark Easter Save The Poudre PO Box 20 Fort Collins, CO 80522 Pete Nichols Waterkeeper Alliance 17 Battery Place, Suite 1329 New York, NY 10014	61. Thank you for your comments.

Comment	Upper Colorado River Alliance (Porzak, Browning, & Bushong, LLP) Comments – February 3, 2012	Response
62		62. Please refer to the comment responses below, including 63 through 66 below.

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February 3, 2012

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Re: Windy Gap Firming Project Environmental Impact Statement

Dear Mr. Collins, Mr. Ryan, Mr. Bezdek and Ms. Maldonado,

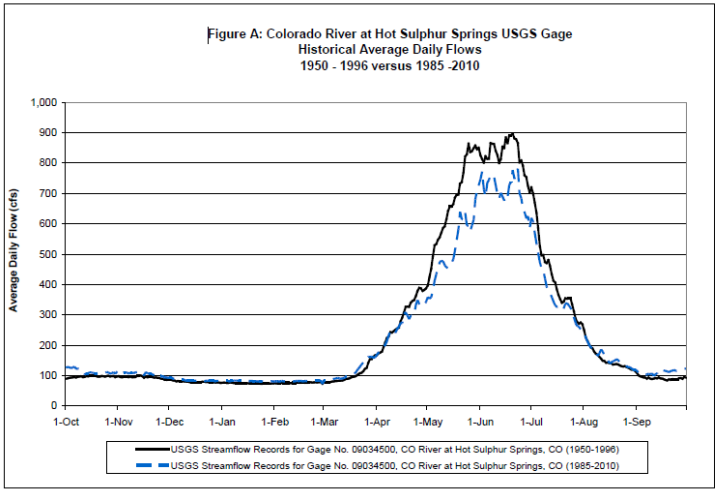
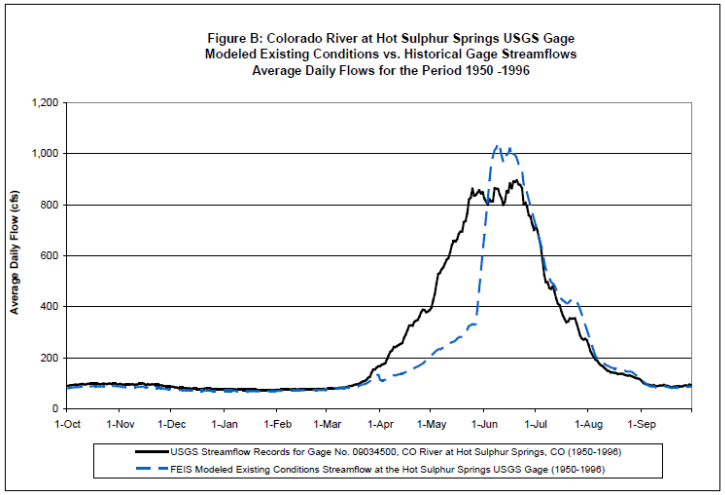
This letter is on behalf of the Upper Colorado River Alliance ("UCRA"). UCRA does hereby supplement its comments on the Final EIS for the Windy Gap firming Project (WGFP) provided by letter dated January 3, 2012. The attached analysis by Resource Engineering provides more detail on some of the most significant problems associated with the Final EIS's analysis of the hydrology and depletions, which in turn significantly affects every aspect of the impacts analysis and the mitigation.

Briefly, the assumptions employed in the Final EIS result in a misrepresentation of the baseline flow conditions for the upper Colorado River. The result is that the Final EIS underestimates the impact that WGFP will have on the critical peak flow period by over 50%. That error is then repeated throughout the analysis of the impacts of such depletions. Further compounding that error are other assumptions that minimize the apparent impact. This includes incorporating 73% of the cumulative depletions of WGFP and the Moffat Tunnel project into the "no action" alternative. The result of such assumptions is to grossly understate the actual impacts of the projects.

Of particular concern is the flushing flow analysis. Since Windy Gap Reservoir was built, sedimentation and armoring of the stream channel below Windy Gap has become a chronic problem. (*See, e.g., Colorado Division of Wildlife, September, 2011*). The main culprits for the sedimentation problem are operation of Windy Gap Reservoir itself and a lack of flushing flows.

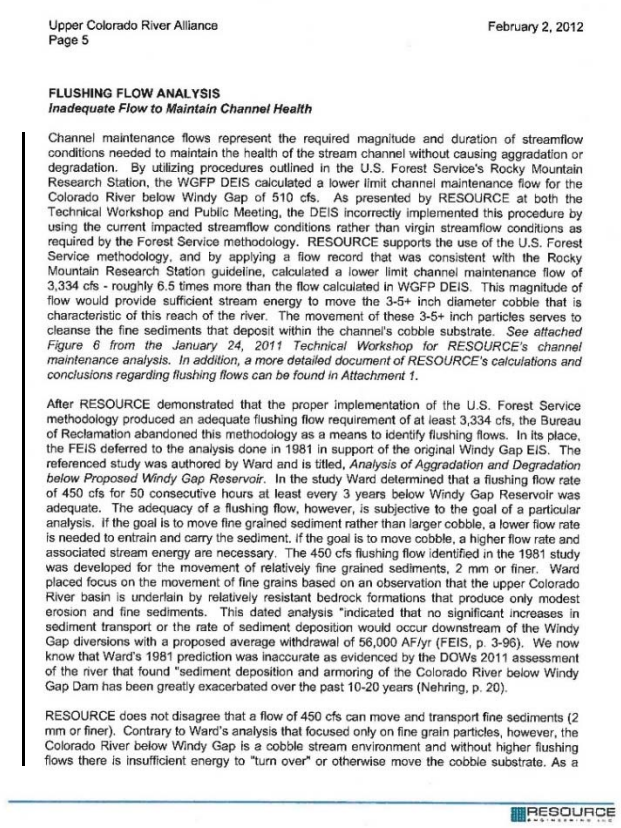
Comment	Upper Colorado River Alliance (Porzak, Browning, & Bushong, LLP) Comments – February 3, 2012	Response
62 (cont'd)	Mr. Collins, Mr. Ryan, Mr. Bezdek and Ms. Maldonado February 3, 2012 Page 2 of 2 (*Id.*). The draft EIS originally used USFS methodology in calculating a flushing flow of 510 cfs. While that methodology is appropriate, it was misapplied. Resource Engineering showed that when properly applied, the USFS methodology results in a needed flushing flow in excess of 3,000 cfs. After learning that the chosen USFS methodology documented the need for much greater flushing flows than originally anticipated, the Final EIS abandoned that methodology and now relies upon the analysis done in 1981 for the original Windy Gap project which predicted that 450 cfs was sufficient flushing flow. Given the current sedimentation problem, going back to the flawed 1981 flushing flow analysis is inexcusable. The attached Resource Engineering analysis by no means addresses all of the hydrology concerns. For example, UCRA remains concerned that the diversions allocated to the original Windy Gap in the Final EIS do not fairly represent historical use, but is unclear on the role that "in-lieu deliveries" and "borrowing" water from C-BT may have on the increased use of Windy Gap. (*See* Final EIS 3-18, n.1). No information is provided by the Bureau on this issue and this was not addressed in the Draft EIS. Further, the legality of allowing C-BT water to be "borrowed" by Windy Gap owners and re-paid at a later time is another concern. In conclusion, as previously set forth by UCRA, the Final EIS fails to recognize the current impacted condition of the upper Colorado River and its aquatic life community. By also failing to consider the actual baseline flow conditions, the analysis of impacts in the Final EIS is meaningless. Without a proper analysis of the issues, it is not possible for the EIS to analyze the extent to which the WGFP will exacerbate the current slate of problems or the true scope of mitigation that is necessary. UCRA strongly encourages the Bureau to address these issues in its Record of Decision. Sincerely, UPPER COLORADO RIVER ALLIANCE By: _____ Steve Bushong, Attorney for UCRA cc: Anne Castle, Assistant Secretary, Department of Interior Michael L. Connor, Commissioner of the Bureau of Reclamation Scott Franklin and Rena Brand, Corps of Engineers James B. Martin, EPA Region 8 Administrator Board of Directors, UCRA (Bud Issacs, Robert Craig, Tony Kay, Norm Carpenter, Alex Wiegers, Robert Weaver)	

Comment	Upper Colorado River Alliance (Porzak, Browning, & Bushong, LLP) Comments – February 3, 2012	Response
63	RESOURCE ENGINEERING INC. Upper Colorado River Alliance Steve Bushong, Esq. Porzak, Browning & Bushong, LLP 929 Pearl Street, Suite 300 Boulder, CO 80302 February 2, 2012 RE: Windy Gap Firming Project – Final EIS Dear Steve: Pursuant to your request, Resource Engineering, Inc. (RESOUCRE) has reviewed the Final Environmental Impact Statement (FEIS) for the proposed Windy Gap Firming Project (WGFP). RESOURCE had previously reviewed the Draft Environmental Impact Statement (DEIS) and provided initial comments at a January 24, 2011 technical workshop attended by both the proponent of the project and the Colorado Division of Wildlife (Technical Workshop). At that workshop, RESOURCE raised concerns with the validity of the calculated existing hydrology and the analysis of the required channel maintenance below Windy Gap Dam. RESOURCE later attended the Wildlife Commission's May 6, 2011 meeting to provide public testimony on behalf of the Upper Colorado River Alliance (Public Meeting). At that meeting, RESOURCE contrasted the baseline assumptions in the WGFP DEIS to the existing degraded environmental conditions in the Upper Colorado River, commented again on the validity of the underling hydraulic calculations, and pointed out the scientific errors and inconsistencies at the foundation of the proposed mitigation plans. In review of the FEIS, RESOURCE found that the technical issues presented at both the Technical Workshop and Public Meeting persist. This letter summarizes RESOURCE's most significant concerns regarding the hydrology aspects of the Environmental Impact Statement for the Windy Gap Firming Project. RESOURCE also has concerns with the aquatic life impact analysis and proposed mitigation described in the FEIS; however, many of those issues have already been addressed by the Upper Colorado River Alliance and Trout Unlimited. **BASELINE STREAMFLOW** ***Improperly Developed = Overstated Existing Conditions = Understated Impacts*** The FEIS continues to underestimate the impact that the WGFP will have on the Colorado River. RESOURCE found that the FEIS continued to improperly calculate baseline streamflow conditions, and as a result the conclusions drawn in the FEIS fail to properly assess the potential impacts. The baseline streamflow conditions calculated in the FEIS are the same as those used in the DEIS, which RESOURCE previously showed to be hundreds of cubic feet per second (cfs) above the existing streamflow measured at the USGS gage downstream of Windy Gap Reservoir. This elevated baseline streamflow condition is subsequently used throughout the FEIS document in its assessment of project impacts. As a result, the environmental consequences described in the FEIS document are flawed and underestimate actual impacts. Consulting Engineers and Hydrologists 909 Colorado Avenue ■ Glenwood Springs, CO 81601 ■ (970) 945-6777 ■ Fax (970) 945-1137	63. The Corps agree with the response to comments provided by the BOR, as follows: *Resource Engineering claims the FEIS overestimates the peak June streamflow under existing baseline conditions by as much as 300 cfs or 42 percent when compared to the average daily streamflow measured at the USGS gage below Windy Gap from 1985-2010 (see Resource Engineering Figure 1). Resource Engineering asserts that this is a result of a decision not to incorporate a forecasting function in the Windy Gap Firming Project model. Figure 1 presented by Resource Engineering is inaccurate for several reasons. Resource Engineering compared average daily flows that were calculated based on two very different periods. The average daily historical flows were calculated based on the period from 1985 through 2010, whereas the average modeled daily flows were calculated based on the model study period from 1950 through 1996. The period from 1985 through 2010 is hydrologically different than the period from 1950 through 1996; therefore, there are differences in flow because one period is inherently wetter or drier overall than the other. Resource Engineering claims the differences in flow are due to inaccuracies in the model, however, a considerable portion of the difference is due to the fact that gaged flows during the period from 1985 through 2010 were simply lower than gaged flows during the period from 1950 through 1996. Figure A (ERC) shows historical average daily flows at the Hot Sulphur Springs (HSS) gage from 1950 through 1996 compared with average historical daily flows at the same gage from 1985 through 2010. Daily flows at the HSS gage after 1994 when the gage was discontinued were based on a correlation with the Windy Gap gage due to its proximity. The HSS gage was selected as opposed to the Windy Gap gage because gaged flow data were available for almost the entire model study period, whereas the Windy Gap gage did not come on line until 1981. Figure A demonstrates that the peak flow in early June is 191 cfs higher for the period from 1950 through 1996 versus the period from 1985 through 2010; however, Resource Engineering attributes the entire difference in flows shown in their Figure 1 to inaccuracies in the model and the lack of a forecasting function. Resource Engineering should base the comparison of flows on the same period of record. Figure B (ERC) compares historical average daily flows and modeled Existing Conditions (baseline) flows at the HSS gage from 1950 through 1996. As shown in Figure B, the average daily modeled peak flow in early June is 189 cfs or 23 percent higher than the gaged flow as opposed to 300 cfs or 42 percent as suggested in Resource Engineering's Figure 1. However, as described below, comparing historical and modeled data even for the same period is not an apples-to-apples comparison.*

Comment	Upper Colorado River Alliance (Porzak, Browning, & Bushong, LLP) Comments – February 3, 2012	Response
63 (cont'd)	Upper Colorado River Alliance Page 2 February 2, 2012 As presented by RESOURCE at both the Technical Workshop and Public Meeting, the analysis to determine the impact of the WGFP on the Colorado River system was inappropriately modeled in the DEIS. The DEIS used the Upper Colorado Water Resources Planning Model from the Colorado Decision Support System (CDSS Model) to develop daily streamflow conditions below Windy Gap under existing conditions and proposed alternatives. The model was operated on a monthly time step from 1950 to 1996. The monthly outputs were then disaggregated into daily streamflow values using historical USGS gage records. When RESOURCE compared the average daily hydrograph calculated by the WGFP DEIS under existing conditions to the average daily hydrograph recorded at the USGS gage below Windy Gap, it was apparent that the WGFP DEIS hydrograph was incorrectly distributed. RESOURCE concluded that this error was largely a result of a modeling assumption not to incorporate a forecasting function in the operational criteria for Windy Gap Reservoir. Instead, the model pumps water when in-priority from Windy Gap Reservoir into Granby Reservoir whenever storage space is available – regardless of the water year (wet, dry, average). As a result, more water is diverted from Windy Gap Reservoir and stored in Granby Reservoir in the early spring without regard for whether a spill is forecasted. The "additional" early spring water is then spilled back to the Colorado River as Granby Reservoir fills under its C-BT water rights during the natural runoff season in May and June. The volume of the spilled back water that is added to the streamflow calculation below Windy Gap is significant – 7,000 to 25,000 AF. Operating in this manner is not how Windy Gap has historically been managed. The proponents of the WGFP characterize the issues associated with type of operations as simply a "retiming" of the streamflow. The "retiming" of the streamflow, however, provides an artificially high volume of water in the summer from which to evaluate the most significant impacts of the WGFP. RESOURCE presented at both the Technical Workshop and Public Meeting evidence that showed that the DEIS overestimated the peak June streamflow under existing "baseline" conditions by as much as 300 cfs or 44% when compared to the average daily streamflow measured at the USGS gage below Windy Gap from 1985-2010. RESOURCE also compared post project conditions under the preferred action alternative (Alt. 2) to an adjusted average daily streamflow below Windy Gap and showed that the WGFP overestimated the peak June streamflow by 280 cfs or 53%. *See attached Figure 5 from the January 24, 2011 Technical Workshop for RESOURCE's streamflow analysis.* Based upon the review of various tables and figures contained in the FEIS, the calculated streamflow conditions used in RESOURCE's comparison did not change from the DEIS and remain valid (FEIS, Figures 3-14 on p. 3-44 and Table A-10). **FEIS Response to DEIS Criticism:** The FEIS addresses the criticism pertaining to the high existing "baseline" condition associated with the CDSS Model used in the DEIS by characterizing the problem as a "retiming" issue – streamflow may be overstated in the summer, but are correspondingly understated during the March/April pumping period. On an average annual basis, therefore, the amount of water flowing past Windy Gap is accurate. The FEIS concludes that "forecasting has little effect on the impact analysis below the Windy Gap diversions," and ultimately retains the methodology used in the DEIS (FEIS, p. 3-20). RESOURCE	 

Comment	Upper Colorado River Alliance (Porzak, Browning, & Bushong, LLP) Comments – February 3, 2012	Response
63 (cont'd)	 RESOURCE does not agree with the FEIS response. The FEIS relies heavily on incorrectly calculated daily streamflow hydrographs to evaluate both environmental effects and cumulative effects of the WGFP. The following four examples highlight areas in the FEIS where the use of elevated baseline streamflows can lead to an improper analysis and study conclusion. 1. Chapter 3.5 of the FEIS analyzes the environmental impact that the WGFP will have on the surface water hydrology of the Colorado River below Windy Gap by comparing changes in the daily streamflow between the existing "baseline" condition and the proposed action alternatives. The FEIS concludes from these comparisons that the "greatest volume of reduction would occur during peak runoff in June" (FEIS, p. 3-43). As RESOURCE has shown, the CDSS Model used in the FEIS overestimates the daily streamflow in June on average by 44%. The greatest volumetric impact, as identified by the FEIS, is therefore applied against a baseline streamflow that is overstated by 44% or 300 cfs. The FEIS goes on to show in Table 3-13 (FEIS p. 3-44) that the number of days that the daily streamflow dropped below 100 cfs, nearing the 90 cfs minimum flow requirement, in the entire 47 year study period would not change in May or June as a result of the proposed action alternatives. Again, this streamflow comparison is based an existing "baseline" condition that overestimate the average daily streamflow in June by 300 cfs. The FEIS does not properly assess the true impact of the proposed action alternatives. Using incorrect baseline hydrology to evaluate changes to the Colorado River is inappropriate and does not assess the true impact of the WGFP. 2. Chapter 3.7 of the FEIS analyzes the environmental impact that the WGFP will have on the stream morphology of the Colorado River by comparing changes in daily streamflow between the existing "baseline" condition and the proposed action alternatives in terms of the occurrence and duration of flow within a set range. The FEIS evaluates the percent of years and number of days that a set range of flows occurred in the 47 year study period under the existing "baseline" condition and under the proposed action alternatives (FEIS, Table 3-32 p. 3-97). The percentages derived for the existing "baseline" condition are then compared to the percentages derived for the proposed action alternatives. These statistics were based upon an incorrect baseline streamflow and thus are essentially meaningless. 3. Chapter 3.9 of the FEIS analyzes the environmental impact that the WGFP will have on the aquatic resources of the Colorado River by referencing sources that support the reduction of peak streamflow event for the betterment of the fish population. The FEIS concludes that the reduction in peak streamflow by the WGFP could actually "increase available fish habitat" and "benefit fish" (FEIS, p. 3-216 and p. 3-255). This conclusion, however, is based on streamflow hydrology that overestimates the peak by more than 44% under existing "baseline" conditions and 53% under the preferred action alternative (Alt. 2). Moreover, it is in direct contradiction to a study released by the Colorado Division of Wildlife in 2011 that examined the aquatic resources under existing baseline conditions. That study "conclusively demonstrated that a native fish the mottled sculpin, has been extirpated from the Colorado River below WDR [Windy Gap Reservoir] all the way to the Blue River confluence" (Nehring, p. 80). 	*Even when comparing similar periods, it is not appropriate to compare modeled Existing Conditions data to historical data. Demands have changed considerably, certain facilities and reservoirs were not in operation, and river administration and project operations have changed over the course of the study period. The differences in historical and modeled flows below Windy Gap reflect all of these factors including the lack of a forecasting function. One would expect potentially large differences when comparing model results for Existing Conditions with historical records. Existing Conditions reflect the current conditions including administration of the river, demands, infrastructure, and operations. Therefore, even the comparison presented in Figure B, which shows a difference in peak flows of 189 cfs, does not indicate there is an error in the model. The purpose of the Existing Conditions model run is not to replicate historical hydrology but rather to demonstrate what flows will be under current conditions. Windy Gap diversions under Existing Conditions reasonably reflect recent operations and diversions and are much higher than the 25-year average from 1985 through 2010. Thus, modeled Existing Conditions more accurately reflects current conditions than historical data.* *Figures 3 and 4 presented by Resource Engineering are also inaccurate. In both figures Resource Engineering used modeled data for the period from 1950 through 1996 and historical average daily flows for the period from 1985 through 2010. Based on comparisons using that data, Resource Engineering concluded that the FEIS overestimates post-project streamflows by 53 percent. That figure is inaccurate because Resource Engineering compared averages using different periods of record. To provide a relevant comparison, the same period of record should be used as shown in Figure 3-14 of the FEIS. In addition, it is not accurate to compare modeled Proposed Action flows to historical daily flows for the reasons explained above. By comparing modeled data to historical data, it is not possible to separate flow differences caused by changes in demands, operations, and administration from flow differences attributable to the Windy Gap Firming Project. The intent of the analysis in the FEIS is to isolate the changes associated with implementation of the WGFP alternatives.* *The annual decision to pump Windy Gap water takes into consideration many factors including snowpack, Granby Reservoir C-BT and Windy Gap contents, precipitation, Big Thompson River basin forecasts, and orders for Windy Gap water. Incorporating a forecasting function in the model would require making a number of assumptions regarding the variables listed above, in which case it may or may not improve the accuracy of model output. Forecasting does not eliminate Windy Gap spills as evidenced by historical Windy Gap spills in 1995, 1996, and 2011. For example, Windy*

Comment	Upper Colorado River Alliance (Porzak, Browning, & Bushong, LLP) Comments – February 3, 2012	Response
63 (cont'd)	 4. Chapter 3.19 of the FEIS analyzes the environmental impact that the WGFP will have on river recreation by comparing changes in the monthly streamflow between the existing "baseline" condition and the proposed action alternatives in terms of boating needs. The FEIS states that "400 cfs is needed for kayaking in June and July" in the reach from Windy Gap Reservoir to the confluence of the Williams Fork (FEIS, p.3-340). The FEIS then concludes that "under all alternatives, the average monthly streamflow would remain above 400 cfs in June" (FEIS, p. 3-340). This conclusion, however, is founded on the results of the CDSS Model used to calculate the streamflow conditions – which, RESOURCE has shown overestimates summer time flows under all alternatives. As a result, stating that the streamflow conditions will remain above 400 cfs may not be accurate; particularly when the cumulative impact of the Moffat Project is considered. Based on these examples, RESOURCE disagrees with the FEIS's position that the "retiming" of streamflow conditions has little effect on the impact analysis. As discussed in some depth above, the FEIS overstates the average daily streamflow during the period of greatest impact (June and July). As a result, the comparative analyses used to evaluate environmental consequences regarding streamflow levels, the needed flushing flows for proper channel maintenance and sediment transport, recreational rafting and other resource elements are invalid. It is more than a simple "retiming" issue. **NO ACTION ALTERNATIVE** ***Improper Assumption = Invalid Comparison = Understated Impacts*** Table 3-20 of the FEIS suggests that there is only a small 2% percent cumulative impact to the Colorado River between the preferred action alternative (Alt. 2) and the No Action alternative. This minimal difference is attributable, in part, to an inappropriate allocation of future depletions to the No Action alternative. The FEIS estimates that 21,787 AF of the 29,870 AF or 73% of the combined project depletions will occur anyways under the No Action alternative (FEIS, Table 3-20 and Figure 3-27). For the WGFP alone, the FEIS estimates that 12,444 AF of the 21,283 AF or 58% of the expected depletions will occur anyways under the No Action alternative (FEIS, Table 3-6). To support this estimate, the FEIS assumes that the WGFP proponents will construct an enlargement of the Ralph Price Reservoir, yet the FEIS discloses that implementation of the No Action alternative will provide only 1,200 AF of new firm yield. With such little firm yield available and an inability to "preposition" its water with C-BT, it is questionable that east slope participants would spend tens of millions of dollars in construction of new storage facilities such as the Ralph Price Reservoir. Moreover, an enlargement of a main reservoir such as Ralph Price will require numerous federal, state, and local permits; and as part of the project, it is probable that the federal agencies will require the preparation of an EIS. The EIS would then examine the probable impact that the new reservoir operations would have on the streamflow and aquatic life of the Colorado River. Given the poor baseline conditions of the upper Colorado River system, as identified in the 2011 DOW study (Nehring, et.al.), it is not clear that the project would be approved much less operated as assumed in the WGFP FEIS. By simulating an unrealistic "No Action" alternative, which incorporates over half of the depletive impact associated with the preferred action alternative - the FEIS understates the magnitude of impact the preferred action will have on the Colorado River system. 	*Gap water was pumped in May and June of 1995, yet Granby Reservoir spilled in July that year. The year 1995 was one of the five wettest years in the study period, yet more than 14,000 acre-feet of Windy Gap water was pumped as late as early June that year. Similarly, almost 7,000 AF was pumped in April and May 2010 and Granby Reservoir would have spilled that year had preemptive measures not been taken to avoid a spill. As the model is configured without a forecasting function, Windy Gap diversions occur as long as storage space is available. As a result, Windy Gap diversions may be overstated in some wet years; however, historical operations show that Windy Gap water would be pumped in some wet years under Existing Conditions. Inclusion of a forecasting function may prohibit Windy Gap pumping in some above average and wet years that would otherwise occur as evidenced by Windy Gap diversions in 1995 and 2010, in which case a forecasting function in those instances would decrease the accuracy of the model results.*
64		*With respect to the impact analyses, the lack of a forecasting function in the WGFP Model may overstate Windy Gap diversions in some wet years under Existing Conditions resulting in higher flows in May, June, and July if water pumped earlier in the year is spilled. However, as pointed out above, it is difficult to ascertain in which wet years pumping should be less under Existing Conditions since the decision to pump depends on numerous factors and does not follow defined rules. This issue does not affect Windy Gap diversions in average and dry years when Granby Reservoir does not fill; therefore, Windy Gap pumping, net depletions to the Colorado River and associated impacts are accurately estimated in dry years, which are typically more critical for aquatics, water quality, and other flow-related resources. The lack of a forecasting function also has minimal effect on model results for the Proposed Action and Alternatives 3, 4, and 5 because Windy Gap diversions early in the season would be stored in firming reservoirs as opposed to Granby Reservoir and as a result, these diversions would not be spilled.* 64. Section III (a) of the Corps ROD. The Corps agrees with the response to comments provided by the BOR, as follows: *The No Action Alternative presents what WGFP Participants would do if Reclamation does not allow the proposed connections to C-BT facilities. Consistent with CEQ guidance on what should be considered in a no action alternative, it does not mean that agencies stop what they are doing. In the case of existing agreements, prior court decisions and CEQ guidance would define no action as no change to existing agreements. For WG and the WGFP, this means Reclamation would continue operation under the existing agreement between Reclamation and the Subdistrict for conveyance of*

Comment	Upper Colorado River Alliance (Porzak, Browning, & Bushong, LLP) Comments – February 3, 2012	Response
65		*Windy Gap water through the C-BT Project system (see CEQ 40 Questions, #3). This also includes foreseeable actions by the Participants. For most Participants, this includes continuing to take Windy Gap deliveries and increasing those deliveries as water demand increases within the capacity of the existing Windy Gap Project facilities and available storage in Granby Reservoir. One Participant would drop out of the WGFP. The City of Longmont would pursue enlargement of Ralph Price Reservoir to store its Windy Gap water. While there is no guarantee that enlargement of Ralph Price Reservoir would acquire all of the regulatory authorizations, it is a reasonable action for the City of Longmont, and no fatal flaws were discovered in review of this alternative in the WGFP FEIS. The majority of the hydrologic impacts, included under the No Action Alternative entail increased Windy Gap diversions by Participants that they can currently do without any infrastructure changes or additional authorizations or approvals from Reclamation. It is unreasonable to assume that Windy Gap diversions would remain status quo under the No Action Alternative.* 65. The Corps agrees with the responses to comments provided by the BOR, as follows: *The Nehring et al. (2011) report provides no documentation, measurements, or physical evidence supporting embedding and armoring of the Colorado River below Windy Gap Reservoir, so it is difficult to understand the nature and the condition of the river based the report's general description. Operation of Windy Gap Reservoir is not a source of sedimentation; on the contrary, the reservoir generally captures and removes sediment from the Colorado River. Hence the need for dredging that has occurred one time in 2010. The Nehring (2011) report states that "sediment deposition and armoring of the Colorado River below Windy Gap Dam has been greatly exacerbated over the past 10-20 years, due to extended droughts, impoundment and storage of spring flushing flows in Willow Creek and Granby Reservoirs, and depletions from transmountain diversions," and "it is our conclusion that chronic sedimentation and clogging of the interstitial spaces in the cobble-rubble dominated riffles areas of the upper Colorado River below WGD is the overarching problem that has increasingly compromised the biotic integrity and proper function of the river over the past 25 years." However, the report does not mention any measurement of channel embeddedness, collection of sediment or other stream channel data, evaluation of sediment movement/deposition, or changes in stream morphology in the Colorado River below the Windy Gap dam or elsewhere from which to base these statements. In addition, a statement in the Nehring 2011 report that "at least twice since 2001, Windy Gap Dam has been drained and untold tons of sediment has been flushed into the Colorado River in mid to late summer, long after spring flushing flows were available*

Comment	Upper Colorado River Alliance (Porzak, Browning, & Bushong, LLP) Comments – February 3, 2012	Response
65 (cont'd)	 result, the substrate stagnates as the voids between the cobbles become filled with sediments. This problematic scenario is exactly what has happened to the Colorado River below Windy Gap under current conditions as confirmed by the 2011 DOW study, which stated that "chronic sedimentation and clogging of the interstitial spaces in the cobble-rubble dominated riffles areas of the upper Colorado River below WGD [Windy Gap Dam] is the overarching problem that has increasingly compromised the biotic integrity and proper function of the river over the past 25 years" (Nehring, p. 31). The report goes on to mention that the "proposed firming projects at Windy Gap and Moffat Tunnel," which will add an approximate 30,000 AF/yr of new depletions, "are only going to further exacerbate this situation" (Nehring, p. 31). Additionally, it should be noted that the role that Windy Gap Reservoir has played in this sedimentation problem by releasing fine silts at low flows, is also not addressed in the FEIS. The FEIS references a recent study of sediment transport in the upper Colorado River (Corps 2010) to support the use of Ward's 1981 flushing flow analysis. RESOURCE has not had an opportunity to review this new study. Based upon the description and graphics contained in the FEIS, however, it appears that this new study has also limited its focus to the transport of relatively fine grain sediments (FEIS, p.3-91 and 3-92). Moreover, the new study took place near Parshall, Colorado at a location that is approximately 15 miles downstream of the Windy Gap Reservoir diversions. **CUMULATIVE IMPACT** ***Make it Clear*** 66 Table 3-20 of the FEIS suggests that the cumulative impact of the WGFP and the New Moffat Collection System (Moffat Project) would reduce the native flow in the Colorado River by a modest 7% over existing "baseline" conditions. A 7% impact to the annual streamflow volume of the Colorado River could easily be interpreted by the public as insignificant. The actual impacts need to be expressed more clearly so that everyone understands the true impact. Stated more directly; the WGFP and Moffat Project will combine to deplete the Colorado River below Windy Gap by an average of 30,000 AF annually. This new depletion will result in a 20% reduction in the existing yield of the Colorado River below Windy Gap. This new 20% depletion together with historic trans-basin diversions will effectively reduce the historic native streamflow of the Colorado River below Windy Gap by a total of 73%. These statistics were originally presented by RESOURCE at the Technical Workshop, and showed that 67% of the native upper Colorado River supply is currently diverted to the East Slope on an average annual basis. This percentage was derived from the available records of diversion for the four major transbasin structures: (1) the Grand River Ditch, (2) Denver's Moffat Collection System, (3) the Colorado - Big Thompson Project, and (4) the Windy Gap Project. RESOURCE showed that these transbasin structures combine to divert an approximate 327,500 AF/yr from the upper Colorado River, leaving approximately 160,000 AF/yr in the native stream system. In average years, the WGFP and Moffat Project propose to divert an additional 30,000 AF/yr. This volume represents approximately 20% of the remaining current supply. The WGFP DEIS was updated to include a similar diversion analysis in the FEIS (Tables 3-1 and 3-20). While the exact numbers used in the FEIS are slightly different than RESOURCE's evaluation, the concluding percentages are similar: the streamflow below Windy Gap is 33% of 	*to transport the sediment downstream" is incorrect. Only once during this period (2010) did the NCWCD release some sediment from the Windy Gap dam after obtaining a 404 permit from the Corps of Engineers and after coordinating with Grand County. This release was related to a dredging operation to remove sediment deposited in Windy Gap Reservoir near the pumping plant. Dredging of the reservoir was only practicable during low flows and most of the sediment was contained within the reservoir. The sediment discharge was followed by a flushing flow release of water from Granby Reservoir to transport sediment downstream. This discharge and flush of sediment was conducted in coordination and agreement with the CDOW (now CPW).* *Despite changes that have occurred in the Upper Colorado River Basin since 1938 (especially flow changes due to C-BT diversions and the construction of Lake Granby), the form and structure of the Colorado River channel, banks, floodplain and watershed within the study area has changed very little. The upper Colorado River is a morphologically stable stream. Because regulation of the river, which began in 1949 when water began to be stored in Lake Granby, has not perceptibly altered the Colorado River below the dam during a period of sixty years, the use of Schmidt and Potyondy's methodology for analyzing channel maintenance flows is considered appropriate for the study area. While instantaneous peak flows were higher during the first half of the 20th century, the decrease in peak flows that occurred during the second half of the 20th century did not perceptibly alter stream morphology or sediment transport in the Colorado River.* *Calculation of channel maintenance flows based on virgin river hydrology is not useful in evaluating the effects of the alternative actions. For a NEPA analysis, the significance of resource impacts is based on changes from no action, not historic conditions. Tables 3-1 and 3-20 in the FEIS provides background information on changes in hydrology prior to water diversions. For the EIS, the model results for 1950-1996 were used to calculate the channel maintenance flows provided in Table 3-32 (and other similar tables). The lowest range of channel maintenance flows provided in Table 3-32 represents bankfull flow at Hot Sulphur Springs (based on a range of descriptions from various sources on when bankfull flows occur) and is 510 to 1,240 cfs. At the nearby Windy Gap gage, the USGS*

Comment	Upper Colorado River Alliance (Porzak, Browning, & Bushong, LLP) Comments – February 3, 2012	Response
66 (cont'd) 67	 its native volume and the cumulative effect of the proposed actions will reduces this amount an additional 30,000 AF/yr. *See attached Figure 1 from the January 24, 2011 Technical Workshop for RESOURCE's cumulative analysis.* RESOURCE concludes that the FEIS continues to improperly calculate baseline streamflow conditions and as a result, the comparative analyses used to evaluate environmental consequences regarding streamflow levels, the needed flushing flows for proper channel maintenance and sediment transport, recreational rafting and other resource elements are invalid. Further, as noted above and by others, the FEIS also does not recognize the loss in aquatic species over the past 30 years as described in the Colorado Division of Wildlife's 2011 study (Nehring, et al.). Without a proper analysis of these issues, it is impossible to adequately assess impacts or the necessary mitigation to address those impacts. Please call if you have any questions or need additional information. Sincerely, **RESOURCE ENGINEERING, INC.** R. Scott Fifer Hydrologist Ashley Moffatt, P.E. Water Resource Engineer 	66. The Corps agrees with the response to comments provided by the BOR, as follows: *The purpose of Table 3-20 is to demonstrate the percentage of native flow remaining at the Windy Gap diversion under Existing Conditions and under Alternatives 1, 2 and 5. While the average annual depletion under Alternative 2 of 30,000 AF/yr represents approximately 20 percent of the remaining native flow under Existing Conditions, it is 6 percent of the native flow at Windy Gap prior to the effect of depletions from the Grand River Ditch, C-BT Project, Denver Water's Moffat Collection System Project and Grand County municipal and industrial use. For a presentation of the cumulative effects of the WGFP, the Moffat Collection System Project and other reasonably foreseeable future actions relative to the flows in the Colorado River below Windy Gap refer to Table 3-21. As shown in Table 3-21 in the FEIS, reasonably foreseeable future actions will deplete Existing Conditions flows in the Colorado River below Windy Gap by approximately 30,000 AF or 20 percent as shown in Table 3-21. This is also described in the sub-section, Colorado River below the Windy Gap Diversion, on page 3-74 of the FEIS. Therefore, the FEIS presents the effects on both native flows and flows under Existing Conditions in the Colorado River below Windy Gap.* 67. Please refer to prior comments.

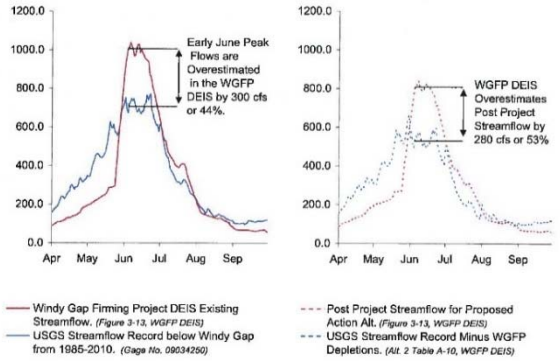
Comment	Upper Colorado River Alliance (Porzak, Browning, & Bushong, LLP) Comments – February 3, 2012	Response
	Figure 5 **Concerns with Windy Gap Firming Project DEIS** ● The Windy Gap Firming Project BESTSM Streamflow Model **over estimates streamflow** thereby creating an **improper baseline condition** against which to measure potential impacts. ● The Windy Gap Firming Project DEIS **overstates June streamflow** by more than **40%**. ● The exaggerated baseline flow causes the estimated **post project streamflow** conditions during June and Mid-Summer to be **overstated** by as much as **53%**. **Colorado River below Windy Gap** **Average Daily Streamflows** **Existing Conditions** (cfs) **Post Project Conditions** (cfs)  5 of 10 RESOURCE ENGINEERING, INC.	

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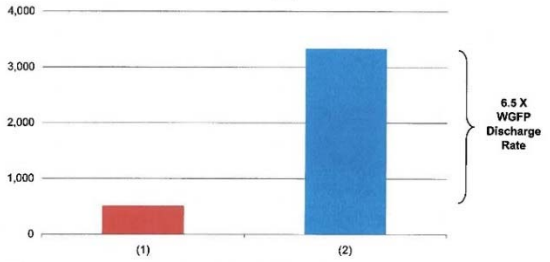
	Figure 6 **Channel Maintenance Flows** **Windy Gap Firming Project** • The Windy Gap Firming Project DEIS study team utilized procedures outlined in the U.S. Forest Service's Rocky Mountain Research Station to develop a calculated channel maintenance flow of 510 cfs. *(Schmidt and Potyondy, 2004)* • RESOURCE supports use of the U.S. Forest Service methodology for defining channel maintenance flow; however, the WGFP technical team **incorrectly implemented the procedure** resulting in a low estimate of the required streamflows. • Utilizing a study period **consistent with the guidelines** contained in the U.S. Forest Service procedure produces a lower limit channel maintenance flow of 3,334 cfs, which is 6.5 times higher than the 510 cfs discharge calculated in the WGFP technical report. **Channel Maintenance Flow** **U.S. Forest Service Rocky Mountain Research Station Procedure** **(cfs)**  (1) Lower limit maintenance flow calculated by the Windy Gap Firming Project technical team. (2) Lower limit maintenance flow calculated by Resource Engineering, Inc. Stream recurrence calculation based on streamflow records, 1904-1935. U.S. Forest Service Procedure by Schmidt and Potyondy, 2004 6 of 10 RESOURCE ENGINEERING, INC.	

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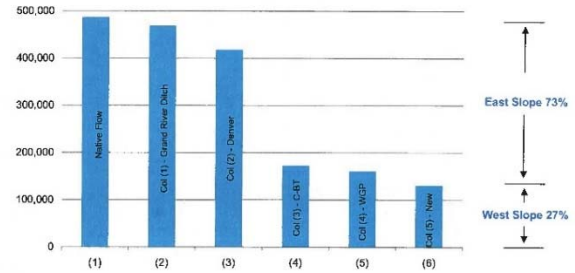
	Figure 1 **Colorado River at Windy Gap** **Historic and Proposed Transbasin Diversions** • Upon completion of the Moffat Collection Project and the Windy Gap Firming Project, an **additional 28,900 AF to 30,000 AF** will be diverted from the Colorado River headwaters *(Moffat DEIS and WGFP DEIS)*. • Denver Water, the C-BT, and the Windy Gap Project combined with the Grand River Ditch transbasin diversions presently divert 327,500 AF/yr on average. This volume represents 67% of the entire water yield in the Colorado River above Windy Gap. • With diversions of an **additional 30,000 AF** as proposed, the transbasin diversions effectively deplete 73% of the natural streamflow of the basin. This is considered conservative; Grand County has estimated that the projects will deplete 85% of the natural streamflow. **Colorado River at Windy Gap** **Cumulative Impact of Transbasin Diversions on Colorado Streamflow** **(acre-feet)**  (1) Colorado River at Windy Gap Native Flow (USGS Windy Gap Gage Record 1985-2010 + Steps (2) through (6)). (2) Basin yield following historic Grand River Ditch diversions (18,500 AF, Table 3.1-14 Moffat DEIS) (3) Basin yield following Moffat Tunnel diversions (51,000 AF, Denver Water Records (1975-2005) - 5,100 AF of Gumlick Tunnel Imports. Data presented in BBA Water Consultants Technical Memorandum dated March 17, 2010). (4) Basin yield following C-BT Adams Tunnel diversions, including evaporation (231,679 AF + 13,500 AF, Table 3-1 WGFP DEIS) (5) Basin yield following Windy Gap diversions (11,500 AF, Table 3.1-14 Moffat DEIS) (6) Basin yield following Windy Gap Firming Project and New Moffat Collection System diversions (30,000 AF) Jan 24, 2011 1 of 10 RESOURCE ENGINEERING, INC.	

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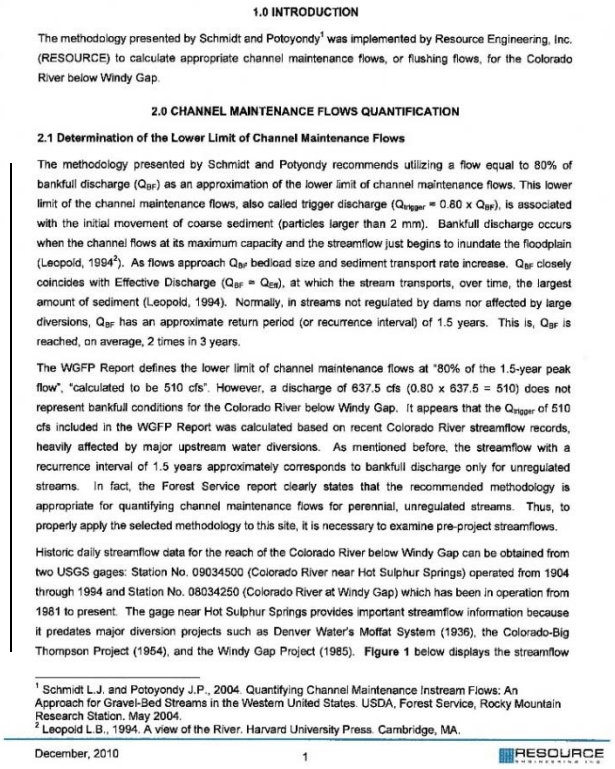
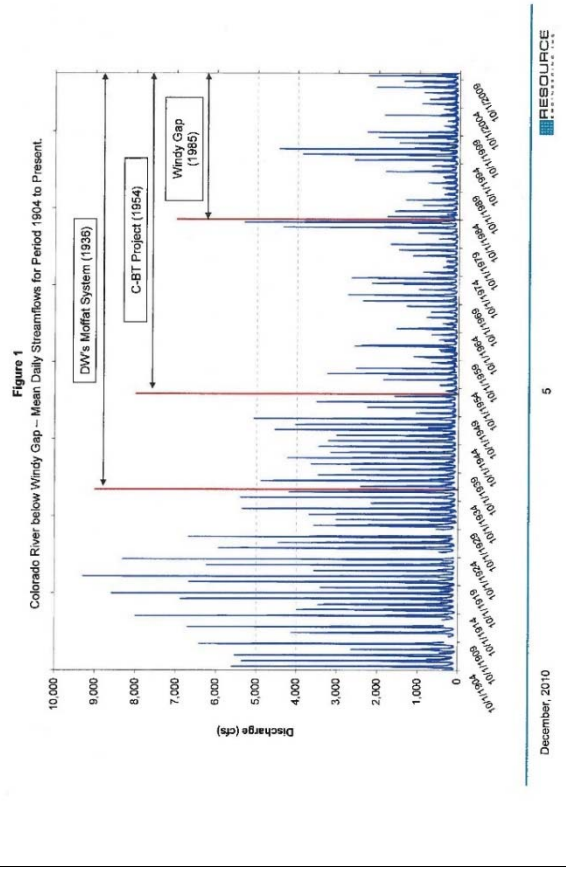
	ATTACHMENT 1 Technical Document on Channel Maintenance Flows prepared by Resource Engineering, Inc. December 2010	

Comment	Upper Colorado River Alliance (Porzak, Browning, & Bushong, LLP) Comments – February 3, 2012	Response
68		68. The Corps agrees with the response to comments provided by the BOR, as follows: *See response to Comment No.* [21] *on why the Schmidt and Potyondy method is appropriate for use to calculate channel maintenance flows for the WGFP EIS. Streamflow in the Colorado River changed substantially after construction of the C-BT Project and Granby Reservoir began storing water in 1947. However, over the last six decades, the river channel has remained stable despite changes in the timing and quantity of flows. The form and structure of the channel, banks, and floodplain have changed very little. The river has continued to convey sediment without aggradation or degradation of the stream channel. To use streamflow data for the modeled period of 1950 to 1996 represents this post-1947 period, and this is what was used to calculate channel maintenance flows representative of current baseline conditions.*

Comment	Upper Colorado River Alliance (Porzak, Browning, & Bushong, LLP) Comments – February 3, 2012	Response
68 (cont'd)	data recorded by the Hot Sulphur Springs gage (note how peak annual flows have decreased with each major diversion). RESOURCE performed a flood frequency analysis using the Log-Pearson Type III distribution and Hot Sulphur Springs daily flow data for the period of 1904 through 1935 (**Figure 2**). This period contains 27 years of continuous daily streamflow records not affected by the aforementioned major diversions (data is not available for water years 1910, 1913, 1925, and 1929). This historic record exceeds the recommendation of a minimum of 20 years of daily discharge data to adequately represent long-term streamflows. The flood frequency analysis, using pre-transbasin diversions data, indicates that an average daily discharge of 4,168 cfs could be expected to occur 2 times every 3 years in the Colorado River below Windy Gap under "natural" conditions. In other words, the historic channel of the Colorado River below Windy Gap, created by natural fluvial processes over thousands of years, flows full at discharges near 4,168 cfs ($Q_{BF} \approx Q_{1.5\text{-yr}}$ = 4,168 cfs). Thus, the lower limit of channel maintenance flows as determined by the Forest Service methodology is approximately equal to 3,334 cfs (0.80 x 4,168 = 3,334). This is 6.5 times larger than the 510 cfs discharge calculated in the WGFP Report using the same methodology. **2.2 Determination of the Upper Limit of Channel Maintenance Flows** Schmidt and Potyondy recommend the 25-year discharge as the upper limit for channel maintenance flow as a means to balance prevention of flood damage with the transport of sufficient sediment, in mass and particle size, and periodic inundation of the floodplain necessary for adequate channel maintenance and riparian regeneration ($Q_{cap} \approx Q_{25\text{-yr}}$). This recommendation is supported by the fact that restricting the upper limit of maintenance flows produces channel aggradation (sediment deposition in the stream channel, particularly larger particle sizes). For instance, Schmidt and Potyondy analyzed several sites throughout Colorado and concluded that limiting the range of maintenance flows to the 5-year flood can cause the stream to leave up to 10% of the sediment in the channel bed. The WGFP Report recognizes that Q_{cap} should be calculated as the 25-year instantaneous peak flow and calculates it as $Q_{25\text{-yr}}$ = 6,250 cfs. It appears that this upper limit flow was calculated using post-diversion projects stream data. RESOURCE calculations show that an unregulated Colorado River below Windy Gap should have a $Q_{25\text{-yr}}$ = 9,281 cfs (i.e. peak discharge expected to have occurred once every 25 years during the pre-diversion projects period). RESOURCE's calculation was performed using the Log-Pearson Type III statistical analysis with the Hot Sulphur Springs gaged data for the 1904-1935 period as described above (**Figure 2**). December, 2010 2 RESOURCE	
69		69. The Corps agrees with the response to comments provided by the BOR, as follows: *Resource Engineering calculated the 25-year flow as 8,726 cfs using the Log-Pearson Type III analysis, and the 1904-1935 period of record for the Hot Sulphur Springs gage. This is a select subset of the full period of record (1904-1946) available before Granby Reservoir was built and is a wetter period than the full period of record.* ***Regardless, the pre-Granby Reservoir period does not represent baseline conditions for the evaluation of impacts of the WGFP****.*

Comment	Upper Colorado River Alliance (Porzak, Browning, & Bushong, LLP) Comments – February 3, 2012	Response
70 71 72 73	**3.0 CONCLUSIONS** The technical studies and reports referenced in the WGFP Report are applicable to a gravel-bed stream such as the Colorado River below Windy Gap. However, it appears that methodologies and conclusions extracted from these references were utilized in a manner that is not conceptually correct. For example, the WGFP Report calculates the lower limit of channel maintenance flows, or $Q_{trigger}$, as 80% of a streamflow with a recurrence interval of 1.5 years ($Q_{trigger}$ = 0.80xQ1.5-yr). Strictly, the lower limit of channel maintenance flows should be calculated as 80% of the bankfull discharge ($Q_{trigger}$ = 0.80 x Q_{BF}). Bankfull discharge often has a recurrence interval of 1.5 years in streams that are not affected by upstream diversions. It is not evident what period of gaged streamflow data was used in the WGFP Report to calculate 637.5 cfs as the discharge that occurs twice every 3 years for the Colorado River below Windy Gap. However, such a calculation clearly corresponds to a post-diversions data set and not to the natural, historic period that formed the river channel. A 1981 report by T.J. Ward titled Analysis of Aggradation and Degradation below Proposed Windy Gap Reservoir is cited several times throughout the WGFP Report to demonstrate that a "periodic flushing flow of 450 cfs should be sufficient to transport fine sediments (2 mm or finer)". Although technically correct, referencing this statement does not address one of the essential attributes of channel maintenance flows: to move all the mass and sizes of alluvial sediment supplied to the channel. The Colorado River below Windy Gap is a gravel-bed stream, with median particle sizes much larger than 2 mm. In fact, recent channel surveys determined that the median size of particles found in riffles within this reach of the Colorado River equals 92 mm (~3 ½ inches). The WGFP Report states that the $Q_{25\text{-}yr}$ = 6,520 cfs and reports that this flow "occurred once under Existing Conditions". Again, it is not evident how this peak discharge was calculated by the WGFP study team but it is clearly an underestimation of the 25-year flood expected to occur for an unregulated Colorado River below Windy Gap. In fact, RESOURCE reviewed the Hot Sulphur Springs and Windy Gap gages on the Colorado River and determined that an instantaneous peak flow of 6,250 cfs has not occurred since 1928 (**Figure 3**). Estimating the range of adequate channel maintenance flows is a challenging task. However, RESOURCE analysis of the available data strongly indicates that the range of channel maintenance flows for the Colorado River below Windy Gap included in the WGFP Report has not been correctly calculated. The preferred methodology to define the range of maintenance flows involves an analysis of particle size distributions of the bedload, bed material, and bedload transport rates (Schmidt and Potyondy, 2004). If this data is not available, an indirect approach may be used to estimate the lower and upper limits of the channel maintenance flows. The indirect approach, as included in the Forest Service methodology, recommends using 80% of Q_{BF} as the lower limit and the 25-year flood as the upper limit of this range of flows. December, 2010 3 RESOURCE	70. Please see previous responses. 71. The Corps agrees with the response to comments provided by the BOR, as follows: *As the FEIS shows, flows at the high end of the channel maintenance flow ranges calculated for Hot Sulphur Springs and near Kremmling would continue to occur under the WGFP action alternatives. Based on the model results for the 1950-1996 period, a flow of 1,240 cfs occurs in 18 of the 47 years of the model period, and would occur in 17 years under no action, and 16 years under the proposed action. In addition, see response to Comment* [No. 21] *regarding Phase 2 sediment transport, and the flow needed to begin moving larger particles in the Colorado River.* 72. The Corps agrees with the response to comments provided by the BOR, as follows: *Model results for the 1950 to 1996 period were used to calculate flow recurrence intervals.* 73. The Corps agrees with the response to comments provided by the BOR, as follows: *It is stated on page 17 of Schmidt and Potyondy's 2004 report that for the lower limit of channel maintenance flows, an average starting point of 80 percent of the 1.5-year discharge is "a good first approximation for general application." Table 3-32 and similar tables in the FEIS provide a range of the low end of channel maintenance flows rather than just a single value.*

Comment	Upper Colorado River Alliance (Porzak, Browning, & Bushong, LLP) Comments – February 3, 2012	Response
74	The channel maintenance flows calculated by RESOURCE following the Forest Service methodology range from 3,334 to 9,281 cfs, not 510 to 6,250 cfs (**Figure 4**). In summary, the WGFP Report underestimates the range of flows necessary to maintain long-term conditions necessary for a healthy stream channel and riparian area on the Colorado River below Windy Gap. The underestimation is of an order of magnitude in the case of the lower limit of this range of flows ($Q_{trigger}$ = 3,334 cfs instead of 510 cfs) and 33% for the upper limit (Q_{cap} = 9,281 cfs instead of 6,250 cfs). December, 2010 4 RESOURCE	74. Please see previous comments.

Comment	Upper Colorado River Alliance (Porzak, Browning, & Bushong, LLP) Comments – February 3, 2012	Response
		

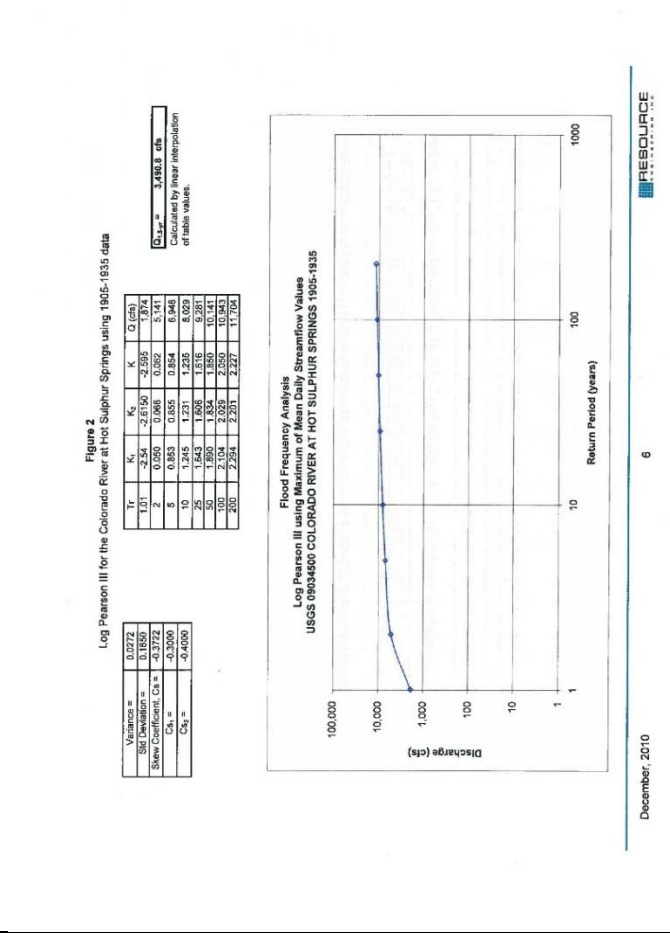
Comment	Upper Colorado River Alliance (Porzak, Browning, & Bushong, LLP) Comments – February 3, 2012	Response
		

Figure 2
Log Pearson III for the Colorado River at Hot Sulphur Springs using 1905-1935 data

Variance =	0.0272
Std Deviation =	0.1650
Skew Coefficent, Cs =	-0.3722
Cs_L =	-0.3000
Cs_H =	-0.4000

Tr	K_T	K_S	K	Q (cfs)
1.01	-2.54	-2.6150	-2.595	1,874
2	0.050	0.066	0.062	5,141
5	0.853	0.855	0.854	6,948
10	1.245	1.231	1.235	8,029
25	1.643	1.606	1.616	9,281
50	1.890	1.834	1.850	10,141
100	2.104	2.026	2.050	10,943
200	2.294	2.201	2.227	11,764

$Q_{1.5yr}$ = 3,490.8 cfs
Calculated by linear interpolation of table values.

December, 2010

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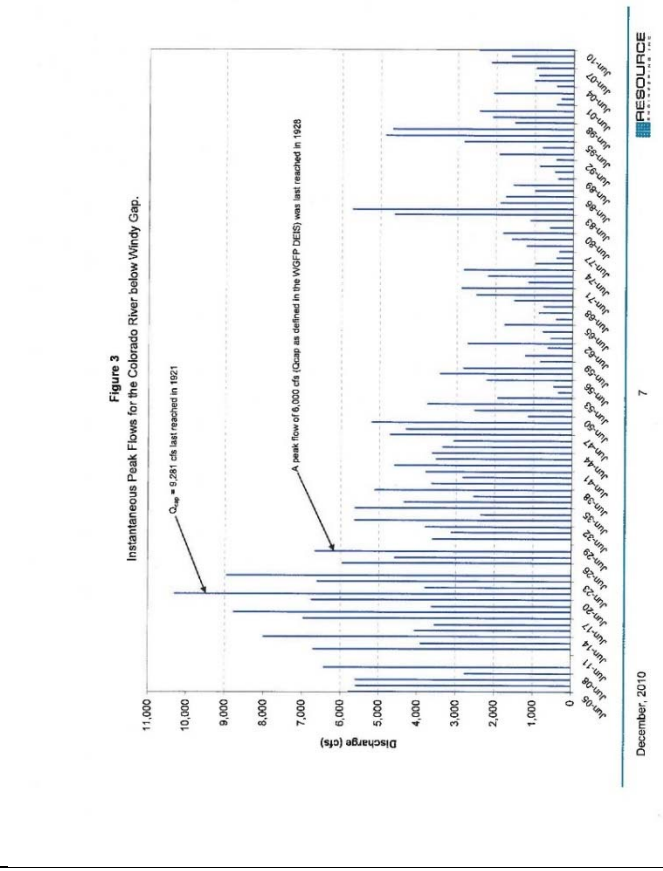
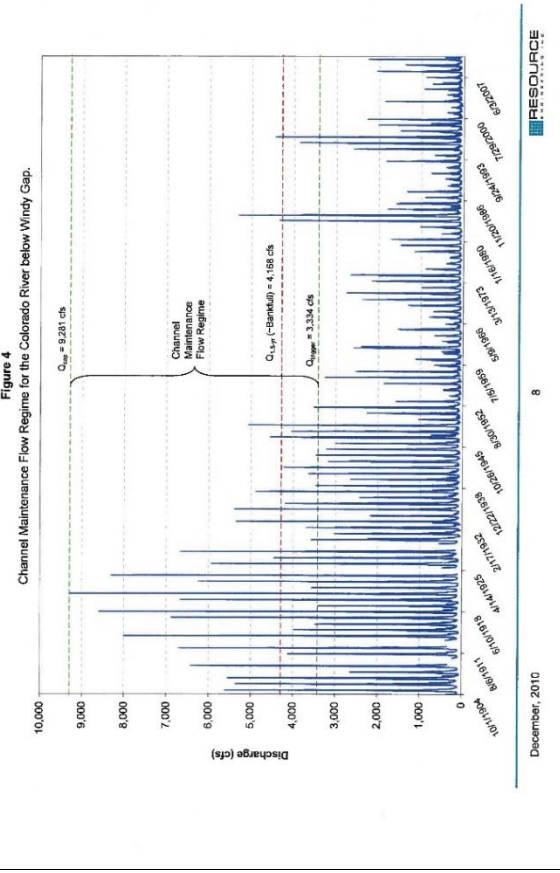
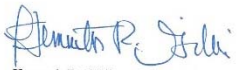
RESOURCE

Comment	Upper Colorado River Alliance (Porzak, Browning, & Bushong, LLP) Comments – February 3, 2012	Response
		

Comment	Upper Colorado River Alliance (Porzak, Browning, & Bushong, LLP) Comments – February 3, 2012	Response
		

Comment	Ouray Ranch Homeowners Association – October 30, 2012	Response
75	October 30, 2012 To Whom it may Concern: I am a Board Member of the Ouray Ranch Homeowners Association and a landowner in Grand County. The Ouray Ranch, approximately 400 acres bisected by 1.25 miles of the Colorado River, is halfway between Windy Gap and Granby Reservoirs. The Ouray Ranch was originally part of a YMCA camp which was purchased in 1981 and redeveloped into 49 home sites. As part of the redevelopment, extensive improvements were made to the river, adding 30 new pools and accompanying channels and riffles. A couple of years later, Lake Ouray, a 3.5 acre lake, was created to provide an additional high quality habitat for trophy trout. In 1984, we deeded a conservation easement on 234 acres of the ranch to help preserve the pristine beauty of the valley. The owners of the Ouray Ranch have invested and will continue to invest a great deal of time and money in creating and maintaining a beautiful and high quality trout fishing and wildlife habitat. We are obviously very interested in maintaining the value of our property and the world class trout habitat in the Colorado River that runs through our land. The Grand County Stream Management Plan ranked the Colorado River between Granby Reservoir and Windy Gap as the reach with the 3rd highest priority for restoration efforts and resource allocation of all the sections of the Upper Colorado River and its tributaries. Studies by Barry Nehring of the Colorado Division of Wildlife show that sculpin and stoneflies, which were in abundance at the Ouray Ranch following the stream improvements we made in 1982, are now "essentially gone" from our reach and others that are directly below dams on the Upper Colorado. Sculpins and stoneflies are, however, abundant, according to Nehring, upstream of Granby, Windy Gap, Willow Creek and Williams Fork Reservoirs. Prior to the historic run-off of 2011, the silt build-up in our stretch of the Colorado had choked the river, killing off many of the insects that the fish rely on for food and destroying the trout breeding habitat. These problems are compounded by an increasing level of algae and didymo in the river. Water pumped from Windy Gap to Granby Reservoir has resulted in increased nutrient loading to the reservoir and a reduction in water quality for the Colorado River below the dam. Clearly, the wildlife and fishery habitats in our reach have declined over the past 25 years. Finally, we are concerned that future climate changes could create other unforeseen problems for fish and wildlife in and along the Upper Colorado. According to a study by the Colorado Water Conservation Board, run-off in the Colorado River is expected to decline by 5 % to 20 % in the 21st Century. Given that approximately 73% of the Upper Colorado will be diverted if the proposed Windy Gap and Moffat firming projects are approved, the proposals have the potential for disastrous results if not monitored and managed properly.	75. The Corps appreciate your comments. Please refer to responses to comments above to address your concerns, including comments 1, 4, 10, 11, 24, 29, and 30.

Comment	Ouray Ranch Homeowners Association – October 30, 2012	Response
	We are concerned that the mitigation plans created by Northern Colorado Water Conservancy District and Denver Water are inadequate to address the impacts of their proposed diversions. In a recent review of the Windy Gap firming project, the EPA recommended "a more robust monitoring and mitigation plan" to protect the river. To improve the mitigation/enhancement plans and address the issues identified above, we would recommend: 1. Restricting diversions when temperatures in the river approach dangerous levels. 2. Require adequate flushing flows to maintain a healthy river. 3. Require that any permits issued to either Northern or Denver must include the adoption of an Adaptive Management Plan, such as that described in the Grand County Stream Management Plan. This plan should monitor the health of the river and adjust the operation to ensure that a healthy, world class, fish and wildlife habitat is maintained. For example, if future changes in the climate cause a reduction in the quantity of water available, then the quantity diverted should be reduced to a level necessary to maintain a healthy cold water fishery. We also believe that the committee created to oversee the Adaptive Management Plan should be diverse and represent the interest of all stakeholders, including the landowners along the Colorado River above Windy Gap. Senate Document 80 requires that the operation of Granby Dam and the diversion of water to the east slope must preserve the fishing, recreation and scenic qualities of the Colorado River and Rocky Mountain National Park. The EPA and The Army Corp of Engineers should demand that the Bureau of Reclamation live up to its obligation and become part of the solution to restore the Upper Colorado River to the world class trout fishery that it was back in the 1980s. Ultimately, the solution may require that Northern and Denver invest a bit more time and money, just as the owners of the Ouray Ranch have, but the result should be something we can all be proud of. Fortunately for Northern and Denver, they can recoup their investment through higher rates, which I, as a customer, would be more than happy to pay. Sincerely,  Kenneth R. Gillis Ouray Ranch Homeowner's Association	

Comment	National Wildlife Federation, Colorado Wildlife Federation, Colorado Environmental Coalition, and Western Resource Advocates – January 6, 2012	Response
76	**National Wildlife Federation** 2995 Baseline Road, # 300 Boulder, CO 80303 **Colorado Wildlife Federation** 1410 Grant Street, # C-313 Denver, CO 80203 **Colorado Environmental Coalition** 1536 Wynkoop Street, #5C Denver, CO 80202 **Western Resource Advocates** 2260 Baseline Rd, # 200 Boulder, CO 80302 January 6, 2012 Lucy Maldonado Kara Lamb U.S. Bureau of Reclamation 11056 West County Rd. 18E Loveland, CO 80537–9711 *Via email to lmaldonado@usbr.gov and klamb@usbr.gov and via fax to (970) 663–3212* **Re: Proposed Windy Gap Firming Project Final Environmental Impact Statement** Dear Ms. Maldonado and Ms. Lamb, On behalf of the National Wildlife Federation (NWF), the Colorado Wildlife Federation (CWF), the Colorado Environmental Coalition (CEC), and Western Resource Advocates, we are writing to submit our comments on the Windy Gap Firming Project Final Environmental Impact Statement (WGFP FEIS). In addition to these comments, the undersigned organizations join the separate comments provided by Trout Unlimited. NWF, CWF, CEC, and WRA collectively represent thousands of Coloradoans statewide, and share a vision to work towards the adoption of water supply and management decisions that are environmentally and economically sustainable in order to conserve, protect and restore Colorado's rivers and wildlife. Our organizations have been following the WGFP for several years and each submitted comments on the Draft EIS in 2008. We commend the Bureau of Reclamation for its efforts to address public comments in the Final EIS and we recognize the considerable time invested by your staff in responding to each comment individually in Appendix F. However, we continue to have a number of concerns regarding the WGFP. Due to the nature of these concerns, which are described in detail below, we request that Reclamation delay its final decision on the proposed WGFP pending release of a revised or supplemental Final EIS. Our concerns as they relate to the FEIS are as follows. **1. Flushing flows proposed in the Final EIS are insufficient** In the Final EIS, Reclamation proposes to increase flushing flows from 450 cfs to 600 cfs. While this is an improvement over flushing flows proposed in the 1980 MOU, 600 cfs is still 	76. The Corps agree with the response to comments provided by the BOR, as follows: *It is important to note that the intent of the original 450 cfs flushing flows and the increased flushing flows to 600 cfs is to provide a minimal amount of guaranteed flushing flows, recognizing that a larger range of channel maintenance flows are still needed to support river ecological functions. Thus, the minimum flushing flow requirement operates similar to the minimum bypass flows developed for the original Windy Gap Project. If flushing flows are less than those specified, Windy Gap must curtail diversions, with the exception that the project cannot be required to bypass more than the natural inflow. The channel maintenance flow analysis indicates that although frequency of larger flows would decrease with the WGFP, there would still be a reasonable distribution of higher flows to maintain the condition of the channel and aquatic habitat. It should also be noted that the maximum Windy Gap diversion is 600 cfs, so any curtailed diversion cannot increase flushing flows by more than this amount.* *Information from the Grand County Stream Management Plan is referenced in the FEIS. Nehring's 2010 report is referenced in the FEIS and data in the 2011 report were reviewed by Reclamation and its aquatic specialist prior to publication of the FEIS to identify if there was any significant new data relevant to the analysis that would change the effects determination. The Nehring et al. (2011) report does not provide documentation to substantiate the report's conclusions regarding the magnitude or duration of flows required to clean cobble-boulder substrates. Data was not collected on stream water temperature and the report did not quantify areas of vegetation or fine substrate. Physical parameters were not measured, analyzed, or modeled. The study was limited to the collection of biological data.* *Consequently, Reclamation did not find the conclusions regarding the existing physical conditions of the Colorado River downstream of Windy Gap Reservoir in the Nehring et al. (2011) report useful in determining the environmental consequences in the FEIS. However, the new macroinvertebrate field data presented in the report was reviewed and considered in concert with the other data sources cited in the FEIS to determine if there was any significant new information relevant to the analysis being presented.*

Comment	National Wildlife Federation, Colorado Wildlife Federation, Colorado Environmental Coalition, and Western Resource Advocates – January 6, 2012	Response
76 (cont'd)	insufficient. Barry Nehring's report cites a need for flushing flows of at least 1,000 cfs for several weeks. Barry Nehring et al., *Colorado River Aquatic Resources Investigations Federal Aid Project F-237R-18*, at p. 81. The FEIS itself acknowledges at least 850 cfs is needed to mobilize coarse gravel. FEIS Appendix F at p. 625. Reclamation should include the scientifically developed flow figures and other habitat recommendations from this report and the Grand County Stream Management Plan in its analysis of the proposed WGFP. As such, Reclamation should publish a revised or supplemental EIS including this data and analysis, so that it can be subject to public review and comment prior to publication of a Record of Decision.	77. Neither the BOR, nor the Corps can guarantee that fisheries habitat will improve beyond the current conditions; however, both agencies have worked with the State of Colorado to develop mitigative measures that are anticipated to negate cumulative effects as much as possible. Adhering to the FWMP is incorporated into a Special Condition of the permit. In addition, the Corps agrees with the response to comments provided by the BOR, as follows:
77	**2. The FEIS should include a commitment to enhance Upper Colorado River fisheries and should better integrate the Fish and Wildlife Management Plan** The aquatic habitats of the Upper Colorado River upstream from the Blue River are already negatively impacted by low flows in that portion of the river. The proposed WGFP should not go forward unless the Final EIS guarantees that the fishery habitat on the Upper Colorado will be improved beyond current conditions. The Fish and Wildlife Mitigation Plan (FWMP), as written, does not guarantee improvements in the quality of aquatic resources on the Upper Colorado River. Furthermore, the FEIS fails to describe how the FWMP relates to ongoing and future impacts. Reclamation should publish a revised or supplemental EIS that integrates the recommendations from the FWMP into the analysis of environmental impacts and proposed mitigation measures. The project proponent should join with the Moffat project to pay for downstream habitat improvements, as determined by Colorado Department of Parks and Wildlife (CDPW) after adequate surveys. Furthermore, the amount of funding proposed in the FWMP and the method for determining that amount must be described in the FEIS.	*The FWMP was developed by the State of Colorado. The objective of a mitigation plan is to ensure that conditions do not deteriorate from current conditions with the implementation of an alternative. It is fully recognized that there have been cumulative effects to the Colorado River over the past 100+ years as transmountain diversions were implemented. The State also worked with both the WGFP and the Moffat project proponents to develop an enhancement plan, which would address some of the cumulative effects of past diversions, including the original Windy Gap Project. This incorporates actions that the State of Colorado believes would improve the conditions within the Colorado River.*
78	**3. The wildlife mitigation plan for the Chimney Hollow Reservoir area is inadequate** The wildlife mitigation plan for the 850 acres that will be inundated by the proposed Chimney Hollow Reservoir on the east slope is insufficient. First, the FWMP dedicates only $50,000 to revegetation and invasive weed control in the communities surrounding Chimney Hollow Reservoir, even though this area provides critical deer wintering habitat during tough winters and important elk habitat. Larimer County will not be able to accomplish much habitat management with a mere $50,000 and the county and CDPW should not be stuck with the bill. Second, the FWMP mentions neither migration corridors nor habitat fragmentation. The FWMP should be revised to ensure important migration corridors will be maintained and habitat fragmentation will be minimized using corridors to connect habitats. 2 of 6	78. The Corps agrees with the response to comments provided by the BOR, as follows: *The FWMP developed with the CPW includes the measures the state regulatory agency deemed necessary for mitigating fish and wildlife impacts from the WGFP. These measures are also consistent with the requirements to identify mitigation for adverse effects in the (CEQ) Regulations for Implementing the Procedural Provisions of NEPA (40 CFR 1502.16(h)). In addition, the U.S. Fish and Wildlife Service approved of the findings in the Fish and Wildlife Coordination Act Report on March 9, 2012, which included mitigations identified in the FWMP, and agreed that the measures to avoid, minimize, and mitigate impacts to fish and wildlife resources from implementation of the Preferred Alternative adequately addressed identified effects. The FEIS incorporated fully the FWMP into the Preferred Alternative, as recommended by the state.* Additionally, the Grand County 1041 Permit requires more stringent measures for wildlife. The FWMP is the least of what the Subdistrict will provide to benefit wildlife.

Comment	National Wildlife Federation, Colorado Wildlife Federation, Colorado Environmental Coalition, and Western Resource Advocates – January 6, 2012	Response
79	**4. If a new east slope reservoir is to be stocked with fish, the FEIS should state that the Colorado Department of Parks and Wildlife will be responsible for all fish stocking activities and that the project proponent will cover all related costs** The FEIS states that Larimer County will manage the proposed Chimney Hollow Reservoir for recreation use, including fishing. However, the FEIS fails to point out that the proposed reservoir must be stocked with fish to accommodate anglers, fails to state who will be responsible for stocking the proposed reservoir, and fails to allocate any funding for fish stocking. The CDPW is responsible for rearing and stocking fish in Colorado reservoirs. Adding a new reservoir to this program will increase the burden on a budget that currently fails to meet existing demands. The FEIS should be revised or supplemented to include a commitment from the project proponent to transfer funds to the CDPW to rear and stock fish for Chimney Hollow Reservoir and to contribute to renovations at a number of outdated fish propagation facilities in the CDPW system.	79. The Corps agrees with the response to comments provided by the BOR, as follows: *The State of Colorado, as the entity with jurisdictional responsibility for managing the fish and wildlife of the state, as with other reservoirs managed for recreation by Larimer County, would have jurisdiction to manage the fishery in the manner they determine appropriate.*
80	**5. The Fish and Wildlife Mitigation Plan should be revised to emphasize adaptive management** Adaptive management is a crucial tool for monitoring and mitigating wildlife impacts, especially where wildlife face cumulative impacts from a number of sources or projects. Adaptive management involves pre-construction collection of baseline data, generation of a monitoring and mitigation plan, including thresholds that will trigger project adjustments, collection of monitoring data and assessment of data trends throughout all stages of the project, and modification of project operations where necessary. *See* Stem et al., *Monitoring and Evaluation in Conservation: A Review of Trends and Approaches*, CONSERVATION BIOLOGY, Vol. 19 No. 25, p. 295 (2005; W.H. Moir & W.M. Block, *Adaptive Management on Public Lands in the United States: Commitment or Rhetoric?*, ENVIRONMENTAL MANAGEMENT, Vol. 28 No. 22, p. 141 (2001); James P. Gibbs et al., *Effect of Monitoring for Adaptive Wildlife Management: Lessons from the Galapagos Islands*, JOURNAL OF WILDLIFE MANAGEMENT, Vol. 63 No. 4, P. 1055 (Oct. 1999); George F. Wilhere, *Adaptive Management in Habitat Conservation Plans*, CONSERVATION BIOLOGY, Vol. 16 No. 1, P. 20 (2002). The FWMP contains no mention of adaptive management, wildlife population monitoring, or mitigation measures that will be carried out should wildlife populations decline as a result of the proposed WGFP. The FEIS and the FWMP should be revised to include an explicit commitment to use the principles of adaptive management to ensure the Fraser and Upper Colorado River fisheries are not adversely affected by the WGFP and related projects that have cumulative impacts on the river system. Careful selection of data collection sites, collection of baseline data, and selection of threshold triggers must occur early in the planning process in order for adaptive management to be effective. Pre-project surveys should be conducted by CDPW and funded by project proponents. Monitoring must occur before, during and after implementation of the project for many years. We are concerned that the proposed number of monitoring stations is inadequate. The revised FWMP should establish habitat and population thresholds, which ensure that action will be taken to improve conditions *before* irreversible effects are felt. The two 3 of 6	80. The Corps agrees with the response to comments provided by the BOR, as follows: *The FWMP developed with the CPW includes the measures the state regulatory agency deemed necessary for mitigating fish and wildlife impacts from the WGFP. These measures are also consistent with the requirements to identify mitigation for adverse effects in the (CEQ) Regulations for Implementing the Procedural Provisions of NEPA (40 CFR 1502.16(h)). In addition, the U.S. Fish and Wildlife Service approved of the findings in the Fish and Wildlife Coordination Act Report on March 9, 2012, which included mitigations identified in the FWMP, and agreed that the measures to avoid, minimize, and mitigate impacts to fish and wildlife resources from implementation of the Preferred Alternative adequately addressed identified effects. The FEIS incorporated fully the FWMP into the Preferred Alternative, as recommended by the state.*

Comment	National Wildlife Federation, Colorado Wildlife Federation, Colorado Environmental Coalition, and Western Resource Advocates – January 6, 2012	Response
81	reports mentioned in Comment #1, above contain valuable information on adaptive management that should be considered in the FWMP and revised FEIS. **6. Reclamation should revise its approach for responding to potential temperature standard exceedances** The FEIS states that the chronic maximum weekly average temperature (MWAT) and acute daily maximum temperature (DMT) will be exceeded in five out of every fifteen years. FEIS § 3.8.2. To mitigate, the FEIS proposes to stop pumping Windy Gap water when temperatures are within 1°C of the MWAT. Yet allowing the water get within 1°C of maximum may be cutting it too close because at that point fish are stressed, more vulnerable to disease, and certainly not growing. Furthermore, it appears that Windy Gap pumping will be halted to prevent MWAT exceedances only where Windy Gap water is not in priority, i.e. when water supplies are high. Thus, the project will not mitigate for MWAT exceedances in low water years, during which fish are already stressed naturally from the heat lower water volumes. The FEIS must be revised or supplemented to include the outline of an operations plan that would ensure rapid response when temperature standards are likely to be exceeded. In other words, the monitoring stations must provide alerts at some point before those levels are reached (e.g., 3 - 5 degrees lower) so that pumping will be stopped in an efficient and rapid manner when needed. Otherwise, if there are delays, many fish may die or become vulnerable to disease. The FEIS mentions that if the water is drawn through the bottom of Lake Granby through a bypass valve, the release can have a cooling effect on the river downstream from the lake. FEIS § 3.8.4.2. We encourage Reclamation to pursue this option and to allow more cooling releases to help maintain proper water temperatures, provided such releases do not degrade overall water quality and stream bottom habitat conditions. Also, if studies demonstrate that it would be biologically productive to construct a flow bypass around Windy Gap dam and its reservoir, the project proponents should pay for it.	81. The Corps agree with the response to comments provided by the BOR, as follows: *The FWMP developed with the CPW includes the measures the state regulatory agency deemed necessary for mitigating fish and wildlife impacts from the WGFP. These measures are also consistent with the requirements to identify mitigation for adverse effects in the (CEQ) Regulations for Implementing the Procedural Provisions of NEPA (40 CFR 1502.16(h)). In addition, the U.S. Fish and Wildlife Service approved of the findings in the Fish and Wildlife Coordination Act Report on March 9, 2012, which included mitigations identified in the FWMP, and agreed that the measures to avoid, minimize, and mitigate impacts to fish and wildlife resources from implementation of the Preferred Alternative adequately addressed identified effects. The FEIS incorporated fully the FWMP into the Preferred Alternative, as recommended by the state.*
82	**7. Nonpoint Source Nutrient Reduction measures must be described in greater detail** While the proposed measures to improve water quality have merit, the nonpoint source nutrient reduction measures described in FEIS § 3.8.4.1 are too vague to determine if they will be effective. The FEIS should be revised to describe proposed nonpoint source measures in more detail (i.e. plantings and fencing). In the FEIS, the project proponent should explicitly commit to paying for nonpoint source mitigation measures. Reclamation should clarify whether it analyzed implementation of nonpoint source measures at operations aside from the two mentioned in the FEIS. It is not clear from the FEIS whether Reclamation approached other agricultural operations (aside from E-Diamond H Ranch and C-Lazy-U Ranch) to determine whether they would be willing to contribute to nutrient reduction efforts. Considering that E-Diamond H Ranch has not entered into an agreement to implement mitigation measures, Reclamation and the Subdistrict may have to approach additional landowners to ensure that adequate nonpoint source reduction measures are carried out. 4 of 6	82. The Corps agree to the response to comments provided by the BOR, as follows: *It was recognized in the FEIS that the proposed reductions as of the date of publication appeared adequate for phosphorous, but that additional reductions would need to be obtained for total nitrogen. As described in Section 3.8.4.1 of the FEIS, the Subdistrict will be required to demonstrate adequate nonpoint source reductions prior to implementation of the WGFP.* Please see comments 1, 4, 5, 10 and 11.

Comment	National Wildlife Federation, Colorado Wildlife Federation, Colorado Environmental Coalition, and Western Resource Advocates – January 6, 2012	Response
83 84 85	**8. The project proponent must commit to pay for operations and management for the life of the project** The FEIS does not include a commitment by the project proponent to pay for operations and management for the life of the project. The FEIS should be revised to include this crucial detail. **9. The Final EIS Overestimates Population Growth and Fails to Use the Best Available Information** The Final EIS continues to rely upon inaccurate projections of population growth in participant cities. For example, the FEIS (at page 1-22) asserts that Broomfield's population is projected to grow at 2.9 percent annually from 2004 through build out in 2035. In contrast, State demographer projections from 2011[1] for Broomfield County have projected annual rates of growth from 2004 through 2035 that average 1.98% with the highest rates already having occurred. The average annual growth rate for the remaining 2012 to 2035 period is 1.60%. Other recent reports[2] have revised downward, often substantially, growth rates for communities in northern Colorado. Appendix F (at page F-615) concedes that Bureau of Reclamation guidance requires the use of best available information. Colorado Department of Local Affairs regional projections from autumn 2009[3] have been substantially revised (downward) from 2008. In general, it appears the FEIS does not make any effort to revise population projections based on the national and state-wide economic downturn now in its fourth consecutive year. Importantly, population projections are heavily dependent on the initial estimate of population *and* the rate of population growth, where errors in the first few years are compounded greatly over time. **10. The Final EIS Continues to Downplay the Role of Conservation** The FEIS recognizes that WGFP participants must have and maintain an approved water conservation plan on file with the Colorado Water Conservation Board, pursuant to Colorado House Bill 04-1365 (as amended). Elsewhere, however, the FEIS suggests that conservation savings are hard to quantify or cannot be relied upon. The FEIS fails to make the connection that one requirement of H.B. 1365 is to estimate actual water conservation savings. These savings are being "counted on" by water providers implementing their conservation plans – otherwise [1] Data info provided at http://www.colorado.gov/cs/Satellite?c=Page&childpagename=DOLA-Main%2FCBONLayout&cid=1251593346867&pagename=CBONWrapper [2] Harvey 2011. Water Supplies and Demands for Participants in the Northern Integrated Supply Project Final Report. Prepared by Harvey Economics for the Northern Colorado Water Conservancy District and the Northern Integrated Supply Participants. January 21, 2011. [3] See http://www.colorado.gov/cs/Satellite?c=Page&childpagename=DOLA-Main%2FCBONLayout&cid=1251593302917&pagename=CBONWrapper 5 of 6	83. The Corps agree with the response to comments provided by the BOR, as follows: *The Windy Gap Firming project is a nonfederal project. Implementation and subsequent operations and maintenance of this project would be at the owner's expense.* 84. The Corps agree with the response to comments provided by the BOR, as follows: *The recession has indeed had an impact on growth in the past 2 years in many previously fast-growing areas, and the Participant service areas are no exception. However, recessions are short-term economic phenomena, similar to economic boom growth. Long-term growth projections are normalized to "smooth out" cyclical high and low-growth periods. The population projections for the EIS, and ultimately the water demand projections, were made on an individual Participant basis, factoring in the unique historical trends, anticipated future trends, land use characteristics, and customer base of each Participant. The projected growth rates applied to each Participant are discussed in the Appendices to the Purpose and Need Report.* *The State Demographers Office prepares updated statewide and county-level population projections each year. These projections incorporate local information and input, and are continually adjusted to reflect current economic conditions. The State of Colorado continues to recognize that there will be a shortage of water, especially in the northeastern section of the state.* 85. The Corps agree with the response to comments provided by the BOR, as follows: *The water savings experienced by Participants as a result of the conservation programs in place is captured in the historical water use data. The majority of Participants also have plans to incorporate additional conservation measures into their overall conservation programs. However, it is generally difficult to determine the savings that would result from any one measure, since savings would depend on how the measure was implemented and on the specific characteristics of each Participant (e.g., type and number of customers affected, age of housing stock, and income levels.)* *Seven of the Participants have approved conservation plans from the CWCB and others are in the process of plan approval, or would have an approved plan prior to delivery of WGFP water. These conservation plans include*

Comment	National Wildlife Federation, Colorado Wildlife Federation, Colorado Environmental Coalition, and Western Resource Advocates – January 6, 2012	Response
86	why would they invest hundreds of thousands of dollars in conservation programming – and thus should be reflected in estimates of future demand. The FEIS (page 1-18) continues to rely upon an unreasonable standard for gallons per capita per day (gpcd). The Utah report cites gpcd in communities in Las Vegas, Nevada, and southwest Utah—some of the driest places in the United States—utilizing data from over a decade ago. Not only have those communities lowered their gpcd in the past decade, they have considerably drier climates than those found in growing communities in Colorado's South Platte Basin. Objections to the 217 gpcd standard—spelled out in detail in Western Resource Advocates' comments on the Draft EIS (see pages 10-13 of that document)—apply with even greater force today, as great strides have been made in conservation. A recent study of Northern Integrated Supply Project (NISP) participant water use (Harvey 2011) includes data that show water use is already below 190 gpcd for most northern Colorado communities. The FEIS (Table 1-4) also notes recent average use below 190 gpcd. Although some future water demand in northern Colorado cities will be at special agricultural facilities (e.g., dairies) where water use may be relatively high, the vast majority of new water demands stem from residential and commercial development that is, over the course of time, generating lower gpcd. Respectfully, Kate Zimmerman, Senior Policy Advisor, Public Lands Program National Wildlife Federation Suzanne O'Neill, Executive Director Colorado Wildlife Federation Dennis G. Buechler, Director Emeritus Colorado Wildlife Federation Becky Long, Water Caucus Coordinator Colorado Environmental Coalition Bart Miller, Water Program Director Western Resource Advocates Cc: Sadie Hoskie, Water Program Director, EPA Region 8 Rena Brand, Army Corps of Engineers Regulatory Office 6 of 6	*reduced water use goals for the water provider and its customers. In fact, the Participants with CWCB-approved conservation plans have developed conservation goals ranging from 5 percent to 17 percent. This conservation will be needed to meet demands in addition to those supplied by the WGFP. The State of Colorado recognizes that there will be a shortage of water in Colorado in the future, especially in the northeastern section of the state. Reclamation recognizes the importance of conservation in contributing toward meeting the future water needs of the project Participants, but agrees with the state that conservation alone will not be enough to meet these needs.* Please see comments 35 and 84 below. 86. The Corps agree with the response to comments provided by the BOR, as follows: *All of the Participants have conservation measures in place and Participants would be required to maintain an approved water conservation plan in accordance with the Water Conservation Act of 2004 (Colorado House Bill 04-1365) as amended. Seven of the WGFP Participants have CWCB-approved plans. These participants would be required to maintain the plans in accordance with the requirements of the Water Conservation Act of 2004, as amended, and the remaining participants would be required to acquire a CWCB-approved plan prior to delivery of WGFP water. Reclamation would require maintenance of a state-approved water conservation plan as a condition to a contract with the Subdistrict. Thus, gpcd values are expected to decrease in the future.*

Comment	Save the Colorado – November 7, 2014	Response
87	 **November 7, 2014** **To: Lois Peterson, Will Tully, Lucy Maldonado, Kara Lamb** (delivered to all via email) **U.S. Bureau of Reclamation** **11056 West County Rd. 18E** **Loveland, CO 80537-9711** **Cc: U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, Colorado Department of Natural Resources, U.S. Senators Michael Bennet and Mark Udall, U.S. Representative Jared Polis** **From: Gary Wockner, Executive Director, Save The Colorado** Save The Colorado is pleased to offer the following comments on the U.S. Bureau of Reclamation's proposed Senate Document 80 Determination and 2014 Carriage Contract for the extremely controversial Windy Gap Firming Project. Reclamation's proposed Senate Document 80 Determination and 2014 Carriage Contract are both flawed and contrary to law. As a result, Save The Colorado urges Reclamation to withdraw its determination that the Windy Gap Firming Project complies with Senate Document 80. In addition, Reclamation should not enter into the 2014 Carriage Contract with the Northern Colorado Water Conservancy District (Northern Water) and its Municipal Subdistrict (collectively, "Northern Water"). Finally, Reclamation should not issue a Record of Decision (ROD) approving the Windy Gap Firming Project because the Final Environmental Impact Statement (FEIS) for the Project violates the National Environmental Policy Act (NEPA) and is fatally flawed. Senate Document 80 Determination Senate Document 80 authorized construction of the Colorado-Big Thompson (C-BT) Project and describes how the project is operated. Senate Document 80 has "the force of a statute," and it represents the "compromise between the respective water interests of Colorado's Eastern and Western Slopes" that led Congress to approve the C-BT Project in 1937. *Pub. Serv. Co. of Colo. v. FERC*, 754 F.2d 1555, 1560–61 (10th Cir. 1985). Senate Document 80 lists five "primary purposes" for the C-BT project and states that the project "must be operated in such a manner as to most nearly effect [those] primary purposes."[1] One of those [1] Senate Document 80 at page 3. 1	87. The Corps defers to the BOR for responses to comments directed to their agency.

Comment	Save the Colorado – November 7, 2014	Response

primary purposes is "[t]o preserve the fishing and recreational facilities and the scenic attractions of Grand Lake, the Colorado River, and the Rocky Mountain National Park."[2]

The Windy Gap Firming Project directly interferes with this primary purpose of the C-BT project because it would take an additional 33,000 firm acre feet of water out of the Colorado River. The Upper Colorado River is already an over-depleted and stressed aquatic ecosystem, and diverting additional water from the river would further harm it. Scores of plants, fish, and other wildlife—in addition to a growing and diverse recreational economy—depend on a healthy Colorado River to survive and thrive. Save The Colorado is vitally concerned about the impacts of additional transbasin diversions of the remaining native flows of the headwaters of the Colorado River. A century of wanton depletion of this prized waterway has pushed it to the brink of irreversible loss, and purported mitigation and restoration efforts offered to offset the draining of the Colorado River headwaters have failed to protect critical resource values. The Windy Gap Firming Project continues this unfortunate history by failing to adequately consider and mitigate the impact of driving the river beyond a sustainable flow threshold. In short, the Windy Gap Firming Project would push the Upper Colorado River over the brink.

Accordingly, rather than "preserv[ing]" the "fishing and recreational facilities and the scenic attractions of Grand Lake, the Colorado River, and the Rocky Mountain National Park" as Senate Document 80 requires, the Windy Gap Firming Project would irreversibly harm these iconic waters and lands. As a result, Reclamation should withdraw its proposed determination that the 2014 Carriage Contract for Windy Gap Firming Project is consistent with Senate Document 80.

2014 Carriage Contract

The proposed 2014 Carriage Contract would allow Northern Water to use excess capacity in Reclamation's C-BT facilities to store, convey, exchange, substitute, and deliver additional Windy Gap water from the Upper Colorado River to the Front Range.[3]

Directives and Standards Manual WTR 04-01 details Reclamation's policy for executing and amending carriage contracts. Manual WTR 04-01 includes a subsection on "Environmental Compliance," which states that "Reclamation will use the NEPA process to identify the environmental and socio-economic impacts, if any, which the proposed use of excess capacity would have, and to identify, as appropriate, reasonable alternatives to the requesting party's proposed use of the excess capacity."[4] Manual WTR 04-01 also states that Reclamation may enter into carriage contracts "only after considering whether and how adverse effects could be avoided and whether such effects should be mitigated."[5]

As summarized below, Reclamation's FEIS for the Windy Gap Firming Project does not comply with NEPA for numerous reasons. Accordingly, Reclamation cannot rely on the inadequate FEIS to identify the environmental and socio-economic impacts of the Windy Gap Firming Project and the proposed 2014

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[2] *Id.*
[3] *See* Press Release, U.S. Bureau of Reclamation, *Reclamation, Northern Water Reach Tentative Agreement on Windy Gap Firming Project* (Oct. 9, 2014), *available at* http://www.usbr.gov/newsroom/newsrelease/detail.cfm?RecordID=47994.
[4] Bureau of Reclamation, *Directives and Standards Manual WTR 04-01*, at 1 (2000), *available at* http://www.usbr.gov/recman/DandS.html.
[5] *Id.* at 3.

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Carriage Contract, as Manual WTR 04-01 requires. In addition, Reclamation cannot rely on the flawed FEIS to identify reasonable alternatives to the Windy Gap Firming Project, or to consider whether its adverse effects could be mitigated. Because the Windy Gap Firming Project FEIS is fatally flawed, Reclamation cannot enter into the 2014 Carriage Contract with Northern Water based on the FEIS.

Specifically, the 2014 Carriage Contract and the FEIS for the Windy Gap Firming Project are flawed for the following reasons:

1. The "Purpose and Need" described in the FEIS is flawed and too narrow to satisfy the statutory requirements of the National Environmental Policy Act, the Clean Water Act, the Endangered Species Act, and Council for Environmental Quality regulations.[6]
2. The 2014 Carriage Contract and FEIS fail to adequately analyze and address water conservation and efficiency alternatives.[7]
3. The 2014 Carriage Contract and FEIS fail to adequately analyze and address cumulative, direct, indirect, and connected impacts.[8]
4. The 2014 Carriage Contract and FEIS fail to adequately analyze and address construction costs.[9]
5. The 2014 Carriage Contract and FEIS fail to adequately analyze and address the impacts to hydrology, water quality, and stream morphology.[10]
6. The 2014 Carriage Contract and FEIS fail to adequately consider and analyze a full range of alternatives.[11]
7. The 2014 Carriage Contract and FEIS fail to adequately analyze and address aquatic and environmental impacts.[12]

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[6] See "Letter #1138," and "Letter #883": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_organizations_groups_businesses.pdf and "Letter 1075": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_cooperating_agencies.pdf and "Letter 1062": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_government_agencies.pdf and "Letter 1141": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_government_agencies.pdf.

[7] See "Letter #1138," and "Letter #883": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_organizations_groups_businesses.pdf and "Letter 1062": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_government_agencies.pdf and "Letter 1141": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_government_agencies.pdf.

[8] "Letter #1138" and "Letter #1059 and "Letter #1060 and "Letter #883" and "Letter #1126": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_organizations_groups_businesses.pdf and "Letter 1075": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_cooperating_agencies.pdf and "Letter 1141": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_government_agencies.pdf.

[9] See "Letter #1138": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_organizations_groups_businesses.pdf.

[10] See "Letter #1138"and "Letter #1126": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_organizations_groups_businesses.pdf and see "Letter 1075" http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_cooperating_agencies.pdf and "Letter 1141": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_government_agencies.pdf.

[11] See "Letter #1138" and "Letter #1059": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_organizations_groups_businesses.pdf and "Letter 1141": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_government_agencies.pdf.

[12] See "Letter #1138" and "Letter #1060" and "Letter #883" and "Letter #1110": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_organizations_groups_businesses and "Letter 1141": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_government_agencies.pdf.

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8. The 2014 Carriage Contract and FEIS fail to adequately analyze and address impacts to the recreational economy of Grand Lake, the Colorado River, and tributary streams of the Colorado River in Grand County.[13]
9. The 2014 Carriage Contract and FEIS fail to adequately analyze and address the likely environmental impact of the preferred alternative in light of the most recent period of record.[14]
10. The 2014 Carriage Contract and FEIS fail to adequately analyze and address the likely environmental impacts of the alternatives in light of the best-available science on climate change.[15]
11. The 2014 Carriage Contract and FEIS fail to adequately analyze and address the environmental impacts to Grand Lake.[16]
12. The 2014 Carriage Contract and FEIS fail to adequately analyze and address stream temperature impacts to the Colorado River and streams in Grand County that are tributaries to the Colorado River.[17]
13. The 2014 Carriage Contract and FEIS fail to adequately analyze and address impacts to federally listed Endangered Species under the Endangered Species Act.[18]
14. The 2014 Carriage Contract and FEIS fails to adequately analyze and address cumulative impacts with the proposed Northern Integrated Supply Project.[19,20]
15. The "No Action Alternative" in the FEIS is misleading, speculative, and does not represent a true "no action" alternative.[21]

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[13] See "Letter #1052": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_organizations_groups_businesses.pdf and "Letter 1075": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_cooperating_agencies.pdf and "Letter 1141": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_government_agencies.pdf.

[14] See "Letter #1059": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_organizations_groups_businesses.pdf and "Letter 1062": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_government_agencies.pdf and "Letter 1141": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_government_agencies.pdf

[15] See "Letter #1059" and "Letter #1126": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_organizations_groups_businesses.pdf and "Letter 1141": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_government_agencies.pdf

[16] See "Letter #58" and "Letter #1103": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_organizations_groups_businesses.pdf and "Letter 1141": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_government_agencies.pdf

[17] See "Letter #1126": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_organizations_groups_businesses.pdf and "Letter 1141": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_government_agencies.pdf

[18] See "Letter 1126": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_organizations_groups_businesses.pdf and "Letter 1141": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_government_agencies.pdf

[19] See "Letter 1126," and "Letter #1117": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_organizations_groups_businesses.pdf

[20] See Save The Poudre letter, April 10, 2011: http://poudreriver.home.comcast.net/~poudreriver/STP_letter_to_Corps_Bureau_EPA_NISP-Impacts-On-Colorado-River-4-10-2001.pdf

[21] See "Letter 1126": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_organizations_groups_businesses.pdf and "Letter 1075": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_cooperating_agencies.pdf and "Letter 1141": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_government_agencies.pdf

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16. The 2014 Carriage Contract and FEIS fail to analyze the capability of individual Windy Gap Firming Project (WGFP) participants, including but not limited to the Platte River Power Authority, to meet their water needs by other means.[22]
17. The 2014 Carriage Contract and FEIS fail to address the impacts of climate change from providing water to the coal-fired power plant at the Platte River Power Authority.[23]
18. The 2014 Carriage Contract and FEIS fail to analyze and address the water used for fracking in the Purpose and Need.[24]
19. The 2014 Carriage Contract and FEIS fail to analyze and address the climate change impacts of using and/or leasing or selling WGFP water for fracking of oil and gas in Colorado by WGFP participants, including but not limited to the City of Greeley and the Platte River Power Authority.[25]
20. The 2014 Carriage Contract and FEIS fail to adequately analyze and address the impact of climate change on water supplies proposed to be used by the WGFP.[26]
21. The 2014 Carriage Contract and FEIS fail to address the impacts of climate change resulting from oil and gas development and consumption that is made possible or supported by WGFP water. It is known that the process of extraction and distribution of oil and gas includes significant methane leaks which significantly contribute to climate change.[27]

Reclamation should not approve the 2014 Carriage Contract, but if it does we urge the agency to employ accurate, stringent, and reliable accounting measures to track Windy Gap water through the C-BT system, and to make this data publicly available. Such measures should ensure that the public and stakeholders can clearly distinguish between Windy Gap and C-BT water as it is diverted from the Upper Colorado River and then transferred and pre-positioned throughout the C-BT system.

Reclamation's Flawed FEIS and Its Upcoming ROD

Because the Windy Gap Firming Project FEIS is flawed for the reasons summarized above, Reclamation should not issue a Record of Decision (ROD) under NEPA approving the Windy Gap Firming Project.

Save The Colorado is a non-profit corporation in the state of Colorado. Save The Colorado's mission is to protect and restore the Colorado River and its tributaries from the source to the sea. One of the keystones of our advocacy is fighting damaging and irresponsible water projects like the Windy Gap Firming Project. We operate in Colorado and run programs throughout the Colorado River basin in the

[22] See Save The Poudre letter, April 19, 2012: http://poudreriver.home.comcast.net/~poudreriver/STP-letter-to-BOR-ACE-PRPA-WGFP-FEIS-4-19-2012.pdf and "Letter 1141": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_government_agencies.pdf

[23] http://www.nwf.org/pdf/Global-Warming/ghg%20co%20fact%20sheet.pdf.

[24] See Save The Poudre letter, October 4, 2011: http://poudreriver.home.comcast.net/~poudreriver/STP_letter-to-BuRec-WGFP-Water-For-Fracking-10-4-2011.pdf.

[25] See Save The Poudre letter, April 19, 2012: http://poudreriver.home.comcast.net/~poudreriver/STP-letter-to-BOR-ACE-PRPA-WGFP-FEIS-4-19-2012.pdf.

[26] See Save The Poudre letter, March 13, 2012: http://poudreriver.home.comcast.net/~poudreriver/STP-letter-to-ACE-WGFP-FEIS-3-13-2012.pdf and "Letter 1141": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_government_agencies.pdf.

[27] http://www.pnas.org/content/111/17/6237.abstract and see the studies linked to in this news report: http://www.climatecentral.org/news/huge-methane-leaks-add-doubt-on-natural-gas-as-a-bridge-fuel-17309.

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western U.S. We have thousands of supporters and followers in Colorado and the western U.S. and are very active and highly visible champions for the river. Save The Colorado has been active since 2010; as such, we were unable to submit earlier comments on Reclamation's August 2008 WGFP Draft EIS.

Save The Colorado thus wishes to officially comment on the Windy Gap Firming Project FEIS by incorporating the comments that have been raised by other commenters and that are summarized above in numbers 1-21. *See supra* at 3-5. Save The Colorado would also like to adopt the comments, letters, reports, and memos regarding the Windy Gap Firming Project FEIS in the footnotes for numbers 1-21 above. In addition, Save The Colorado requests that this comment letter on the FEIS's flaws be placed into the public record for the Windy Gap Firming Project FEIS.

Save The Colorado would like to thank Reclamation for considering these comments before it makes a final decision whether to approve the Windy Gap Firming Project. The FEIS for the nearby Moffat Collection System Project contains similar flaws, and the Army Corps of Engineers' Moffat Project manager stated the agency would "carefully consider all comments [it] receive[s] up to the point we make a decision," as "[a]ll federal agencies across the nation are required to consider all meaningful and substantive comments that come in on a public disclosure document such as an EIS."[28] We respectfully request that Reclamation similarly consider these comments on the Windy Gap Firming Project FEIS prior to issuing a ROD. Thank you for considering our comments on the proposed Senate Document 80 Determination and the 2014 Carriage Contract. In addition, thank you for inserting these comments into the legal, public record for the Environmental Impact Statement process for the Windy Gap Firming Project.

Respectfully,

Gary Wockner, PhD, Executive Director, Save the Colorado
PO Box 1066, Fort Collins, CO 80522
http://savethecolorado.org, 970-218-8310

[28] Charlie Brennan, *Army Corps will take more comment on Gross Reservoir project*, Daily Camera, June 5, 2014, *available at* http://www.dailycamera.com/News/ci_25908721/Army-Corps-will-take-more-comment; *see also Wyo. Lodging & Rest. Ass'n v. U.S. Dep't of Interior*, 398 F. Supp. 2d 1197, 1208-11 (D. Wyo. 2005) (allowing parties to raise issues regarding a NEPA Environmental Assessment that were previously brought to the agency's attention by other commenters); *Portland Gen. Elec. Co. v. Bonneville Power Admin.*, 501 F.3d 1009, 1024 (9th Cir. 2007) (similar).

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	 December 19, 2014 Tim Carey Denver Regulatory Office U.S. Army Corps of Engineers Littleton, Colorado 80128 *The Windy Gap Firming Project FEIS is fatally flawed and must be supplemented, and the Army Corps must provide an additional public comment period before issuing a 404 Permit.* Dear Mr. Carey, The Upper Colorado River is an over-depleted and stressed aquatic ecosystem. The proposed Windy Gap Firming Project (WGFP) would divert additional water from the river, resulting in further harm. Scores of plants, fish, and other wildlife—in addition to a growing and diverse recreational economy—depend on a healthy Colorado River to survive and thrive. We are extremely concerned about the impacts of WGFP and additional transbasin diversions on the remaining native flows of the Colorado River's headwaters. A century of wanton depletion of this prized waterway has pushed it to the brink of irreversible loss, and purported mitigation and restoration efforts offered to offset the draining of the Colorado River headwaters would not adequately protect critical resource values. In addition, the entire Colorado River ecosystem—from Grand County, Colorado to San Luis Rio Colorado, Mexico—is severely depleted and further endangered. The extended drought in the Colorado River basin has lowered flows in the river and lowered the levels of reservoirs along its path. The Central Arizona Project is predicting a shortage of Colorado River water in 2017[1], and Las Vegas is planning for continued falling levels of Lake Mead, including a potential "Dead Pool."[2] Fish species listed by the Endangered Species Act continue to struggle for survival and have remained on the endangered [1] http://www.cap-az.com/index.php/public/blog?start=4 [2] http://www.reviewjournal.com/news/water-environment/panel-recommends-650-million-lake-mead-project-rate-hike	

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88	and threatened lists for decades.[3] The Grand Canyon continues to degrade due to low water levels, water temperatures, and a lack of sediment, all caused by the construction of dams and the diversion of water upstream.[4] And finally, farther downstream the Colorado River continues to be 100% drained dry and does not reach the Sea of Cortez. Remarkably, all ~5 trillion gallons/year of the Colorado River's waters are diverted for human use and consumption.[5] The proposed WGFP would drain an additional tens-of-thousands of acre feet of water out of the very top of the Colorado River system in Grand County, Colorado. In wet years, well over 30,000 acre feet would be diverted. This proposal would continue the environmentally devastating history of further draining and destroying the Colorado River and its tributaries, and would likely worsen all of the downstream environmental impacts noted above. If built, the WGFP would push the Upper Colorado River over the brink. The Army Corps Cannot Rely on the FEIS's Flawed Analysis To Issue a Section 404 Permit The U.S. Army Corps of Engineers must issue a Clean Water Act section 404 permit before the Windy Gap Firming Project can be constructed. The Corps cannot issue a 404 permit for a project "if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem." 40 C.F.R. § 230.10(a). When the Corps analyzes the WGFP 404 permit application, it intends to rely on the U.S. Bureau of Reclamation's Final Environmental Impact Statement (FEIS) for the project. However, as summarized below, the FEIS for WGFP is fatally flawed and does not comply with the National Environmental Policy Act (NEPA) or the Clean Water Act for numerous reasons. Accordingly, neither Reclamation nor the Army Corps can rely on the inadequate FEIS to identify the environmental and socio-economic impacts of the WGFP, as required by NEPA. In addition, when deciding whether to issue a Clean Water Act section 404 permit for the project, the Army Corps cannot rely on the flawed FEIS to identify reasonable alternatives to the WGFP or to consider whether its adverse effects could be mitigated. Because the Windy Gap Firming Project FEIS is fatally flawed, the Army Corps must conduct additional analysis before issuing a 404 permit for the project. [3] http://cpluhna.nau.edu/Biota/fishes.htm [4] http://www.glencanyon.org/glen_canyon/grand-canyon [5] http://www.smithsonianmag.com/science-nature/the-colorado-river-runs-dry-61427169/?no-ist	88. The Corps responds to these comments above. Please refer to Comment 2 and 35 above.

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89	Specifically, the FEIS for the Windy Gap Firming Project is fatally flawed for the following reasons:[6] 1. The "Purpose and Need" described in the FEIS is flawed and too narrow to satisfy the statutory requirements of the National Environmental Policy Act, the Clean Water Act, the Endangered Species Act, and Council for Environmental Quality regulations.[7] 2. The FEIS fails to adequately analyze and address water conservation and efficiency alternatives.[8] 3. The FEIS fails to adequately analyze and address cumulative, direct, indirect, and connected impacts.[9] 4. The FEIS fails to adequately analyze and address construction costs.[10] [6] Save The Colorado incorporates the comments that have been raised by other commenters and that are summarized below in numbers 1-22. Save The Colorado would also like to adopt the comments, letters, reports, and memos regarding the Windy Gap Firming Project FEIS in the footnotes for numbers 1-22 below. *See Wyo. Lodging & Rest. Ass'n v. U.S. Dep't of Interior*, 398 F. Supp. 2d 1197, 1208-11 (D. Wyo. 2005) (allowing parties to raise issues regarding a NEPA Environmental Assessment that were previously brought to the agency's attention by other commenters); *Portland Gen. Elec. Co. v. Bonneville Power Admin.*, 501 F.3d 1009, 1024 (9th Cir. 2007) (similar). [7] See "Letter #1138," and "Letter #883": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_organizations_groups_businesses.pdf and "Letter 1075": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_cooperating_agencies.pdf and "Letter 1062": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_government_agencies.pdf and "Letter 1141": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_government_agencies.pdf. [8] See "Letter #1138," and "Letter #883": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_organizations_groups_businesses.pdf and "Letter 1062": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_government_agencies.pdf and "Letter 1141": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_government_agencies.pdf. [9] "Letter #1138" and "Letter #1059 and "Letter #1060 and "Letter #883" and "Letter #1126": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_organizations_groups_businesses.pdf and "Letter 1075": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_cooperating_agencies.pdf and "Letter 1141": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_government_agencies.pdf. [10] See "Letter #1138": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_organizations_groups_businesses.pdf.	89. Please refer to Comments 36, 37, 38, and 39, respectively, above.

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90	5. The FEIS fails to adequately analyze and address the impacts to hydrology, water quality, and stream morphology.[11] 6. The FEIS fails to adequately consider and analyze a full range of alternatives.[12] 7. The FEIS fails to adequately analyze and address aquatic and environmental impacts.[13] 8. The FEIS fails to adequately analyze and address impacts to the recreational economy of Grand Lake, the Colorado River, and tributary streams of the Colorado River in Grand County.[14] 9. The FEIS fails to adequately analyze and address the likely environmental impact of the preferred alternative in light of the most recent period of record.[15] 10. The FEIS fails to adequately analyze and address the likely environmental impacts of the alternatives in light of the best-available science on climate change.[16] 11. The FEIS fails to adequately analyze and address the environmental impacts to Grand Lake.[17]	90. Please refer to Comments 40, 41, 42, 43, 44, 45, and 46, respectively, above.

[11] See "Letter #1138"and "Letter #1126": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_organizations_groups_businesses.pdf and see "Letter 1075" http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_cooperating_agencies.pdf and "Letter 1141": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_government_agencies.pdf.

[12] See "Letter #1138" and "Letter #1059": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_organizations_groups_businesses.pdf and "Letter 1141": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_government_agencies.pdf.

[13] See "Letter #1138" and "Letter #1060" and "Letter #883" and "Letter #1110": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_organizations_groups_businesses and "Letter 1141": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_government_agencies.pdf.

[14] See "Letter #1052": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_organizations_groups_businesses.pdf and "Letter 1075": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_cooperating_agencies.pdf and "Letter 1141": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_government_agencies.pdf.

[15] See "Letter #1059": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_organizations_groups_businesses.pdf and "Letter 1062": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_government_agencies.pdf and "Letter 1141": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_government_agencies.pdf

[16] See "Letter #1059" and "Letter #1126": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_organizations_groups_businesses.pdf and "Letter 1141": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_government_agencies.pdf

[17] See "Letter #58" and "Letter #1103": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_organizations_groups_businesses.pdf and "Letter 1141": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_government_agencies.pdf

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91	12. The FEIS fails to adequately analyze and address stream temperature impacts to the Colorado River and streams in Grand County that are tributaries to the Colorado River.[18] 13. The FEIS fails to adequately analyze and address impacts to federally listed Endangered Species under the Endangered Species Act.[19] 14. The FEIS fails to adequately analyze and address cumulative impacts with the proposed Northern Integrated Supply Project.[20,21] 15. The "No Action Alternative" in the FEIS is misleading, speculative, and does not represent a true "no action" alternative.[22] 16. The FEIS fails to analyze the capability of individual WGFP participants, including but not limited to the Platte River Power Authority, to meet their water needs by other means.[23] 17. The FEIS fails to address the impacts of climate change from providing water to the coal-fired power plant at the Platte River Power Authority.[24] 18. The FEIS fails to analyze and address the water used for fracking in the Purpose and Need.[25]	91. Please refer to Comments 47, 48, 49, 50, 51, 52, and 53, respectively, above.

[18] See "Letter #1126": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_organizations_groups_businesses.pdf and "Letter 1141": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_government_agencies.pdf

[19] See "Letter 1126": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_organizations_groups_businesses.pdf and "Letter 1141": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_government_agencies.pdf

[20] See "Letter 1126," and "Letter #1117": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_organizations_groups_businesses.pdf

[21] See Save The Poudre letter, April 10, 2011: http://poudreriver.home.comcast.net/~poudreriver/STP_letter_to_Corps_Bureau_EPA_NISP-Impacts-On-Colorado-River-4-10-2001.pdf

[22] See "Letter 1126": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_organizations_groups_businesses.pdf and "Letter 1075": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_cooperating_agencies.pdf and "Letter 1141": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_government_agencies.pdf

[23] See Save The Poudre letter, April 19, 2012: http://poudreriver.home.comcast.net/~poudreriver/STP-letter-to-BOR-ACE-PRPA-WGFP-FEIS-4-19-2012.pdf and "Letter 1141": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_government_agencies.pdf

[24] http://www.nwf.org/pdf/Global-Warming/ghg%20co%20fact%20sheet.pdf.

[25] See Save The Poudre letter, October 4, 2011: http://poudreriver.home.comcast.net/~poudreriver/STP_letter-to-BuRec-WGFP-Water-For-Fracking-10-4-2011.pdf.

Comment	Save the Colorado – December 19, 2014	Response
92	19. The FEIS fails to analyze and address the climate change impacts of using and/or leasing or selling WGFP water for fracking of oil and gas in Colorado by WGFP participants, including but not limited to the City of Greeley and the Platte River Power Authority.[26] 20. The FEIS fails to adequately analyze and address the impact of climate change on water supplies proposed to be used by the WGFP.[27] 21. The FEIS fails to address the impacts of climate change resulting from oil and gas development and consumption that is made possible or supported by WGFP water. It is known that the process of extraction and distribution of oil and gas includes significant methane leaks which significantly contribute to climate change.[28] 22. In addition, as enumerated in the its comments[29], the U.S. Environmental Protection Agency has stated that the FEIS: a. has "issues with data, methodologies, and conclusions" b. does not account for important new information from the Colorado Division of Wildlife c. needs to be "supplemented" (i.e., a Supplemental Environmental Impact Statement needs to be created).	92. Please refer to Comments 54, 55, 56, and 57, respectively, above.
93	The Army Corps Must Supplement the WGFP FEIS As noted above, EPA commented that the FEIS needs to be supplemented due to its numerous flaws. We agree with the EPA and we ask that the Army Corps, at a minimum, supplement the FEIS and conduct additional data collection and analysis, as requested by EPA. The NEPA regulations state it is "essential" that an FEIS contains "high quality" and "accurate scientific analysis." 40 C.F.R. § 1500.1(b); *see also id.* § 1502.24 ("Agencies shall insure the professional integrity, including scientific integrity, of the discussions and analyses" in an EIS). An agency must supplement an FEIS if there are "significant new circumstances or information" relevant to a project. *Id.* § 1502.9(c)(1)(ii). Moreover, the Clean	93. Please refer to Comment 19 above.

[26] See Save The Poudre letter, April 19, 2012: http://poudreriver.home.comcast.net/~poudreriver/STP-letter-to-BOR-ACE-PRPA-WGFP-FEIS-4-19-2012.pdf.

[27] See Save The Poudre letter, March 13, 2012: http://poudreriver.home.comcast.net/~poudreriver/STP-letter-to-ACE-WGFP-FEIS-3-13-2012.pdf and "Letter 1141": http://www.usbr.gov/gp/ecao/wgfp_feis/feis_appendix_f_government_agencies.pdf.

[28] http://www.pnas.org/content/111/17/6237.abstract and see the studies linked to in this news report: http://www.climatecentral.org/news/huge-methane-leaks-add-doubt-on-natural-gas-as-a-bridge-fuel-17309.

[29] http://www.savethecolorado.org/blog/wp-content/uploads/2014/11/EPA-comments-WGFP-FEIS-2-6-2012.pdf

Comment	Save the Colorado – December 19, 2014	Response
93 (cont'd)	Water Act Section 404(b)(1) Guidelines recognize that there may be cases when the Army Corps must supplement NEPA documents in order to meet the independent requirements of Clean Water Act section 404. *Id.* § 230.10(a)(4). Because the FEIS for the WGFP does not include the up-to-date and accurate analysis required by NEPA and the Clean Water Act, the Army Corps must collect additional data and supplement the FEIS. The Army Corps Should Provide an Additional Public Comment Period Even if the Army Corps fails to supplement the FEIS, we request that the Corps open up its review of the WGFP FEIS to a new public comment period. EPA recommended that the Corps make all supplemental information available for public comment, and we agree with EPA. EPA Letter to Corps at 2. Because the FEIS contains significant new information, and because the WGFP is extremely controversial, opening up a new public comment period would be in the public's interest and in accordance with the Clean Water Act. *See* 40 C.F.R. § 1500.1(b) ("Accurate scientific analysis, expert agency comments, and public scrutiny are essential to implementing NEPA."); 33 C.F.R. § 325.2(d) (Corps may extend public comment period for Section 404 permits). We would like to thank the Army Corps for considering these comments before it makes a decision on whether to issue a Section 404 permit for the Windy Gap Firming Project. In addition, thank you for inserting these comments into the legal, public record for the Section 404 and Environmental Impact Statement processes for the Windy Gap Firming Project. Respectfully,  Gary Wockner, PhD, Executive Director Save The Colorado PO Box 1066 Fort Collins, CO 80522 http://savethepoudre.org 970-218-8310 **About Save The Colorado**: Save The Colorado is a non-profit corporation in the state of Colorado. Save The Colorado's mission is to protect and restore the Colorado River and its tributaries from the source to the sea. One of the keystones of our advocacy is fighting damaging and irresponsible water projects like the Windy Gap Firming Project. We operate in Colorado and run programs throughout the Colorado	
94		94. Please refer to Comment 60 above.

Comment	Save the Colorado – December 19, 2014	Response
	River basin in the western U.S. We have thousands of supporters and followers in Colorado and the western U.S. and are very active and highly visible champions for the river.	

Comment	Save the Poudre – April 19, 2012	Response
	SavethePoudre.org Poudre Waterkeeper April 19, 2012 Michael J. Ryan, Regional Director Great Plains Regional Office Bureau of Reclamation P.O. Box 36900 Billings, Montana 59107-6990 Tim Carey Denver Regulatory Office U.S. Army Corps of Engineers Littleton, Colorado 80128 Dear Director Ryan and Mr. Carey, A few weeks ago, Save the Poudre sent you each letters with requests about the FEIS for the Windy Gap Firming Project (WGFP). Since that time, we have obtained new information that we also request that you address in a supplement to the WGFP FEIS. We recently obtained a memorandum (dated March 21, 2012) from the Platte River Power Authority (PRPA) regarding their "surplus" Windy Gap water and a proposal to sell or lease that water to Oil and Gas companies for drilling and fracking. First, this letter reveals serious concerns about PRPA's need to be participating in the WGFP. This letter strongly suggests that PRPA does not have a need for the total amount of water that they have requested in the WGFP. "Initially, 5,150 acre-feet of the Windy Gap water was planned for use at Rawhide Unit 1. An additional 4,060 acre-feet was identified and held in reserve for future generation units at the Rawhide Energy Station. This left approximately 6,790 acre-feet as surplus Windy Gap water. It is unlikely that future coal units will be constructed at Rawhide, but the water held in reserve can be used for other types of generation, such as gas-fired combined cycle generation. Even with the use of all water identified or current and future generation, Platte River still has surplus Windy Gap water." (http://savethepoudre.org/documents/PRPA-Surplus-Water-Sales0001.pdf, page1, underlined added) Second, language in the letter could be construed as suggesting that PRPA does not need and is therefore "speculating" in WGFP water. The FEIS "Purpose and Need" for WGFP states that PRPA needs water for current power generation: "**Water Need.** Platte River's participation in the WGFP is to meet the water needs for their current power generation facility, not to meet future water needs for expansion of power generating capacity." (FEIS, Chapter 1, 1.7.13, page 1-39)	

Comment	Save the Poudre – April 19, 2012	Response
95 96 97	But the PRPA March 21, 2012 memo states that PRPA can sell or rent it back to its owner cities, serve as a current or future 'water bank' for those cities, or sell water to someone else in perpetuity: "In the past, the Board has wanted to hold this Windy Gap water for potential future use by the four cities, but this surplus Windy Gap may be leased to the cities or others subject to Board approval." (page 1) Third, as of the writing of this letter to you, PRPA has not yet decided if it will sell or lease water to the Oil and Gas Industry for drilling and fracking. If PRPA does go forward with this lease, we, again[1], request that the WGFP FEIS analyze the full potential for water to be used for drilling and fracking in a supplement to the FEIS. As this memo from PRPA states: "Platte River's surplus effluent is in demand because a large portion of the effluent is reusable and can be used to extinction anywhere within the State of Colorado, thereby making it an ideal supply of water for oil and gas well development. Windy Gap return flow water may also be used for oil and gas well development anywhere within the State f Colorado." (page 3, underline added) We note that the memo suggests that PRPA can lease water for drilling and fracking at a price ($300 - $500/acre foot) that is ten times, or higher, than the price it can lease water to farmers for irrigated agriculture ($10 - $40/acre foot). PRPA may be able to profit significantly from selling or leasing WGFP water for drilling and fracking. Therefore, we request that you: 1. Reconsider whether PRPA has a purpose and need for participating in the WGFP. 2. Consider whether PRPA is speculating in water rights. 3. If PRPA moves forward with a sale or lease of water or effluent to Oil and Gas drilling and/or fracking companies, include a full analysis of these impacts (as noted in the October 4, 2011 letter, below) in a supplement to the WGFP FEIS. Thank you for considering our concerns. Respectfully,  Gary Wockner, PhD, Director, Save The Poudre: Poudre Waterkeeper, Fort Collins, Colorado, http://savethepoudre.org 970-218-8310 Cc: U.S. EPA [1] We made this request in our previous letters to you, dated March 13, 2012, and dated October 4, 2011. March 13, 2012: http://savethepoudre.org/documents/STP-letter-to-BOR-WGFP-FEIS-3-13-2012.pdf October 4, 2011: http://savethepoudre.org/documents/STP_letter-to-BuRec-WGFP-Water-For-Fracking-10-4-2011.pdf	95. The Corps agree with the response to comments provide by the BOR, as follows: *The purpose and need for the Platte River Power Authority's participation in the WGFP has not changed. Currently, Platte River's firm yield from the Windy Gap Project is zero without storage. As indicated in the FEIS p. 1-39: "The current operation to meet Platte River's water supply needs is subject to the availability of Windy Gap water and these deliveries are not reliable."* *The WGFP addresses Platte River's water demand to meet the current operation for the existing Rawhide plant, or about 5,150 acre feet. The Save the Poudre letter is incorrect in its statement that "PRPA does not have a need for the total amount of water that they have requested in the WGFP." There may be a misunderstanding about the relationship of the WGFP storage requests to the original Windy Gap Project.* *As the WGFP FEIS documents, Platte River's participation in the WGFP is based on the anticipated storage required to meet firm yield needs, (FEIS p. 1-21:* *"Participant WGFP firm yield values discussed in this section are based on firm yield goals. Actual firm yield estimates from hydrologic modeling of the Proposed Action are described in Section 3.5.2.9 and Section 3.5.3.7."* *Platte River's modeled firm yield from the WGFP is 4,720 acre-feet (FEIS Table 3-19). As discussed in Section 3.5.3.7, WGFP yields also would be reduced if reasonably foreseeable actions, such at the Moffat Collection System Project are implemented and flows available for WGFP diversion decrease. Platte River's WGFP firm yield using cumulative effects hydrology would be 4,330 acre-feet (FEIS Table 3-28).* 96. The Corps agree with the response to comments provide by the BOR, as follows: *The WGFP FEIS states on page 1-1: "The original Windy Gap Project was completed by the Subdistrict in 1985. Since that time, the Windy Gap Project has not been able to reliably deliver water supplies to Windy Gap Project unit holders (allottees). In addition, the Windy Gap Project does not currently provide annual carry-over water storage for the Middle Park Water Conservancy District (MPWCD) on the West Slope. Because of the deficiency in water deliveries and lack of storage, the Windy Gap Project allottees and MPWCD have not been able to fully rely on Windy Gap water for meeting a portion of their annual water demand. As a result, a group of the Windy Gap Project unit holders, working through the Subdistrict, have initiated the proposed WGFP, which would firm all or a portion of their*

Comment	Save the Poudre – April 19, 2012	Response
		individual Windy Gap units to meet a portion of existing and future municipal and industrial water requirements." *Platte River has owned Windy Gap shares since 1974 and has been using Windy Gap water, when available, since 1985. While Platte River already owns 160 units of Windy Gap water, which under the anticipated yield of the original Windy Gap project would represent 16,000 acre feet per year, they have only requested 12,000 acre feet of storage in the WGFP, which would be used to help firm their need for about 5,150 acre feet of water for use at the existing Rawhide Power Plant. In some years they may have excess water available from Windy Gap water not in the firming project or return flows of first use Windy Gap water, but they have requested storage in the WGFP for their existing water rights in an amount to firm their supply for the Rawhide Power Plant. This should not be considered "speculating in water rights", since they already own and use the rights (shares). The WGFP would firm up the likelihood that those shares would be available to support their needs for operating the Rawhide Power Plant. Platte River's Windy Gap shares not included in the firming project could be used by Platte River for future power generation or they may be sold or leased for other purposes. Because Windy Gap water can be used to extinction, reuse of WGFP water or unfirmed Windy Gap water can be used for other purposes.* 97. The Corps agree with the response to comments provide by the BOR, as follows: *The WGFP deals only with Platte River's need to firm their water supply for the existing Rawhide plant, or 5,150 acre feet. Reuse of WGFP water by project participants for a variety of purposes is discussed in the FEIS. Use of other unfirmed Windy Gap Project water is not a part of the firming project. Platte River's future plans for their reuse of WGFP water or unfirmed Windy Gap Project water is irrelevant to the purpose of providing a firm yield to the Rawhide Power Plant.*

Comment	Trout Unlimited – January 31, 2012	Response
98	*Mely Whiting, Legal Counsel, Colorado Water Project* January 31, 2012 Mike Collins, Manager Eastern Colorado Area U.S. Bureau of Reclamation *Via email to mcollins@usbr.gov* Mike Ryan, Regional Director Great Plains Region U.S. Bureau of Reclamation *Via email to mryan@usbr.gov* Lucy Maldonado Eastern Colorado Area U.S. Bureau of Reclamation *Via email to lmaldonado@usbr.gov* John Bezdek, Assistant Solicitor Office of the Solicitor Department of the Interior *Via email to john.bezdek@sol.doi.gov* **Re: Windy Gap Firming Project Final Environmental Impact Statement (Final EIS)** Dear Mr. Collins, Mr. Ryan, Mr. Bezdek and Ms. Maldonado, I am writing on behalf of Trout Unlimited to offer our comments on the Final EIS for the Windy Gap Firming Project (WGFP). Our intent is not to repeat or replace our Draft EIS comments but to highlight some of the most significant unresolved problems and to propose specific steps to resolve them without litigation. Attached you will find a more detailed description of these problems and our proposed resolution. From the outset, Trout Unlimited along with EPA, Colorado Division of Parks and Wildlife (CDPW) biologists, Grand County, the Colorado River Water Conservation District, Colorado River landowners and others, have expressed serious concerns about the cumulative impacts of WGFP and the proposed Moffat Collection System Project on the upper Colorado River and on the future viability of its valuable trout fisheries. One of the most popular fly fishing destinations in Colorado, the river is showing signs of degradation – including stream bed armoring, sediment accumulation, algae and the documented loss of macroinvertebrate and native fish species (Nehring 2011). We are concerned that these projects, which will take approximately 23% of the remaining river flows and reduce the river to less than 25% of its native flows, will be the final death knell for this valuable, wild trout fishery. Our concern is shared by thousands of anglers, residents, business owners and citizens who fear for the future of our state's name-sake river.[1] [1] Over 1,000 individual comment letters were received by BOR on the Draft EIS asking for river protection. Four separate petitions, adding up to thousands of signatures, have been signed by concerned anglers, residents, citizens and business owners. On January 24, 2012, over 100 demonstrators gathered in front of EPA's Region VIII offices in Denver to plead for river protection. Links to signed petitions and media coverage of the Rally for the Colorado River can be found at www.defendthecolorado.org. *Trout Unlimited: America's Leading Coldwater Fisheries Conservation Organization*	98. The Corps agree with the response to comments provided by the BOR, as follows: *The new macroinvertebrate field data presented in the Nehring et al. (2011) report was reviewed and considered in concert with the other data sources cited in the FEIS to determine if there was any significant new information relevant to the analysis being presented. The Nehring report did not collect data on streambed armoring and algae accumulation. The data collection was limited to macroinvertebrate data and fish data. Consequently, Reclamation did not find the conclusions regarding the existing physical conditions of the Colorado River downstream of Windy Gap Reservoir in the 2011 Nehring report useful in determining the environmental consequences in the FEIS. We concurred with Nehring 2010 and 2011 that there is a reduction in some taxa of invertebrates and fish in the FEIS. We note that as late as fall 2011, CPW stated the trout populations in the Colorado River downstream of Windy Gap are "consistently excellent" (Ewert 2011).*

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99	The Bureau of Reclamation (BOR) does not have an obligation to approve the use of Colorado Big Thompson (C-BT) project facilities for the benefit of WGFP. Nor does it have an obligation to minimize the burden of its proponent, Northern Colorado Water Conservancy District, Municipal Subdistrict (Subdistrict), to ensure that operations do not harm the Colorado River. On the contrary, BOR's primary obligation is to the C-BT project and to ensuring that, if approved, WGFP is operated in a manner that does not interfere with C-BT project purposes. One of the primary purposes of the C-BT project, as stated in Senate Document 80, is "[t]o preserve the fishing and recreational facilities and the scenic attractions of Grand Lake, the Colorado River, and the Rocky Mountain National Park." *SD 80 at p. 3.* BOR's first obligation is to ensure that WGFP operations do not impact Grand Lake, the Colorado River or its fisheries.	99. The Corps agree with the response to comments provided by BOR, as follows: *Reclamation is aware of and acknowledges its responsibility to operate the C-BT Project consistent with Senate Document 80 (SD 80) (FEIS, p. 1-47). As stated in the FEIS (p.1-47), prior to entering into a contract, Reclamation will make a determination whether the proposed WGFP contract is consistent with the provisions of SD 80.*
100	Given the current state of river depletion and decline, Trout Unlimited, EPA, CDPW, Grand County and others have repeatedly asked BOR to take special care in evaluating the cumulative impacts of WGFP on the Colorado River's aquatic ecosystem.[2] An impacts analysis of this magnitude and complexity cannot be accomplished without making significant assumptions. We have urged BOR to be conservative in its assumptions and to resolve uncertainty in favor of aquatic life protection. We have urged BOR to look at cumulative impacts as a continuum, trying to understand how stream depletions have affected and are currently affecting aquatic life and whether additional depletions are likely to make those conditions worse. We have urged BOR to look, not just at how aquatic life will react to single dry, average or wet years, but how the river hydrology will change over a period of years and how those changes will cumulatively affect aquatic life. Will aquatic life be exposed to lower flow conditions more often? For longer periods of time? How will these changes affect aquatic life? How will they affect their habitat? And we have asked the agencies to contemplate the possibility that the system is reaching its threshold for non-linear, catastrophic responses and to develop adequate measures to monitor for and prevent the loss of these prized fisheries.	100. The Corps agree with the response to comments provided by the BOR, as follows: *The FEIS included an in depth evaluation of the cumulative effects to the aquatic environment in the Colorado River. This began with hydrologic modeling of daily flows for a 47-year period of record using the hydrologic changes associated with all quantifiable reasonably foreseeable actions including the Moffat Project. Hydrologic model output was then used to quantitatively evaluate impacts to water quality constituents, stream temperature, channel maintenance flows, and aquatic habitat modeling. Results of these analyses are presented in the FEIS and multiple technical reports. Mitigation and monitoring measures were then developed and incorporated into the FEIS to address identified adverse impacts attributable to the WGFP.*
101	In reviewing the Final EIS, Trout Unlimited is appreciative of BOR's progress in evaluating stream temperature impacts and their effect on aquatic life in the Colorado River. While stream temperature mitigation measures remain insufficient, Trout Unlimited applauds BOR's acknowledgment of the seriousness of the issue. We are dismayed by the Final EIS evaluation of other potential impacts of WGFP on the Colorado River and its aquatic life.	101. The Corps agree with the response to comments provided by the BOR, as follows: *Reclamation believes all evaluations were appropriately conducted and provide a fair representation of anticipated impacts of the WGFP.*
102	The Final EIS continues to use modeling assumptions that underestimate WGFP impacts. Data is presented through skewed statistics that mask the true magnitude of impacts. Even when incremental flow changes are acknowledged, their impacts are arbitrarily dismissed. Aquatic life is presumed to be healthy and thriving in spite of clear evidence of significant decline. Future aquatic life conditions continue to be evaluated through the artificial lens of historical year types and patterns, rather than a changed hydrological condition that could expose aquatic life to constant stress year after year after year. A critical report by the state's fish and wildlife agency, which findings contradict key findings in the Final EIS, is ignored. The very real possibility of threshold responses arbitrarily disregarded. In sum, while acknowledging significant potential stream temperature impacts, the Final EIS brings us no closer to understanding the potential impacts of anticipated additional reduction of peak flows and of prolonged, low flow periods on the health of the Colorado River and its aquatic life. These impacts can be as devastating as elevated stream temperatures. [2] Comments reflecting these requests are part of the WGFP Draft EIS record. 2	102. Please refer to Comments above.

Comment	Trout Unlimited – January 31, 2012	Response
103	Rather than taking special care to ensure that the proposed use of CB-T facilities for non-project uses can be accomplished without affecting the primary purposes of the CB-T Project, BOR appears to be going out of its way to ensure WGFP is approved with minimal risk or burden to its proponents. Indeed, the Final EIS offers not a single mitigation measure for the protection of the Colorado River and its fisheries beyond the limited and insufficient measures the Subdistrict has already agreed to undertake. The risk that assumptions and conclusions in the Final EIS are incorrect and that these errors will lead to further degradation or, in the worst case scenario, catastrophic loss, is placed on the Colorado River and its fisheries.	103. The Corps agree with the response to comments provided by the BOR, as follows: *The mitigation measures provided in the FEIS were developed based on identified adverse impacts and comments received on the draft EIS. CPW and the Wildlife Commission had a significant role in the development and review of mitigation measures specific to aquatic resources.*
104	Trout Unlimited urges BOR to fulfill its obligation under Senate Document 80. We urge BOR to take a closer look at the risks posed by WGFP to Grand Lake and to the Colorado River and its fisheries with an eye to minimizing risks to those resources which BOR is duty bound to protect. We urge BOR to adopt enforceable mitigation measures designed to minimize those risks as a condition to any approval of the use of CB-T facilities for WGFP purposes. Those measures must include, at a minimum, (1) restrictions on project diversions *anytime* stream temperature nears acute *or chronic* state standards, (2) adequate flushing and channel maintenance flows, (3) a detailed, robust and *enforceable* monitoring and adaptive management plan that uses baseline conditions and specific thresholds to trigger additional protective action, and (4) bypass of Colorado River flows around Windy Gap Reservoir. These measures are further detailed in the attached.	104. The Corps agree with the response to comments provided by the BOR, as follows: *The FEIS identifies the measures necessary to mitigate the adverse impacts of the proposed project, including the measures identified by the State of Colorado to mitigate impacts to fish and wildlife.*
105	We believe the Final EIS to be legally defective. It fails to meet NEPA's substantive and procedural requirements and it fails to provide critical information needed by BOR and the U.S. Army Corps of Engineers to ensure compliance with their respective statutory obligations. Given the significant risks WGFP poses to Grand Lake and to the health of the Colorado River and its fisheries, we also believe that less damaging alternatives to meet WGFP participants' demands are available. Nevertheless, our primary interest is to ensure that adequate, enforceable mitigation measures, such as those we propose, are adopted. We urge BOR to do so. Thank you for the opportunity to comment. Sincerely,  Amelia S. Whiting Legal Counsel, Trout Unlimited Colorado Water Project (720) 470-4758 mwhiting@tu.org cc (w/selected attachments): Anne Castle, DOI John Tubbs, DOI David Murillo, BOR James Martin, EPA Region VIII Rena Brand, USACE Attachments 3	105. The Corps agree with the response to comments provided by the BOR, as follows: *This Final EIS was prepared in accordance with the NEPA of 1969 and amendments, and the Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of NEPA (40 CFR 1500-15-8).*

Comment	Trout Unlimited – January 31, 2012	Response
106	***WGFP DETAILED COMMENTS*** ***Attachment A*** ***Trout Unlimited's Final EIS Comments Letter*** ***Dated January 31, 2011*** **1. The Final EIS ignores new critical information** In September of 2011, the Colorado Division of Parks and Wildlife (CDPW), formerly the Colorado Division of Wildlife, released a report entitled "Colorado River Aquatic Resources Investigations – Federal Aid Project F-237R-18" (Nehring Report or Nehring 2011).[3] A copy of the report is attached (Attachment C). The purpose of the report is: To document the relative distribution and abundance of the mottled sculpin Cottus bairdi and the aquatic invertebrate fauna of the Colorado River in Middle Park, Colorado in 2010 and compare the results with historical data and records compiled over the past 25-40 years, prior to the construction and operation of Windy Gap Dam in 1983. *Nehring 2011 at p.1.* The report summarizes data showing a dramatic decline in numbers and diversity of macroinvertebrate species in the Colorado River since the construction of Windy Gap Reservoir, including: • 38% loss of total macroinvertebrate diversity from 1980-1981 to 2010 • Among the three most sensitive insect groups (EPT), losses from 1980-1981 to 2010 include 19 mayfly, four stonefly, and eight caddisfly species • Sensitive species like Pteronarcys californica, Pternarcella badia, and Drunella grandis were eliminated below Windy Gap Dam • Stoneflies have declined by 40% with the greatest losses at stations nearest WGD • Species that were present and/or abundant at Reach One study sites WG11 and WG12 for most or all of the 1980-1981 period but greatly diminished in number or totally absent at these two sites nearest WGD in 2010 include *Psychomia flavida,* and the large free-living taxa *Arctopsyche* sp. and *Cheumatopsyche* sp. *Nehring 2011 at pp. 13-21.* The report goes on to describe the changes leading to the aquatic life declines, including: • Reduction in flushing flows • Loss of channel connectivity due to Windy Gap Reservoir • Elevated water temperatures • Fine sediment deposition and transport • Rooting of vegetation mats dislodged from Windy Gap reservoir *Nehring at pp. 23-29.* The report reaches the following overarching conclusion: [3] The report is dated June 2011 but it was not signed by its authors until September 1, 2011. 4	106. The Corps agree with the response to comments provided by the BOR, as follows: *Nehring's 2010 report is referenced in the FEIS and data in the 2011 report were reviewed by Reclamation and its aquatic specialist prior to publication of the FEIS to identify if there was any significant new data relevant to the analysis that would change the effects determination. The FEIS included information on the decline of Pteronarcys and mottled sculpin in the affected environment section of Aquatic Resources. The change in species composition is what is expected below a river impoundment, is recognized in cumulative effects, and is also described in existing conditions.* *The Nehring et al. (2011) report does not provide documentation to substantiate the report's conclusions regarding the magnitude or duration of flows required to clean cobble-boulder substrates. Data was not collected on stream water temperature and the report did not quantify areas of vegetation or fine substrate. Physical parameters were not measured, analyzed, or modeled. The study was limited to the collection of biological data.* *Consequently, Reclamation did not find the conclusions regarding the existing physical conditions of the Colorado River downstream of Windy Gap Reservoir in the 2011 Nehring report useful in determining the environmental consequences in the FEIS. However, the new macroinvertebrate field data presented in the report was reviewed and considered in concert with the other data sources cited in the FEIS to determine if there was any significant new information relevant to the analysis being presented.*

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106 (cont'd)	It is our conclusion that chronic sedimentation and clogging of the interstitial spaces in the cobble-rubble dominated riffles areas of the upper Colorado River below WGD is the overarching problem that has increasingly compromised the biotic integrity and proper function of the river over the past 25 years. The proposed firming projects at Windy Gap and the Moffat Tunnel are only going to further exacerbate this situation. *Nehring 2011 at p. 31.* The Nehring Report is the most comprehensive site-specific study of aquatic life impacts in the Colorado River downstream of Windy Gap Reservoir. It is a study conducted and released by the state's fish and wildlife agency. Its findings and conclusions are not only informative, they are in some cases diametrically opposite to and contradict critical findings and conclusions of the Final EIS, including the Final EIS's overall finding that reductions in peak flows will not affect aquatic life in the Colorado River. The Nehring Report was made available to BOR by letter dated August 19, 2011 from the Upper Colorado River Alliance. Yet, the report is not considered in the Final EIS. The Nehring Report constitutes "significant new information relevant to environmental concerns and bearing on the proposed action or its impacts." BOR's failure to consider it in a supplemental EIS is not only inexcusable in light of its Senate Document 80 obligations, it violates NEPA. *40 CFR 1502.9(1)(c)(ii).*	107. The Corps agree with the response to comments provided by the BOR, as follows: *The rationale for selection of model assumptions is presented in the FEIS and/or the technical reports. The modeling provides a predicted estimate of effects for comparison purposes between alternatives.* 108. The Corps agree with the response to comments provided by the BOR, as follows: *The use of more recent data for Windy Gap diversions is due to the increasing demand that Windy Gap Participants have for Windy Gap water as their populations have increased. Given future demand projections, it is realistic to expect this demand will continue to increase. In contrast, the use of a 1950-1996 period for hydrologic modeling provides a broad range of average, wet, and dry flow conditions for evaluating hydrologic impacts. The potential of extending the study period and/or using additional periods for comparative analyses was considered in relation to whether these alternative hydrologic inputs would change conclusions regarding the yield of the Windy Gap Firming Project and/or change conclusions related to effects on hydrologic and other resource areas. With regard to inclusion of more recent hydrology, Windy Gap would not divert additional water due to the proposed WGFP in drought years like 2002 because the Windy Gap water rights would not be in priority as was the case in 2002. The period from 1997 through 2003 was analyzed in a spreadsheet exercise using Microsoft Excel. A copy of the technical memorandum, Significance of 2002 Hydrology to WGFP Modeling (Meg Frantz September 27, 2004), which summarizes that analysis, was provided to Grand County and Bishop-Brogden Associates, Inc. (Grand County's water consultants) at a meeting on March 4, 2005. Results of that analysis show that for the Windy Gap Firming Project Participants, other dry periods during the 1950 through 1996 study period were more critical than the recent drought. The model study period used also addresses the carryover and recovery effects of additional Windy Gap diversions in wet years following dry years like 2002 and 2003. The study period includes several series of dry years followed by wet years, which illustrate the effects of increased diversions to refill storage. For example, the study period includes the mid-1950's drought followed by 1957 (a wet year), 1963 and 1964 (dry years) followed by 1965 (wet year), 1977 (dry year) followed by 1978 (wet year), and 1981 (dry year) followed by several wet years in the mid-1980s. These sequences of years allow for an evaluation of impacts associated with diverting additional water in wet years following dry years. The model study period is suitable for estimating hydrologic effects associated with the EIS alternatives because it includes a broad range of average, wet, and dry years, and sequences of years that include dry years followed by wet years. The FEIS includes information for years that are reflective of some of the*
107	**2. The Final EIS arbitrarily selects modeling and other assumptions that favor project development over resource protection** Given the complexity of the analysis involved, the Final EIS must of necessity make assumptions. The Final EIS makes assumptions that consistently underestimate project impacts, placing the risk of error on the Colorado River and its aquatic ecosystem in direct contravention of Senate Document 80. The following is a non-exhaustive list of examples.	
108	**a. Selective use of modeling period** The Final EIS uses a 1950 to 1996 model period for all purposes except for the purpose of defining Windy Gap diversions, where the more recent 2004 to 2008 period is used. Because Windy Gap water diversions in the more recent period are higher, future depletions associated with WGFP appear smaller. BOR argues that the more recent period of greater diversions should be used because it is more indicative of existing conditions (although it ignores the declining aquatic health conditions during that time). In contrast, BOR uses hydrological patterns (sequences of dry, average and wet years) of the 1950 to 1996 period to model existing and future stream conditions in spite of known, significant changes in the last decade and anticipated future changes due to climate change.	
109	**b. Skewed statistics** The Final EIS calculates "average year" flows in a manner that significantly over estimates the amount of flows expected to remain in the Colorado River after WGFP in an average year. It does so by including the five wettest years of the period of record in its average year 5	

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		driest and wettest conditions that have occurred in the past. The study period does not have to include all of the five driest and wettest years at each location in the study area to accurately characterize hydrologic effects in dry and wet years. Extension of the modeling period to include additional dry and wet years would not substantially change the predicted impacts to flows as a result of the proposed Windy Gap Firming Project. *Climate change may alter temperature and precipitation in the Upper Colorado River basin. Potential environmental impacts from climate change are qualitatively evaluated as part of the cumulative effects evaluation. A qualitative assessment of potential impacts due to climate change is reasonable given the uncertainty associated with the data and methodologies typically used to quantitatively evaluate hydrologic effects associated with climate change. For example, Global Climate Change Models contain a significant amount of uncertainty and routinely fail to represent regional climate phenomena, including the southwestern U.S. monsoon. Both climate and hydrologic models use datasets that are interpolated across large spatial and temporal scales, which likely introduces significant uncertainty in terms of how accurately they predict future runoff.* 109. The Corps agree with the response to comments provided by the BOR, as follows: *As noted, the methodology was explained in the FEIS, including an understanding of the biases. The approach used is reasonable and meets requirements set forth in CEQ Regulations for Implementing the Procedural Provisions of NEPA (40 CFR 1502.24).*

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110 111	calculations.[4] Trout Unlimited suggested leaving the extreme events (i.e., the five wettest years and five driest years) out of the calculation or, in the alternative, the use of a median approach which reflects average conditions much more accurately. BOR acknowledges that its approach skews the outcome but insists that it is a legitimate, commonly used methodology. *Final EIS at F-491.* **c. One-sided corrections** The Final EIS acknowledges that the model used to predict reductions in peak flow does not have a "predictive" function, meaning that it assumes full diversion by Windy Gap and WGFP during the shoulder season regardless of whether Granby is projected to spill. If Granby is modeled to spill, the model assumes the projects' pumping will be released as part of the spill. In reality, Windy Gap is not pumped when Granby is projected to spill to save on pumping costs. The Final EIS notes this model shortcoming and warns that, as a result, more shoulder season flows should be available below Windy Gap Reservoir than the model predicts, resulting in fewer impacts during that season. What the Final EIS omits is the fact that the model shortcoming also results in the model's predicting much higher flows during peak season than documented by the actual gage records. The result is that the Final EIS overestimates post-project peak flows by 53 percent.[5] This error is carried throughout the Final EIS analysis, including the conclusion that further reduction in peak flows will not affect aquatic life and its habitat. **d. Speculative "no action" conditions** BOR compares WGFP impacts with the impacts of a future, speculative "no action" condition rather than to existing conditions. *See Final EIS at 3-2.* BOR's "no action" alternative assumes that if WGFP is not approved, another reservoir enlargement will be built that will take significant additional Colorado River flows. As a result, WGFP impacts appear smaller. Enlargement of Ralph-Price Reservoir is speculative at best, given the lack of any current plan for it and absence of firm yield from Windy Gap to justify its expense. Any expansion of the reservoir would also require a 404 permit and be subject to NEPA, running into the same issues as the WGFP.[6] According to data presented by the Upper Colorado River Alliance, BOR's assumptions regarding the no action alternative lessens the true impact of WGFP on peak flows by about 70 percent. [4] The model also uses three of the five driest years in the calculation. However, because high flows during the wettest years are orders of magnitude larger than low flows during dry years, averaging the wettest years results in flows that are significantly higher than if both extremes are left out of the calculation. [5] Resource Engineering, Inc., consultants for the Upper Colorado River Alliance, presented this information to BOR in a technical meeting on January 24, 2011. A copy of Resource Engineering's slides from the meeting is attached as Attachment D (*see Figure 5*). These concerns were again cited in the Upper Colorado River Alliance's letter to BOR dated January 3, 2012. The information is disregarded in the Final EIS. It is our understanding that Resource Engineering will supplement its earlier work in the near future. [6] Ironically, while deeming Ralph-Price enlargement, a project that is not even in the drawing board, "reasonably foreseeable," BOR does not consider NISP, a project that is undergoing permitting and, as described below, could have serious impacts on the Colorado River, sufficiently "reasonably foreseeable" to evaluate it in WGFP's cumulative impacts analysis. 6	110. The Corps agree to the response to comments provided by the BOR, as follows: *The annual decision to pump Windy Gap water takes into consideration many factors including snowpack, Granby Reservoir C-BT and Windy Gap contents, precipitation, Big Thompson River basin forecasts, and orders for Windy Gap water. Incorporating a forecasting function in the model would require making a number of assumptions regarding the variables listed above, in which case it may or may not improve the accuracy of model output. Forecasting does not eliminate Windy Gap spills as evidenced by historic Windy Gap spills in 1995, 1996, and 2011. For example, Windy Gap water was pumped in May and June of 1995, yet Granby Reservoir spilled in July that year. The year 1995 was one of the five wettest years in the study period, yet more than 14,000 acre-feet of Windy Gap water was pumped as late as early June that year. Similarly, almost 7,000 AF was pumped in April and May 2010, and Granby Reservoir would have spilled that year had preemptive measures not been taken to avoid a spill. As the model is currently configured without a forecasting function, Windy Gap diversions occur as long as storage space is available. As a result, Windy Gap diversions may be overstated in some wet years; however, historic operations show that Windy Gap water would be pumped in some wet years under Existing Conditions. Inclusion of a forecasting function may prohibit Windy Gap pumping in some above average and wet years that would otherwise occur as evidenced by Windy Gap diversions in 1995 and 2010.* *With respect to the impact analyses, the lack of a forecasting function in the WGFP model may overstate Windy Gap diversions in some wet years under Existing Conditions, resulting in higher flows in May, June, and July if water pumped earlier in the year is spilled. However, as discussed above, it is difficult to ascertain in which wet years pumping should be less under Existing Conditions since the decision to pump depends on numerous factors and does not follow well-defined rules. This issue does not affect Windy Gap diversions in average and dry years when Granby Reservoir does not fill, therefore, Windy Gap pumping, net depletions to the Colorado River, and associated impacts are accurately estimated in dry years, which are typically more critical for aquatics, water quality, and other flow-related resources. The lack of a forecasting function also has minimal effect on model results for the Proposed Action and Alternatives 3, 4, and 5 because Windy Gap diversions early in the season would be stored in firming reservoirs as opposed to Granby Reservoir and, as a result, these diversions would not be spilled.* *The statement that the FEIS overestimates post-project peak flows by 53 percent is inaccurate. That figure was estimated by Resource Engineering based on a comparison of modeled data for the period from 1950 through*

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		1996 and historical average daily flows for the period from 1985 through 2010. Based on comparisons using that data, Resource Engineering concluded the FEIS overestimates post-project streamflows by 53 percent. That analysis is inaccurate because Resource Engineering compared averages using different periods of record. To provide a relevant comparison, the same period of record should be used as shown in Figure 3-14 of the FEIS. In addition, it is not accurate to compare modeled Proposed Action flows to historical daily flows because it is not possible to separate flow differences caused by changes in demands, operations, and administration from flow differences attributable to the Windy Gap Firming Project. Demands have changed considerably, certain facilities and reservoirs were not in operation, and river administration and project operations have changed over the course of the study period. The differences in historical and modeled flows below Windy Gap reflect all of these factors; therefore, one would expect potentially large differences when comparing model results for Existing Conditions with historic records. Existing Conditions reflect the current administration of the river, demands, infrastructure, and operations. The intent of the analysis in the EIS is to isolate the changes associated with implementation of the WGFP alternatives. 111. The Corps agree with the response to comments provided by the BOR, as follows: *NEPA requires that action alternatives be compared against a no action alternative. In the FEIS, existing conditions were also used as a comparison for the purpose of assisting the Corps of Engineers with their CWA 404 permitting process, which they are required to compare against existing conditions. The No Action Alternative presents what WGFP Participants would do if Reclamation does not allow the proposed connections to C-BT facilities. Consistent with CEQ guidance on what should be considered in a no action alternative, it does not mean that agencies stop what they are doing. In the case of existing agreements, prior court decisions and CEQ guidance would define no action as no change to existing agreements. For WG and the WGFP, this means Reclamation would continue operation under the existing agreement between Reclamation and the Subdistrict for conveyance of WG water through the C-BT Project system (see CEQ 40 Questions, #3). This also includes foreseeable actions by the Participants. For most Participants, this includes continuing to take Windy Gap deliveries and increasing those deliveries as water demand increases within the capacity of the existing Windy Gap Project facilities and available storage in Granby Reservoir. One Participant would drop out of the WGFP. The City of Longmont would pursue enlargement of Ralph Price Reservoir to store its Windy Gap water. While there is no guarantee that enlargement of Ralph Price Reservoir would acquire all of the regulatory authorizations, it*

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112	**e. Non-representative sampling locations** To evaluate WGFP impacts on the Colorado River's ability to transport sediment, the Final EIS relies on an analysis performed for the original Windy Gap EIS in 1981, then attempts to support the validity of that analysis by a more recent study done for the USACE which finds the sediment transport rate of the river exceeds the sediment supply. The site used in the more recent study, however, is particularly favorable to a finding of no impact and not representative of the reach most impacted by the project. The site is located immediately below the confluence of the Colorado River with Williams Fork, some 15 miles downstream of Windy Gap dam. Unlike Windy Gap, a shallow reservoir that collects and routinely releases large amounts of silt and sediment to the stream, Williams Fork Reservoir traps sediment, delivering an infusion of low-sediment flows to the Colorado River that benefits the sediment heavy Colorado River at the particularly selected site. As further discussed below, 15 miles upstream, the Colorado River stream bottom is armored due to the periodic release of sediment and silt from the shallow Windy Gap Reservoir that solidify in the river bed in the absence of sufficient peak flows to move materials downstream. *(Nehring 2011).* The Colorado River site used in the more recent sediment transport analysis is not representative of current sediment conditions downstream of Windy Gap Reservoir, nor is it appropriate for use to describe how additional peak flow reductions associated with WGFP will impact this most severely affected portion of the Colorado River. Further, both the original 1981 EIS and the more recent analysis focus only on the transport of fine grain sediments and not the movement of larger particles needed for scouring and overall maintenance of channel health.	*is a reasonable action for the City of Longmont, and no fatal flaws were discovered in review of this alternative in the WGFP EIS. Just because a no action alternative may require NEPA compliance or a 404 permit does not make it speculative. The majority of the hydrologic impacts included under the No Action Alternative entail increased Windy Gap diversions by Participants, which they can currently do without any infrastructure changes or additional authorizations or approvals from Reclamation. It is unreasonable to assume that Windy Gap diversions would remain status quo under the No Action Alternative.* 112. The Corps agree with the response to comments provided by the BOR, as follows: *The site selected for hydrologic modeling was selected because of the long period of record of flows collected by the USGS at that location. A comparison of flow data at that site and the site below Windy Gap Dam had a very high correlation and thus it was considered to be representative of the affected area.*
113	**f. Arbitrary selection of aquatic life and river health data** One of the most serious deficiencies of the draft EIS is the assumption, imbedded in its aquatic impacts analysis, that the Colorado River and the aquatic life it supports is in good condition and not in a state of decline. If the river is in a state of decline, the cumulative impacts of WGFP and the Moffat Project could be devastating, a point brought up in many comments, including comments provided by EPA. The Final EIS looks at aquatic life conditions in the Colorado River downstream of Windy Gap Reservoir.[7] However, rather than carefully weighing all available evidence to reach a conclusion on this critical issue, the Final EIS ignores conclusive data evidencing significant aquatic life decline (Nehring 2010 and 2011) in favor of selective, unreliable and in some cases outright erroneous data that presents an inaccurate picture of river and aquatic life health.	*The Breeze site was chosen near Parshall as described in the previous response, and the focus of the study was on aquatic habitat substrate for flows up to 1,250 cfs. Flows ranging from 50 cfs needed to move fine sediment (<2 mm) up to 1,150 cfs to move very coarse gravels (64 mm, 2.5 inches) were evaluated because these are the flows critical for aquatic life at this location. Figure 3-31 shows that at this location, the transport capacity of the Colorado River far exceeds the sediment supply. As noted in Figure 3-31 of the FEIS, at a flow of about 200 cfs, sediment supply is the same as the transport capacity of the river, and at flows greater than 200 cfs, the capacity of the river to transport sediment exceeds sediment supply.*
114	***Macroinvertebrate Data*** To answer the question - is the Colorado River macroinvertebrate community in decline – the Nehring report compares macroinvertebrate data collected before construction of Windy Gap Reservoir to data collected in 2010. As previously discussed, the data reveals significant declines, including a 38% loss of total macroinvertebrate diversity, including the loss of 19 mayfly, 4 stonefly and 8 caddisfly species, the complete loss of key indicator species like the [7] *See Amended Aquatics Report (2010); Miller Ecological Consultants Memorandum dated August 22, 2011(Miller Memo); Final EIS 3-207 to 208.* 7	*Sediment transport can be considered to occur in two phases. In Phase 1, finer materials are transported from within the channel bed armor at a relatively low flow rate, and transport is typically limited by sediment supply (Schmidt and Potyondy 2004). During Phase 2 transport, the rate of sediment transport becomes much greater as the channel bed is disrupted by higher flows and the channel itself is mobilized. This is the flow required to rejuvenate the channel bed and achieve channel maintenance objectives (Schmidt and Potyondy 2004). When Phase 2 sediment transport begins in gravel bed rivers such as the Colorado River larger particles (medium gravel up to boulders) begin to move (Ryan et al 2002). This occurs at approximately 80 percent of the bankfull flow, and is the onset of the transport of D16-sized particles. From a material size standpoint, research indicates that Phase 2 transport is initiated with flows that are large enough to transport D16-sized particles (Ryan et al 2002). At the Breeze site, the*

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		D16 particle size was measured by ERC as being 22 mm (draft Moffat EIS), so the flow needed to begin Phase 2 sediment transport at that location would be about 510 cfs. In summary, a flow of about 510 cfs would be needed at the Breeze site to begin disrupting the streambed and begin moving larger particles in the river. 113. The Corps agree with the response to comments provided by the BOR, as follows: *Both Nehring 2010 and 2011 reports were considered prior to publication of the FEIS. In addition to Nehring's data, data from other sources were also used in the analysis of effects of each alternative. It is recognized that different habitat is provided below river impoundments than in free-flowing streams. The aquatic life below Windy Gap Reservoir is a healthy (reproducing) representation of the fauna supported by this changed habitat. This changed habitat represents existing conditions as a result of the cumulative effects of the past impoundment and diversion project. The changes downstream from reservoirs is well documented in the peer-reviewed literature for more than 30 years (Ward and Stanford 1979; Zimmerman and Ward 1982). This is due to a variety of causes including nutrients, water temperature, and flow regime. These same characteristics of a different faunal community downstream from reservoirs compared to undammed river reaches is also evident downstream from natural lakes.*

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114 (cont'd)	Pteronarcys californica, Ptnracella badia, and Drunella grandis, and a 40% decline in stoneflies. *Nehring Report at pp. 13 to 21.* Ignoring this data, the Final EIS looks not at how the macroinvertebrate community has changed over the years but simply compares recent macroinvertebrate counts to a hypothetical, reference condition using a modeling tool entitled "Multi-Matrix Index" (MMI). Using erroneous data, the Final EIS concludes that aquatic life downstream of Windy Gap Reservoir is healthy. *Final EIS at 3-208.* The Final EIS conclusion is both non-responsive and incorrect. First, the MMI tool is designed to assess *impairment* not *degradation*. Whether or not aquatic life use is *impaired* - which as explained below it is – the question being asked is whether the river's aquatic life has been *degraded* and whether further depletions by WGFP will cause or contribute to further degradation. This information can be best ascertained by comparing aquatic life data for the same stream over a period of years. Where this data is unavailable, searching for alternate methods makes sense. Here, however, the data is available. (Nehring 2010 and 2011). BOR simply chose to ignore it. BOR's decision to ignore pertinent information in favor of the less relevant MMI approach is not only arbitrary and capricious, it reflects BOR's bias toward selection of data that shows the least amount of impacts. Second, when properly calculated, MMI scores show that macroinvertebrates downstream of Windy Gap reservoir are actually *impaired* within the meaning of section 303(d) of the Clean Water Act. For mountain streams, MMI values of 50 or less indicates non-attainment of aquatic life use and scores of 42 or less, impairment.[8] According to the Final EIS, 2008 MMI calculations below Windy Gap reservoir provided by the Subdistrict's consultant scored the segment at 89 (Rees 2009). However, at a recent hearing before the Colorado Water Quality Control Commission, the Subdistrict's consultant indicated that the 2008 MMI score at that site was 44.6 (Rees 2011)(attached as Attachment E). The 44.6 score below the reservoir (Rees 2011) is well below the MMI non-attainment threshold and just 2.4 points shy of MMI defined impairment.[9] Moreover, when data reported in the Nehring Report was added, the MMI for the site scored 37.4, well below the aquatic life use impairment threshold.[10] Thus, the MMI methodology confirms that aquatic life downstream of the reservoir has not only been *degraded*, it has actually been *impaired.*[11] ***Fish Data*** The Final EIS further evaluates the condition of aquatic life downstream of Windy Gap Reservoir by looking at fish data collected over the last 10 years. The data for this period shows an average fish population of approximately 7,740 fish per mile. The Final EIS concludes that "[w]hile species composition and streamflow has changed substantially from pre settlement conditions, the trout populations in the Colorado River are very high and comparable to the best fisheries in the state." *Final EIS at 3-207.* Again, BOR insists in assessing the health of aquatic life in the Colorado River by reference to outside conditions, rather than by looking at available [8] *See Methodology to Determine Use Attainment for Rivers and Streams Policy*, Policy Statement 10-1, Colorado Water Quality Control Commission, at p. 10. [9] Rees Memo (11/30/11), Exhibit 5 to the Subdistrict's Rebuttal Statement (attached). [10] WQCD Rebuttal Statement – 303(d) List and Monitoring and Evaluation List December 2011 Reg. 93 RMH at p. 26 (attached as Attachment F). [11] MMI measures aquatic life impairment based on macroinvertebrate, not fish counts. Thus, based on available information, including the MMI scores, it appears that, while trout numbers are still strong, their food source is in serious decline. 8	114. The Corps agree with the response to comments provided by the BOR, as follows: *The Multi Metric Index (MMI) values reported in the FEIS were calculated using an outdated version of MMI. The Colorado Department of Public Health and Environment (CDPHE) has revised the methodology for the calculations and new values were calculated. The values reported in the FEIS were valid for the older MMI version; however, the new methodology resulted in different MMI values. The change in the methodology the state uses to calculate the score involves limiting a kick sample to no more than 300, regardless of whether thousands of insects are collected. An errata sheet has been prepared to correct this error in the FEIS. In addition, a supplemental information report (SIR) was prepared to determine if the revised MMI values, which were calculated using the updated CDPHE methodology and previously collected aquatic invertebrate data, presented significant new information relevant to the analysis that would change the effects determination of the FEIS. The revised MMI values are lower than those presented in the FEIS, but are still above the impairment threshold. The MMI values are only one of the metrics used in the evaluation of the aquatic invertebrates. Other traditional macroinvertebrate metrics that were used to evaluate existing conditions based on the original sampling data included -- diversity, evenness, Hilsenhoff biotic index (HBI), functional feeding groups, density, and biomass. This data indicates a healthy aquatic invertebrate population. The changed MMI scores provided another metric to assess existing conditions, but did not provide significant new information relevant to the analysis that would change the effects determination in the FEIS and thus a supplemental EIS is not warranted.* *The newer methodology is generally as follows:* *• The samples are collected in the stream using a kick-net method for approximately 1 m2 streambed in 1 minute, preserved and returned to the lab for analysis.* *• In the lab, the samples are sorted using a random grid selection process and picked to a fixed count of 300 individual specimens.* *• A single subsample is used for each site without replication.* *• The sorted specimens are identified and logged into the EDAS database.* *• The EDAS database software is used to determine ecoregion, slope, and elevation based on the GPS coordinates of the sample location.* *• The EDAS software then calculates the MMI using the equations appropriate for the biotype shown in Policy Statement 10-1, Appendix D (CDPHE 2010).* *Miller Ecological Consultants (MEC) samples were collected as replicate samples using a modified Hess sampler. This method collects a quantitative sample as compared to the qualitative sample collected using the kick-net*
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		technique listed in Policy Statement 10-1 (Aquatic Life Use Attainment, Methodology to Determine Use Attainment for Rivers and Streams, CDPHE October 12, 2010). MEC used a whole sample count to get a complete description of the invertebrates in their samples. The three replicate samples allowed calculation of statistics for each location sampled. The methodology in Policy Statement 10-1 results in a single value from a subsample of the entire sample collected. No statistical analysis can be completed on the value since there are no replicated samples. *One of the main reasons for using subsampling is the ability to provide a metric in a cost- and time-efficient manner when compared to whole sample counts (Barbour and Gerritsen 1996; Courtemach 1996). There is also discussion of how many samples or how much area to sample. Vinson and Hawkins (1996) recommend pooled small area samples rather than a single sample of the same total area. The overall objective of subsampling for biomonitoring is twofold: 1) to distinguish when an actual change to the stream biota occurs and 2) to conduct the sampling on a large number of streams in a cost- and time-effective manner. The first objective is not easy to achieve and several researchers have investigated the effect of subsampling. Doberstein et al. (2000) found that subsampling reduced the ability to differentiate between stream classes for some levels of subsampling. They concluded that for subsamples of 100 to 300 individuals, the discriminatory power was low enough to mislead water resource decision makers. However, rapid bioassessment protocols and regulatory agencies heavily rely on subsampling in the protocols developed for evaluation of stream aquatic life (CDPHE 2010; Nichols et al. 2006; Nichols and Norris 2006; Baker and Huggins 2005; Environment Canada 2002; Russell 2008).* *MEC recalculated the MMI values using the 300 fixed count from the whole count samples and subsequently had concerns similar to those expressed by Doberstein et al. (2000) that the results are misleading to the regulatory decision makers.* ***Colorado's Ecological Data Application System (EDAS) program*** *The EDAS program was developed by CDPHE for use in the MMI protocol. The database will calculate the slope, ecoregion, and elevation of each sample site based on the geographic coordinates. These physical data are needed to determine the biotype for the stream sample and apply the appropriate equations to compute the MMI value.* *EDAS classified the sample sites on the Colorado River collected by MEC in 2004 as biotype 1. This biotype is characterized as "transitional" between mountains and plains. Ecoregion designation and the stream slope mainly*

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		determine the classification. MEC notes that the biotype includes the metric for "Sensitive Plains taxa." Since the study sites for both the MEC study and Nehring et al. (2011) are on the western slope, this metric may produce inaccurate results due to lack of sensitive eastern plains taxa. *CDPHE aquatic life thresholds for biotype 1 (transition) have an attainment threshold MMI value of 52 and an impairment MMI value of 42. For scores between these two values, auxiliary metric thresholds are used to supplement MMI values. Auxiliary metrics for biotype 1 include a Hilsenhoff Biotic Index (HBI) value of less than 5.4 and a Shannon Diversity Index greater than 2.4.* *The data from MEC samples were formatted for the EDAS database and imported into it. Once imported, the various metrics used by the EDAS program were calculated using the EDAS software. One step in that process is to subsample the MEC data whole count samples to construct a 300-count subsample consistent with CDPHE (2010) protocols. This subsample was constructed using the software supplied with EDAS.* ***Subsampling to 300 fixed count from whole count*** *MEC composited their three replicate samples collected with a modified Hess sampler for the subsampling procedure to compute the 300-count subsample. The subsample was then used in EDAS to calculate the intermediate values used in calculation of the MMI. To test the repeatability of the MMI value, MEC ran the subsampling three times to generate three random samples. They expected to get a different dataset each time due to the random sampling technique but were concerned at the difference in the resulting MMI calculated for each subsample. The three runs show that depending on the subsample, the same dataset can generate an MMI that shows impairment, an MMI that shows attainment, and an MMI in the gray zone (Table 1 and Table 2). The secondary metrics for all runs and the whole count meet or exceed the values for HBI and Shannon Diversity showing that the sites are not impaired. MEC was concerned that the method has a fatal flaw in its current version and should not be used to evaluate stream health until the flaws in the protocol are corrected. Because MMI values do not provide a reliable indicator of macroinvertebrate health, they should not be relied on as the sole indicator of aquatic life health.*

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		Table 1. MMI calculations for Colorado River at Breeze site using EDAS software 300 fixed count compared to whole count samples.

Biotype 1	EDAS			MEC Whole Count Data
	Run #1	Run #2	Run #3	
(Sub)sample size	345	328	320	6,908
S-W Diversity	3.57	3.57	3.47	3.68
HBI	3.67	3.8	3.69	2.4
MMI	42.9	52.5	40.4	68.3

Table 2. MMI calculations for Colorado River at Lone Buck site using EDAS software 300 fixed count compared to whole count samples.

Biotype 1	EDAS			MEC Whole Count Data
	Run #1	Run #2	Run #3	
(Sub)sample size	343	301	346	1,978
S-W Diversity	3.84	3.72	3.94	3.90
HBI	3.72	4.01	3.76	3.52
MMI	52.7	41.4	51.5	68.8

We conducted additional analysis on the data from Nehring et al. (2011) for the sites closest to Windy Gap dam to compare to the results from MEC studies. The results for those data also were variable by subsample. We increased the subsample runs up to five to better understand the range of conditions that would be projected by the software. The results were similar to the results for the MEC data. The EDAS database software can produce results that have a large difference in MMI score, at times greater than 14 points (Table 3) that range from impairment to attainment. These simple tests of the software show that the results are neither accurate nor precise in the calculations based on a 300 fixed count method. We are presenting the results but would caution the use of the results until the CDPHE can rectify the errors in the program. Given this information, we feel that the stronger dataset for interpretation of aquatic life conditions are the traditional metrics such as EPT taxa, diversity, evenness, HBI, density, biomass, and functional feeding groups. MEC used those metrics in their original interpretation of the benthic macroinvertebrate data and continues to rely on the traditional metrics rather than the MMI until such time the EDAS database is shown to be reliable and representative based on an outside peer review of the methodology and thorough testing of the database calculations. These traditional metrics were used for all three replicate samples at each of the WGFP study sites, and use more data in the interpretation of aquatic invertebrates than the limited subsampling used for calculation of MMI.

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		MEC has continued to work with EDAS MMI calculations to better understand the database and its functions and has several unresolved issues that were discussed with CDPHE personnel to determine the source of the discrepancies. The main concern is the difference in the resulting MMI value when calculated by hand and the EDAS with the same input data set. These two methods should produce identical results. The hand calculation uses the equations listed in Policy Statement 10-1 and the intermediate metrics from EDAS subsampling. This should produce identical results as the EDAS calculation. The EDAS calculation is not identical to the hand calculation as it should be. This leads one to conclude that there are additional calculations or errors in calculations in EDAS that are not specified in Policy Statement 10-1. Additional specific issues with the EDAS calculations are described in a Miller Ecological Technical Memo (2012). ***Table 3. MMI calculations for Colorado River sites and data from Nehring et al. (2011).*** **Location** **COL NEW WG11** / **Run #1** / **Run #2** / **Run #3** / **Full Sample** MMI 42.4 34.5 41.7 73.8 S-W Diversity 2.65 2.79 2.83 2.87 HBI 4.62 4.64 4.58 4.54 **COL WG12** / **Run #1** / **Run #2** / **Run #3** / **Full Sample** MMI 53.6 39.5 47.1 68.5 S-W Diversity 3.21 3.27 3.20 3.31 HBI 4.76 4.87 4.80 4.75 **COL HWY40 BR** / **Run #1** / **Run #2** / **Run #3** / **Full Sample** MMI 72.4 65.8 66.4 79.7 S-W Diversity 3.54 3.65 3.58 3.67 HBI 3.88 3.89 3.88 3.75 **COL WG13** / **Run #1** / **Run #2** / **Run #3** / **Full Sample** MMI 56.1 56.3 64.7 61.5 S-W Diversity 3.24 3.27 3.25 3.31 HBI 2.98 2.85 2.85 2.82 115. The Corps agree with the response to comments provided by the BOR, as follows: *The cumulative effects of past actions have resulted in the current existing conditions. While cumulative effects are acknowledged and analyzed, the effects of each alternative are based on expected incremental effects when compared to no action and supplemental comparison to existing conditions is also provided. The most recent trout populations reported by CPW show*

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115 (cont'd)	data showing local changes over a period of years. In so doing, the Final EIS fails to assess the extent to which aquatic life has been degraded or the extent to which it will be further degraded by increased WGFP depletions. Fish data for the Colorado River downstream of Windy Gap reservoir spans at least back to 1981, before the construction of Windy Gap Reservoir. According to the CDPW: "In 1981, the trout population in the Kemp-Breeze State Wildlife area near Parshall included 89 trout per acre longer than 14 inches. In 2007, the estimate for the same reach of the river was 21 trout per acre longer than 14 inches. This data supports the popular notion among the angling public that the quality fishing on this reach of the river has steadily declined since the construction of the Windy Gap project." *Final EIS at V-193.* More recent data collected by CDPW shows a dramatic decline in trout population over the last 10 years. According to CDPW, the reason for the decline remains uncertain (Ewert 2010) (attached).[12] In any event, fish data clearly shows that trout biomass has declined since the construction of Windy Gap Reservoir and is currently in a state of decline.	*that trout longer than 14 inches have increased since 2007 (Ewert 2011). The number of trout longer than 14 inches was reported as high as 52 per acre in 2010 and 44 per acre in 2011. These values are nearly four times higher than the 12 trout per acre greater than 14 inches to qualify for Gold Medal water status. The total biomass is declining, but still nearly double the amount required to qualify for Gold Medal water status. Ewert (2011) attributes the lower biomass to the large number of small trout from previous year classes. The FEIS uses data measured directly from the Colorado River in the project area.*
116	**3. The Final EIS fails to provide information and analysis critical to assess the cumulative impacts of WGFP on aquatic life** A major criticism of the draft EIS, waged not only by Trout Unlimited but by EPA and others, is its failure to recognize the importance of variable flows to aquatic life and stream health. Impacts to aquatic life were evaluated in terms of changes to available summer habitat using IFIM and PHABSIM or River2D methodology. Other factors affecting aquatic life, such as changes in peak flows, were evaluated in terms of stream morphology impacts but their effect on aquatic life was left unaddressed. The Final EIS is an improvement over the draft EIS in that it acknowledges the importance of variable (base, peak, shoulder season) flows to the aquatic ecosystem and describes how they are connected. *Aquatic Resource Tech Report (2010); Miller Memo (2011).* Unfortunately, while the importance of variable flows to preserve aquatic life is acknowledged, the Final EIS fails to properly evaluate how anticipated hydrological changes brought about by WGFP, the Moffat Project and other future events will affect the aquatic ecosystem of the Colorado River.	116. The Corps agree with the response to comments provided by the BOR, as follows: *The FEIS included a discussion of the importance of variable flows to aquatic life. The discussion includes the evaluation of impacts to aquatic life consistent with NEPA and the CEQ Regulations for Implementing the Procedural Provisions of NEPA. See FEIS pages 3-225 and 3-226.*
117	**a. Effect of reduced peak flows on winter habitat availability not analyzed** Even with the questionable assumptions discussed above, the Final EIS admits that WGFP will reduce summer trout habitat by as much as 34% but dismisses the impact claiming that winter, not summer habitat is limiting trout fisheries. *Final EIS at ES-17.* The Final EIS also admits that, by scouring the stream, peak flows create refuge habitat that adult and juvenile fish use in the winter to hide from harsh winter conditions. *Miller Memo at p. 9.* In another display of bias, while dismissing WGFP impacts in the summer, the Final EIS entirely fails to evaluate the impacts WGFP's anticipated peak flow reductions will have on the availability of what has been identified as critical winter habitat. [12] The Final EIS speculates, without a shred of evidence or support, that the declines are due to higher flows since 2002. 9	117. The Corps agree with the responses to comments provided by the BOR, as follows: *The FEIS evaluated the expected change to stream morphology and its impact to aquatic life, including impacts on winter habitat.*

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118 119	**b. Armored and embedded stream condition ignored** Healthy stream riffle areas, free of sediment and armoring, are three-dimensional ecosystems that support a wide variety of aquatic insects, particularly large stoneflies and many types of mayflies that thrive on, above, behind and beneath cobble boulder substrates. These same three-dimensional ecosystems provide critical over-wintering microhabitats for many life stages of fishes. When these riffle areas become embedded and/or armored, they become a simplified one-dimensional habitat where only the surface in contact with the water is available for occupancy. To put it in anthropogenic terms, it would be akin to forcing all of the people living in a multi-story apartment building to move to the roof of the building and living in total exposure to the elements. The result is a vastly simplified aquatic invertebrate community and a reduced carrying capacity for fish as well. The Colorado River below Windy Gap reservoir shows signs of both embedding and armoring. *See e.g., Nehring Report; Grand County Streamflow Management Plan, Phase III Report, CR-4 Stream Reach Summary; observations of CDPW biologists, anglers and landowners on the River.* Embedding of the substrates occurs when flushing flows are insufficient to remove sediment and silt. The sediments settle and compact in and around cobble, boulder substrates in riffle areas that provide critical habitat to aquatic life. Armoring of the surfaces of cobble, boulder-dominated riffle areas can occur when the flow regime is modified to provide lower, stable flow regimes, sometimes even flat-lining the discharge hydrograph. Under this flow scenario, the surface of the riffle areas develop a surface film comprised of an amalgam of very fine sediment, filamentous algae and sessile diatoms. Without channel scouring flows of sufficient magnitude to move cobble boulder substrates, and literally "sand-blast" those large substrates, this surface amalgam grows thicker and stronger and harder over time. Further reduction in the frequency and magnitude of peak flows are likely to exacerbate these degraded conditions, exposing the river's aquatic life to further declines. This is particularly alarming when, as further discussed below, the frequency of flows large enough to move cobble boulder substrates or "sand-blast" those large substrates are expected to be significantly reduced once WGFP and the Moffat Project are on line. As further discussed below, rather than focusing on this most impacted reach of the Colorado River and the flows needed to prevent these degraded conditions from worsening, the Final EIS looks at stream conditions 15 miles downstream of the impact zone to conclude that reduction of peak flows will not impact the river or its aquatic life. **c. Flushing flow needs miscalculated** The Final EIS acknowledges the critical role of flushing flows and the importance of quantifying them in order to assess WGFP impacts. Unfortunately, the Final EIS fails to provide an adequate quantification of flushing flow needs. ***1981 assessment is dated and wrong*** To assess flushing flow needs, the *draft* EIS relied on sediment transport studies and predicted flushing flow needs conducted in 1981 for the original Windy Gap Project (Ward and Eckhardt 1981). This approach was severely criticized because the data is old and stream conditions have 10	118. The Corps agree with the response to comments provided by the BOR, as follows: *The gage further down the Colorado River was utilized for modeling due to the longer period of data available. A comparison of flows between this gage and the Windy Gap gage showed a very high level of similarity and was thus considered to be applicable to the reach.* *The Nehring et al. (2011) report provided no documentation, measurements, or physical evidence supporting embedding and armoring of the Colorado River below Windy Gap Reservoir, so it is difficult to understand the nature and the condition of the river based on the report's general description..* 119. The Corps agree with the response to comments provided by the BOR, as follows: *As stated on page 3-101 of the EIS, as part of the original Windy Gap Project and a 1980 MOU between the Municipal Subdistrict, Northern Colorado River Water Conservancy District, NCWCD, and CDOW, flushing flows of 450 cfs for 50 consecutive hours were required at least every 3 years below Windy Gap Reservoir. The analysis completed for this section of the EIS was not used to determine flushing flow requirements, but rather to show changes in the frequency of various channel maintenance flows. The EIS also showed the change in the frequency of the existing 450 cfs flushing flow requirement under the alternatives (Table 3-34). The CPW had information on changes in channel maintenance flows for use in the evaluation of flushing flow during development of the FWMP. The State's FWMP identified what it considered to be reasonable mitigation for the direct and indirect effects of the project, including a recommendation for flushing flows of 600 cfs. The recommended flushing flow mitigation in the FWMP was then incorporated into the FEIS. In addition, the U.S. Fish and Wildlife Service approved of the findings in the Fish and Wildlife Coordination Act Report on March 9, 2012, which included the recommended flushing flow mitigation identified in the FWMP, and agreed that the measures to avoid, minimize, and mitigate impacts to fish and wildlife resources from implementation of the Preferred Alternative adequately addressed identified effects.* *It is important to note that the intent of the original 450 cfs flushing flows and the increased flushing flows to 600 cfs is to provide a minimal amount of guaranteed flushing flows, recognizing that a larger range of channel maintenance flows are still needed to support river ecological functions. Thus, the minimum flushing flow requirement operates similar to the minimum bypass flows developed for the original Windy Gap Project. If flushing flows are less than those specified, Windy Gap must curtail diversions, with the except that the project cannot be required to bypass*

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		more than the natural inflow. The channel maintenance flow analysis indicates that although frequency of larger flows would decrease with the WGFP, there would still be a reasonable distribution of higher flows to maintain the condition of the channel and aquatic habitat. It should also be noted that the maximum Windy Gap diversion is 600 cfs, so any curtailed diversion cannot increase flushing flows by more than this amount. *Windy Gap Reservoir is not a source of sediment and silt to the Colorado River below the reservoir; rather, it stores sediment and silt and reduces it downstream. The statement in the 2011 Nehring report that "at least twice since 2001, Windy Gap Dam has been drained and untold tons of sediment has been flushed into the Colorado River in mid to late summer, long after spring flushing flows were available to transport the sediment downstream" is incorrect. Only once during this period (2010) did the NCWCD release some sediment from the Windy Gap dam after obtaining a 404 permit from the Corps of Engineers, and in agreement with Grand County. This release was related to a dredging operation to remove sediment deposited in Windy Gap Reservoir near the pumping plant. Dredging of the reservoir was only practicable during low flows and most of the sediment was contained within the reservoir. The sediment discharge was followed by a flushing flow release of water from Granby Reservoir to transport sediment downstream. This discharge and flush of sediment was conducted in coordination and agreement with the CDOW.* *See response to Comment* [114] *on why the Breeze site was chosen for study. The study at the Breeze site was just one analysis used to discuss and evaluate the effects of the WGFP to stream morphology and effects to channel maintenance flows.*

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119 (cont'd)	significantly changed. Indeed, since 1981, one of the largest sources of silt and sediment – Windy Gap reservoir – has come on line. Perhaps the best evidence that Ward and Eckhardt's 1981 flushing flow needs prediction was wrong is the state of the river downstream of the reservoir. The river's armoring and embedding, discussed above, offer better evidence of the current, degraded condition of the river than any model can possibly offer. ***More recent assessments fail to assess needs in the most impacted reach of the river*** The Final EIS attempts to "verify" the 1981 sediment transport and flushing flow needs analysis based on current conditions. According to the Final EIS, Ward and Eckhardt's assessment is confirmed by a "recent evaluation . . . of available stream flow versus shear stress data at the Colorado River Breeze station, a riffle site located downstream of the confluence with the Williams Fork (ERC 2009)." *Final EIS at 3-96.* The referenced ERC 2009 study has not been made available for public review. Therefore, meaningful comment is not possible at this time.[13] ERC's previous sediment transport modeling and analysis, relied upon in the Moffat Project draft EIS (ERC 2006), has been severely criticized due to the inadequacy of the model used, fundamentally flawed assumptions, and conclusions that defy reality. *See e.g., Comments of Dr. Brian Bledsoe, PhD, Colorado State University Professor (March 16, 2010) (attached as Attachment G); comments by Resource Engineering Inc. (Attachment E – Figure 8).* Whether the fundamental deficiencies identified by Dr. Bledsoe and others have been resolved is unknown to us. Regardless of its validity, the ERC 2009 sediment transport analysis, as described in the Final EIS, models flushing flow needs at a site located 15 miles downstream of the reach of the Colorado River most impacted by WGFP and the Moffat Project. As previously discussed in these comments, the Colorado River at the Breeze station benefits from the influx of low-sediment flows supplied by its tributary, the Williams Fork River. Fifteen miles upstream, conditions are dramatically different as heavy influx of sediment and silt from Windy Gap reservoir and reduced peak flows combine to armor the stream bed and create degraded habitat conditions. The study is entirely inadequate to assess the flushing flow needs of the reaches of the Colorado River most impacted by WGFP and the Moffat Project or to assess the extent to which their additional depletions will further impact its already degraded condition. ***Available data indicates that higher flushing flows are needed*** Current data and evidence of stream armoring, embedding and degradation confirms that the flushing flow for the Colorado River downstream of Windy Gap reservoir, as identified in the original Windy Gap EIS, is insufficient. Other sources of information indicate that higher flows are needed. The Grand County SMP identifies flushing flows of "*at least* 600 cfs for a 3-day duration with a frequency of 1 in 2 years during late May to late June period." (Tetratech 2010, CR-4). [13] The study constitutes "significant new information relevant to environmental concerns and bearing on the proposed action or its impacts" developed since the Draft EIS. NEPA regulations require that such information be made available to the public for review and comment in the same manner as the draft EIS. *40 CFR 1502.9(4).* BOR has failed to do so in violation of NEPA. 11	120. The Corps agree with the response to comments provided by the BOR, as follows: *The Breeze site is located upstream of the Williams Fork (8-10 miles below Windy Gap reservoir), so it is not affected by the Williams Fork. It is not the case that the Colorado River below Windy Gap Reservoir has a "heavy influx of sediment and silt from Windy Gap reservoir;" in fact, the opposite is true – the reservoir captures sediment and reduces sediment load downstream. See response to Comment* [114] *on why the Breeze site was chosen for study.* *In response to the footnote regarding 40 CFR 1502.9(4), the CFR 1502.9 reference is for justifying a Supplemental EIS. The 2009 ERC analysis was conducted after the DEIS to help substantiate the Ward study that was referenced in the DEIS. It is not significant new information. It was a supplemental analysis of existing data which corroborated previously made conclusions. This additional analysis does not support preparing a Supplemental EIS.*
120		121. The Corps agree with the response to comments provided by the BOR, as follows: *The minimum flushing flow recommendations in the 2010 Phase 3 Stream Management Plan (SMP) (Table ES-1) are 600 cfs for the Windy Gap to the Williams Fork reach and 800 to 850 cfs for the Williams Fork to the Blue River reach, with a minimum duration of 3 days during 50 percent of all years. The 600 cfs flushing flow mitigation measure below Windy Gap Reservoir as stated in the WGFP FWMP would provide the minimum flushing flow recommended by the SMP. As described above, this is a minimum value and Reclamation recognizes that higher channel maintenance flows are needed and would continue to occur with the WGFP.* *The State's FWMP identified what it considered to be reasonable mitigation for the direct and indirect effects of the project, including a recommendation for flushing flows involving 600 cfs. The recommended mitigations in the FWMP were incorporated into the FEIS. In addition, the U.S. Fish and Wildlife Service approved of the findings in the Fish and Wildlife Coordination Act Report on March 9, 2012, which included the flushing flow mitigation identified in the FWMP, and agreed that the measures to avoid, minimize, and mitigate impacts to fish and wildlife resources from implementation of the Preferred Alternative adequately addressed identified effects.*
121		

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121 (cont'd)	However, according to the SMP, these flows are the *minimum* necessary to initiate "spawning gravel mobilization." They are not sufficient to move larger material, such as cobbles, which is essential to maintain habitat. Indeed, in a previous version, the SMP recommended a range of flushing flows of 600 cfs at the low end and bankfull (1,245 cfs) at the upper end. The most recent version of the plan removes that upper end as too restrictive. In this regard, the SMP states: The 2008 Draft Report flushing flow recommendations were presented as a range of values with a minimum flow, based on sediment transport, and a maximum flow, based on bankfull capacity. This has been modified to eliminate the bankfull value so as to not imply there should be an upper limit on peak flows for the purposes of producing a flushing flow. *Grand County SMP, Executive Summary, at pp. 8-9.* Completely disregarding this clarification, the Final EIS relies on the Grand County SMP to assert that 600 cfs is a more than adequate flushing flow. The assertion, as the above SMP references indicate, is incorrect.	
122	Importantly, the Draft EIS originally used U.S. Forest Service methodology (Schmidt and Potyondy, 2004) to calculate a channel maintenance flow of 510 cfs. At the technical meeting with the Bureau on January 24, 2011, Resource Engineering, Inc. pointed out that the Bureau had incorrectly implemented the procedure by utilizing a study period that was already impacted by diversions. The methodology requires the use of un-impacted flows. Resource Engineering reported that utilizing a study period consistent with the U.S. Forest Service methodology produced a channel maintenance flow of 3,334 cfs. (*See Attachment E – Figure 7).* While the Final EIS still references the U.S. Forest Methodology, it no longer applies it. In fact, the results obtained by Resource Engineering are not even discussed. Instead, the Final EIS resorts to the 1981 analysis. Clearly, since the proper application of a methodology that BOR first embraced results in needed flows of over 3,000 cfs, it is alarming that the Final EIS would now completely ignore that information in order to conclude that a mere fraction of such flows is adequate. Given the state of information, additional analysis should be conducted to understand the flushing flow needs of the Colorado River, particularly that section that stands to be most impacted by WGFP and the Moffat Project. Absent this information, the impacts of WGFP's reduction of peak flows on stream health and aquatic life cannot be ascertained.	122. The Corps agree with the response to comments provided by the BOR, as follows: *For the EIS, the model results for 1950-1996 were used to calculate the channel maintenance flows provided in Table 3-32 (and other similar tables). The lowest range of channel maintenance flows provided in Table 3-32 represents bankfull flow at Hot Sulphur Springs (based on a range of descriptions from various sources on when bankfull flows occur) and is 510 to 1,240 cfs. At the nearby Windy Gap gage, the USGS has determined the bankfull flow to be 765 cfs, plus or minus 10 percent. This value is within the range calculated and provided in Table 3-32. Resource Engineering's calculated lower limit of channel maintenance flows is based on virgin hydrology and is not indicative of current conditions and the USGS's calculation of bankfull discharge.*
123	***Channel maintenance flow needs are unknown*** In addition to flushing flows, the Final EIS acknowledges the importance of "channel maintenance flows" to maintain a healthy stream ecosystem. *Final EIS at 3-91.* The Final EIS describes channel maintenance needs in terms of lower ranges with higher frequency (1.5 to 2 years) and higher ranges with lower frequencies (25-year event). *Id.* The Final EIS presents often conflicting data of channel maintenance needs in the Colorado River downstream of Windy Gap Reservoir. Given the state of information, additional analysis should be conducted to understand the channel maintenance flow needs of the Colorado River. Absent this information, the impacts of WGFP's reduction of peak flows on stream health and aquatic life cannot be ascertained. 12	123. The Corps agree with the response to comments provided by the BOR, as follows: *The FEIS presents tables showing the effects to ranges of channel maintenance flows for the alternatives for Hot Sulphur Springs and near Kremmling for direct, indirect, and cumulative effects. Reclamation believes the analysis presented in the FEIS is consistent and adequate to reflect the incremental effects that the WGFP will have on channel maintenance.*

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124 125	**c. Impacts of "operational flexibility" of NISP unevaluated** In addition to WGFP, the Municipal Subdistrict is concurrently seeking approvals for its Northern Integrated Supply Project (NISP). NISP envisions using Colorado River water diverted through the C-BT and Windy Gap projects for an initial fill of the proposed Glade Reservoir. In addition to the one time fill, however, NISP contemplates the use of Colorado River water supplies, including Windy Gap water, to fill Glade Reservoir whenever the very junior and unreliable Poudre River sources for the project are not available. The draft EIS for NISP anticipates that these source may yield "several years in a row of divertible flow followed by as many as 8 years with no flow available. *NISP Draft EIS, section 2.4.1.3.* Neither the cumulative impacts of the one-time initial fill nor the cumulative impacts of the proposed, routine fills to provide NISP participants "operational flexibility" are evaluated as a "reasonably foreseeable action" in the Final EIS. This is ironic as, unlike the Ralph Price Reservoir enlargement, assumed by BOR to be "reasonably foreseeable" and therefore used to inflate the impacts of the "no action" alternative, NISP is currently in the midst of permitting and "no insurmountable" legal obstacles for its construction have been identified. Given the foreseeable cumulative depletions of WGFP, NISP and the Moffat Project, these projects impacts must be considered together. **d. Possibility of non-linear, catastrophic responses ignored** As previously stated, a major concern with the proposed WGFP is the potential for non-linear, catastrophic aquatic life responses – "the tipping point" in lay parlance. Ecologists have long recognized that many ecosystems exhibit nonlinear behavior in response to human changes. A continued change in an independent variable (e.g., decline in stream flow) may not produce smooth changes in a response variable (e.g., fish productivity). Instead, if a threshold is crossed, the system may flip from one capable of supporting trout to one that cannot. The term "ecological resilience" has been used to describe the amount of disturbance required to propel the ecosystem across such threshold (Holling 1996). Given the significant changes the affected portion of the Colorado River has been subjected to over the years and the fact that WGFP and the Moffat Project, combined, are expected to remove an additional 23 percent of the remaining 36 percent of its flows, a number of parties, including EPA, have expressed serious concerns about the potential for such responses. In this regard, EPA's comments to the draft EIS state: "[EPA] is concerned that further reductions to the existing hydrograph will reduce the resiliency of the system and place the system at much higher risk of threshold (non-linear) changes to the aquatic community . . . The EIS should assess the long-term cumulative impacts and uncertainty in the predicted responses. An additional component of a cumulative impacts analysis should address the potential for threshold responses. *Final EIS at F-241-2.* The Final EIS does not discuss, much less contemplate the possibility of threshold (non-linear) responses. In its response to EPA's comments, BOR simply indicates that "there is no indication that the river is at a critical threshold based on the data gathered for the existing conditions and the analysis of projected changes." *Final EIS at F-241.* As previously shown in these comments, the Final EIS's assumption that the aquatic ecosystem is healthy is unfounded. Alarming signs of degradation, including the loss of aquatic species 13	124. The Corps agree with the response to comments provided by the BOR, as follows: *Five of the WGFP Participants—Central Weld County Water District, Erie, Evans, Fort Lupton, and Lafayette—are also participants in the Northern Integrated Supply Project (NISP). These entities have identified future water needs that will require multiple sources of water. The fact that these entities are participating in more than one project does not mean that there is a cumulative impact. There are no substantial overlapping impacts between the NISP and the WGFP.* *Windy Gap water could potentially be rented by NISP participants as part of the initial fill of Glade Reservoir. NISP participants can either collectively or separately rent Windy Gap water from Windy Gap Participants. If the rented Windy Gap water is greater than the Participants' need that year, the water could be delivered into Glade Reservoir. The water would be delivered to the NISP participants from Horsetooth Reservoir through the Windsor Extension into the Poudre Valley Canal. Should Windy Gap water be used for the initial fill of Glade Reservoir, it would have minimal cumulative impacts since it merely changes the delivery location of WGFP Participants' water.* 125. The Corps agree with the response to comments provided by the BOR, as follows: *While Colorado River streamflows have changed substantially since the first half of the 20th century, sufficient channel maintenance flows and peak flows would occur under the WGFP to maintain aquatic habitat. Current healthy fish populations ranging from about 4,000 to 11,000 fish per mile attest to the existing quality of the Colorado River. The majority of the impacts to aquatic habitat are of a magnitude that is not a limiting factor for fish survival. Mitigation measures in the Fish and Wildlife Mitigation Plan developed by the Subdistrict (FEIS Appendix E) would reduce potential impacts to trout from elevated stream temperatures in the summer. The FWMP also includes an increase in flushing flows to 600 cfs. Nutrient mitigation measures (FEIS Section 3.8.4) would offset the nutrient loadings from Fraser River WWTPs and nonpoint agricultural sources in the Willow Creek basin, a tributary to the Colorado River, and improve water quality in these streams year-round. Results of the detailed modeling of hydrologic conditions, water quality, and aquatic habitat in the Colorado River indicate the WGFP (along with existing bypass flows and flushing requirements and new mitigation measures developed to address stream temperature and nutrients) would not lead to threshold level impacts that threaten the ecology of the river. Existing minimum flow requirements that maintain base flows during summer would not change and would protect primary and secondary productivity. These flows support the trout and other fish*

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125 (cont'd)	indicate that we may indeed be reaching that critical threshold. BOR's actions, including its persistent bias in data selection and willingness to draw conclusions in the absence of critical information are placing the Colorado River ecosystem in jeopardy in clear violation of Senate Document 80. **4. The Final EIS arbitrarily dismisses identified impacts**	*populations below Windy Gap Reservoir, and are expected to continue with the proposed action. Windy Gap does not divert in dry years so the changes in these years are due to projects other than WGFP. The lowest flows and the lowest habitat still occur during late fall and winter for several months in all flow years. Therefore, the reduction in habitat during the summer is likely not the limiting habitat factor for trout.*
126	As discussed throughout these comments, the Final EIS makes arbitrary assumptions that over estimate future Colorado River flows and under estimate cumulative impacts to its aquatic life. Critical information needed to evaluate the impacts of WGFP is missing. Still, the Final EIS manages to identify a number of impacts. Unfortunately, the identified impacts are often expressed in statistical terms that minimize their gravity and then dismissed as not significant. Other times, the impacts are dismissed without much explanation. As a result, adequate measures to minimize the identified impacts are not proposed. The following is a non-exhaustive list of examples.	*The decreases that are shown for dissolved oxygen are small and the total concentration remains above the state standard of 6.0 mg/l. The change in thermal regime should not impact the macroinvertebrate community since the tolerance of many of the macroinvertebrates is similar to the temperature tolerance of trout. Seasonal water temperature variations that follow air temperature would remain similar with the WGFP, which would allow macroinvertebrates that rely on water temperature cues to complete their life cycles. The nongame fish species would also remain protected by the Fish and Wildlife Mitigation Plan. In total, there is no indication that the river is at a critical threshold based on the data gathered for the existing conditions and the analysis of projected changes.*
	a. Significant loss of summer trout habitat disregarded	
127	The Final EIS admits that WGFP will reduce summer habitat for trout in July and August of average and wet years. The greatest decrease in habitat would be in the segment between Windy Gap Reservoir and above the confluence with Williams Fork, where adult rainbow and brown trout habitat would decrease by 34 percent and 8 percent, respectively, in August of average years. *Final EIS at 3-322.* These are significant habitat losses, particularly for a system that has already been depleted and degraded, and is facing additional stresses brought about by climate change and increased stream temperatures. Yet, the Final EIS dismisses the losses, postulating that the real limiting factor is winter habitat availability. *Final EIS at 3-224.* The allegation that winter habitat is the limiting factor is speculative. Habitat curves relied upon in the Final EIS to evaluate fish habitat are based on *summer* not *winter* habitat. Fish have different needs depending on the time of year. Using summer habitat curves to draw conclusions regarding winter habitat limitations is unjustified and the resulting dismissal of clearly identified summer trout habitat impacts arbitrary.	126. The Corps agree with the response to comments provided by the BOR, as follows: *The FEIS does not make arbitrary assumptions regarding future Colorado River flows. While hydrologic modeling is required to project future conditions, model assumptions were based on sound rationale and the FEIS and supporting technical reports fully describe model assumptions. See response to Comment Nos.* [21 and 24] *on hydrologic modeling. A complete analysis of the direct, indirect, and cumulative effects for the alternatives was conducted and mitigation measures were developed where adverse impacts associated with the WGFP were identified.*
	b. Loss of sediment transport capacity dismissed	
128	The Final EIS admits that "reductions in flow under all of the alternatives would decrease the sediment transport capacity of the stream below Windy Gap Reservoir." *Final EIS at 3-96.* The Final EIS further admits that, under its own sediment transport analysis: • 50 cfs are needed to mobilize fine sediments • 200 cfs are needed to move fine gravel • 400 cfs are needed to move medium gravel, and • 850 cfs are needed to move coarse gravel. *Id.* The Final EIS further admits that, under the Ward and Eckhardt 1981 study, flows ranging from 140 and 240 cfs are needed to move fine sediment. *Id.* Using its own model calculations, the Final EIS predicts that the frequency of available flows in the Colorado River below Windy Gap will be reduced in all described categories as follows: 14	127. The Corps agree with the response to comments provided by the BOR, as follows: *It is standard practice to apply the available suitability criteria to IFIM analyses. The available suitability criteria for rainbow trout and brown trout from the state of Colorado does not include winter habitat suitability data. As such, the summer criteria were applied to flows year round. Use of non-winter criteria were also used in the Grand County Stream Management Plan.* 128. The Corps agree with the response to comments provided by the BOR, as follows: *While the reductions in flow under all of the alternatives would decrease the sediment transport capacity of the stream below Windy Gap Reservoir, the*

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128 (cont'd)	• Flows will be below 150 cfs 3.5 % more often. *Final EIS at 3-94.* • Frequency of flows of 200 cfs will be **reduced by 25%** (from occurring 14 % of the time to 10.5 % of the time under WGFP conditions). *Id.* • Frequency of flows of 500 cfs will be **reduced by 28.5 %** (from occurring 7 % of the time to 5 % of the time under WGFP conditions. *Id.* • Frequency of 1000 cfs flows will be **reduced by 25 %** (from occurring 4 % of the time to 3 % of the time under WGFP conditions). *Final EIS at 7-253.* This means that flows the Final EIS has determined are needed to move fine sediment (140 to 240 cfs under the Ward and Eckerdt 1981 model), coarse sediment (200 cfs), fine gravel (400 cfs) and coarse gravel (850 cfs) will be available ***25 percent*** less often than under existing conditions. This is indeed a significant reduction in frequency of available flushing flows, especially for a river where "channel armoring and chronic sedimentation" have already been identified as two of the most significant causes for the loss of aquatic species. (Nehring, 2011, p.79). The Final EIS concludes that these significant reductions will not impact aquatic life but fails to explain why. The conclusion is arbitrary and capricious. **c. Loss of channel maintenance flows dismissed** The Final EIS evaluates changes in the frequency of availability of channel maintenance flows due to WGFP using the following ranges: • 510 to 1,240 cfs with a recurrence interval of 1.5 to 2 years • 1,240 to 3,160 cfs with a recurrence interval of 2 to 5 years • 3,160 to 4,600 cfs with a recurrence interval of 5 to 10 years • 4,600 to 6,520 cfs with a recurrence interval of 10 to 25 years 129 *Final EIS, Table 3-32 at 3-97.* Based on its own modeled hydrology, the Final EIS predicts the following reductions in frequency of available channel maintenance flows for the above identified ranges as follows: • **17.7 % reduction** in 1.5 to 2 year peak flows (from 62% to 51% of the time) • **10.5 % reduction** in 2 to 5 year peak flows (from 38% to 34% of the time) • **43.3 % reduction** in 5 to 10 year peak flows (from 30% to 17% of the time) • **53.8 % reduction** in 10 to 25 year peak flows (from 13% to 6% of the time) *Final EIS, Table 3-32 at 3-97.* These figures represent a very significant reduction in the frequency of peak flows even when looking at the very broad flow ranges evaluated in the Final EIS (i.e., 510 to 1,240 cfs, 1,240 to 3,160 cfs, etc.). The impacts of additional WGFP and Moffat diversions could be even more dramatic when looking at how much they will reduce peak flows *within* each range (e.g., reduction of flows of 500 cfs vs. 600 cfs vs. 1,240 cfs, etc.). This is particularly troublesome in the case of the 1.5 to 2 year peak flow, as the lower end of the range (i.e., 510 cfs) is even lower than the lowest channel maintenance flow need identified immediately downstream of Windy Gap Reservoir (765 cfs). Since the Final EIS does not identify reduction in the availability of peak flows in the low end, as opposed to the higher end of the range, the true dimension of WGFP impact is not really known. 15	*projected flow changes and existing flushing flow requirements would not substantially affect sediment transport processes. Sediment transport capacity, even at relatively low flows, would remain substantially higher than the available sediment supply. As noted in Figure 3-31 of the FEIS, at a flow of about 200 cfs, sediment supply is the same as the transport capacity of the river, and at flows greater than 200 cfs, the capacity of the river to transport sediment exceeds sediment supply. Thus, under the action alternatives, flows sufficient to maintain channel capacity provide periodic scouring, and transport sediment would continue to occur. Despite changes in streamflow that have occurred in the past that were much greater than what would occur under the WGFP, the Colorado River has remained a morphologically stable stream. See response to Comment* [117]. 129. The Corps agree with the response to comments provided by the BOR, as follows: *The EIS does present information showing changes in the frequency of channel maintenance flows including information on reductions in the low end of channel maintenance flows. These changes in channel maintenance flow frequencies are based on the percentage change in the number of years within the 47-year period of record analyzed. To provide additional detail on the frequency of changes within these flow ranges, the data were rerun using daily data for the 47 year hydrologic study period. The data are presented in the tables below and show greater resolution in the frequency in the 47-year period that the various flow ranges occur. The question is whether this range of channel maintenance flows would remain adequate to support ecological functions.* *For the reach of the Colorado River below Windy Gap Reservoir, the U.S. Geological Survey estimated bankfull discharge of 765 cfs (EIS pg. 3-97). Bankfull flows are when many of the morphological characteristics of a channel are formed, and these flows are equivalent to the 1.5- to 2-year flow (Rosgen 1996). As noted in the table below, the frequency of bankfull discharges at Hot Sulphur Springs (which has almost the identical flow as the Windy Gap Gage) is 3.9% of all days during the 47-year model period under Existing Conditions and 2.7% of all days during the 47-year model period under the Proposed Action. This is a 26% decrease in the number of days that bankfull flows would occur at Hot Sulphur Springs. The upper range of bankfull discharge (1,240 cfs) would occur in 18 of the 47-year model period, 17 years under no action, and 16 years under the proposed action.* *The impact of the WGFP on particular flows is not greater than for the range of channel maintenance flows provided in Table 3-32 and similar tables. See the section on Changes in Flow Duration (page 3-94 of the*

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FEIS) for changes in specific flows. For example, 500 cfs flows would occur slightly more than 5 percent of the time compared to slightly more than 7 percent of the time under existing conditions; 1,000 cfs flows would occur 3 percent of the time compared to slightly more than 4 percent of the time under existing conditions; and flows of 2,000 cfs or greater would occur 1.6 percent of the time compared to 2 percent of the time under existing conditions.

As previously discussed in response to Comment No. [18]*, the transport capacity of the Colorado River would continue to exceed the sediment load. In addition, the frequency of larger channel maintenance flows (tables below), although reduced, would continue to move fine and coarse gravels needed to support spawning habitat and larger cobbles and boulders for channel scouring, periphyton removal, and bedload transport. Compared to the WGFP action alternatives, much greater changes have occurred to the Colorado River since diversions began in the late 1800s; particularly the construction of Granby Reservoir, yet the Colorado River has remained a morphologically stable stream.*

Table 3-32a. Changes in Colorado River channel maintenance flows at Hot Sulphur Springs (1950-1996 model hydrology).

Recurrence Interval	Percent of Days in 47 Year Model Period when Flow Range Occurred			
	Range in Flows (cfs)	Existing Conditions	No Action	Proposed Action
0.8 x 1.5-yr to 2-yr flow	510 to 1,240	3.9%	3.1%	2.9%
2- to 5-yr flow	1,240 to 3,160	2.5%	2.1%	2.1%
5- to 10-yr flow	3,160 to 4,600	0.8%	0.69%	0.48%
10- to 25-yr flow	4,600 to 6,520	0.14%	0.12%	0.1%

Table 3-35a. Colorado River at Hot Sulphur Springs channel maintenance flows, cumulative effects (1950-1996).

Recurrence Interval	Percent of Days in 47 Year Model Period when Flow Range Occurred			
	Range in Flows (cfs)	Existing Conditions	No Action	Proposed Action
0.8x1.5-yr to 2-yr flow	510 cfs to 1,240	3.9%	2.6%	2.5%
2-yr to 5-yr flow	1,240 to 3,160	2.5%	1.9%	1.8%
5-yr to 10-yr flow	3,160 to 4,600	0.8%	0.6%	0.4%
10-yr to 25-yr flow	4,600 to 6,520	0.14%	0.09%	0.09%

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130	In any event, the Final EIS identifies significant reductions in channel maintenance flows. Yet, it concludes that the reductions are insignificant without basis or explanation. **5. Mitigation measures proposed in the Final EIS are insufficient to enable BOR and the USACE to comply with their respective statutory duties** BOR's approval of the use of C-BT project facilities and special use permits for WGFP purposes is subject to Senate Document 80 and compliance with other federal and state laws. Under Senate Document 80, BOR cannot approve use of C-BT facilities in a manner that would negatively impact Grand Lake or the Colorado River scenic attractions and fishery. The USACE's may not issue a 404 permit that "causes or contributes" to "violations of any applicable State water quality standard" or to a "significant degradation of the waters of the United States." *40 C.F.R 230.10(b) and (c).* In addition, the USACE is prohibited from issuing a 404 permit "unless appropriate and practicable steps have been taken which will minimize the potential adverse impacts of the discharge on the aquatic ecosystem. *40 C.F.R 230.10(c).* As these comments demonstrate, the Final EIS fails to provide sufficient information needed to assess the cumulative impacts of the WGFP on the Colorado River and its aquatic resources. Mitigation measures offered in the Final EIS fail to address identified impacts, much less provide relief from the uncertainty created by the absence of critical information. The following is a non-exclusive list of problems associated with proposed mitigation, together with specific, proposed measures to resolve them. **a. Reliance on the Fish and Wildlife Mitigation Plan (FWMP) misplaced** The Final EIS relies entirely on the FWMP to supply sufficient mitigation for WGFP's impacts on fish and wildlife in the Colorado River. No specific mitigation measures are proposed beyond those included in the FWMP. BOR's reliance on the FWMP is misplaced. As acknowledged by the very Wildlife Commission and its legal counsel, the Commission's authority to impose mitigation measures on water projects is quite narrow. Most troublesome is the state's statutory prohibition against the Commission's imposition of mitigation measures that could have the effect of "impairing" WGFP water rights. *C.R.S. §33-1-120(3).* A mitigation measure would be deemed to "impair" the Subdistrict's water rights if it requires the Subdistrict "to forego water to which they are entitled under a water right." *Id.* In other words, to the extent mitigation measures result in WGFP diverting one drop of water less than the 600 cfs the Subdistrict's water rights allow, state law prohibits the Commission from imposing them regardless of the consequences to fish and wildlife. For this reason, mitigation measures in the FWMP are not based on what is needed to preserve fish and wildlife, but on what the Municipal Subdistrict has been willing to agree to do. Both BOR and USACE have statutory duties well beyond those imposed on the Wildlife Commission by state law and are not restricted by the restrictions imposed by those laws. The FWMP does not offer critical mitigation measures needed to enable the agencies to comply with federal law. Additional mitigation measures must, therefore, be adopted if WGFP is to move forward. 16	130. Please refer to comment 32 above. 131. The Corps agree with the response to comments provided by the BOR, as follows: *The FWMP developed with the CPW includes the measures the state regulatory agency deemed necessary for mitigating fish and wildlife impacts from the WGFP. These measures are also consistent with the requirements to identify mitigation for adverse effects in the (CEQ) Regulations for Implementing the Procedural Provisions of NEPA (40 CFR 1502.16(h)). In addition, the U.S. Fish and Wildlife Service approved of the findings in the Fish and Wildlife Coordination Act Report on March 9, 2012, which included mitigations identified in the FWMP, and agreed that the measures to avoid, minimize, and mitigate impacts to fish and wildlife resources from implementation of the Preferred Alternative adequately addressed identified effects.*
131		

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132	**b. Reliance on "enhancement" promises misplaced** The Subdistrict has offered to undertake certain measures to help improve current degraded conditions in the Colorado River downstream of Windy Gap reservoir as reflected in the Fish and Wildlife Enhancement Plan. While potentially helpful, these measures are *expressly* not intended to mitigate the impacts of WGFP. Because they are not intended as mitigation, no significant evaluation has been made in the Final EIS to assess their effectiveness or helpfulness in ameliorating WGFP impacts. Most importantly, the Subdistrict is not responsible if they are not. Indeed, because the so-called "enhancement" measures are not *mitigation* and have not been proposed as terms and conditions of federal approval of WGFP, the Subdistrict is under no obligation to perform them under federal law. For these reasons, while "enhancement" measures, if implemented, may or may not help conditions in the river, they fail to provide enforceable measures to mitigate (i.e., avoid, minimize or mitigate) the impacts of WGFP.	132. The Corps agree with the response to comments provided by the BOR, as follows: *A mitigation plan is designed to minimize the adverse direct and indirect effects of an alternative. The Fish and Wildlife Enhancement Plan was not intended to address the incremental impacts of the WGFP, rather to enhance the existing condition of fish and wildlife resources.*
133	**c. Proposed mitigation allows violation of stream temperature standards** ***Acute temperature violations.*** The Final EIS proposes specific measures to prevent violation of state stream temperature standards. For *acute* stream temperature standards, the Final EIS requires reduction or curtailment of Windy Gap pumping whenever monitored stream temperatures are within 1°C of the state standards. However, the measure is suspended if "there is no material causal relationship between" project operations and the exceedence of acute standards. The measure is a good start, but has two fundamental problems. First, if placed upon the federal agencies, the burden of establishing causality would render the mitigation measure entirely ineffective. Moreover, the proviso is contrary to law. Under the CWA, restrictions must be placed on 404 discharges that "cause or contribute" to water quality violations. Second, a 1°C warning is unlikely to be sufficient to prevent the project from causing or contributing to the violation. A demonstration that it is sufficient has not been made. *Proposed solution:* Eliminate the causal relationship caveat and require a determination of an adequate threshold to trigger pumping restrictions as part of monitoring and adaptive management.	133. The Corps agree with the response to comments provided by the BOR, as follows: *The state is the entity with the jurisdictional authority to set and enforce stream standards. The state identified and approved the mitigation measures regarding stream temperature violations in the FWMP. Additional stream monitoring stations to be installed as part of mitigation, if an action alternative is selected, would assist in responding to these criteria.*
134	***Chronic temperature violations.*** To prevent the project's contribution to *chronic* stream temperature standards violations, the Final EIS requires reduction or curtailment of *WGFP* pumping whenever the weekly average temperature (WAT) levels violate the chronic (MWAT) standard. The measure is subject to the same "causal relationship" restriction proposed for acute standard violations. In addition, pumping must be restricted or curtailed only to the extent the Municipal Subdistrict predicts that Granby will spill. The restriction is portrayed as making a distinction between original Windy Gap pumping and WGFP pumping. Such distinction is groundless. WGFP can pump at times other than when Granby is expected to spill. Moreover, approval of WGFP's further degradation of degraded conditions created by the original Windy Gap project is prohibited under both Senate Document 80 and the CWA. The distinction is neither relevant nor administrable. *Proposed solution:* Require restriction or curtailment of Windy Gap pumping whenever WAT measurements indicate that the MWAT is likely to be exceeded. Require a determination of an adequate threshold to trigger pumping restrictions as part of monitoring and adaptive management. 17	134. Please refer to Comment 1 and 138.

Comment	Trout Unlimited – January 31, 2012	Response
135 136 137	**c. Proposed mitigation fails to adequately protect flushing and channel maintenance flows** The Final EIS proposes to increase current flushing flow requirements from the current 450 cfs to 600 cfs for 50 consecutive hours every three years. Windy Gap pumping will cease to allow higher flushing flows if Subdistrict water supplies in Chiminey Hollow exceeds 60,000 acre-feet on April 1. While an improvement from current restrictions, which are known to be inadequate, the proposed measures are insufficient to prevent further degradation of the aquatic ecosystem. First, even though the mitigation measure purports to follow recommendations of the Grand County SMP, it does not meet the frequency (once every two years) and length of time (three consecutive days or 72 hours) recommended under the plan for this minimum flow. Second, as further discussed in these comments, the Final EIS fails to provide an adequate analysis of flushing flow needs. Third, allowing flushing flows to occur only when Chimney Hollow is at 60,000 acre-feet puts the health of the Colorado River second to the desires and convenience of the Subdistrict and, in any event, is meaningless if its supply is to be relied upon to fill Glade Reservoir as part of NISP. Fourth, no restriction to ensure sufficient flows to maintain channel maintenance functions is provided. *Proposed solution:* Determine flushing and channel maintenance needs prior to project operation as part of monitoring and adaptive management. Restrict or curtail Windy Gap pumping whenever flushing and channel maintenance needs are not met. **d. Proposed mitigation fails to address added impacts from Windy Gap reservoir** Windy Gap Reservoir has been identified as one of the primary sources of degradation of the Colorado River downstream of the reservoir (Nehering 2011). Increased pumping from WGFP and further reductions of peak flows due to WGFP and the Moffat Project are anticipated to cause or contribute to further degradation (Nehring 2011). Solving the problems caused by Windy Gap Reservoir is described as one of the critical measures needed in order for any new mitigation to be successful. (Nehring, 2011, p.79). Yet, the Final EIS does not analyze the issue and proposes no operational measures or limitations on the reservoir to deal with the problems. *Proposed solution:* Develop and implement a bypass channel or similar modification to bypass river flows around Windy Gap Reservoir to be funded by the Subdistrict while allowing the reservoir to operate off-channel. **e. Proposed mitigation fails to address uncertainty associated with additional depletions, including potential for threshold (non-linear) responses** As described in these comments, the Final EIS fails to answer critical questions and provide critical information necessary to fully assess the impacts of WGFP. Both BOR (DOI) and USACE have agency guidance directing the use of monitoring and adaptive management in cases such as WGFP, when significant uncertainty regarding impacts and adequacy of 18	135. The Corps agrees with the response to comments provided by the BOR, as follows: *TU indicates that the 600 cfs flushing flow in the FWMP would only be required when there is over 60,000 acre feet in storage in Granby Reservoir and Chimney Hollow Reservoir. This is incorrect. The FWMP includes a 600 cfs flushing flow without limits on the storage. When storage is over 60,000 acre feet, then all WGFP pumping would cease for 50 hours (FEIS, page 3-105).* 136. The Corps agrees with the response to comments provided by the BOR, as follows: *The existence of Windy Gap Reservoir and the past effects of its construction is an existing condition. The Nehring et al. (2011) report does not provide documentation to substantiate the opinion regarding the magnitude or duration of flows required to clean cobble-boulder substrates. The study was limited to the collection of biological data. It did not measure, analyze, or model any physical parameters.* *In addition to mitigation measures in the FWMP, the Subdistrict has agreed to a variety of enhancement measures with the CPW for channel improvements and study of a bypass channel around Windy Gap Reservoir if an action alternative is selected. The Fish and Wildlife Enhancement plans for the WGFP and Moffat Project were endorsed by the Wildlife Commission and CWCB at the same time as the mitigation plans were adopted. The components of the enhancement plans are not intended to substitute for any mitigation required by the federal agencies for the projects. The goal of these plans is to coordinate the application of any required mitigation efforts with the voluntary and collaborative efforts of the stream enhancement projects to assure the maximum benefit for the stream environment.* *While TU appears to rely on the limited data in the Nehring report to justify a bypass channel, there are currently insufficient data available to determine if this is the correct action. Mitigation for any effects associated with original construction of Windy Gap Reservoir is inappropriate to classify as mitigation for the WGFP. As such, the Fish and Wildlife Enhancement Plan developed by the Subdistrict with CPW and endorsed by the Colorado Wildlife Commission includes an expenditure of $250,000 to study the feasibility and benefits with constructing a bypass channel. It is prudent to evaluate the bypass channel before committing millions of dollars toward its construction.*

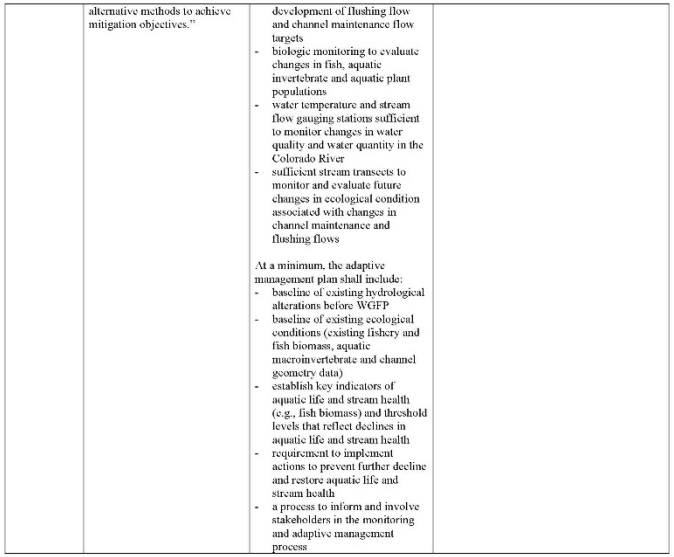
Comment	Trout Unlimited – January 31, 2012	Response
137 (cont'd)	mitigation remains.[14] Monitoring and adaptive management has been urged by experts as a means to address concerns over the resiliency of aquatic ecosystems.[15] The Final EIS provides: > In the event that identified mitigation measures are unsuccessful in reducing or avoiding resource impacts as anticipated, Reclamation would coordinate with the Subdistict and other appropriate entities to determine what steps should be taken to correct any deficiencies in planned mitigation or develop alternative methods to achieve mitigation objectives. *Final EIS at 3-399.* While a good hint at a potential monitoring and adaptive management plan, the language does not provide sufficient detail to constitute an actual plan. An adequate monitoring and adaptive management plan must be developed, made available for meaningful public comment, and once approved, incorporated as a term and condition of BOR and the USACE's approvals, the carriage contract, and the 404 permit.	*If such a study determines that a bypass channel would have benefits, the enhancement plan describes several mechanisms for funding construction.* Please refer to Comments 1 and 30. 137. Please refer to Comments 5, 11, and 21.
138	*Proposed solution:* Require the Subdistrict's development and implementation of a detailed monitoring and adaptive management plan for the express purpose of monitoring, preventing and responding to negative changes in the aquatic ecosystem of the Colorado River from the outlet of Granby Reservoir to Gore Canyon. The plan must be submitted for public comment and approved by BOR and USACE as a condition of any final approval or permitting of WGFP. The plan must include, at a minimum: Monitoring Plan • Monitoring necessary for the development of flushing flow and channel maintenance flow targets • Biologic monitoring to evaluate changes in fish, aquatic invertebrate and aquatic plant populations • Water temperature and stream flow gauging stations sufficient to monitor changes in water quality and water quantity in the Colorado River • Sufficient stream transects to monitor and evaluate future changes in ecological condition associated with changes in channel maintenance and flushing flows Adaptive Management • Baseline of existing hydrological alterations before WGFP • Baseline of existing ecological conditions (existing fishery and fish biomass, aquatic macroinvertebrate and channel geometry data) [14] *See 43 CFR §46.145(DOI), 33 CFR Parts 325 and 332 (USACE) and 40 CFR Part 230 (USACE and EPA).* A detailed monitoring and adaptive management plan was required by BOR and USACE as a condition to approval of the Southern Delivery System Project, another Colorado water project which involves significant less scientific uncertainty than the upper Colorado River. [15] National Research Council. "Executive Summary." *Adaptive Management for Water Resources Project Planning.* Washington, DC: The National Academies Press, 2004. 19	138. The Corps agrees with the response to comments provided by the BOR, as follows: *Reclamation will consider Trout Unlimited's suggestions for monitoring and adaptive management if an action alternative is selected in the Record of Decision and a draft contract is negotiated between the Subdistrict and Reclamation.* Please refer to Comments 1 and 30.

Comment	Trout Unlimited – January 31, 2012	Response
138 (cont'd)	• Baselines to be developed over a period of at least 2 to 3 years; sampling frequency should be sufficient to gage variability and sampling locations sufficient to identify potential impacts • Establish key indicators of aquatic life and stream health (e.g., fish biomass) and threshold levels that reflect declines in aquatic life and stream health • Requirement to implement actions to prevent further decline and restore aquatic life and stream health • A process to inform and involve stakeholders in the monitoring and adaptive management process 20	

Comment	Trout Unlimited – January 31, 2012	Response

PROPOSED MITIGATION TABLE
Attachment B
Trout Unlimited's Final EIS Comments Letter
Dated January 31,, 2011

Measure	Final EIS Mitigation	TU's Proposed Mitigation	Rationale
Temperature	**Acute standards violations:** Reduce or curtail all Windy Gap diversions ***after July 15*** if stream temperature in the Colorado below Windy Gap Dam is within 1°C of acute state standard; not implemented if no causal relationship between flow reduction and temp benefits **Chronic standards violations:** Reduce or curtail diversions if stream temperature exceeds chronic state standard but only if Northern determines that Granby is likely to spill	**Acute standards violations:** Reduce or curtail all Windy Gap diversions whenever stream temperature in the Colorado below Windy Gap Dam is w/n 1°C of acute state standard Adequate monitoring and early warning systems needed to ensure standards are not violated shall be included in the Monitoring and Adaptive Management Plan **Chronic standards violations:** Reduce or curtail all Windy Gap diversions whenever stream temperature in the Colorado below Windy Gap Dam is expected to exceed chronic state standards based on weekly average temperature (WAT) calculations	**Acute standards violations:** State stream temperature standard violations must be avoided whenever they occur not after an arbitrary starting date. An appropriate start date for stream temperature monitoring obligations could be established under the monitoring and adaptive management plan (see below). Demonstration of causal relationship is inconsistent with 404(b)(1) regulations which provide project may not cause ***or contribute to*** violation of standards **Chronic standards violations:** State stream temperature standard violations must be avoided, be it acute or chronic. Limiting mitigation to times when project operator predicts a spill is arbitrary and capricious, particularly as there WGFP operation is not ***restricted*** to times when Granby spills
Peak Flows	Existing flushing flow requirements increased from 450 cfs to 600 cfs In any year when flows below Windy Gap have not exceed 600 cfs for at least 50 consecutive hours in the previous two years, and total Subdistrict water supplies in Chimney Hollow and Granby Reservoirs exceed 60,000 AF on April 1, the Subdistrict will cease all Windy Gap pumping for at least 50 consecutive hours to enhance peak flows below Windy Gap	Restrict or curtail Windy Gap diversions whenever flushing and channel maintenance flows approved under the monitoring and adaptive management plan are not met	Flushing and channel maintenance flows are critical components of stream and aquatic life health. Site specific study by the Colorado Division of Parks and Wildlife (Nehring 2011) concludes that reduction of peak flows is degrading aquatic life conditions and that further reduction of peak flows will result in further degradation; the study finds that minimum peak flows of 1000 cfs for several weeks are needed The Final EIS fails to properly evaluate peak flow (flushing and channel maintenance) needs
Windy Gap Reservoir Bypass	None	Develop and implement a bypass channel or similar modification to bypass river flows around Windy Gap Reservoir while allowing the Reservoir to operate off-channel	Site specific study by the Colorado Division of Parks and Wildlife (Nehring 2011) identifies Windy Gap Reservoir as a major cause for existing degradation of aquatic life in the Colorado River and that a Windy Gap bypass is critical to the success of any mitigation
Monitoring & Adaptive Management	None specifically proposed in the Final EIS Final EIS (p. 3-339) states: "Reclamation will be responsible for enforcing the monitoring and mitigation measures that are finalized in the ROD. In the event that identified mitigation measures are unsuccessful in reducing or avoiding resource impacts as anticipated, Reclamation would coordinate with the Subdistrict and other appropriate entities to determine what steps should be taken to correct any deficiencies in the planned mitigation or develop	Develop and implement a monitoring and adaptive management plan for the express purpose to monitor, prevent and respond to negative changes in trout and other aquatic life in the Colorado River from the outlet of Granby Reservoir to Gore Canyon Plan to be proposed by the Subdistrict for approval by BOR and USACE prior to final contract approval and issuance of 404 permit after reasonable public notice and an opportunity for public comment At a minimum, the monitoring plan shall include: - monitoring necessary for the	Available information is insufficient to fully assess impacts The concept of monitoring and adaptive management is already contemplated in the Final EIS but the mitigation measure is meaningless unless its purpose and minimum requirements are specified. Plan must be approved by the federal agencies after public notice and opportunity for comment.

Comment	Trout Unlimited – January 31, 2012	Response
		

	alternative methods to achieve mitigation objectives."	development of flushing flow and channel maintenance flow targets - biologic monitoring to evaluate changes in fish, aquatic invertebrate and aquatic plant populations - water temperature and stream flow gauging stations sufficient to monitor changes in water quality and water quantity in the Colorado River - sufficient stream transects to monitor and evaluate future changes in ecological condition associated with changes in channel maintenance and flushing flows At a minimum, the adaptive management plan shall include: - baseline of existing hydrological alterations before WGFP - baseline of existing ecological conditions (existing fishery and fish biomass, aquatic macroinvertebrate and channel geometry data) - establish key indicators of aquatic life and stream health (e.g., fish biomass) and threshold levels that reflect declines in aquatic life and stream health - requirement to implement actions to prevent further decline and restore aquatic life and stream health - a process to inform and involve stakeholders in the monitoring and adaptive management process	

Comment	Roger Drotar Comments – May 11, 2016	Response
139	U S Corps of Engineers, Denver Regulatory Office, 9307 South Wadsworth Blvd., Littleton Colorado, 80128-6901, EIS-Windy Gap Firming (Chimney Hollow Reservoirs). 11 May 2016 A.D. To whomever considers the Windy Gap Firming Permit. From Spring Garden Inc. and Roger L. Drotar We ask you to withhold the firming permit until a means is provided to release exchange water from Chimney Hollow Reservoirs to the Little Thompson River. There needs to be provided a way to release water to Spring Garden Inc. (ranch) from those reservoirs. We have asked and been denied a pipe line from the reservoirs to the river where we could then use the water on our land. Our land has been in the CBT area since it's inception. We have always paid the CBT fee. Yet we have not been helped to get a means for our CBT water to be brought to our land. In the past we bought 4 shares but could not use them, so we sold them. The Corps of Engineers appear to be our last hope. Please withhold the final permit until a means is provided for our land. Roger L. Drotar Roger L. Drotar, President Roger L. Drotar, Spring Garden Inc., 100 Thunder Road, Longmont Colorado, 80503-9198 rldrotar@exede.net, 303-823-4567, Sec. 33, 4n, 70w, 6pm. +/- 300 acres, 2/3 mile of the Little Thompson River. RECEIVED MAY 2016	139. Thank you for your comment. Unfortunately the Section 404 permit process is not the proper avenue to address your stated concerns.

Comment	Save the Colorado Comments – February 12, 2017	Response
140	 Save The Colorado River Campaign, PO Box 1066, Fort Collins, CO 80522 · SaveThe Colorado.org · @SaveTheColorado · 970-218-8310 February 12, 2017 U.S. Army Corps of Engineers Amanda Lyon, Tim Carey Omaha Division Transmitted electronically to: Amanda.A.Lyon@usace.army.mil, Timothy.T.Carey@usace.army.mil **Re: Save The Colorado's Comments on Windy Gap Firming Project FEIS' Failure to analyze climate change in Colorado River basin and its impact on the Project's very junior water right** **Dear Ms. Lyon and Mr. Carey,** Thank you for the opportunity to provide comments on the Windy Gap Firming Project (Project) EIS process. We find serious shortcomings in the FEIS that must be addressed in order for the Army Corps of Engineers to comply with federal laws including the National Environmental Policy Act, Clean Water Act, and Endangered Species Act. **The FEIS fails to take climate change seriously and does not represent the most current and best available science on climate change and its likely impacts on the Colorado River basin, and its impact on the Windy Gap Firming Project's very junior water right.** Over the last year, new science and information has come forward that accelerates our concern about your inadequate FEIS and its failure to grapple with the likely impacts of climate change on the volume of flow in the Colorado River and on the yield of water of the Windy Gap Firming Project, which is a very "junior" water right (1980) in Colorado. Your FEIS completely fails to adequately analyze how climate change will diminish the availability of this junior water right and could cause the Project water right to no longer exist or be called downstream to refill Lake Powell or due to a "Call on the River[1]." 1. A peer-reviewed scientific article titled, "Relative impacts of mitigation, temperature, and precipitation on 21st-century megadrought risk in the American Southwest,[2]" was released on October 5, 2016. This article paints a dire picture as compared to any of the analyses done in your FEIS. The study puts the risk of "megadrought" in the American Southwest between 70% and 99%. Such a megadrought would impose considerably higher decreases in streamflows than predicted (or completely ignored) in your FEIS. These decreases could diminish the availability of [1] See our Sept 9, 2015 letter: "Corps' FEIS for Windy Gap Firming Project must analyze impact of diversions on the Colorado River Compact, climate change, looming "shortages," and increasing the likelihood of a "Compact Call"": http://www.savethecolorado.org/blog/wp-content/uploads/2015/09/STC-letter-corps-WGFP-CompactCall-Final-9-9-2015.pdf [2] http://advances.sciencemag.org/content/2/10/e1600873.full	140. Thank you for your comment. Please refer to Comments 29 and 113 above. In addition, A significant effort was made by the Corps and the Reclamation to coordinate the modeling efforts for the WGFP EIS and Moffat Project EIS. Prior to initiating the modeling of EIS alternatives and cumulative effects for the Moffat Project and WGFP, the lead Federal agencies compared the hydrologic modeling approaches and tools. This process included reviews of Windy Gap diversions, Granby Reservoir, and Adams Tunnel flows simulated in Denver Water's PACSM, and Moffat Tunnel, Gumlick Tunnel and Roberts Tunnel flows simulated in the WGFP model. This process also included a detailed comparison of flows in the vicinity of the Projects' diversions which is presented in the technical memorandum, Comparison of Fraser River flows simulated in the WGFP CDSS Model with those simulated in PACSM (Boyle 2005). Where possible, model data were compared to assure that the WGFP and Moffat Project were reflected in a similar manner in each model. The cumulative effects analysis for both EISs considered the same reasonably foreseeable actions. More specifically, the analysis evaluates what time of year reductions occur, what type of reductions take place, and the magnitude of reductions; that is, reductions occur only in wet years when the system can absorb the flow changes. Additionally, the Moffat Project and WGFP would not divert West Slope water in dry years. Per the direction of the lead Federal agencies, hydrologic data were shared so that the model simulations of the Moffat Project and WGFP were consistent and in appropriate detail for each EIS. The Corps acknowledges there is valid concern in the scientific community that global climate change may affect future water supplies in Colorado. The Corps also acknowledges that climate change is an evolving science and at this time there is little quantitative data with which to accurately predict or portray these changes. There is a considerable amount of uncertainty inherent in the various climate and hydrology models and associated input data set used in climate change models. In particular, it is extremely difficult to predict how climate change may impact small, inland, mid-latitude, mountainous, snowpack-driven watersheds with any amount of certainty. The latest climate model projections indicate streamflow in the north-central Colorado headwaters will increase in future, whereas past studies indicated decreases. The range of climate projections and corresponding implications to a basin-scale hydrology is growing and uncertain, and is anticipated to increase rather than decrease over time. Additionally, the methods and data available to translate climate projections into local hydrologic changes add uncertainty to the projections rather than decrease uncertainty and different approaches to evaluating climate

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	the Project's junior water right and could cause the Project water right to no longer exist or be called downstream to refill Lake Powell or due to a "Call on the River." 2. Second, a group of pre-eminent scientists calling themselves the "Colorado River Research Group[3]" issued a report in October of 2016, titled, "Climate Change and the Colorado River: What We Already Know[4]" that adds additional weight to our concern. The report states: "The climate change scenarios utilized in some of the Bureau of Reclamation's Basin Study analyses suggest an average streamflow decline of roughly 9 percent by 2060. This value was compiled from a suite of 112 projections derived from 16 climate models driven by 3 greenhouse gas emissions scenarios (high, medium and low). Utilizing climate change hydrology in the Basin Study's scenario planning was a major advance for Reclamation, and an invaluable first step in understanding the challenges of water management in an era of climate change. More recent, but not necessarily more accurate, climate models suggest the possibility of small increases in flow. However, with 16 years of the 21st century already passed, there is now considerable evidence that a 9 percent decline is likely an optimistic scenario. Streamflows thus far in the 21st century are already down roughly 15% from the previous century, significantly more than the median decline projected in the Basin Study for 2060. Reductions in precipitation do not fully explain these losses, leaving higher temperatures as the likely culprit behind the remaining declines. With far warmer temperatures expected as the century unfolds, this does not bode well for future runoff. If there is a point of widespread agreement regarding future runoff volumes, it is that it is dangerous to focus too heavily on a mean estimate of flow changes—9 percent or otherwise; it is the range of plausible flow scenarios that is critically important. Likewise, the enhanced probability for extreme events, such as decades-long megadroughts, associated with a warming planet must be considered jointly along with any changes in the overall trajectory of runoff. (page 2 – 3, underline added) 3. A paper in review was presented at the "Law of the Colorado River" conference in Las Vegas in February of 2016 by two of the scientists in the Colorado River Research Group, Brad Udall and Jonathan Overpeck, that also adds weight to our concern. That paper predicts a range of outcomes, some with dramatically decreased runoff in the Colorado River basin as compared to the 2012 Basin Study. Mr. Overpeck stated in his presentation: o "3) Scientists and water managers alike, however, should be careful not to assume the currently estimated "worst case" drought scenarios will remain so for long. As climate science has advanced in the Southwest, there have been a steady progression of new results that imply that today's "worst-case" drought scenario is tomorrow's second-worst case scenario. Water managers should pay particular attention to the emerging science that has been highlighted in the testimony above.[5]" (page 192) 4. Fourth, Mr. Overpeck actively takes to social media to express his scientific climate change research and the outcomes and policies that should be implemented from it. On Oct. 22, 2016, [3] http://www.coloradoriverresearchgroup.org/ [4] http://www.coloradoriverresearchgroup.org/uploads/4/2/3/6/42362959/crrg_climate_change.pdf [5] http://www.savethecolorado.org/blog/wp-content/uploads/2016/08/Law-of-the-Colorado-River-Course-Meterials.pdf.pdf	impacts produce different results. The lack of actionable, consistent science coupled with the significant uncertainties in climate and hydrology projections are too large for the information to be of value in a permit at this point in time, leaving historical hydrology as the best source of information to inform planning decisions in north-central Colorado. Typically, additional diversions would be greatest in wet years following dry years. There would be no *additional* diversions in dry years (i.e., when reduced supplies are available) because Denver Water would divert the maximum amount physically and legally available under their existing water rights and infrastructure without additional storage in their system.

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Mr. Overpeck tweeted[6]:

5. Finally, the State of Colorado, Water Conservation Board, has funded and is moving forward with the "Colorado River Risk Study."[7] Although the study is not yet complete, it highlights the risk that Lake Powell will drop below 'power pool' which is the lake level at which the hydroelectric facility will stop working. The "Risk Study" is a central part of the State of Colorado's management of its allotment of Colorado River water, and that the State of Colorado is taking this so seriously means that the potential for Lake Powell to drain is very real. The "goal" of the "Risk Study" is to "identify actions that can reduce the risk of losing power production[8]" at Glen Canyon Dam, including obtaining water in the state of Colorado to run downstream and refill Lake Powell.

Further, a news report about the study, titled: "Study: Drought like 200-2006 would empty Lake Powell,[9]" discusses many public statements by Mr. Eric Kuhn, who is the Director of the Colorado River District and is in charge of the study for the State of Colorado:

> "If we were to have another 2000-2006 drought, with where our starting conditions are today, we would basically empty Lake Powell," Kuhn told the board of directors of the river district last month in an update on the study.
>
> Further, Mr. Kuhn stated, "This is what I call the 'sticker shock,'" Kuhn said of those figures. "Basically, what we're saying is if we were to have, under today's conditions, one of these three droughts, we would go below our target of 3,525 feet."
>
> Finally, Mr. Kuhn stated, "I haven't shown the climate change hydrology because it just scares everybody," Kuhn said. "This is the recent hydrology."

A hint at that climate change hydrology is revealed in the graph below, which is slide 13 in Mr. Kuhn's presentation that he gave at the public meeting from which this newspaper story was generated. In the graph, the hydropower operations at Glen Canyon Dam cease to operate if any of the three recent drought scenarios are repeated. The red horizontal line is approximately "power pool" at Lake Powell, and when storage levels drop below that line -- as they do in all three modeled drought scenarios – the hydroelectric turbines stop spinning:

[6] https://twitter.com/TucsonPeck/status/789937940172460032
[7] http://www.coloradoriverdistrict.org/wp-content/uploads/2016/10/2016-09-16-seminar-kuhn.pdf
[8] http://www.coloradoriverdistrict.org/wp-content/uploads/2016/10/2016-09-16-seminar-kuhn.pdf (slide 2)
[9] http://www.aspendailynews.com/section/home/172183

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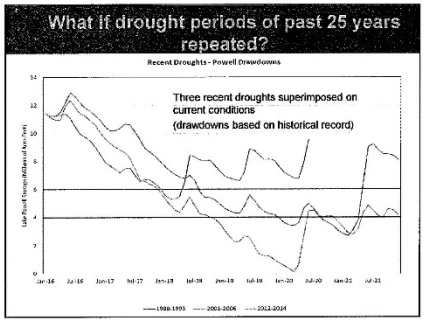

Adding to this presentation and newspaper article, on September 16, 2016, Mr. Kuhn gave a written version of the interim report of the "Colorado River Risk Study" to the board of directors of the Colorado River Water Conservation District[10]. Specifically addressing how real the threat is of drought and climate change draining Lake Powell, Mr. Kuhn writes:

> **"4. Is the threat of draining Lake Powell real or is it just a paper threat?**
> Answer: This is a difficult question, but I believe the best answer is the threat is very real. HOWEVER, the risk is relatively low. The study shows that at today's development levels two conditions would have to occur before there is a real threat that we would drain Lake Powell Page and trigger the need for a significant amount of demand management. First, we need a drought the magnitude of 2000-2005 or 1952-1956. AND second, the initial storage levels in Lake Powell need to be at or below 13-14 MAF. Based on historical hydrology, the risk of both of these occurring is relatively low. However, I need to point out that because Lake Powell storage is currently only 13 MAF, today we are clearly at an elevated risk. Further, some hydrologists have pointed out that based on what has actually happened since 2000, even the 1988-2012 "stress test" hydrology may be too optimistic. The 1988-2012 period had a mean natural flow at Lee Ferry of 13.3 million-acre feet per year. The estimated mean natural flow at Lee Ferry for 2000-2016 is only 12.5 MAF per year. NOTE, the annual natural flows for 2014-2016 are still preliminary estimates. If the hydrologic conditions we've experienced in the Colorado River Basin since 2000 continue on into the future, the risk of draining Lake Powell is substantial." (page 12, underline added)

Additionally, in the "key findings" of Mr. Kuhn's 9/16/2016 report, he writes:

> "In the most extreme drought scenarios, even after drought operations and additional demand management in the Lower Basin, the shortfall may be too large to meet with

[10] http://www.coloradomesa.edu/water-center/documents/JOINT%20WEST%20SLOPE%20RISK%20STUDY%2009-13-16.pdf

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	demand management programs, suggesting the need for discussions now about the necessary tradeoffs and alternative strategies to meet worst case scenarios." (page 1) Your FEIS fails to analyze the impact of climate change on the junior water right that would be used for the Windy Gap Firming Project. • If climate change intensifies -- as all scientists predict it will -- this junior water right may no longer exist. • If climate change intensifies -- as all scientists predict it will – this junior water right may be called downstream to attempt to refill Lake Powell, or called to the Lower Basin as a "Call on the River." Your FEIS completely fails to analyze any of these potential outcomes and their impact on the Project or the environment. Because climate change could reduce flows in the river dramatically, you must consider the risks to the Project's water right as well as the risks to the environment. The prediction that the hydropower plant at Glen Canyon Dam no longer operates is very real, so real that the State of Colorado is studying and planning for the risk of it happening, and trying to identify actions to keep it from happening. Further, Mr. Kuhn's statement that his "Risk Study" will not reveal to the public the "climate change hydrology because it just scares everybody" implores the Army Corps of Engineers to reveal that exact information in order to serve the public's interest as well as comply with the National Environmental Policy Act, Clean Water Act, and Endangered Species Act in your analyses of the Windy Gap Firming Project Your Windy Gap Firming Project FEIS fails to adequately analyze how climate change will diminish the availability of the Project's junior water right, and how climate change could cause the Project water right to no longer exist or be called downstream to refill Lake Powell or due to a "Call on the River." Please insert this letter into the public record for the Windy Gap Firming Project EIS process. Thank you,  -- Gary Wockner, PhD, Executive Director Save the Colorado PO Box 1066, Fort Collins, CO 80522 http://savethecolorado.org http://www.facebook.com/savethecolorado https://twitter.com/savethecolorado 970-218-8310	

Comment	Save the Colorado Comments – April 15, 2017	Response
141	 Save The Colorado River Campaign, PO Box 1066, Fort Collins, CO 80522 SaveThe Colorado.org @SaveTheColorado 970-218-8310 **April 15, 2017** **To: Amanda Lyon, U.S. Army Corps of Engineers, Windy Gap Firming Project manager** **From: Save The Colorado** **RE: Your FEIS for the Windy Gap Firming Project must take a "hard look" at methane emissions from dam and reservoir operations** **Dear Ms. Lyon,** We send you this comment letter for insertion into the public record for the EIS process for the Windy Gap Firming Project (WGFP). Over the last three years, we have repeatedly sent you requests to open up a new comment period as your agency develops a FEIS for WGFP. As you know, the Corps NEPA guidance allows for such a comment period. Further, when compelling new technical information and science is developed that impacts the WGFP EIS decision, it should further compel your agency to consider that science as well as place it in the public record for the WGFP EIS process. Over the last two years, compelling new scientific information has been published that must be considered in the EIS process for WGFP. **The Bureau of Reclamation's (Reclamation) FEIS and ROD is severely deficient because it does not consider the methane emissions and climate change impact of the dam and reservoir operations of WGFP.** Specifically, Reclamation does not consider or count methane emissions from the increased diversion of water or the operation of Chimney Hollow dam and reservoir, nor does Reclamation consider a full range of alternatives that would mitigate, avoid, or offset methane emissions from dam operations. In 1993, the first scientific paper[1] was published indicating that dams and reservoirs emitted greenhouse gases, namely methane, as a byproduct of hydropower electricity generation. That research set off a long chain of subsequent scientific inquiry, some of which was headed by American scientist Phillip Fearnside[2] whose groundbreaking 1996 publication[3] ignited a controversy in the international hydropower industry about significant methane emissions in tropical environments. Subsequent publications indicated that not only were methane emissions significant, hydroelectric dams/reservoirs [1] Gagnon L, Chamberland A (1993). Emissions from hydroelectric reservoirs and comparison of hydroelectric, natural gas and oil. Ambio 22:568-569 [2] https://www.internationalrivers.org/blogs/433-12 [3] Fearnside PM (1996). Hydroelectric dams in Brazilian Amazonia: response to Rosa, Schaeffer and dos Santos. Environ Conserv 23:105-108.	141. Thank you for your comment. Please refer to Comments 29, 113, and 140 above.

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could generate even greater greenhouse gas equivalents than coal-fired powerplants in tropical environments[4].

The international scientific community continued to investigate and publish on this topic throughout the 1990s and early 2000's. In 2006, the Intergovernmental Panel on Climate Change (IPCC) published "guidelines" for estimating some of the methane emissions from hydropower and reservoirs[5]. These guidelines were an important starting point for IPCC research and negotiations but have mostly been ignored by every country in the world as the Kyoto Protocol was implemented[6]. Worse, the same Kyoto Protocol called hydropower "clean" and included it in their "Clean Development Mechanism[7]" toolkit that was carried forward into COP 21.

In the early 2000's, after methane emissions were estimated in tropical environment as being very significant, measurements were also taken at a few reservoirs in more temperate environments in Canada, Europe, and the United States. That research accelerated from 2010 to the present as scientists began to better understand how, where, and when methane and other greenhouse gases were generated and emitted from reservoirs, dam spillways, hydropower infrastructure, and dam-impacted river reaches downstream. In recent years, scientists (including those at the EPA) have also developed improved methods and technologies to better measure the emissions.

- A 2013 study in Environmental Science and Technology better articulated the concept that reservoirs in temperate climates in Europe had methane "hot spots" and better measured those methane emissions[8].
- A 2012 study in Washington was able to measure how certain dam operations "dramatically" increased methane emissions[9].
- A 2014 study indicated that a reservoir in the Midwestern U.S. had significantly higher methane emissions than were previously estimated[10].

At the same time that these U.S. studies were published, estimates of methane emissions from around the world were also published indicating that worldwide emissions may be dramatically higher than previously estimated[11]. In 2016, researchers from the U.S. Environmental Protection Agency published results based on new methodologies indicating that a Midwestern U.S. reservoir may emit as much methane as reservoirs in tropical environments. The study, titled, "Estimates of reservoir methane emissions based on a spatially balanced probabilistic-survey[12]," summarizes:

> "Several literature reviews suggest that total CH4 emission rates from temperate reservoirs are typically less than 1 mg CH4 m22 h21 (Barros et al. 2011; Bastviken et al. 2011). The total CH4 emission rate reported here (8.3 6 2.2 mg CH4 m2 h21) is well above that value and is in the range more frequently reported for tropical reservoirs. However, recent studies that included

[4] See Fearnside references: https://www.internationalrivers.org/resources/philip-fearnside-comments-on-jirau-dam-brazil-7471
[5] http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/4_Volume4/V4_p_Ap3_WetlandsCH4.pdf
[6] http://www.ecowatch.com/hydropower-will-undermine-cop21-as-false-solution-to-climate-change-1882117292.html
[7] http://unfccc.int/kyoto_protocol/mechanisms/clean_development_mechanism/items/2718.php
[8] http://pubs.acs.org/doi/abs/10.1021/es4003907
[9] https://www.sciencedaily.com/releases/2012/08/120808081420.htm
[10] http://pubs.acs.org/doi/pdf/10.1021/es501871g
[11] https://sustainability.water.ca.gov/documents/18/3407432/Uncertainties+of+carbon+emission+from+hydroelectric.pdf
[12] http://onlinelibrary.wiley.com/doi/10.1002/lno.10284/pdf

> hot spots in temperate zone reservoirs have reported emission rates ranging from 4 mg CH4 m2 h21 to 13 mg CH4 m2 h21 (DelSontro et al. 2010; Maeck et al. 2013; Beaulieu et al. 2014) (excluding CH4 released during passage through the dam), suggesting that emissions from temperate systems may have been systematically underestimated." (page 11, underline added)

The same EPA researchers, and a host of other international scientists, published a paper in *Bioscience* in October 2016[13] of "synthesis findings" all of the applicable studies (to date), which was funded by the U.S. Army Corps of Engineers, the U.S. Environmental Protection Agency, and the National Science Foundation.

Among other conclusions, the article states:

> "When CH4, CO2, and N2O emissions are combined, our synthesis suggests that reservoir water surfaces contribute 0.8 Pg CO2 equivalents per year over a 100-year time span (fifth and ninety-fifth confidence interval: 0.5–1.2 Pg CO2 equivalents per year), or approximately 1.5% of the global anthropogenic CO2-equivalent emissions from CO2, CH4, and N2O reported by the IPCC (table 1; Ciais et al. 2013) and 1.3% of global anthropogenic CO2-equivalent emissions from well mixed GHGs overall (Myhre et al. 2013). Therefore, we argue for inclusion of GHG fluxes from reservoir surfaces in future IPCC budgets and other inventories of anthropogenic GHG emissions." (page 12-13)

Finally, on Sept 16, 2016, the first ever estimate of GHGs from Glen Canyon Dam operations was published in the peer-reviewed scientific journal PLOS[14]. The study estimated that operations at Glen Canyon Dam created 415 kg CO2e/MWh[15] which is roughly equal to the lower values created by natural gas powerplants[16]. Further, this estimate is in the process of being refined because it does not include a full "life cycle analysis" of emissions and does not include emissions related to mud flats and sediment ponds. Further, the estimate at Hoover Dam was much worse, indicated that the Hoover Dam/Lake Mead complex created approximately same amount of greenhouse gas emissions, per unit of electricity produced, as a coal fired powerplant[17].

Specific to the Windy Gap Firming Project:

The increased diversion of water caused by the Windy Gap Firming Project, and the operations of Chimney Hollow Dam and Reservoir will cause methane emissions. These methane emissions will be generated by the follow operations of WGFP, including but not limited to:

- The seasonal growth and drowning of vegetation on the banks of Chimney Hollow Reservoir as that vegetation anaerobically decomposes under the surface of the reservoir due to the fluctuating water levels.

- The anaerobic decomposition of the sediment, entrained algae, and nutrients that will increasingly exist in the warmer water that is pumped out of Shadow Mountain Reservoir, backwards through Grand Lake, and down into Chimney Hollow Reservoir.

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[13] http://www.savethecolorado.org/blog/wp-content/uploads/2016/10/BioScience-2016-Deemer-biosci_biw117.pdf
[14] http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0161947#pone-0161947-g001
[15] http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0161947#pone-0161947-g001 (see Table 1, line 307, column Q)
[16] http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0161947#pone-0161947-g001 (see Figure 2)
[17] http://savethecolorado.org/hoover-dam-vs-najavo-powerplant-whos-the-biggest-climate-polluter/

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- The anaerobic decomposition of the natural occurring sediment and organic material that flows into Chimney Hollow Reservoir via the Big Thompson River.

The National Environmental Policy Act requires that the U.S. Army Corps of Engineers take a "hard look" at all direct, indirect, and cumulative impacts associated with the proposed alternatives in the Final Environmental Impact Statement for the Windy Gap Firming Project[18].

Although Reclamation's FEIS purports to analyze the environmental impacts of operating the WGFP – including the increased diversion of water and dam and reservoir operations at Chimney Hollow Reservoir – the FEIS fails to analyze the methane and greenhouse gas emissions of any alternative.

Further, in August of 2016 (after the release of Reclamation's FEIS), the Whitehouse Council on Environmental Quality issued its "Final Guidance on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change[19]" which states:

> "This final guidance provides a framework for agencies to consider both the effects of a proposed action on climate change, as indicated by its estimated greenhouse gas emissions, and the effects of climate change on a proposed action. The final guidance applies to all types of proposed Federal agency actions that are subject to NEPA analysis and guides agencies on how to address the greenhouse gas emissions from Federal actions and the effects of climate change on their proposed actions within the existing NEPA regulatory framework." (website)

And also states:

> "Counsels agencies to use the information developed during the NEPA review to consider alternatives that would make the actions and affected communities more resilient to the effects of a changing climate[20];" (page 5)

In summary, Reclamation's FEIS for WGFP fails to comply with NEPA guidelines and with the CEQ guidance for estimating or addressing methane and greenhouse gas emissions. The Corps' FEIS must address these emissions or the Corps' FEIS will violate NEPA. Further, the Clean Water Act requires that the Corps choose the LEDPA for WGFP – failure to analyze and consider methane and greenhouse gas emissions from WGFP will also violate the Clean Water Act.

Thank you,

--
Gary Wockner, PhD, Director
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[18] http://www.nwo.usace.army.mil/Media/Fact-Sheets/Fact-Sheet-Article-View/Article/487716/nepa/
[19] https://ceq.doe.gov/current_developments/ceq_guidance_nepa-ghg-climate_final_guidance.html
[20] https://www.whitehouse.gov/sites/whitehouse.gov/files/documents/nepa_final_ghg_guidance.pdf