Mely Whiting, Legal Counsel, Colorado Water Project

July 30, 2012

Board of County Commissioners
Grand County
c/o Lurline Underbrink-Curran
P.O. Box 264
308 Byers Ave.
Hot Sulphur Springs, Co 8

Via E-mail: ***lcurran@co.grand.co.us***

Re: 1041 Permit Application – Windy Gap Firming Project

Dear BOCC members,

As requested by County Attorney Jack DiCola, the following is a summary of testimony to be provided by our expert and exhibits Trout Unlimited plans to offer during the hearing in the above-referenced matter, which is scheduled for August 1 and 2, 2012. Electronic copies of the exhibits are attached. Paper copies of selected exhibits will be provided at the hearing. A general description of Trout Unlimited's position is provided at the end of the document.

Expert Testimony

Trout Unlimited may call Greg Espegren to provide expert testimony during the hearing.

Mr. Espegren holds a Masters of Science degree in Fishery and Wildlife Biology. He has worked as an aquatics specialist for the Colorado Division of Wildlife (now Colorado Parks and Wildlife) and for the Colorado Water Conservation Board. Mr. Espegren was formerly part of Trout Unlimited's staff and is now an independent consultant.

Mr. Espegren may testify about the importance of peak flows to aquatic habitat, effects of excess sediment on aquatic life and habitat, the findings of the 2011 Nehring Report, and effects of WGFP. Mr. Espegren may further testify regarding peak flow needs for the Colorado River downstream of Windy Gap Reservoir, sufficiency of peak flow impacts analysis and mitigation proposals, and related matters. Mr. Espegren may also provide rebuttal testimony in response to matters presented by other parties or the public during the hearing.

Exhibits

The following is an initial list of documents which Trout Unlimited believes should be part of the record. Additional exhibits may be offered while the record remains open.

EXHIBIT A

1. "Colorado River Aquatic Resources Investigations, Federal Aid Project F-237#-18" by R. Barry Nehring, dated June 2011 (2011 Nehring Report)

This report documents the results of years of intense study of the biological and physical condition of the Colorado River downstream of Windy Gap reservoir and comparison with pre-reservoir conditions. It documents the loss of 38% of aquatic insect species and complete loss of *Pteronarcys californica*, a species of stonefly, and the mottled sculpin, a native fish, below Windy Gap reservoir. Both species are key indicators of aquatic life health and an essential source of food for trout. The species were abundant before the reservoir was built and they remain abundant upstream of the reservoir. The report concludes: "The proposed firming projects at Windy Gap and the Moffat Tunnel are only going to further exacerbate this situation." *2011 Nehring at p. 31.*

2. EPA Comments on Windy Gap Firming Project Final Environmental Impact Statement; CEQ # 20110413

These are EPA's comments on the final EIS for the WGFP. The comments should help the BOCC understand some of the most serious inaccuracies of the WGFP EIS which renders that document incapable of predicting the true impacts of the project on the Colorado River's aquatic habitat with any degree of accuracy. EPA expresses particular concern over the fact that the 2011 Nehring report was not evaluated as part of the final EIS; that the reach of the Colorado River that will be most impacted by the proposed projects was not evaluated; and that the EIS concludes that conditions are not expected to change much, in spite of the fact that the availability of critical peak flows will be reduced by as much as 54 percent. EPA recommends that mitigation for the Colorado River include "a bypass channel around Windy Gap Dam," "commit to in-stream channel reconfiguration," and "[c]omit to additional channel maintenance flow requirements of sufficient magnitude, duration and frequency to maintain the ecological functions of the river." Whether the federal agencies will be willing to accept EPA's recommendations is unknown.

3. Trout Unlimited's January 31, 2012 letter to the Bureau of Reclamation regarding the WGFP Final EIS

The Subdistrict has no entitlement to WGFP. On the contrary, under SD 80 protection of Grand Lake and the Colorado River must come above the needs of the Subdistrict or its providers. Yet, both the draft and the final EIS make assumptions and draw arbitrary conclusions that place Grand Lake and the Colorado River in jeopardy while minimizing the burden on the Subdistrict to develop the project. This letter describes the most significant instances and urges BOR to develop specific mitigation designed to reduce the risk and burden on the Colorado River and its fisheries.

4. Comments on the Draft EIS submitted by EPA, DOW (now CDPW), WRA and Grand County

The Subdistrict relies on the draft and final EIS to describe the project need and anticipated impacts. EPA's comments, along with comments provided by Trout Unlimited, CDPW, Grand County, and others, are essential to understand the deficiencies of both the draft and the final EIS, which render those documents incapable of providing an accurate picture of the potential impacts of the project. Comments provided by WRA question the extent to which adequate conservation measures have been undertaken by the project participants.

5. Analysis Of The Relationship Between Minimum Flow Below Windy Gap And Water Temperature Above The Williams Fork, by Blair Hanna, AMEC Earth and Environmental 2/5/2009

This report, prepared by AMEC for the Subdistrict, concludes that "a flow of 105 cfs instead of 90 cfs might better achieve water temperature compliance" in the Colorado River downstream of Windy Gap Reservoir. It is helpful to understand that the minimum flows established as part of mitigation for the original Windy Gap project are insufficient to address stream temperature problems.

6. Moffat Expansion and Windy Gap Firming Project: Impacts of Mitigation, Colorado Wildlife Commission Hearing, May 6, 2011, Western Resources Advocates

Using fees and population figures published by proposed WGFP providers, this report calculates the cost of mitigation per $5 million and compares it to the total cost of WGFP. The analysis shows that the cost of mitigation for WGFP would be $1.60 per household per year for 30 years. The cost is a miniscule percentage of the cost of the project.

7. Powerpoint presentation – for August 1 and 2 hering.

8. Letter to Governor Hickenlooper signed by hundreds of businesses in Grand County

Trout Unlimited's Position

As it will be further described during the hearing, Trout Unlimited believes the 1041 permit should be denied unless adequate terms and conditions to prevent WGFP impacts are incorporated in the permit. These conditions include the requirement for a bypass through or around Windy Gap reservoir, the establishment of adequate flushing and channel maintenance flow requirements, adequate biological monitoring, and a prohibition against pumping whenever stream temperature is nearing acute or chronic state standards – no restrictions attached. Based on current information, Trout Unlimited supports the issuance of a 1041 permit if said terms and conditions are incorporated in the permit.

Sincerely,

Mely Whiting, Legal Counsel
Trout Unlimited
Colorado Water Project
720.470.4758
Mwhiting@tu.org

cc: Lurline Underbrink-Curran
Jack DiCola, Esq.
Barbara Green, Esq.
David Taussig, Esq.
Peggy Montano, Esq.
Steve Bushong, Esq.

TROUT UNLIMITED'S MISSION IS TO CONSERVE, PROTECT AND RESTORE NORTH AMERICA'S COLDWATER FISHERIES AND THEIR WATERSHEDS

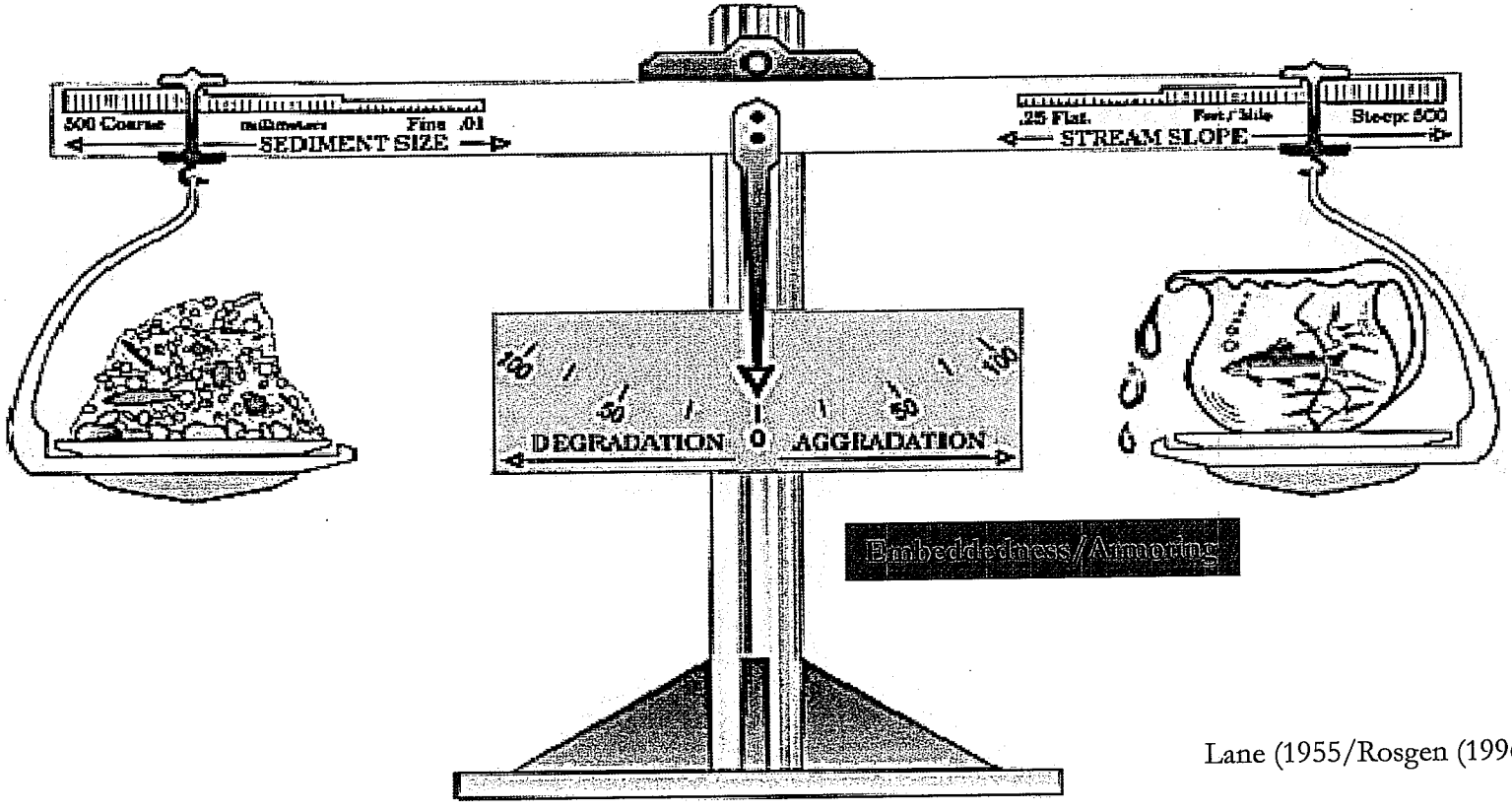
TROUT UNLIMITED

Windy Gap Firming Project 1041 Permit

Trout Unlimited
August 2012

EXHIBIT B

The relationship between sediment and streamflow



Lane (1955/Rosgen (1996)

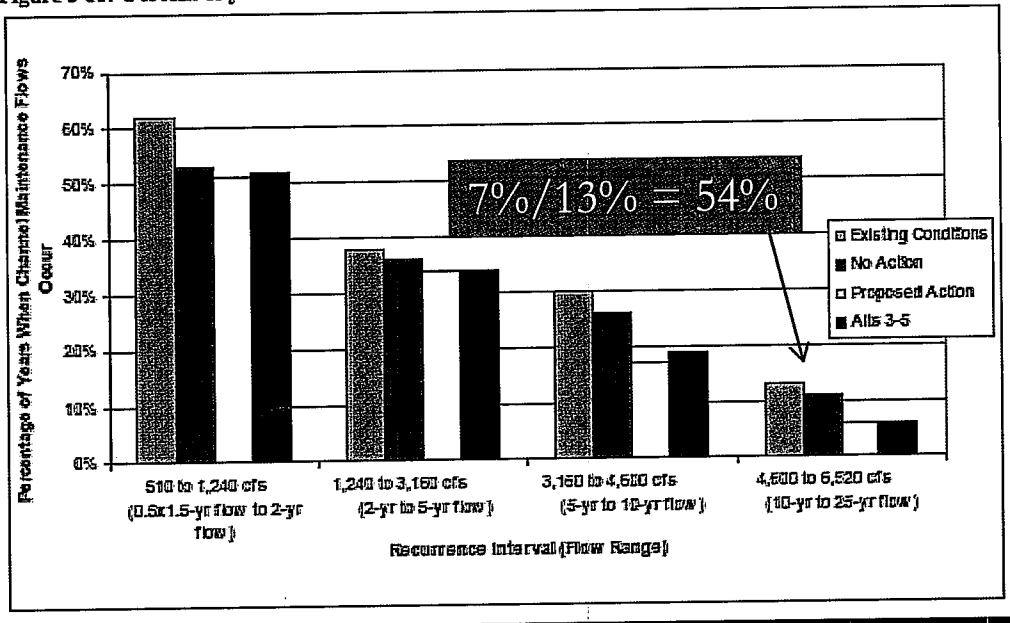
(Sediment LOAD) x (Sediment SIZE) ⋈ (Stream SLOPE) x (Stream DISCHARGE)

Changes in Colorado River Channel Maintenance Flows at HSS (1950-1996

Recurrence Interval	Flow Range cfs	Percentage of Years Flow Range Occurs			
		Existing Conditions	No Action	Proposed Action	Alternatives 3-5
0.8x1.5-yr to 2-yr flow	510 to 1,240	62%	53%	51%	51-53%
2- to 5-yr flow	1,240 to 3,160	38%	36%	34%	34%
5- to 10-yr flow	3,160 to 4,600	30%	26%	17%	19%
10- to 25-yr flow	4,600 to 6,520	13%	11%	6%	6%

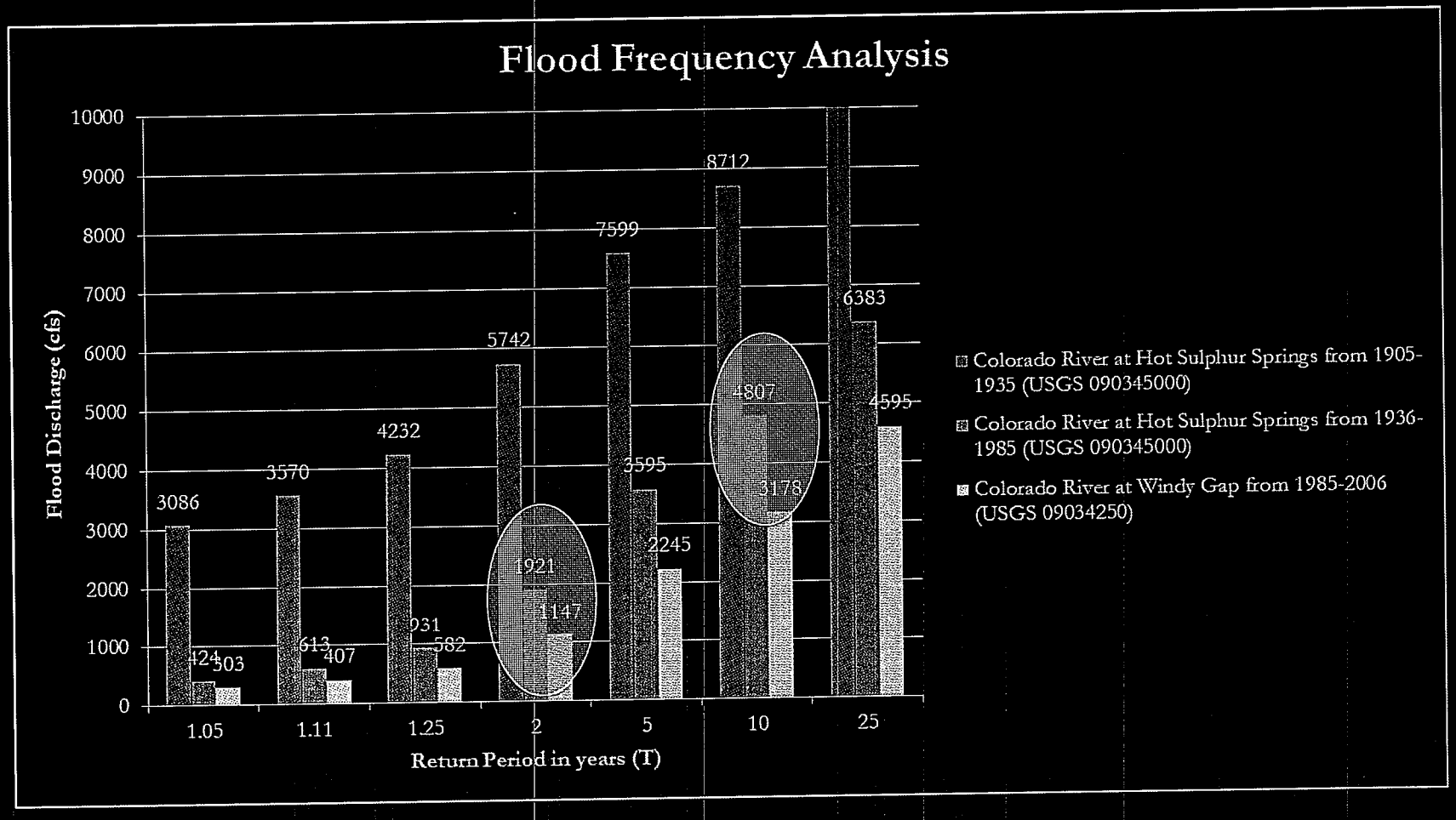
13%-6% = 7%

Figure 3-35. Percent of years when channel maintenance flows occur at Hot Sulphur Springs.



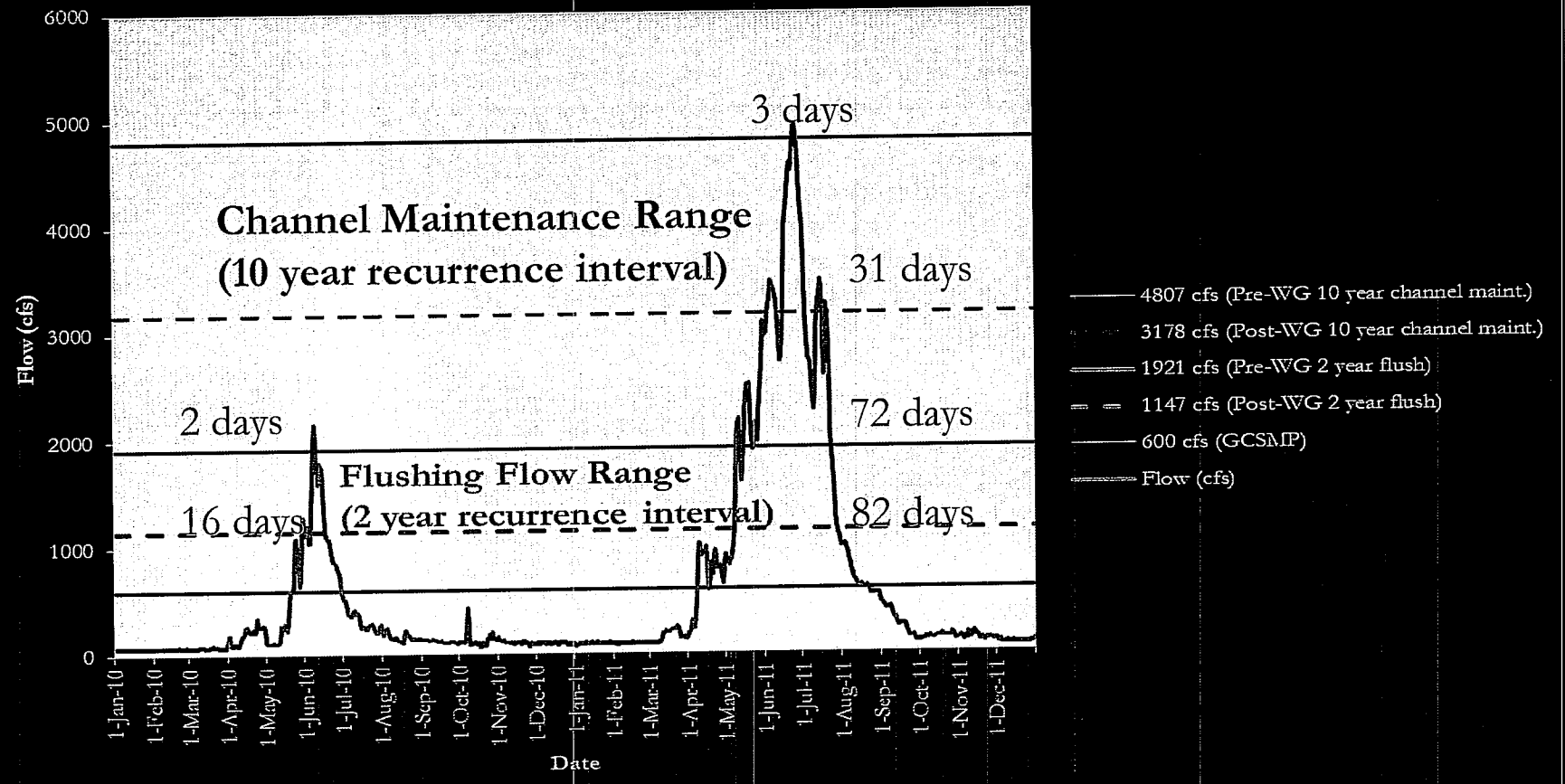
- The Final EIS attempts to downplay the reduction in frequency of channel maintenance flows like the 10-25 year recurrence interval stating that these flows would "occur about 7% less" under the action alternative.
- EPA countered this statement saying "Peak flows needed for channel maintenance…will occur 44-54% fewer years under the proposed action compared to existing conditions below Windy Gap Diversion. This represents a relatively significant change considering the naturally low frequency of these events."

Grand County Stream Management Plan



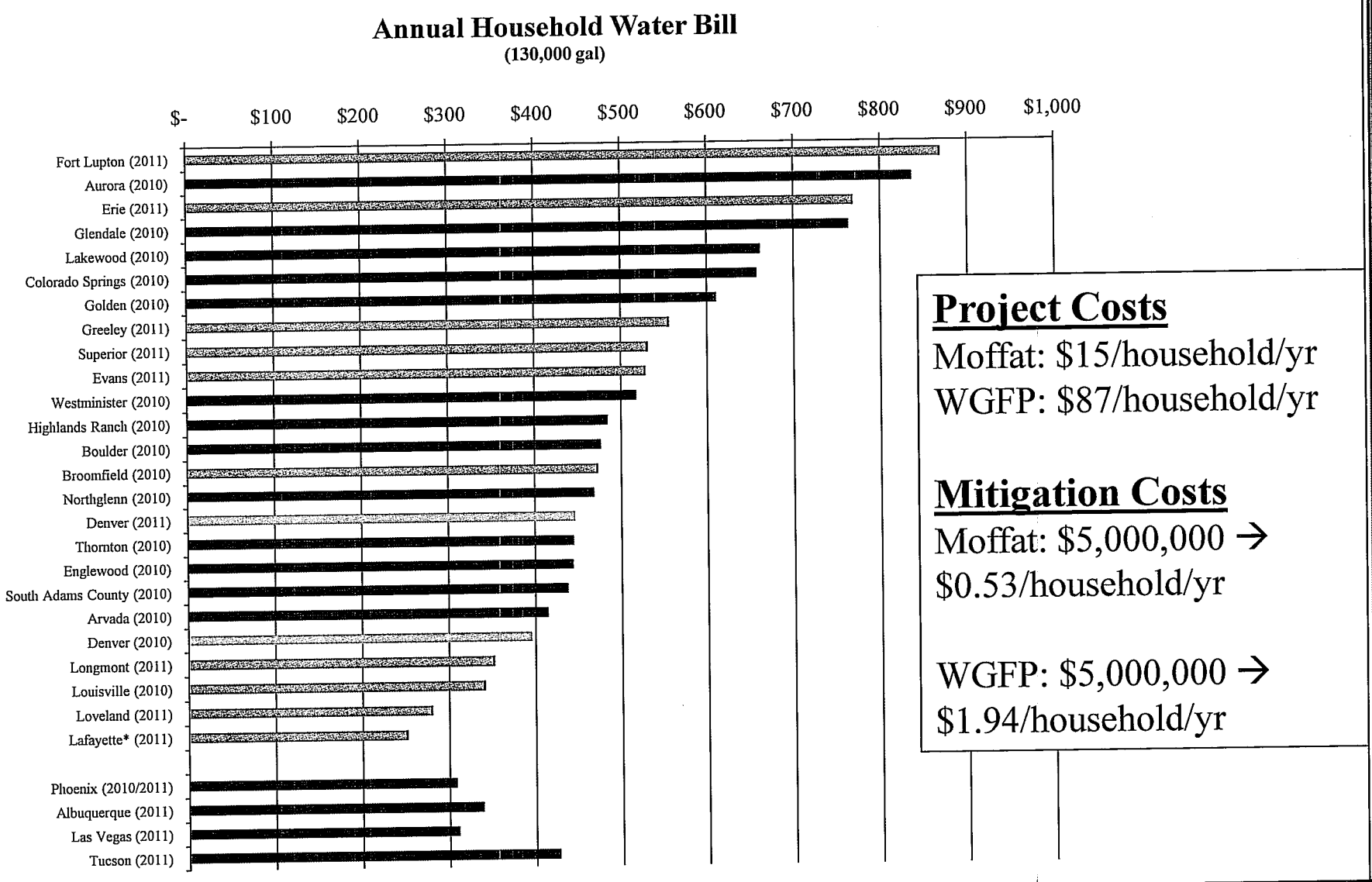
- Flushing Flows (fine sediment) generally recur every 2 years
  - Pre-Windy Gap = 1,921 cfs; Post-Windy Gap = 1,147 cfs
- Channel Maintenance Flows (larger cobble) generally recur every 10 years
  - Pre-Windy Gap = 4,807 cfs; Post Windy Gap =3,178 cfs

2010 and 2011 Flows at Colorado River at Windy Gap (USGS 09034250)



- Pre-WG Channel Maintenance Flow (4807 cfs) was available for 3 days in 2011
- Post-WG Channel Maintenance Flow (3178 cfs) was available for 31 days in 2011.
- Pre-WG Flushing Flow (1921 cfs) was available for 2 days in 2010 and 72 days in 2011.
- Post-WG Flushing Flow (1147 cfs) was available for 16 days in 2010 and 82 days in 2011.

Impact of Mitigation on Water Rates



Project Costs

Moffat: $15/household/yr

WGFP: $87/household/yr

Mitigation Costs

Moffat: $5,000,000 → $0.53/household/yr

WGFP: $5,000,000 → $1.94/household/yr

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 8
1595 Wynkoop Street
DENVER, CO 80202-1129
Phone 800-227-8917
http://www.epa.gov/region08

DEC 19 2008

Ref: 8EPR-N

Michael Ryan
Regional Director
Great Plains Director
Bureau of Reclamation
P.O. Box 36900
Billings, Montana 59107-6900

RE: Windy Gap Firming Project, Northern Colorado, Draft Environmental Impact Statement, CEQ #20080333

Dear Mr. Ryan:

The United States Environmental Protection Agency, Region 8 (EPA) has reviewed the U.S. Bureau of Reclamation's (BOR) Draft Environmental Impact Statement (DEIS) for the Windy Gap Firming Project. EPA offers these comments in accordance with the Agency's responsibilities under the National Environmental Policy Act (NEPA), 42 U.S.C. Section 4332(2)(C), and Section 309 of the Clean Air Act, 42 U.S.C. Section 7609.

The Windy Gap Firming Project (WGFP) is a proposed water supply project that is intended to provide more reliable water deliveries to Front Range and West Slope communities and industries. Due to physical limitations and constraints within the existing system, the current Windy Gap facilities have been and are currently unable to deliver the anticipated firm yield of water. Firm yield is typically defined as the amount of water that can be delivered on a reliable basis in all years and is typically determined by yield in dry years. The WGFP would add water storage and related facilities to the existing Windy Gap operations capable of delivering a firm yield of about 30,000 acre feet to Project Participants. Project Participants are all in the State of Colorado and include the City and County of Broomfield, Central Weld County Water District, the Town of Erie, City of Evans, City of Fort Lupton, City of Greeley, City of Lafayette, Little Thompson Water District, City of Longmont, City of Louisville, City of Loveland, Platte River Power Authority, and the Town Of Superior. In addition, the WGFP seeks to firm the water supply for the Middle Park Conservancy District which is a wholesale water supplier that allocates Windy Gap water to about 67 water providers in Grand and Summit Counties.

The DEIS analyzes five alternatives. Alternative 1, the no action alternative, assumes the continuation of existing operations and the enlargement of Ralph Price Reservoir by the City of Longmont. Alternative 2, development of a 90,000 acre –foot (AF) Chimney Hollow Reservoir on the East Slope of the Continental Divide (East Slope) along with the ability to store or

EXHIBIT C

preposition Colorado-Big Thompson (C-BT) water in the new reservoir, is the proposed action Alternative 3 is a combination of a 70,000 AF Chimney Hollow reservoir on the East Slope and Jasper East Reservoir (20,000 AF) on the West Slope of the Continental Divide (West Slope). Alternative 4 is a combination of a 70,000 AF Chimney Hollow Reservoir on the East Slope and a 20,000 AF Rockwell Reservoir on the West Slope. Alternative 5 is a combination of a 60,000 AF Dry Creek Reservoir on the East Slope and a 30,000 AF Rockwell Reservoir on the West Slope. All build alternatives include various pipeline and connection infrastructure as well. All build alternatives would require a similar amount of water diverted from the Colorado River. Windy Gap firm yield would increase from zero under existing conditions to about 30,000AF under the Action alternatives.

EPA believes that this DEIS provides significant complex information. However, EPA has concerns with several aspects of the analysis, identified herein. In addition, based on EPA's review of the DEIS, EPA has significant objections to the WGFP's impacts to the Colorado River and to impaired water bodies. EPA also has concerns with the lack of analysis of conservation alternatives, the impacts to stream morphology of the Colorado River, and the water quality analysis in all of the water bodies potentially affected by this project. EPA's major comments on the DEIS are highlighted below, with attached detailed comments on these and additional concerns. In a separate letter to the United States Army Corps of Engineers (Corps), EPA is commenting on the Clean Water Act (CWA) 404 permit application, notice of which the Corps issued at the same time as the BOR issued the WGFP DEIS. EPA understands the Corps intends to rely on the BOR DEIS to ensure compliance with the CWA Section 404(b)(1) Guidelines requirements. A summary of EPA's CWA Section 404 permit application comments to the Corps is provided in this letter.

Water Quality Standards Violations and Degradation

EPA objects to the high potential for the WGFP to exacerbate existing water quality impairments in East Slope and West Slope water bodies. The DEIS predicts increased nutrient loading and consequent dissolved oxygen (D.O.) reductions to both East and West Slope rivers and reservoirs, several of which are already impaired. Carter Lake and Horsetooth Reservoir are on the State of Colorado's 2008 Clean Water Act Section 303(d) List of Water-Quality-Limited Segments as impaired for their Aquatic Life Use due to mercury (associated with nutrient enrichment and reduced oxygen environments). In addition, Horsetooth Reservoir is listed for D.O. impairment. Granby Reservoir, Shadow Mountain Reservoir, and Grand Lake are all acknowledged as exceeding applicable water quality standards (WQS). Projected instream temperature increases are also a significant stressor to aquatic life, and a significant impact of the project. High temperature and nutrient levels (and consequent low D.O. levels) may lead to additional, more severe, or further impairments throughout these watersheds, which will be difficult to remedy through point source controls alone. Further, any worsening of these conditions increases the future required efforts and costs associated with remediation and restoration. The proposed action appears to have the potential to directly impact the assimilative capacity for high temperatures and nutrients in all of the downstream reservoirs and streams,

exacerbating the difficult cleanup plans and wasteload allocations required in any forthcoming "Total Maximum Daily Loads" (TMDLs).

The DEIS does not provide adequate mitigation measures for these water quality impacts. The EIS should identify appropriate measures to address these impacts. EPA strongly suggests that BOR include enforceable mitigation measures in its Record of Decision (ROD) to minimize pollutant loading in the basin, and maintain healthy aquatic ecosystems in these waterbodies. Suggested mitigation measures are included in the enclosed detailed comments.

Impacts to the Colorado River

According to the DEIS, the WGFP will result in flow reductions to the Colorado River. The DEIS predicts the majority of the reductions to occur between May and August. From WGFP alone, the Colorado River average annual flow below Granby Reservoir is estimated to decrease by 15% (9,000 AF) under the proposed action, and 12-13% for the other action alternatives (see DEIS p. ES-8). Below the Windy Gap diversion, the decrease to the Colorado River is 14% for the action alternatives. The WGFP with other projects analyzed in the cumulative effects portion of the DEIS are estimated to reduce the Colorado River annual flow, below the Windy Gap diversion, by 21% in a wet year (1% in a dry year) (see DEIS p. ES-8). EPA has significant concerns with the reduction in flows to the Colorado River below Windy Gap (as well as at other points on the Colorado River, listed on Table 3-16, DEIS p. 3-45) associated with the action alternatives and cumulative impacts. This significant reduction in flow would impact aquatic ecosystem functioning and could result in unforeseen and irreversible ecological impacts. Further, EPA is concerned that mitigation for adverse or unavoidable impacts associated with an altered flow regime is extremely difficult and perhaps infeasible to offset losses.

The climate change discussion contends that modeling the future impacts of climate change relating to the Colorado River is not a useful exercise since existing reports on the impacts of climate change on the Colorado River are uncertain and predict a variety of outcomes (see DEIS p. 2-44). EPA believes BOR should model the impacts of a scenario where flows are reduced substantially because of climate change. It is reasonably foreseeable that minimal stream flows will occur much more often. That, coupled with the 21% flow reduction discussed above, suggests severe impacts to portions of the Colorado River affected by this project.

Sustainability and Conservation

The growth in the number of water projects in Colorado raises concerns over the sustainability of the current approach to water supply in the western United States. EPA believes that a higher priority should be placed on conservation, efficiency, and reuse, which could result in significant cost efficiencies and result in reduced environmental impacts and energy conservation. EPA believes that all of the communities taking part in the WGFP should be required, before any action alternative is considered, to take part in a number of conservation efforts that would boost the use of existing water supplies before building new infrastructure,

dams, and reservoirs. Most water providers appear to have implemented some water conservation measures, but many water saving measures appear underutilized and undeveloped or voluntary.

Alternatives Evaluated

The alternatives evaluated in the DEIS are limited to providing storage or firming for all or a portion of the existing junior water rights of the Windy Gap Firming Project for current and future municipal and industrial supply. EPA believes other alternatives may exist that are within a reasonable range of alternatives required by NEPA as well as less damaging practicable alternatives required by the CWA Section 404(b)(1) Guidelines to meet current or future water supply demand. These alternatives include, but are not limited to: 1) water conservation including active municipal, industrial (M&I) and agricultural efficiency measures; 2) acquisition of more senior water rights including water rights that have been available to the project proponent since the original Windy Gap Project; 3) agricultural transfers including permanent, interruptible, and rotating/fallowing transfers; 4) use of short-term agricultural leases for immediate temporary water supplies; 5) conjunctive use of surface water and ground water; and 6) M&I reuse, including water rights exchanges, non-potable reuse, and indirect potable reuse. EPA believes a conservation alternative, potentially in combination with other alternatives, would be in the best interests of the communities involved, from both a cost perspective and an environmental perspective.

Compliance with the CWA Section 404(b)(1) Guidelines

As noted above, EPA is providing comments on the CWA Section 404 permit application for the project in a separate letter to the Corps. EPA understands the Corps intends to use the BOR EIS to satisfy the requirements of the CWA Section 404(b)(1) Guidelines (Guidelines). The Corps must ensure compliance with the Guidelines prior to issuance of a CWA Section 404 permit for the discharge of dredged or fill material into waters of the United States. EPA disagrees with the narrow scope of the purpose and need statement in the DEIS for the issuance of a CWA Section 404 permit. EPA believes the basic (overall) project purpose is to provide a portion of the existing and future water supply demands of project participants.

EPA believes the DEIS analysis is not in compliance with the Guidelines in accordance with 40 CFR 230.12 due to: 1) an improperly truncated review of alternatives (40 CFR 230.10(a)); 2) a lack of meaningful analysis of regarding potential violations of State water quality standards (40 CFR 230.10(b)); 3) a lack of meaningful analysis regarding the potential for the proposed action to cause or contribute to significant degradation of waters of the U.S, specifically in light of secondary and cumulative effects of this and other reasonably foreseeable water projects within the Upper Colorado River Basin (40 CFR 230.10(c)); and 4) insufficient mitigation (40 CFR 230.10(d)).

In addition, based on the information currently available in the DEIS, EPA believes the proposed action will result in substantial and unacceptable impacts to the Upper Colorado River

Basin, which EPA has determined is an aquatic resource of national importance (ARNI) in accordance with the CWA Section 404(q) and Part IV(3)(b) of the 1992 Memorandum of Agreement between EPA and the Department of the Army. In its letter to the Corps regarding the WGFP CWA Section 404 permit application, EPA is requesting the Corps reconsider the availability of potentially less environmentally damaging practicable alternatives.

Mitigation

The mitigation measures for water quality and stream morphology impacts are not sufficiently definitive and give no assurance that they will be required or will mitigate for the impacts expected (see DEIS p.3-292). EPA strongly suggests that enforceable mitigation measures for the water quality and stream morphology impacts of this project be included in the ROD. We have included examples of mitigation measures in our enclosed detailed comments.

Rating

Based on EPA's review as summarized in the above comments, and in accordance with our policies and procedures for reviews under NEPA and Section 309 of the Clean Air Act, EPA has rated the DEIS as "Environmental Objections - Insufficient Information" ("EO-2") (Because the DEIS does not identify a preferred alternative, EPA is rating all of the action alternatives EO-2). The "EO" rating signifies that EPA's review has identified significant environmental impacts that should be avoided in order to adequately protect the environment. The basis for the EO rating is EPA's belief that the action might violate or be inconsistent with achievement or maintenance of the Clean Water Act, e.g., impairment of already impaired waters without assurance of adequate mitigation of these impacts. The "2" rating signifies that the DEIS does not contain sufficient information for the EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment. The water quality and stream morphology sections of the enclosed detailed comments discuss the information EPA believes is insufficient. EPA's comments, and this rating, apply to all the action alternatives carried through the analysis. A description of EPA's EIS rating system is enclosed.

EPA remains committed to working with the BOR and the Corps on the issues described in this letter. We are committed to providing information in areas where we have requested additional information or additional mitigation, if you request. Please contact me at 303 312-6004, or Melanie Wasco of my staff, at 303 312-6540.

Sincerely,

Larry Svoboda
Director, NEPA Program

cc: Will Tully, U.S. Bureau of Reclamation
Chandler Peter, U.S. Corps of Engineers

PURPOSE AND NEED

The DEIS states that the purpose and need of the proposed project is, in part, "to deliver a firm annual yield of about 30,000 AF of water from the existing Windy Gap Project to meet a portion of the water deliveries anticipated from the original Windy Gap Project" (see DEIS p. 1-1). The Purpose and Need stated in the DEIS artificially constrains alternatives to those directly associated with the existing Windy Gap Project. EPA believes the project purpose is to meet a portion of the existing and future water supply demands of project participants and thus additional alternatives that address this purpose should be analyzed and included.

In addition, detailed information on the demand shortfall that occurred after the original Windy Gap project was built is not included in the DEIS. The historical perspective of the potential cause of the demand reductions during the post project time period may be pertinent to present day circumstances. Because demand projections are difficult to estimate, EPA recommends that the Bureau of Reclamation (BOR) and the Army Corps of Engineers (Corps) request an independent review of the Participants' estimated and future water requirements and supply studies (i.e., alternatives) by the Corps' Institute for Water Resources, and utilize the most current economic and population growth indicators for future water demand and supply information in subsequent NEPA documentation. EPA notes that the recent downturn in the real estate market could slow growth significantly in all of the communities served by this water.

SUSTAINABILITY AND CONSERVATION

The growth in the number of water projects in Colorado raises concerns over the sustainability of the current approach to water supply in the western United States. EPA believes that a higher priority should be placed on conservation, efficiency, and reuse, which could result in significant cost efficiencies, reduced environmental impacts, and increased energy conservation.

EPA believes all of the communities taking part in the WGFP should be required, before any action alternative is considered, to take part in a number of conservation efforts that would boost the use of existing water supplies before building new infrastructure, dams, and reservoirs. Most water providers appear to have implemented some water conservation measures, but many water saving measures appear underutilized and undeveloped, or voluntary. The BOR should evaluate different levels of conservation practices available to the Participants and require the communities participating in this project demonstrate that they have implemented a variety of sustainable water conservation measures, including but not limited to: water metering, water leak detection, conservation pricing, landscape requirements, water reuse, consumer education, golf course water conservation, emergency water use restrictions.

The BOR could suggest a per capita use percentage reduction for each community as a goal, and that number could depend on the water use percentage of industry in the community, and the current status of the community's per capita usage. While EPA recognizes that the water use per capita for Windy Gap participants dropped 37% between 1988 and 2003, EPA believes the participants can go further in cutting the water demand (see DEIS p. 1-15).

ALTERNATIVES

NEPA regulations require an evaluation of a reasonable range of alternatives in a manner that provides a clear and consistent comparison (40 CFR 1502.1, 40 CFR 1502.14(b)). The CWA Section 404(b)(1) Guidelines require the Corps to issue a CWA Section 404 permit for the discharge of dredged or fill material into waters of the United States only for the least environmentally damaging practicable alternative (LEDPA) (40 CFR Part 230). Alternatives that are reasonable and practicable may include alternatives that are outside the capability of the applicant and are feasible from a technical and economic standpoint. EPA does not believe the DEIS provides an alternatives analysis that complies with either the Council on Environmental Quality (CEQ) regulations at 40 CFR 1502.14 or the CWA Section 404(b)(1) Guidelines. The alternatives evaluated in the DEIS are limited to providing storage or firming for all or a portion of the existing junior water rights of the Windy Gap Firming Project for current and future municipal and industrial supply. The DEIS described the process of evaluating a broad range of alternatives including structural and nonstructural water supply alternatives. However, according to the DEIS, the screening process resulted in the elimination of the majority of alternatives in order to comply with the Guidelines.

Despite the screening criteria used in the DEIS, EPA continues to believe other reasonable and less damaging practicable alternatives may be available to meet current or future demand. Such alternatives include, but are not limited to: 1) water conservation including active municipal, industrial (M&I) and agricultural efficiency measures; 2) acquisition of more senior water rights including water rights that have been available to the project proponent since the original Windy Gap project; 3) agricultural transfers including permanent, interruptible, and rotating/fallowing transfers; 4) use of short-term agricultural leases for immediate temporary water supplies; 5) conjunctive use of surface water and ground water; and 6) M&I reuse, including water rights exchanges, non-potable reuse, and indirect potable reuse. These water supply alternatives are detailed in the State of Colorado Statewide Water Supply Initiative, Phase II Report (SWSI) CDM 2004; http://cwcb.state.co.us/IWMD/AlternativeAgriculturalWaterTransfersGrantProgram/). EPA understands the State of Colorado considers these alternatives viable to address Colorado's water supply needs.

The DEIS states that each participant has developed a unique portfolio of water supply sources to meet existing and anticipated water needs and that a diversity of water supply sources is generally preferred to ensure reliable deliveries (see DEIS p. 1-11). EPA believes the alternatives identified above may provide comparably diverse water supply opportunities, or potentially more reliable and efficient options for water supply for the Participants than the

proposed project and should be critically explored. An alternative that is aggressive on conservation (alone or in combination with other alternatives identified above) will not only disclose valuable information for the decisionmakers and the public to compare the magnitude of environmental effects of the alternatives, but will also reduce costs and dramatically reduce environmental impacts and energy use.

USE OF NO ACTION ALTERNATIVE FOR BASELINE CONDITIONS:

The BOR compares impacts of the action alternatives to the no action alternative, rather than to existing baseline conditions. The DEIS, in most cases, contains sufficient information to enable the reader to compare action alternatives to existing conditions, which EPA believes is more consistent with the intent of NEPA. In the case of stream temperature impacts, the DEIS does not indicate whether the projected percent temperature increase is related to the no action or existing conditions. We believe, when specifying mitigation measures, the BOR should be comparing impacts to existing conditions.

INDIRECT IMPACTS

The DEIS fails to evaluate "indirect" impacts (caused by the action and later in time or farther removed in distance) to wetlands and other waters resulting from reasonably foreseeable growth inducing effects from the proposed action. Firming of Windy Gap water will likely provide more reliable water supply to both the Front Range communities and the West Slope Participants. This proposed water supply will affect future development growth rates, population density and changes in land use patterns. These potentially significant indirect effects from land development and construction should be evaluated and disclosed to determine the potential adverse impacts to wetlands and other waters. An analysis similar to the one used in the Northern Integrated Supply Project DEIS, which identified the wetland losses as cumulative effects but that EPA believes is a combination of indirect and cumulative impacts, should be used to calculate indirect impacts to wetland acreages resulting from construction and development in the broader study area (and not just related to development near the proposed reservoirs). In addition, it should not be assumed that Clean Water Act Section 404 permits including mitigation will be required for reasonably foreseeable development impacts because certain wetlands and other waterbodies in Colorado do not require permits due to their locations on the landscape.

CUMULATIVE IMPACTS

According to the DEIS, the WGFP will result in flow reductions to the Colorado River, the majority of which are projected to occur between May and August. From this project alone, the Colorado River average annual flow below Granby Reservoir is estimated to decrease by 15% (9,000 AF) from existing conditions under the proposed action, and 12-13% for the other action alternatives. Below the Windy Gap diversion, the decrease to the Colorado River is 14% for the action alternatives. Other projects analyzed in the cumulative effects portion of the DEIS, in combination with Windy Gap, are estimated, as an annual average, to reduce the Colorado

River flow below the Windy Gap diversion by 21% in a wet year (1% in a dry year). EPA has significant concerns with the reduction in flows to the Colorado River below Windy Gap (as well as at other points on the Colorado River, listed on Table 3-16, DEIS p. 3-45) associated with the action alternatives and cumulative impacts. It is important to note that the DEIS states that average annual stream flow in the Colorado River at Hot Sulphur Springs declined from 486,209 AF in 1905-1949 to 175,264 AF in 1950-1994 (see DEIS p. 3-7), a decline in average annual stream flow of 64% due, in part, to diversions from Moffat, Colorado Big Thompson and Windy Gap diversions. Thus, this project, in combination with other reasonably foreseeable actions, will remove an additional 21% of the remaining 36% of the annual flow hydrograph, leading to further impacts to the river from manmade diversions.

This project's impacts to the Colorado River, coupled with other reasonably foreseeable actions, could be severe, with irreparable harm done. EPA has objections to the cumulative impacts to the Colorado River. We believe much more attention should be given to what these projects are doing in total to the Colorado River. EPA recognizes that the existing peak flow conditions on the Colorado River are very different than historical conditions (Figure 1, Table 1), and 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.

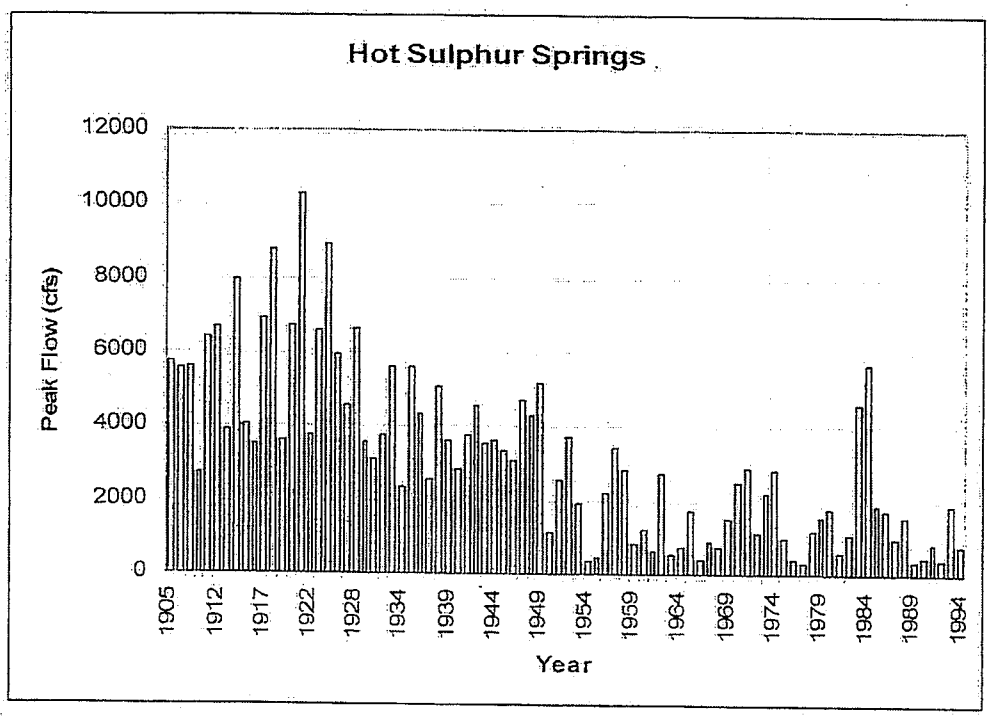


Figure 1: Instantaneous peak flows from the USGS gage at Hot Sulphur Springs from 1904-1994. The study period for WGFP hydrologic analyses began in 1950.

Table 1: Instantaneous peak flow return intervals from USGS gage at Hot Sulphur Springs for 1904-1949 and 1950-1994 calculated by EPA using a Log-Pearson Type III Distribution. Flow is displayed in cubic feet per second (cfs).

Return Interval (years)	1905-1949 Flow (cfs[1])	1950-1994 Flow (cfs)
2	4,629	1,232
5	6,302	2,297
10	7,440	3,176
25	8,909	4,483
50	10,026	5,598
100	11,166	6,831
200	12,334	8,199

Throughout the DEIS there are references to the project's direct and indirect impacts to stream morphology, water quality and aquatic life as minor, and that cumulative effects are similar to the direct effects. EPA believes that when the impacts of this project are analyzed in combination with past and reasonably foreseeable actions, the impacts reach a level of significance that is objectionable. EPA believes that it is likely that the proposed project will have serious adverse effects on aquatic ecosystem diversity, productivity and stability not analyzed sufficiently in the DEIS.

EPA is concerned that the cumulative effects analysis did not consider the potential for threshold (non-linear) responses within the Colorado River. The impacts of the project are exacerbating current hydrologic conditions associated with the operation of diversion within the Upper Colorado Basin. Incremental or piecemeal movement towards a reduced hydrograph with altered temporal variation increases the likelihood for the system to approach a threshold point beyond which the system may exhibit dramatic changes, potentially including loss of native fish species. The EIS should assess the long-term cumulative impacts and uncertainty in their predicted responses. An additional component of a cumulative impacts analysis should address the potential for threshold responses.

The DEIS acknowledges the importance of bankfull and channel maintenance flows in the DEIS. EPA suggests that BOR address a minimum mitigation that is equivalent to that flow volume (e.g., 1,240 cfs for bankfull discharge) instead of the 450 cfs of the existing mitigation.

The climate change discussion contends that modeling the future impacts of climate change relating to the Colorado River is not a useful exercise since existing reports on the impacts of climate change on the Colorado River are uncertain and predict a variety of outcomes. (see DEIS p. 2-44) However, EPA believes BOR should model the impacts of a scenario where flows are reduced substantially because of climate change. It is reasonably foreseeable that minimal stream flows will occur much more often than occurs now. That, coupled with the 21%

reduction discussed above, suggest severe impacts to the portions of the Colorado River impacted by this project.

WATER QUALITY

In general, increased nutrient loading and consequent dissolved oxygen (D.O.) reductions to both East and West Slope rivers and reservoirs are the most significant water quality impacts of the proposed project. Projected instream temperature increases are also a significant stressor to aquatic life, and a significant impact of the project.

High temperature and nutrient levels, and consequent low D.O. levels, are impacts disclosed in the DEIS. These water quality impacts may lead to additional or further impairments in these watersheds, which could be difficult and costly to remedy, and probably not practical to remediate through point source controls alone. The mitigation measures for temperature and nutrient reductions and controls are not specific and must be designed to minimize pollutant loading in the basin commensurate with the projected increases. Specific nonpoint source mitigation agreements should be included in the Record of Decision along with quantifiable reduction targets. The following comments contain specific water quality impacts for individual water bodies affected by the WGFP. In addition, specific impacts to waste water treatment plants and other point sources affected by this project are included, as well as suggestions for mitigation.

Impaired Waterbodies Potentially Impacted by the WGFP

The action alternatives would impact multiple waterbodies in both East and West Slope watersheds. Many of these waterbodies are recognized as impaired and are on the State of Colorado's 2008 Clean Water Act Section 303(d) List of Water-Quality-Limited Segments Requiring TMDLs (the 303(d) List). Although Table 3-41 shows the 303(d) listing status for major lakes and reservoirs potentially impacted by the project, the DEIS does not summarize the projected impacts from this project on those impaired waters. Carter Lake and Horsetooth Reservoir are listed as impaired for their Aquatic Life Use due to mercury (associated with nutrient enrichment and reduced oxygen environments). In addition, Horsetooth Reservoir is impaired for D.O.. Granby Reservoir, Shadow Mountain Reservoir, and Grand Lake are all acknowledged as exceeding applicable water quality standards (WQS).

EPA objects to the high potential for the WGFP to exacerbate existing water quality impairments in these basins. High temperature and nutrient levels (and consequent low D.O. levels) may lead to additional, more severe, or further impairments potentially widespread throughout these watersheds, which could be difficult to remedy through point source controls alone. Further, any worsening of these conditions increases the future required efforts and costs associated with remediation and restoration. The proposed action appears to have the potential to directly impact the assimilative capacity for high temperatures and nutrients in all of the downstream reservoirs and streams, exacerbating the difficult cleanup plans and wasteload allocations required in any forthcoming "Total Maximum Daily Loads" (TMDLs).

EPA strongly suggests that BOR include in its ROD enforceable mitigation measures for temperature and nutrient reductions and controls designed to minimize pollutant loading in the basin, as well as controls to decrease chlorophyll a and undesirable algal growth, and maintain requisite D.O. for healthy aquatic ecosystems in these waterbodies. Specific enforceable nonpoint source mitigation agreements should be included in the ROD along with quantifiable reduction targets for each mitigation activity. EPA suggests that an initial 2 to 1 ratio of expected reductions to projected impacts be committed to, along with specified monitoring requirements to verify actual reductions. This allows the proponents to try multiple cost-effective remediation practices simultaneously, while monitoring the success of each activity. Ultimately, the proponents may choose whatever cost-effective remediation means provide mitigation commensurate with the projected impacts. Beginning with a 2:1 ratio of estimated reduction to credit for mitigation ensures that water quality standards violations will be minimized as the mitigation selection process is finalized. Monitoring of the mitigation measures success may be used to select the most preferable methods; to verify actual reductions occur; and to establish when sufficient mitigation has occurred. Below are specific comments for some of the individual water bodies affected by this project, and examples of mitigation measures EPA believes should be implemented.

Colorado River: The DEIS clearly acknowledges that Colorado River flows could regularly (and more frequently than under existing conditions) diminish to the required minimum 90 cfs flows during summer, and that those decreased flows could precipitate increased Colorado River instream temperatures. Decreased flows (see, e.g., DEIS Table ES-2) and subsequent increased summer temperatures could lead to exceedences of the applicable WQS for instream temperature (see DEIS p.3-96, and Figure 3-38).

The DEIS modeling analysis is calibrated utilizing median USGS July water temperatures. To better estimate the more realistic impact(s) of the proposed alternative on instream temperatures, EPA suggests an additional analysis, relating daily discharge values to the 85th percentile daily water-temperature values. Since reduction in flow (discharge) will likely reduce the water depth of the river, in-stream temperatures are likely to increase, as is the frequency of days with elevated temperatures (and lower dissolved oxygen values). Modeling with median temperature data is insufficient to assess the more realistic effects of proposed water withdrawals

EPA suggests that the EIS include these model calibration changes, and disclose the estimated effects, which we believe will be greater than disclosed. EPA further notes that exceeding the applicable temperature criteria could significantly and adversely affect aquatic life. Further, additional nutrient loading and decreased D.O. could contribute to future needs for nutrient reductions, and additional stresses on aquatic life (see DEIS pp. 3-97 through 3-100, and Figure 3-46). Temperature mitigation activities could include planting trees or other riparian vegetation to provide shading; providing increased flows during periods of high temperatures; and construction of instream refuge habitat such as pools and undercut banks.

Three Lakes System: Granby Reservoir, Shadow Mountain Reservoir, and Grand Lake: The DEIS estimates that the proposed project could significantly increase the loading of both phosphorus and nitrogen into the Three Lakes System by as much as 12.7% (see Table 3-51), and chlorophyll a levels by as much as 6.8% (see DEIS Table 3-53). This system is already experiencing nutrient imbalance issues as evidenced by recent Colorado State Water Quality Control Commission (WQCC) actions; ongoing workgroup meetings to address nutrient loading; and monitoring and data sharing activities. Existing Windy Gap pumping is identified as the largest contributor of phosphorus, and the second largest contributor of nitrogen loading to the Three Lakes system (see DEIS Table 3-47). The proposed action would significantly increase phosphorus loading, decrease D.O., and decrease clarity (see Tables 3-48 through 3-55) to these waterbodies already recognized by the WQCC as receiving an abundance of nutrients (WQCC Grand Lake clarity WQS action, 2008).

Mitigation measures in enforceable agreements can include: best management practices for agricultural and livestock production near the riparian corridor (e.g., buffer zones, nutrient minimization, livestock fencing and contour cropping); stormwater runoff control and retention for all nearby communities; incentive-based inspections and servicing of nearby septic systems; and operational changes in the Colorado Big Thompson system where practical.

Carter Lake and Horsetooth Reservoir: Carter Lake and Horsetooth Reservoir are impaired for their Aquatic Life Use due to high mercury levels in fish tissue samples taken from their resident fish populations. Elemental mercury may be atmospherically deposited and reach aquatic systems through natural processes such as during sheet flow or snowmelt events. The methylation of mercury in Colorado reservoirs has been associated with nutrient enrichment and reduced oxygen environments, where low oxygen or anoxic conditions foster the methylation of mercury, which is subsequently biomagnified in the food web. Larger, longer-living, higher trophic level fish species (e.g., walleye, smallmouth bass, wiper) may have significant levels of toxic methyl mercury accumulate in their organs and flesh. Some of these species are important sport fish prone to high levels of consumption by certain segments of the population. This is a serious human health concern being actively studied by the CDPHE for future management decisions and remediation actions (www.cdphe.state.co.us/wq/FishCon/Analysis/).

Additionally, Horsetooth Reservoir is impaired for D.O., with seasonal low oxygen levels associated with eutrophication in the reservoir. The action alternatives are predicted to be a major contributor of phosphorus and nitrogen loading, and subsequent decreased D.O. to Carter Lake and Horsetooth Reservoir (see DEIS pp. 3-113 through 114). The proposed action would significantly increase phosphorus loading (up to 11%), increase nitrogen loading (up to 5.8%), and increase chlorophyll a (>11% in both waterbodies). Further, the proposed action is predicted to decrease D.O. in both waterbodies (See Tables 3-65 thru 68). EPA strongly suggests mitigation to minimize pollutant loading which can include measures such as those described in the above comment on the Three Lakes System.

Appropriate Use of Water Quality Standards and Exceedence

EPA objects to the way in which the DEIS and Water Quality Technical Reports utilize WQS for D.O. in lakes and reservoirs, and then interpret those standards against existing lake and reservoir data profiles to determine WQS exceedence. Specifically, it appears that the DEIS is utilizing the "15th percentile of daily average epilimnion profiles," presented as "In-Lake Values" (e.g., see DEIS Table 3-26) for D.O. Issues regarding use of WQS include:

1) Hypolimnion exclusions and interpretation of stratification – It appears the DEIS and technical reports only analyze and present epilimnion (surface layer) data for some of the analyses, ignoring the readily available thermocline and bottom layer data. Further, it is unclear how the analyses establish thermal stratification; what data is used and what is excluded; and how the presented results are calculated. Under most circumstances lake data are treated as discrete samples, and directly compared to water quality criteria, one measurement at a time, for the entire water column. EPA notes that under certain circumstances, State assessment determinations evaluate data from the epilimnion and metalimnion (surface layer and thermocline) of a lake or reservoir, and do not evaluate data from the hypolimnion (bottom layer) – see below. Otherwise, all lake and reservoir data are compared directly to all applicable WQS, which would be the logical protocol to ascertain impacts in any EIS. It appears that for some parameters the DEIS and supporting documents are examining only epilimnion data (e.g. see Lake and Reservoir Water Quality Technical Report, Table 16) ignoring the important water quality measurements throughout the rest of the water column (i.e. metalimnion, or thermocline, and hypolimnion). Further, it is unclear what methodology is utilized to establish the epilimnion depth during dynamic stratification cycles and individual sampling events, and what data is used for the presented results. EPA is concerned that this is a misapplication of applicable water quality standards; ignores the existing impaired conditions and potential impacts that may occur in the thermocline and bottom waters (as well as their influence on surface layers); and that this may distort water quality analyses and presentations of projected impacts. A disclosure of existing conditions and potential impacts should include all available data to inform the potential effects of the proposed project. EPA is unable to evaluate the full impacts of the proposed project under this type of deficient analysis. The DEIS should examine and present the data for all depths of lakes and reservoirs – not just the epilimnion. The water quality technical reports should disclose the specific methodology and data establishing any thermal stratification for all lakes and reservoirs examined, discussing what data are utilized and excluded and how the presented results are calculated. This should be at a level of detail sufficient to allow for independent confirmation of conclusions.

2) Averaging Profile Data – Neither the DEIS nor the Lake and Reservoir Water Quality Technical Report provide sufficient detailed methodology to understand the analysis that is presented for water quality data in lakes and reservoirs. Nevertheless, it appears that the analysis averages D.O. profile data (and possibly other parameters), which may lead to masking the disclosure of existing conditions and projected impacts. (See the WQCC's stated protocol in Colorado Section 303(d) Listing Methodology – 2008 Listing Cycle, for D.O. data: http://www.cdphe.state.co.us/op/wqcc/SpecialTopics/303(d)/303dLM2008.pdf)

"Dissolved Oxygen: Each measurement within the mixed layer of an unstratified lake, or within the epilimnion and the metalimnion of a stratified lake, is subject to comparison with the standard, which is a 1-day minimum."

The State Listing Methodology explains that averaging D.O. is an "acceptable metric for assessment," but this is not the preferred option for handling such data where direct comparison is possible. Individual profile data points should be compared to the WQS, and a synopsis of that comparison should be presented in the EIS and technical reports. Further, the methodology used should be detailed to a level sufficient to allow for independent corroboration of results and conclusions. The existing D.O. data should be analyzed and presented (at least in the technical reports) as discrete samples, without averaging, allowing insight into the potential impacts of the proposed project. Averaging such data risks masking over important D.O. dynamics in lakes and reservoirs. This is inconsistent with the WQCC's stated intentions for implementing water quality standards for a broad range of parameters (especially D.O.) that are to be utilized as instantaneous maxima or minima to protect aquatic life and human health at all times (not just on average). Profile data for D.O. should be presented and evaluated as individual points, and the methodology used should be documented at a level of detail sufficient to allow for independent confirmation of conclusions.

3) 15th Percentile and "In-Lake Values" for D.O. Data – It is inappropriate to utilize a percentile ranking statistic in presenting D.O. measurements, as is done throughout the DEIS and supporting technical reports (e.g. Lake and Reservoir Water Quality Technical Report, Table 24, D.O. footnote). Use of the 15th or 85th percentile of data, or as a screening tool, for some criteria is outlined in State WQS and methods documents. However, presentation of the 15th percentile of D.O. data is inconsistent with applicable WQS. Utilizing a 15th percentile of this criterion would afford little to no protection of aquatic life propagation and growth in the lower ranked 14% of reported profiles, and could lead to extensive and frequent under-reporting of low D.O. conditions. Further, such presentation is misleading in the DEIS and probably masks the actual existing conditions and projections of potential impacts. Additionally, EPA finds the presented "In-Lake Value" for D.O., and subsequent comparison to applicable criteria particularly problematic. Creating a novel "In-Lake Value" for the DEIS, and disclosing the use of this characterization only in footnotes, may further limit the public's ability to assess and understand actual existing conditions and projected impacts from the proposed project. This practice does not foster open disclosure of existing observations and projected impacts. D.O. criteria are established as 1-day minima in Colorado WQS, designed to protect the growth and propagation of aquatic life at all times. The DEIS and supporting technical reports should present the full range of data values (without any percentile ranking or creative classification) for all D.O. profiles, analyses, presentations, and conclusions.

4) Spawning Season D.O. Criteria – Both the DEIS and the Lake and Reservoir Water Quality Technical Report appear to consider spawning seasons and early life stages of aquatic life, but do not appear to use the spawning season D.O. criterion (e.g,. Lake and Reservoir Water Quality Technical Report, Table 16, D.O. footnote, elsp). A spawning season D.O. criterion (typically 7.0 mg/L) is assigned to many of the assessed lakes and reservoirs by the WQCC, and applied

with seasonality dependent upon the species present (see e.g. Regulation 31- The Basic Standards and Methodologies for Surface Water - Spawning, or Colorado Section 303(d) Listing Methodology – 2008 Listing Cycle, Spawning Season DO Criteria). The DEIS and supporting documents should utilize the 7.0mg/L criterion wherever, and whenever, applicable for all D.O. profiles, analyses, presentations, and conclusions.

5) WQS Exceedence and Impairment Projection – The use of the above data exclusions, averaging, presented statistics, and applicable criteria raise questions wherever the DEIS discloses if WQS are currently being exceeded (e.g. see DEIS Table 3-40, far right column). The DEIS and supporting documents should be amended to address the issues above, and the impairment status for individual waterbodies should be redone implementing these changes. Because impairment determinations allow for the exclusion of hypolimnion data only under specific, limited circumstances, the analyses should include all data wherever possible. In any instances where hypolimnion data is not used, the analyses should specify those circumstances. Specifically, the hypolimnion exclusion is utilized only where a waterbody is strongly thermally-stratified with colder, denser bottom waters becoming isolated from warmer, less-dense surface waters, sequestering the hypolimnion from mixing and other processes. In order to utilize this hypolimnion assessment exclusion, one would first establish that strong thermal stratification exists (showing individual temperature profiles), and then determine to what depth (where the base of the thermocline exists) impairment determinations are still applicable for individual profiles. Otherwise, all lake and reservoir data are generally compared directly to all applicable WQS as outlined in CDPHE protocol for impairment determinations (see WQCC Colorado Section 303(d) Listing Methodology – 2008 Listing Cycle: http://www.cdphe.state.co.us/op/wqcc/SpecialTopics/303(d)/303dLM2008.pdf

Impacts to Wastewater Treatment Plants

The potential impacts to wastewater treatment plants (WWTPs) depends on whether the plants are located on the West Slope or East Slope of the Continental Divide. On the West Slope (Hot Sulphur Springs and Three Lakes WWTPs), where water is being taken out of the system, the potential impacts of this project are decreased upstream flows which will reduce available pollutant assimilative capacity in the receiving waters (Colorado River and Willow Creek). This will likely result in more stringent National Pollutant Discharge Elimination System (NPDES) permit limits for, e.g., ammonia, which may require additional treatment facilities or processes. Any additional treatment will require additional capital and/or operational expenditures and could be expensive particularly for lagoon treatment systems like the Hot Sulphur Springs facility. If required, treatment methods or other controls for other pollutants like metals, e.g., selenium, can also be costly to the facility. The reduced low flow impacts appear to be greatest for the proposed action (see DEIS p. 3-92, 3-101). This impact should be better addressed in the EIS.

On the East Slope, increased pollutant loadings from project participant WWTPs would be required to meet Colorado's WQS including antidegradation provisions for the receiving

waters. Where there is no additional pollutant assimilative capacity available, additional treatment will be required which is a potentially expensive impact.

The DEIS does not discuss potential impacts to the Estes Park water and sewage facility from the additional nutrient loading which will occur in the Big Thompson River due to this project. The DEIS indicates that a flow increase in the Upper Big Thompson River below Lake Estes from additional Windy Gap deliveries (9 percent for the proposed action) will bring additional nitrogen and phosphorous load (see DEIS p. 3-109). The impacts to the Estes Park facility should be added to the discussion in the EIS.

Increased flows (and pollutant loadings) at a point source may 1) trigger antidegradation review on reviewable segments and result in more stringent NPDES permit limits at the time of permit reissuance (every 5 years), and 2) decrease available pollutant assimilative capacity available for downstream point sources. In addition, on CWA Section 303(d) listed waters, pollutants driving the listing have no available assimilative capacity and increased loadings are not allowed from point sources. For waters having a completed TMDL for a pollutant, point source loadings are limited by the approved wasteload allocation in the TMDL, and no additional loading of the pollutant from a point source is allowed to be permitted without a change in the EPA-approved TMDL. When water deliveries from the proposed alternative and other alternatives (including the no action alternative) result in an increased point source discharge flow, pollutant loads are increased and additional costs to treat increased pollutant loads are likely to occur for the affected point source.

STREAM MORPHOLOGY

The DEIS states that flushing flows in the Colorado River equal to or greater than 450 cfs occur about 45 days in an average year and 103 days in a wet year per year under existing conditions (see DEIS p. ES-11). Under the proposed action, the flushing flows would occur 36 days in an average year (35 days for the other action alternatives) and 93 days in a wet year for all action alternatives (see DEIS Table 3-22). In addition, stream morphology impacts were assessed by comparing the frequency of bankfull discharge (equal to or greater than 1,240 cfs at Hot Sulphur Springs) under existing and proposed conditions and by comparing changes in the range of channel maintenance flows. The DEIS states that the frequency of flushing flows and bankfull discharge would remain adequate to transport sediment and prevent deposition, and therefore no mitigation for stream morphology impacts is proposed. Furthermore, the DEIS states that the differences in channel maintenance flows would be small and unlikely to measurably alter channel morphology or sediment movement. EPA is concerned that these analyses do not adequately characterize potential impacts to the stream morphology and associated ecological communities of the Colorado River.

The DEIS states that channel maintenance flows are the flows considered necessary to maintain the physical characteristics of a stream channel and provide benefits to the stream ecosystem by conveying water and eroded materials, preventing vegetation establishment in the channel, sustaining aquatic ecosystems, temporarily storing flood flows on the floodplain, and

maintaining healthy streambank and floodplain vegetation (see DEIS 3-60). The DEIS presents an analysis of channel maintenance flows consistent with the Schmidt and Potyondy (2004) methodology. EPA is concerned that this methodology has been inappropriately applied to assess changes in channel maintenance flows from the proposed project. According to Schmidt and Potyondy (2004), "(t)he approach is appropriate for quantifying channel maintenance flows on perennial, ***unregulated***, snowmelt-dominated, gravel-bed streams with alluvial reaches" (emphasis added). As stated in the DEIS and illustrated in Figure 1 and Table 1 of this letter, the flow regime under existing conditions is substantially altered through regulated water diversions in the basin. For example, the 25-year instantaneous peak flow in the period of record from 1904 to 1949 has, under existing conditions, a return interval of 200 years not 25 years (see Table 1 above). Both the magnitude and frequency of flow events are substantially altered compared with unregulated conditions on the Colorado River, and as such, applying this methodology likely significantly understates the potential impacts to stream morphology from this proposed project.

As stated in the Water Resources Technical Report, the frequency, magnitude and duration of flow events affects channel dynamics. In snowmelt dominated systems like the Colorado River, much of the work on the channel is done by the spring snowmelt peak flows, and channel geometry and complexity respond to these dominant, or bankfull, discharges of water and sediment. The river stage associated with bankfull discharge is considered to be the point at which the river begins geomorphic "work" on the entire channel system, and higher flows extend the duration and magnitude of this work. Thus, river stage may be a better indicator of the effectiveness of flows on channel geometry and the physical habitat template for aquatic communities than bankfull discharge. The additional withdrawal of flow from the Colorado River due to the proposed project will probably cause bankfull stage to be reached less frequently, resulting in less capacity within the river system to maintain adequate conditions for aquatic ecosystem integrity (e.g., temperature, D.O., channel habitat, back-water areas for juvenile amphibians, fish, endangered species, etc).

The diversion of water from the Colorado River to meet water supply needs will alter the natural hydrology downstream of the diversion point, thus affecting the aquatic ecosystem downstream. Diversion of the snowmelt peak flows in wet and average years will reduce the frequency of medium and high flow events, which will likely, in turn, affect stream morphology, instream water quality, the physical habitat template of downstream aquatic communities, food web structure, spawning, egg hatching, and migration cues for fish, and the ability for riparian species recruitment and inundation of backwater and floodplain habitats. To truly understand what the diversion will mean for the aquatic ecosystem and hydrology downstream of the diversion point, EPA suggests that the following analyses be performed:

- Establish/characterize the relationship between bankfull discharge and river stage at monitored points, e.g., at two gauged points downstream from the withdrawal point on the Colorado River;
- Model the stage of the river and projected effects of the project alternatives on stage at these gage locations;

- Document the current pattern of river stages and consequent (existing) habitat availability, temperature and D.O. levels. Then model, with the expected decreases in flow and resultant decreases in river stage, the change in frequency that stream temperature and D.O. meet (or conversely exceed) water quality criteria and that physical habitat parameters are maintained;
- Assess the potential for threshold responses of the aquatic community.

These analyses should be done both within the context of the direct and indirect impacts of this project as well as cumulative impacts of this and other reasonably foreseeable actions (e.g., Moffat Collection System and climate change).

The DEIS states that changes in streamflow associated with the alternatives are not expected to significantly impact stream morphology or change sediment transport or deposition. In part, the Stream Morphology conclusions were made based upon a comparison of frequency of exceedence of the 2-year peak discharge (estimated to be 1,240 cfs at Hot Sulphur Springs) under existing and proposed conditions. EPA believes the conclusions of this analysis are misleading. For example, in Section 3.7.3 Cumulative Effects (see DEIS p. 3-65), the DEIS states that under current conditions, the 2-year peak discharge was exceeded 4% of the days within the study period and that under the proposed action, this discharge would be exceeded 2.5% of the days. The DEIS conclusion, that the 2-year peak discharge would occur 1.5% less frequently is somewhat misleading. For example, if the frequencies were examined on a yearly basis, there would be a reduction in peak discharge occurrence from 15 days to 9 days. This mischaracterization was also made in Section 3.7.2.3 (see DEIS p. 3-63). EPA requests that the applicant modify these descriptions and consider changes in the conclusions to reflect the potential reduction in frequency of peak flows.

In the Water Resources Technical Report, Table 3 shows the average total historical monthly Windy Gap diversions at Windy Gap reservoir for April through July as 11,080 AF. However, Table 3-2 of the Draft EIS shows the average annual flow under existing conditions for the Windy Gap diversions used for the model as 36,532 AF. It is not clear why this diversion flow used for the model is so much higher than the average historical diversion. Use of the higher flow in the model can result in significant underestimation of the hydrological impacts associated with the project.

AQUATIC LIFE IMPACTS

Project-induced changes in flow characteristics will likely impact aquatic life in the upper Colorado River Basin ecosystems due to changes in aquatic habitat, including changes in stream morphology and water quality. In the DEIS, impacts to aquatic life were concluded to be minor, or in some cases beneficial, however EPA believes the analysis did not adequately consider potential impacts to aquatic communities due to changes in water quality or physical habitat. Increased nutrient loading, reductions in D.O. and instream temperature increases are all impacts disclosed in the DEIS, and may result in an inability to support aquatic life use standards due to expected changes in ambient environmental conditions. Changes in these conditions can

influence the abundance and distribution of native and sport fish, macroinvertebrate and algal communities, and may lead to a community dominated by species tolerant to degraded water conditions.

The DEIS states that project-induced changes to channel morphology and sediment movement are minor, however EPA believes that these analyses do not adequately characterize potential impacts to the stream morphology and associated ecological communities of the Colorado River. Spawning site availability for fish, habitat heterogeneity (e.g., riffle and pool complexes) and refugia for aquatic macroinvertebrates is largely influenced by changes in substrate characteristics and channel complexity associated with the timing, frequency and magnitude of flow events. Furthermore, peak flows that mobilize and transport medium sized sediments (sands and gravels) abrade periphyton assemblages from larger substrates, and loss of this abrasive ability with reduced flows will facilitate periphyton growth and survival and alter the algal and macroinvertebrate assemblages. It is important to note that project-induced reductions in habitat availability are based upon existing conditions, which represent a substantially altered and regulated flow regime. Further, piecemeal impacts due to this project and other reasonably foreseeable actions have the potential to significantly and permanently reduce the quality of habitat for aquatic communities. EPA suggests that a more complete analysis of impacts to aquatic resources be conducted, including a meaningful integration of water quality and stream morphology impacts. Ecological modeling and analyses should be conducted using a daily time-step, instead of a montly time-step that may mask discharge values that occur for only a few days within any given month.

COMPLIANCE WITH THE CWA SECTION 404(b)(1) GUIDELINES

EPA is providing comments on the CWA Section 404 permit application for the WGFP in a separate letter to the Corps. EPA understands the Corps intends to use the BOR EIS to satisfy the requirements of the CWA Section 404(b)(1) Guidelines (Guidelines). The Corps must ensure compliance with the Guidelines prior to issuance of a CWA Section 404 permit for the discharge of dredged or fill material into waters of the United States. EPA disagrees with the narrow scope of the purpose and need statement in the DEIS for the issuance of a CWA Section 404 permit. EPA believes the basic (overall) project purpose is to provide a portion of the existing and future water supply demands of project participants.

EPA believes the DEIS analysis is not in compliance with the Guidelines due to: 1) an improperly truncated review of alternatives (40 CFR 230.10(a)); 2) a lack of meaningful analysis regarding potential violations of State water quality standards (40 CFR 230.10(b)); 3) a lack of meaningful analysis regarding the potential for the proposed action to cause or contribute to significant degradation of waters of the U.S, specifically in light of secondary and cumulative effects of this and other reasonably foreseeable water projects within the Upper Colorado River Basin (40 CFR 230.10(c)); and 4) insufficient mitigation (40 CFR 230.10(d)).

In addition, based on the information currently available in the DEIS, EPA believes the proposed action will result in substantial and unacceptable impacts to the Upper Colorado River

Basin, which EPA has determined is an aquatic resource of national importance (ARNI) in accordance with the CWA Section 404(q) and Part IV(3)(b) of the 1992 Memorandum of Agreement between EPA and the Department of the Army. In its letter to the Corps regarding the WGFP CWA Section 404 permit application, EPA is requesting the Corps reconsider the availability of potentially less environmentally damaging practicable alternatives.

MITIGATION

EPA believes the mitigation proposed for water quality impacts is not sufficient to address the impacts disclosed in the DEIS (see DEIS p. 3-292). Impaired waters are projected to be further impaired due to this project, therefore the mitigation measures should be much more definitive than currently proposed in the DEIS. EPA has provided suggested water quality mitigation measures in the water quality section above. In addition, the DEIS does not contain proposed mitigation for the stream morphology impacts. EPA strongly recommends identifying appropriate mitigation measures in the EIS and including such mitigation as enforceable measures in the ROD.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 8
1595 Wynkoop Street
DENVER, CO 80202-1129
Phone 800-227-8917
http://www.epa.gov/region08

DEC 2 4 2008

Ref: EPR-EP

Colonel David C. Press
Omaha District Commander
U.S. Army Corps of Engineers, Omaha District
1616 Capital Avenue
Omaha, Nebraska 68102

RE: Public Notice No. 200380523
Municipal Subdistrict, Northern Colorado Water Conservancy District

Dear Colonel Press:

The Environmental Protection Agency Region 8 (EPA) has reviewed the referenced Public Notice regarding the discharge of dredged and fill material in waters of the U.S. in conjunction with the construction of a 90,000 acre feet Chimney Hollow Reservoir in Larimer County, Colorado. The proposed dam, reservoir, and pipeline construction activities would permanently and temporarily impact 1.74 acres of wetlands and 1.4 acres of other waters. Construction of the Chimney Hollow Reservoir is part of the applicant's proposed project to improve firm yields and existing water rights from the previously authorized Bureau of Reclamation's (BOR) Windy Gap Project (WGP) completed in 1985. The WGP diverts water from the Colorado River at Windy Gap Reservoir and delivers a majority of it to the eastern slope of the Continental Divide via the Colorado Big-Thompson Project infrastructure.

The Corps of Engineers (Corps) has participated in the preparation of the Windy Gap Firming Project (WGFP) Draft Environmental Impact Statement (DEIS) as a cooperating agency with the Bureau of Reclamation (BOR) as the lead federal agency. The DEIS describes and analyses the estimated environmental effects of action alternatives, including the no action alternative, and is intended to satisfy the Corps' regulations for NEPA implementation as well as to serve as the basis for a decision regarding the projects compliance with the Clean Water Act (CWA) Section 404(b)(1) Guidelines, 40 CFR Part 230 (Guidelines).

EPA's review of the proposed project included early scoping comments and meetings, review of the DEIS, technical reports, the Public Notice for the CWA Section 404 permit application, and multiple meetings with the BOR and Corps. EPA provided comments on the DEIS (dated December 19, 2008) which are enclosed with this letter. EPA's comments on the CWA Section 404 permit application also incorporate by reference our comments on the DEIS as the DEIS serves as the basis for our recommendations on compliance with the Guidelines.

Our Conclusion is that the DEIS analysis is not in compliance with the Guidelines due to: 1) an improperly truncated review of alternatives (40 CFR 230.10(a)); 2) a lack of meaningful analysis regarding potential violation of State water quality standards (40 CFR 230.10(b)); 3) a

EXHIBIT D

lack of meaningful analysis regarding the potential for the proposed action to cause or contribute to significant degradation of waters of the U.S., specifically in light of secondary and cumulative effects of this and other reasonably foreseeable water projects within the Upper Colorado River Basin (e.g., the Moffat Collection System Project) (40 CFR 230.10(c)); and 4) insufficient mitigation to compensate for proposed unavoidable impacts (40 CFR 230.10(d)).

In addition, based on the information currently available in the DEIS, the proposed action will result in substantial and unacceptable impacts to the Upper Colorado River, which EPA has determined is an aquatic resource of national importance (ARNI) in accordance with the CWA Section 404(q) and Part IV(3)(b) of the 1992 Memorandum of Agreement between EPA and the Department of the Army.

We recommend that the Corps hold the permit in abeyance and supplement the DEIS with a broader range of alternatives that would meet the project purpose of water supply while avoiding impacts to the Colorado River and other water bodies affected by this project. Further, a revised cumulative impact assessment is needed that adequately evaluates and discloses long-term impacts associated with this project and other similar water supply projects in the headwaters of the Colorado River (i.e., Colorado-Big Thompson, Moffat Collection System, and WGP). These additional analyses should be completed before the Corps proceeds with the decision on the CWA Section 404 permit.

EPA commits to continue to work with the Corps to identify acceptable alternatives to the proposed project during supplemental NEPA analysis. If resolution of our concerns can be satisfactorily achieved with the applicant, and any resulting agreed upon conditions incorporated into the permit by the District, EPA would withdraw its request for your review.

Thank you for your consideration of our recommendations of this proposed project's compliance with the Section 404(b)(1) Guidelines. If you have any questions or concerns regarding these comments or recommendations, please contact me, or your staff may contact Jim Luey at (303) 312-6791.

Sincerely,

for Carol Rushin
Acting Regional Administrator

Enclosure

cc: Martha Chieply, Branch Chief, U.S. Army Corps of Engineers, Omaha District
Chandler Peter, U.S. Army Corps of Engineers, Omaha District
Jon Hranac, CWQCD, Denver
Susan Linner, USFWS, Lakewood
Allen Pfister, USFWS, Grand Junction

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Thank you for your consideration of our recommendations of this proposed project's compliance with the Section 404(b)(1) Guidelines. If you have any questions or concerns regarding these comments or recommendations, please contact me, or your staff may contact Jim Luey at (303) 312-6791.

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Allen Pfister, USFWS, Grand Junction

WESTERN RESOURCE
ADVOCATES

Ms. Kara Lamb and Mr. Will Tully
US Bureau of Reclamation
11056 West County Road
Loveland, CO 80537

Mr. Chandler J. Peter
US Army Corps of Engineers
18E Denver Regulatory Office
9307 South Wadsworth Boulevard
Littleton, CO 80128

December 29, 2008

Western Resource Advocates (WRA) is pleased to offer these comments on the Draft Environmental Impact Statement (DEIS) prepared by the U.S. Bureau of Reclamation (BOR or Bureau) and the associated § 404 Permit Application to the U.S. Army Corps of Engineers on the proposed Windy Gap Firming Project (WGFP).

WRA—with members and offices in several western states—is a regional non-profit organization working to find sustainable solutions to meeting human needs while also protecting the environment, the economy it supports, and western quality of life. Specific to water resources in Colorado, WRA promotes sound water management and advocates for environmentally and economically sustainable decisions that conserve, protect, and restore Colorado's rivers. These comments were generated by a team of WRA staff who, collectively, has dozens of years of experience on water issues.

In addition to these comments, WRA joins in the separate comments provided by Trout Unlimited, National Wildlife Federation, Grand County, Northwest Colorado Council of Governments, and the Colorado River Water Conservation District.

These comments address the analysis, findings, and underlying assumptions of the WGFP DEIS in light of the requirements under the National Environmental Policy Act (NEPA) and Section 404 of the Clean Water Act (CWA). They are grouped into the following topic areas:

1. Background on purpose and goals of NEPA and CWA (pp. 2-4);
2. Purpose and Need Statement (pp. 5-8);
3. Water Conservation and Efficiency (pp. 8-27);
4. Similar and Related Actions; Cumulative and Connected Impacts (pp. 27-32);
5. Construction Costs (pp. 32-37);
6. Hydrology, Modeling, Water Quality, and Stream Morphology (pp. 37-39);
7. Energy Use (p. 40);
8. Range of Alternatives (pp. 40);
9. Aquatic and other Environmental Impacts (p. 41)
10. Mitigation (p. 41).

COLORADO • 2260 Baseline Road, Suite 200 • Boulder, CO 80302 • 303-444-1188 • Fax: 303-786-8054 • E-mail: info@westernresources.org
NEVADA • 769 Basque Way, Suite 400 • Carson City, NV 89706 • 775-841-2400 • Fax: 866-223-8365 • E-mail: info@westernresources.org
UTAH • 425 East 100 South • Salt Lake City, UT 84111 • 801-487-9911 • Fax: 801-486-4233 • E-mail: utah@westernresources.org
www.westernresourceadvocates.org

EXHIBIT E

1. National Environmental Policy Act and Clean Water Act Requirements

The National Environmental Policy Act[1] requires federal agencies to prepare a detailed statement on the environmental impacts of a proposed "major federal action" and all of the reasonable alternatives thereto before authorizing any such action.[2] An agency proposal for major federal action exists for NEPA purposes "at that the stage . . . when an agency subject to [NEPA] has a goal and is actively preparing to make a decision on one or more alternative means of accomplishing that goal and the effects can be meaningfully evaluated."[3] NEPA's purpose is to promote efforts "which will prevent or eliminate damage to the environment",[4] to inform the public of environmental consequences,[5] and to "help public officials . . . take actions that protect, restore, and enhance the environment."[6]

Under NEPA, the WGFP DEIS must analyze "connected", "cumulative", and "similar" actions and three types of impacts.[7] Connected actions are those which are "closely related," including those that "[c]annot or will not proceed unless other actions are taken", or those that "[a]re interdependent parts of a larger action and depend on the larger action for their justification."[8] Cumulative actions are those that "have cumulatively significant impacts and should therefore be discussed in the same impact statement."[9] Similar actions include those that have "common timing or geography."[10] To assess "significance" NEPA requires consideration of "[w]hether the action is related to other actions with individually insignificant but cumulatively significant impacts."[11]

The three types of impacts to be studied in an EIS are those that are "direct," "indirect," and "cumulative."[12] Direct effects are those that "are caused by the action and occur at the same time and place."[13] Indirect effects are those "which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable."[14] A project's "cumulative impact," is

> the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable

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[1] 42 U.S.C. §§ 4321-4370f.
[2] *Id.* at § 4332(2)(C).
[3] 40 C.F.R. § 1508.23.
[4] 42 U.S.C. § 4321.
[5] 40 C.F.R. § 1500.1(b).
[6] *Id.* at § 1500.1(c).
[7] *Id.* at §§ 1508.25, 1508.7, 1508.8.
[8] *Id.* at § 1508.25(a)(1).
[9] *Id.* at § 1508.25(a)(2).
[10] *Id.* at § 1508.25(a)(3).
[11] *Id.* at § 1508.27(b)(7).
[12] *Id.* at 1508.25(c); *see also id.* at §§ 1508.7, 1508.8.
[13] *Id.* at § 1508.8(a).
[14] *Id.* at § 1508.8(b).

> future actions . . . . Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.[15]

NEPA's many policies and goals include:

- Encouraging a "productive and enjoyable harmony between man and his environment";[16]
- Promoting "efforts which will prevent or eliminate damage to the environment and biosphere";[17]
- Using "all practicable means and measures . . .to create and maintain conditions under which man and nature can exist in productive harmony";[18]
- Fulfilling "the responsibilities of each generation as trustee of the environment for succeeding generations";[19]
- Assuring "all Americans safe, healthful, productive, and esthetically and culturally pleasing surroundings";[20]
- Allowing beneficial use of the environment "without degradation . . . or other undesirable and unintended consequences";[21]
- Preserving "important historic, cultural, and natural aspects of our national heritage";[22]
- Achieving a "balance between population and resource use";[23] and
- Enhancing "the quality of renewable resources" and maximizing recycling of depletable resources.[24]

Mitigating Environmental Impacts

At the most fundamental level, NEPA is intended to help public officials make decisions that are based on an understanding of environmental consequences, and to take actions that protect, restore, and enhance the environment.[25] Federal agencies are required, to the fullest extent possible, use all practicable means consistent with the requirements of NEPA to "restore and enhance the quality of the human environment and avoid or minimize any possible adverse effects of their actions upon the quality of the human environment."[26] Federal Council on Environmental Quality (CEQ) regulations further define mitigation as:

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[15] *Id.* at § 1508.7. *See also Neighbors of Cuddy Mountain v. U.S. Forest Serv.*, 137 F.3d 1372, 1379 (9th Cir. 1998) (with respect to a cumulative impacts analysis, an agency must provide "some quantified or detailed information" because "[w]ithout such information, neither courts nor the public . . . can be assured that the [agency] provided the hard look that it is required to provide.").
[16] 42 U.S.C. § 4321.
[17] *Id.*
[18] *Id.*
[19] *Id.* at § 4331(b)(1).
[20] *Id.* at § 4331(b)(2).
[21] *Id.* at § 4331(b)(3).
[22] *Id.* at § 4331(b)(4).
[23] *Id.* at § 4331(b)(5).
[24] *Id.* at § 4331(b)(6).
[25] *See* 40 CFR § 1500.1(b).
[26] *Id.* at 1500.2(f).

- Avoiding the impact altogether by not taking a certain action or parts of an action.
- Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
- Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.
- Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
- Compensating for the impact by replacing or providing substitute resources or environments.[27]

Effective mitigation starts at the beginning of the NEPA process, not at the end, and must be included as part of the alternatives development and analysis process.

CWA requirements also apply to the WGFP, including § 404(b)(1) guidelines. These Guidelines (40 CFR Part 230.10(a)) allow "... permit issuance for only the least environmentally damaging practicable alternative." The emphasis is on the avoidance of impacts. The Guidelines require "...that no discharge shall be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact to the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences." The Guidelines also make clear that "compensatory mitigation may not be used as a method to reduce environmental impacts in the evaluation of the least environmentally damaging practicable alternatives for the purposes of requirements under Section 230.10(a)."

***

Based on our review of the WGFP DEIS, the analysis completed thus far fails to satisfy the requirements of NEPA and CWA Section 404(b) noted above. In particular, the DEIS lacks an adequate evaluation of the proposed project's: purpose and need; water conservation and efficiency by proposed participants; similar and related actions; cumulative and connected impacts; construction costs; hydrologic modeling, water quality and stream morphology; energy use; alternatives (including the No Action Alternative and elements considered but rejected); and proposed mitigation.

[27] 40 C.F.R. § 1508.20. *See also* MEMORANDUM OF AGREEMENT BETWEEN The Department of the Army AND The Environmental Protection Agency CONCERNING THE DETERMINATION OF MITIGATION UNDER THE CLEAN WATER ACT SECTION 404(b)(1) GUIDELINES, February 6, 1990.

2. Purpose and Need Statement

The stated "Purpose and Need" of the WGFP is:

> The purpose of the Windy Gap Firming Project is to deliver a firm annual yield of about 30,000 AF of water from the existing Windy Gap Project to meet a portion of the water deliveries anticipated from the original Windy Gap Project and to provide up to 3,000 AF of storage to firm water deliveries for the Middle Park Water Conservancy District. Firm water deliveries from the Windy Gap Project are needed to meet a portion of the existing and future demands of the Project Participants. (DEIS Executive Summary at 2).

This statement of purpose and need is flawed and too narrow to satisfy the statutory requirements of NEPA, CWA, and CEQ regulations found at 40 C.F.R. §§1500 *et seq*., including §1500.2, §1502.1 (full and fair discussion of significant environmental impacts and reasonable alternatives that would avoid or minimize adverse impacts), §1502.14 ("rigorously explore and objectively evaluate all reasonable alternatives"), and §1508 (full analysis of connected, cumulative, and similar actions as well as direct, indirect, and cumulative impacts).

The consequence of the DEIS's unreasonably constrained purpose and need statement is to screen out alternatives for meeting the water supply needs of the participating municipalities. These alternatives include, but are not limited to, increasing levels of water conservation and transferring water in the South Platte basin from agricultural to municipal use. The purpose and need should be revised to more accurately reflect the purpose of helping meet municipal water demands and the DEIS should include a broader range of alternatives for meeting those demands.

For all practical purposes, Reclamation has simply used the applicant's assertion regarding the project's purpose and need, i.e., "firming up" Windy Gap. When this issue was raised in the scoping meetings, Reclamation responded by ignoring the criticism (see **Public Scoping Report**, Reclamation, December 13, 2003). It offered instead a laundry list of the demand side comments acknowledging

> issues raised about the purpose and need for the Firming Project included clearly identifying and substantiating participant water demands and the methodology by which water demand was projected. (**Public Scoping Report**, page 10)

Defining purpose and need so narrowly by relying on the language of the applicant is inadequate. Federal agencies may give deference to a private party applicant's stated purpose and need, but agencies also are required to look more broadly to ensure consideration of reasonable alternatives. *Citizens Committee to Save our Canyons v. United States Forest Service*, 297 F.3d 1012, 1030-31 (10th Cir. 2002). Courts repeatedly find a nexus between an agency's need to develop a project's purpose and need independently, on the one hand, and the agency's duty to identify reasonable alternatives, on the other. An agency cannot define objectives so narrowly as to preclude

a reasonable consideration of alternatives. *Davis v. Mineta*, 302 F.3d 1104 (10th Cir. 2002), *citing Colo. Environmental Coalition v. Dombeck*, 185 F.3d 1162, 1174-75 (1999). To be consistent with this legal requirement, Reclamation should have conducted its own analysis of the purpose of the applicant's proposed project.

NEPA provisions requiring an examination of potential alternatives to a project or proposal are considered the "linchpin" of the impact statement. *Monroe County Conservation Council v. Volpe*, 472 F2d 693 (2nd Cir. 1972). If one accepts the premises that policy objectives of NEPA (including Section 101) can be achieved only through good planning and that the consideration of a wide range of alternatives is essential to "good" planning, then the analysis of alternatives in the EIS process is the most important measure of the effectiveness of NEPA. It is unlawful for an agency to arbitrarily restrict its purpose when the result excludes viable alternatives. *See Simmons v. Corps of Engineers*, 120 F.3d 664, 666 (7th Cir. 1997) (court found Army Corps "defined an impermissibly narrow purpose" and "therefore failed to examine the full range of reasonable alternatives and vitiated the EIS").

CEQ guidelines require an EIS to describe "[a]lternatives to the proposed action, **including those not within the existing authority of the responsible agency**." CEQ Guidelines, 40 C.F.R. §1500.8(a)(4) (emphasis added). The range of alternatives must include a "no action" alternative and "non-structural" options as well as modifications of the proposed project. Based on NEPA Section 102(2)(A), the Guidelines stress "[t]he interdisciplinary approach should not be limited to the preparation of the environmental statement, but should also be used in the early planning stages of the proposed action." Guidelines, §1500.8(c) (emphasis added).

Because the Army Corps of Engineers is also part of this NEPA process, the Section 404(b)(1) Guidelines are relevant. As noted above, these Guidelines allow "... permit issuance for only the least environmentally damaging practicable alternative" and "...that no discharge shall be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact to the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences." 40 CFR Part 230.10(a). They also make clear that "[C]ompensatory mitigation may not be used as a method to reduce environmental impacts in the evaluation of the least environmentally damaging practicable alternatives for the purposes of requirements under Section 230.10(a)."

In sum, for all the above reasons, the "purpose and need" section of the DEIS is invalid. It must either be re-written or interpreted in a way that it does not restrict or eliminate alternatives by either restricting the **purpose** or misstating the **need**. Structuring the Purpose and Need of the WGFP as delivering "a firm annual yield of about 30,000 AF of water from the existing Windy Gap Project" dramatically reduces the scope of alternatives for achieving the real need of the participant cities—meeting water demands. The DEIS thus arbitrarily drops consideration of alternatives that could better comport with 40 C.F.R. § 1502.14 including, among other things, water conservation, water reuse, transfers of water from agricultural use in the South Platte basin, land use planning

strategies, and other mechanisms for providing water (or reducing demand) that might equally well meet future water demands in a more economic and sustainable manner.[28]

Perhaps most importantly, as noted in detail under the next comment section, **Water Conservation and Efficiency**, the WGFP Purpose and Need is flawed due to over-estimations of future population compounded by incomplete and inaccurate data on per capita use by participants. These over-estimations create fatal flaws not only in the No Action alternative but—since DEIS alternatives necessarily include comparisons to each other—also in the entirety of the DEIS. In addition, population over-estimations compound over time: an inaccurately high projected growth rate in the first several years of any period compounds errors in later-year projections. The Final EIS—and DEIS revisions in the meantime—must address this shortcoming by broadening the Purpose and Need Statement to more accurately reflect the participant municipalities' projected population and water demands.

As an additional note, the Purpose and Need Statement may inaccurately project future water demands for the Platte River Power Authority (PRPA). PRPA supplies its customers with electricity primarily generated at its coal-fired Rawhide Plant and several simple-cycle natural gas turbines. The PRPA's future water demands may be incorrectly estimated because of: (1) artificially high population growth estimates and (2) inaccurate assumptions about the type of future electricity generation.

Conventional forms of electricity generation—coal- and natural gas-fired power plants—require water to cool and condense steam and for other plant processes. A typical western coal plant consumes approximately 541 gallons of water per MWh of electricity generated; in contrast, a combined cycle gas plant uses 180 gallons/MWh, and wind turbines and solar photovoltaic panels use virtually no water. Likewise, energy conservation consumes no water.[29]

Many WGFP participants—and much of the PRPA's service area—have experienced rapid population growth in recent years. With the recent economic downturn, however, population growth has slowed dramatically. The PRPA's future electricity load growth is likely based, in part, on out-of-date population growth estimates. Slowed population growth is likely to lead to lower water demands *and* lower future electricity demands (*see* detailed comments in the **Water Conservation and Efficiency** section). Reduced electricity demands will delay PRPA's need to construct new power generation facilities, and delay its demand for use of WGFP water.

The amount of water demanded by the PRPA depends on the type of power plant. The Draft EIS states that the PRPA'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."[30] However, continued electricity generation at

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[28] *See* Forty Most Asked Questions Concerning CEQ's NEPA Regulations, 46 Fed. Reg. 18026 (1981).
[29] Western Resource Advocates. 2008. *A Sustainable Path: Meeting Nevada's Water and Energy Demands.* Boulder, CO.
[30] Draft EIS, Chapter 1, page 1-35.

PRPA's coal-fired Rawhide power plant is not consistent with other initiatives taken by the power authority. For example, the PRPA has signed on to Colorado Governor's Climate Action Plan to reduce greenhouse emissions by 20% before 2020. If PRPA pursues energy efficiency and conservation measures, along with water-efficient renewables like wind and solar photovoltaics, its need for WGFP water may be substantially reduced.

In sum, the recent economic downturn, slowed population growth, and changing regulatory climate for greenhouse gas emissions cast doubt on PRPA's future electricity and water demands. All of these factors have changed since 2005, when the WGFP Purpose and Need Statement was first issued. Prior to issuing a Final EIS, the Bureau should explain why all project participants, including the PRPA, have a bona fide need for the WGFP.

3. Water Conservation and Efficiency

Prior to committing large financial resources to the proposed Windy Gap Firming Project (WGFP), the proposed beneficiary water utilities must greatly increase their demand management.

Conservation represents a "no regrets" strategy – one that does not tie the utilities to expensive infrastructure or rising electricity costs, and does not have detrimental impacts on river systems or rural communities. While conservation programs come with a price tag, it's much smaller than the one for the Windy Gap Firming Project.

The proposed alternative for WGFP involves a contract with the Bureau of Reclamation.[31] As a result, the provisions of the federal Reclamation Reform Act (RRA) apply. *See* 42 U.S.C. § 390aa *et seq*. Under the RRA, the Bureau has a duty to promote "full consideration and incorporation of prudent and responsible water conservation measures" in the water projects of non-Federal water entities that receive water from Federal reclamation projects. 42 U.S.C. § 390jj(a). Project beneficiaries must develop conservation plans containing definite objectives, proposed conservation measures and a proposed time schedule for compliance, *id.* at § 390jj(b); 43 C.F.R. § 427.1, and must submit their conservation plans to the Bureau. 43 C.F.R. § 427.1. The RRA requires that water recipients certify their compliance with the Act. 42 U.S.C. § 390ff. These requirements must be met prior to approval of the project, to ensure timely and economic inclusion of water conservation measures in the original design of the project. *See* 43 U.S.C. § 390jj. Post-hoc consultation could result in expensive refitting, lengthy delays in service, or less effective conservation measures.

It is unclear from the draft environmental impact statement (DEIS) whether all project beneficiaries have complied with the RRA. The final EIS must include evidence that the provisions of the RRA have been met by all project beneficiaries.

[31] Implementation of prepositioning may require modification or replacement of the existing conveyance and storage contract between Reclamation, the Subdistrict, and the NCWCD. *See* DEIS at 1-42.

DEIS Population Projections are Over-inflated:

Section 1.6.2.1 of the DEIS discusses population projections for the participants. The DEIS indicates that the combined population of all 13 project participants (excluding Platte River Power Authority) will increase from 426,000 in 2004 to 750,000 in 2030 and 901,000 by 2050. Given the increasingly severe economic recession (which many are calling a recession) in 2007-2008, and its impact on housing sales, population growth in the area will be slow in the near-term. Indeed, Denver Metro area November 2008 home sales were the "worst on record", with average prices falling to levels not seen since 2001.[32] Other cities along the Front Range – including WGFP participants – have seen similar trends.

The population growth projected in the Draft EIS reflects an annual growth rate of 2.2% between 2008 and 2030, and 0.9% between 2031 and 2050. An annual growth rate of 2.2% exceeds both the projected national annual growth rate (0.84%) and Colorado's projected annual growth rate (0.91%) for the period from 2005 to 2030.[33] Although several WGFP participants experienced above-average rates of growth before the 2007-2008 economic downturn, these high rates of growth will not be sustained.

If population in WGFP cities grows at an annual rate of 1.0% over the period from 2008 to 2030, total water demands will be substantially lower. Under this more conservative (and likely more accurate) growth rate, WGFP participants' population would be 552,000 in 2030, and 673,000 in 2050 – that's **227,000 fewer residents than projected in the DEIS** (Figure 1, below). If population grows more slowly than projected by the DEIS, water demands will also rise more slowly.

[32] Rocky Mountain News. December 10, 2008. "November home sales in metro area worst on record." http://www.rockymountainnews.com/news/2008/dec/10/november-home-sales-in-metro-area-worst-on/

[33] U.S. Census Bureau, Population Division. 2005. File 1: Interim State Projections of Population by Sex: July 1, 2004 to 2030. Accessed on December 17, 2008 through http://www.census.gov/population/www/projections/projectionsagesex.html

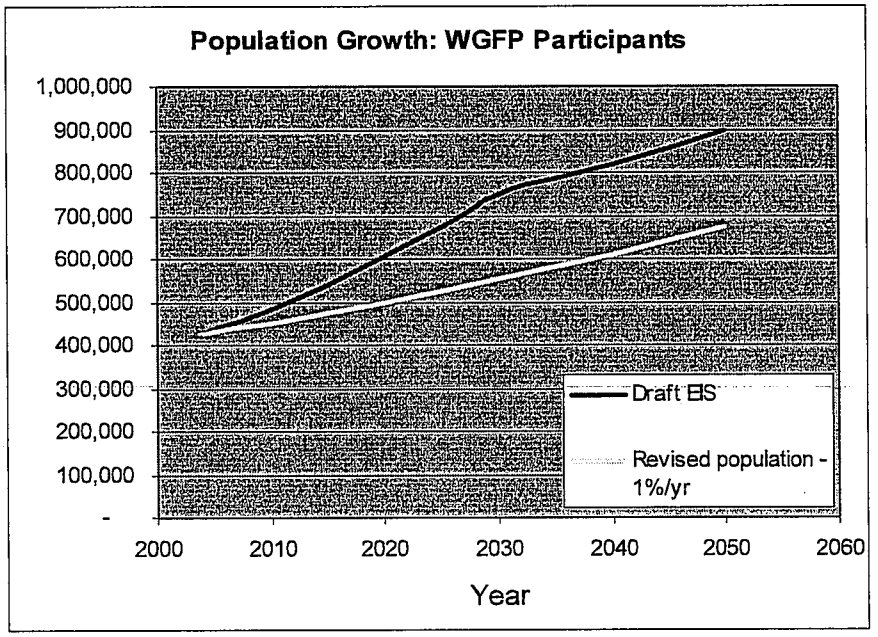

Figure 1. Population growth for WGFP participants, as projected by the Draft EIS (blue) and under a revised scenario of 1% annual growth rate (yellow).

WRA's calculations throughout these comments use the population growth estimates used by BOR in the Draft EIS. However, we note here that these population projections are fatally flawed and cannot support the proposed project. As noted in the prior section, population over-estimations compound over time: an inaccurately high projected growth rate in the first several years of any period compounds errors in later-year projections. If population grows more slowly than the DEIS projects—which all evidence indicates that it will—future water demands will be correspondingly lower than our re-calculated estimates.

Proposed Per Capita Water Use is Arbitrary:

With just a few paragraphs of explanation, the Purpose and Need and DEIS proposes 217 gallons per person per day (gpcd) as a "reasonable average" of system-wide water use against which to compare WGFP beneficiaries.[34] The figure is averaged from year-2000 data that underlie both the first phase of Colorado's recent Statewide Water Supply Investigation (SWSI) and a paper from the University of Utah. The proposed average is arbitrary, capricious, and unreasonable. It is a fatal flaw in the DEIS that must be revised.

The proposed average water use rate is flawed for several reasons:

1. The water use rate in the Purpose and Need is derived from a single year of data, rather than a range of years;

[34] Purpose and Need, p. 34.

2. Many of the communities that were analyzed in the University of Utah paper and compared to WGFP participants have higher average temperatures and lower rates of precipitation than WGFP participants;
3. The University of Utah study relies on county-wide water use data, rather than city-specific data, skewing water use rates;
4. The University of Utah paper does not adequately integrate expected conservation savings; and
5. The Purpose and Need determines a per capita water use rate using communities from across Colorado, including several from the Western Slope, which have much higher rates of water use than Front Range communities.

First, it is arbitrary to use single year data to set an average for future years. The year 2000 is outside the norm; indeed, based on the multi-year data for Windy Gap cities in the P&N, the year 2000 had unusually high water rates of water use. The P&N and DEIS must not perpetuate the errors inherent in using high, single-year data. Rather, it must use a range of years to derive an average for projected future use.

Second, many of the communities studied in the Utah report have considerably hotter and drier climates than WGFP participants. For example, as shown in Table 1, below, Salt Lake City, St. George, Phoenix, Lewiston, Las Vegas and Boise all have significantly higher average annual temperatures and higher average July temperatures than Greeley, Broomfield and Longmont.[35] Additionally, nearly all receive less precipitation than the Colorado cities, some as little as 1/2 to 1/3 of Front Range communities.[36] The more arid climates of many cities in the Utah paper make it a poor choice for comparison to WGFP participant cities.

Table 1: Temperature and Precipitation for Select Cities[37]

	Average Annual Temperature (F)	Average July Temperature (F)	Average Annual Precipitation (in.)
Boise, ID	51	74	11.8
Greeley, CO	48	72	12.1
Broomfield, CO	49	71	13.8
Longmont, CO	48	71	13.3
Las Vegas, NV	67	90	4.1
Lewiston, ID	53	74	12.6
Phoenix, AZ	73	93	7.7
Salt Lake City, UT	52	78	15.6
St. George, UT	60	83	8.3

Third, the Utah paper relies upon county-wide data rather than water provider data, thereby skewing any comparison to residents of WGFP cities. Using county-wide

[35] http://www.weatherbase.com/
[36] Id.
[37] Id.

data rather than data from discrete water providers distorts the average because rural communities typically have higher rates of use. As the WGFP P&N accurately notes, the use of county data is prone to over-estimate use: "larger communities . . . typically have lower gpcd."[38] For instance, in 2000 the water utility for Boulder, Colorado, reported a system-wide gpcd of 201.[39] By comparison, the USGS data, which underlies the Utah paper, uses a county-based system-wide gpcd of 245 for Boulder County, over 22% higher. Because the vast majority of new development is in tightly-knit residential development rather than rural development, use of county-wide data is arbitrary and irrelevant to projected future municipal water demand.

Fourth, exacerbating the flawed choice of comparison cities, year-2000 data, and county-data, the University of Utah paper fails to reflect the anticipated reductions in per capita use by most cities in the region. Utah itself has formally committed to a statewide 25% reduction in water use over the next few decades. Numerous water providers throughout that state have also adopted this goal and many have nearly attained those savings today. The Jordan Valley Water Conservancy District, which provides water to the cities of West Jordan, South Jordan, Sandy, Midvale, Riverton and South Salt Lake as well as numerous irrigation districts, has committed to reduce use by 25% from 2000 levels by 2025.[40] As of 2004, the Jordan Valley Water Conservancy District already had seen a 20 percent reduction, lowering their per capita water use from 250 to 207 gpcd in only four years.[41] This commitment has, and will continue to, drastically reduce the per capita use throughout Utah.

Even more on point with water demands of WGFP cities, Colorado cities have experienced dramatic and sustained reductions in per capita use since 2002. The Colorado Water Conservation Board (CWCB) has incorporated a 25% per capita reduction goal for state-wide water planning. *See* sub-section on "**Demand Forecasting**" below.

Fifth, the Purpose and Need report also looked at Phase I of Colorado's Statewide Water Supply Initiative (SWSI) which determined a statewide system-wide average of 210 gpcd for the year 2000. This is an inaccurate predictor of Front Range consumption as it factors-in West Slope communities where usage is not representative of WGFP proponents. Many of the levels of system-wide per capita use listed in the SWSI report exceed 300 gpcd.[42] These rates are significantly higher than documented 2001 water use data in Front Range Colorado municipalities—when Boulder's system-wide water use was 180 gpcd, Highlands Ranch was 191 gpcd, and Denver was 205 gpcd.[43,44] A number

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[38] US Bureau of Reclamation . Windy Gap Firming Project Purpose and Need Report. September 2005. 30.
[39] City of Boulder, Colorado 2000 Treated Water Master Plan & 2000 Utilities Annual Report.
[40] Jordan Valley Water Conservancy District, *2004-2005 Summary of Operations,* at p. 49.
[41] Id.
[42] Colorado Water Conservation Board, Statewide Water Supply Initiative Report (SWSI), November 2004, Appendix E, Table 7, at p. 917.
[43] Western Resource Advocates, *Smart Water: A Comparative Study of Urban Water Use Efficiency Across the Southwest*, Dec. 2003, at p. 66.
[44] Western Resource Advocates. Table 4. 1998-2003 Front Range Municipality Consumption Data (GPCD). 11.

of the county rates even exceed 400 gpcd, with one at 681 gpcd (Pitkin County).[45] Water use at this level is virtually unheard of throughout the entire Southwest, exceeding some of the regional system-wide averages by a factor of two to three. Like the Utah study, the SWSI data is also only a snapshot of use from one, relatively high water use year (2000) as illustrated in Table 4 (page 19, *infra*), not an average taken over a number of years.

Importantly, the SWSI has undergone significant updates since its release in late 2004. Notably, SWSI Phase II included a Water Conservation Technical sub-committee that generated data on water savings available through a range of conservation measures.[46] The research found that, state-wide, between 287,000 and 459,000 acre-feet per year could be saved by conservation.[47]

Conservation Planning and Savings Targets are Required by Law:

Much like planning for new supplies, demand-side management takes time to plan and implement. Therefore, the two must be concurrently considered and integrated into long term planning. In some communities, effective demand management programs can reduce, delay, or eliminate the need to seek new supplies, as well as reduce costs and energy consumption associated with pumping and treating water before and after use — thereby saving tax payers money.

Unfortunately, conservation savings goals do not appear to play a prominent role in the planning processes for many of the WGFP participants. Contrary to the DEIS' claim that "all WGFP participants have conservation plans,"[48] not all have taken the steps to create comprehensive planning documents that comply with State law. Five communities' plans are so new they were submitted to the CWCB following the release of the DEIS (*see* Table 2)[49] As a prerequisite to moving forward with the WGFP, all participants that qualify as "covered entities" under state statute must have approved conservation plans on file with the Colorado Water Conservation Board. At this time, only Erie and Fort Lupton have newly approved plans (see Table 2, next page), while others have yet to meet the state and RRA requirements.

The City of Broomfield, Louisville, Loveland, Lafayette and Central Weld County Water District have no recent water conservation plans. Since their last submitted plan, new state law requires stronger conservation planning, savings goals and tracking savings. In addition, the requirements of the RRA—including conservation plan objectives, proposed conservation measures and a proposed time schedule for compliance—would not be met were the City of Lafayette or Central Weld County Water District to rely on such outdated plans. Recently the City of Lafayette had a draft

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[45] SWSI, Appendix E, Table 7, at p. 917.
[46] Colorado Water Conservation Board, Colorado's Water Supply Future: State Wide Water Supply Initiative Phase 2. November, 2007. Table 2-1. http://cwcb.state.co.us/NR/rdonlyres/C65D6406-3EE0-4E44-9C5E-E1655D814CB8/0/S2_ConservationEfficiency.pdf.
[47] *Id.*
[48] WGFP DEIS §1.6.2.3 Water Conservation. 1-15.
[49] Colorado Revised Statute §37-60-126.

conservation plan posted on their website; however; it limited "public" comment to utility customers—in violation of state statute.[50]

Little Thompson Water District and the Town of Superior have no conservation plans on file. These plans must be submitted to the CWCB and fully comply with state conservation statutes, including specific conservation savings targets and goals that are integrated in the utilities' long term planning processes. Setting conservation savings goals is an essential component of a community's water conservation plan, a requirement of the RRA and of state statute.

Table 2: Status of Conservation Plans of WGFP Participants (as of fall 2008)

Participant	Annual Deliveries (AF)[51]	Qualified as a "Covered Entity" under Colorado State Statute	Approved Conservation Plan on file with the CWCB
City & County of Broomfield	10,107	Yes	In Process
City of Evans	2,578	Yes	In Process
City of Ft. Lupton	2,500	Yes	Yes
City of Greeley	27,067	Yes	In Process
City of Lafayette	4,700	Yes	In Process
City of Longmont	20,000	Yes	In Process
City of Louisville	4,900	Yes	NO
City of Loveland	13,837	Yes	NO
CWCWD	2,786	Yes	2005 Plan
Little Thompson Water District	4900	Yes	NO
Town of Erie	2,800	Yes	Yes
Town of Superior	2,163	Yes	NO

At least seven of the fourteen participants are also participants in other regional water projects currently in the permitting process. In many cases it is unclear that all water being pursued is needed, especially if adequate water rates, loss reduction and conservation measures are adopted and implemented. Developing more water than is

[50] Colorado Revised Statute §37-60-126. Water conservation and drought mitigation planning - programs - relationship to state assistance for water facilities - guidelines - water efficiency grant program - repeal. §5. 2004.

[51] Colorado Water Conservation Board database of covered entities; except Superior from WGFP DEIS, 2003 figure Table N-5. pg N-6.

necessary places an undue burden on existing residents though increased costs. All projects and demand projects should be examined collectively to ensure that needs are not being over estimated. *See also* Section 4 of these comments, **Similar and Related Actions and Cumulative and Connected Impacts**.

Table 3: Firm Yield and Storage Requests for Front Range Water Projects

Participant	WG Firm Yield	NISP Firm Yield	Halligan/ Seaman (Storage)^	Total FY	Total FY + H/S Storage
Berthoud	—	1,300	—	1,300	1,300
Broomfield	5,600	—	—	5,600	5,600
Central Weld Co.	100	7,100	—	7,200	7,200
Eaton	—	1,300	—	1,300	1,300
Erie	2,000	6,500	—	8,500	8,500
Evans	500	1,600	—	2,100	2,100
ELCWD	—	—	3,795	—	3,795
Fort Lupton	300	3,000	—	3,300	3,300
Fort Morgan	—	3,600	—	3,600	3,600
Ft. Collins (city)	*See Loveland*	*see FCLWD*	1,200	—	1,200*
FCLWD	*See Loveland*	3,000	7,260	3,000*	10,260*
Greeley	4,400	—	48,000	4,400	52,400
Lafayette	800	1,800	—	2,600	2,600
Left Hand WD	—	4,900	—	4,900	4,900
Little Thompson	1,200		—	1,200	1,200
Longmont	5,125	—	—	5,125	5,125
Louisville	900	—	—	900	900
Loveland (city)	4,000	*see FCLWD*		4,000*	4,000*
Morgan Co.	—	1,300	—	1,300	1,300
No. Weld Co.	—		5,445		5,445
NPIC	—	—	5,000	—	5,000
Platte River Power	5,150	—	—	5,150	5,150
Severance	—	1,300	—	1,300	1,300
Superior	1,500	—	—	1,500	1,500
Windsor	—	3,300	—	3,300	3,300
WSSC	—	—	5,000	—	5,000

* cross over between city and water district?

^ as yet no definitive, project wide storage-to-yield ratio for Halligan/Seaman project.

DEIS Demand Forecasts are Flawed:

As previously noted, conservation savings goals do not seem to be part of any of the participants' long term forecasting. **This is a fatal flaw of the DEIS**: future projected demands must integrate savings goals, as required by state and federal law.

Conservation savings is an important part of water supply planning. In a recent presentation to the West Slope Joint Water Roundtable Meeting in November 2008, CWCB staff projected future water demands, assuming that per capita water use is reduced by **25% by 2030**.[52] Given that demand management has been proven to result in real water savings, in a cost-effective manner, conservation savings goals **must** be part of the planning and demand forecasting process for **all** WGFP participants and incorporated into the DEIS.

Based on per capita water use reductions of 25% and average population growth estimates, WRA re-calculated demand projections for the thirteen WGFP participants.[53] This conservation scenario reduces per capita demands by 1% annually, starting in 2008. Based on this scenario, WGFP participants' water use rates fall from 194 gpcd (average, 1998 – 2003) to 147 gpcd by 2033.[54] We assume these conservation savings are capped at 25% in 2033; but in reality water use efficiency evolves and improves just like any other technology. Therefore, although the scenario does not assume additional savings beyond 2033, further reductions in per capita use will be possible in 2034 and later years.

WRA's projected future water demands include system water losses. We assume water losses increase total demands by 10%, a water loss rate deemed acceptable by the American Water Works Association.[55] We note, however, that other cities along the Front Range have significantly lower levels of water loss—sometimes 5% or lower.[56] Thus, 10% is a very conservative estimate.

WRA compared our re-calculated projections of total future water demands with existing firm supplies and potential future supplies from other proposed projects. Figure 2, below, shows projected supplies and demands through 2050. According to the DEIS, §1.6.1 Table 1-1, firm yield of WGFP participants is 140,762 AF in 2005. Table 1-4 in the DEIS shows that participants' demand is projected to increase to 251,450 AF in 2050,

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[52] Relative to use in 2000. Hecox, Eric. November 14, 2008. Presentation to the West Slope Joint Roundtable Meeting.

[53] Two recent studies contain examples of widely used demand reduction measures from Colorado and the Western U.S.: The Colorado Water Conservation Board's *Statewide Water Supply Initiative (SWSI) Phase 2 Report* (http://cwcb.state.co.us/IWMD/SWSITechnicalResources/SWSIPhaseIIReport/, viewed on 8/31/2008) and Western Resource Advocates (2003) *Smart Water: A Comparative Study of Urban Water Use Efficiency Across the Southwest* (http://www.westernresourceadvocates.org/media/pdf/SmartWaterBrochure.pdf, viewed on 8/31/2008).

[54] Draft EIS, Table 1-3 on p. 1-16.

[55] Janice A. Beecher, Ph.D. Survey of State Agency Water Loss Reporting Practices: Final Report to the American Water Works Association. January 2002

[56] Western Resource Advocates. 2007. *Front Range Water Meter: Water Conservation Ratings and Recommendations for 13 Colorado Communities.* (http://www.westernresourceadvocates.org/watermeter/index.php)

110,688 AF greater than participants' 2005 firm yield. Notably, with WRA's conservation savings and revised demand projections, ***existing* firm supplies will meet future water demands through 2030**. Other proposed projects, including NISP and its alternatives[57], Broomfield Reservoir, and Halligan/Seaman Reservoir, will meet future demands through 2050 *without construction of the WGFP*.

Furthermore, if population grows more slowly than expected, total water demands may be significantly lower. Using the same assumptions about conservation savings and a revised annual population growth rate of 1%, total water demands in 2030 are 105,300 AF/yr, *slightly less than the current demand.* In 2050, participants' water demands grow to 122,000 AF/yr, well below today's firm supplies.

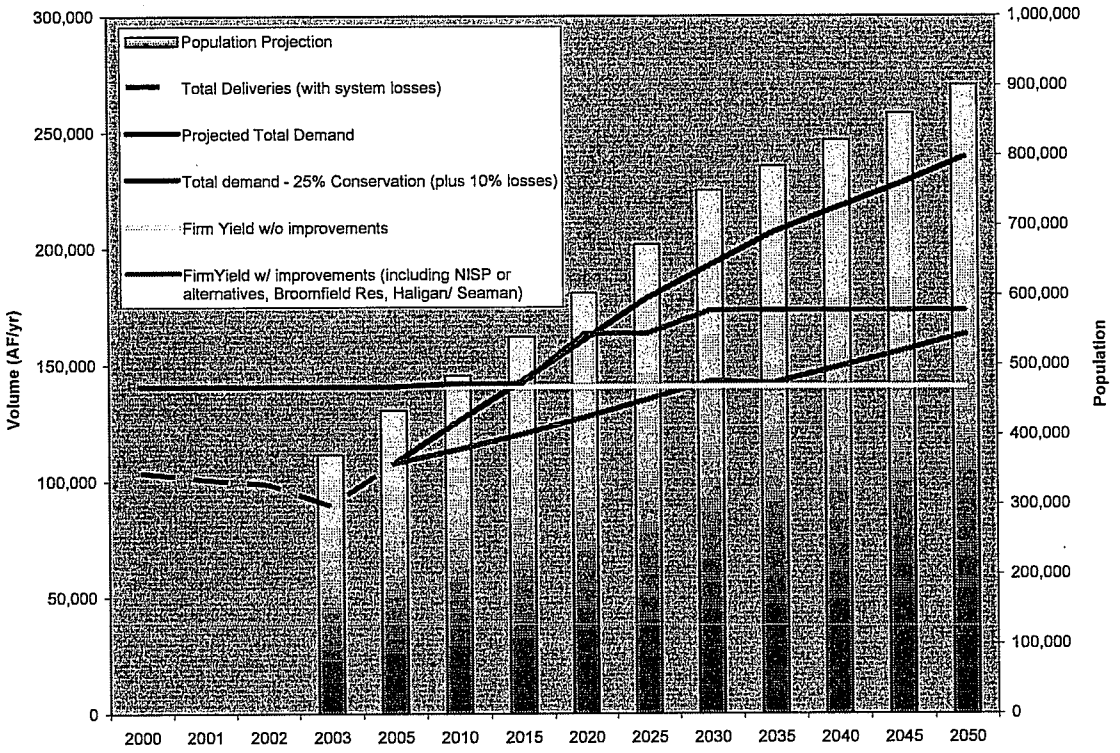


Figure 2. Population growth (right axis; uses DEIS proposed rates of population growth), water demands, and water supply projections (left axis) for WGFP participants. If NISP or its potential alternatives, Broomfield Reservoir, and the Halligan/Seaman Reservoirs are constructed, firm supplies will exceed projected demands through 2050 without the construction of the WGFP.

[57] The "Healthy Rivers Alternative" is an alternative to NISP that was developed by the Save the Poudre and Western Resource Advocates. The Healthy Rivers Alternative estimates the potential for water conservation and rotational fallowing of agricultural lands to provide future water supplies.

Conservation:

The reductions in per capita water use modeled above reflect reasonable and attainable goals for project participants. While nearly all WGFP participants have adopted the 1992 National Energy Policy Guidelines (required), few have gone beyond these basic national requirements to promote indoor efficiency, despite existing technologies—readily available in the marketplace—that save more water.

Many of the participant utilities have implemented education and outreach measures that inform customers about the importance of water efficiency. However, many lack conservation measures that go beyond education. For example, rebates provide incentives for customers to use water more efficiently and regulations require wise water use. Conservation measures like these help to further increase efficiency, improve behavioral practices, and educate the public. The combination of multiple measures greatly improves the overall effectiveness of any conservation program. Furthermore, public perception of water conservation has drastically changed in areas where education and other measures—such as incentives, regulation and conservation pricing—are present.

The DEIS claims in §1.6.2.3 that water use reductions since 1988 indicate that conservation efforts have been successful. However, it does not mention that during this time many communities became fully metered, drastically reducing levels of use and that this conservation measure is likely the cause of the large reduction in use.[58]

In truth, few participants in the WGFP have comprehensive conservation programs in place, and it is likely that implementation of further conservation measures will lead to additional reductions in use. Furthermore, conservation measures have proven to be cost effective and a source of real water savings.[59] Indeed, many studies have shown that conservation is not only cost effective, but is often less expensive per acre-foot than traditional supply development.[60]

In the fall of 2007, WRA completed a report—*Front Range Water Meter: Water Conservation Ratings and Recommendations for 13 Colorado Communities*—that provides useful information for analyzing levels of water use and conservation programs in many WGFP cities. Much of the data in the pages that follow rely upon the *Water Meter* and data therein that were provided directly from water utilities.

All WGFP participants have implemented some sort of demand-side management measures aimed at reducing water use. Conservation measures help to increase efficiency, improve behavioral practices, and educate the public. The combination of multiple measures greatly improves the overall conservation program. Because there are

[58] U.S. Bureau of Reclamations. Windy Gap Firming Project Draft Environmental Impact Statement. August 2008. §1.6.2.3, pg 1-16

[59] Western Resource Advocates, *Smart Savings: Water Conservation Measures that Make ¢ents*. 2008. http://www.westernresourceadvocates.org/media/pdf/Smart%20Savings%20Water%20Conservation.pdf

[60] Colorado Water Conservation Board, Colorado's Water Supply Future: State Wide Water Supply Initiative Phase 2. November, 2007. Table 2-1. http://cwcb.state.co.us/NR/rdonlyres/C65D6406-3EE0-4E44-9C5E-E1655D814CB8/0/S2_ConservationEfficiency.pdf

a multitude of conservation measures utilities can adopt, we look closely at five key criteria:

- Incentives/rebates (including giveaways)
- Ordinances/rules
- Education
- Commercial and industrial (C&I) programs
- Xeriscape

Greeley has all of the five criteria included in their conservation programs but relatively low levels of penetration for their incentive based programs, increasing levels of unaccounted for water, and only a uniform water rate structure that provides no incentive for customers to use water more efficiently. Some communities (e.g., Broomfield, Erie, Louisville, Loveland, Lafayette and Fort Lupton) have conservation ordinances, but appear not to track or enforce the regulations, diminishing their effectiveness. In particular, ordinances dealing with new growth are essential, especially in cities experiencing extremely rapid growth.

Longmont, Loveland, Lafayette and Louisville all use four out of five of the above categories in their conservation measures. All lack a commercial and industrial program, something that needs to be addressed as these water use sectors grow. Furthermore, while the communities listed do utilize four out of the five conservation measures, their programs are not robust; with more effective implementation, the communities can attain significant water savings. For instance, Longmont and Louisville are the only two of these four communities that offer rebates. Yet their level of penetration is quite low, in some instances reaching less than 1% of their service area population.

Fort Lupton, Evans, Broomfield, and Berthoud all have limited measures in place, and rely heavily upon ordinances, but these are not often enforced or tracked. While the number of measures a community has adopted is not necessarily an indicator of conservation program success, communities with more measures in place typically have better tracking and enforcement in place. Tracking provides an accurate picture of what percentage of the population is being reached by their measures.[61] The above communities also have extremely limited education measures in place, do not have dedicated staff or budget to properly carry out these measures, and do not have incentive based measures or rebates in place.

A huge potential exists for additional reductions in per capita demand through the implementation of more progressive policies and programs. Adopting improved rate structures, incentives and enforced regulations and a well executed education program can result in significant cost savings for the water providers.

[61] Western Resource Advocates, *Front Range Water Meter*. November, 2007.

If WGFP beneficiaries secure water at a storage-to-yield ratio of 4-to-1 (typical in Colorado), they can expect to pay $9,600 per acre-foot of firm yield,[62] not including the potential for additional costs to store this water locally and projected construction cost increases for these structural features. Many conservation measures are far less expensive. A 2004 report estimates the cost of implementing a progressive water rate structure at $6000/AF.[63] A water conservation sub-committee carrying out Phase II of SWSI has developed expected costs of $2,000-7,000/AF for landscape audits, water loss reduction, and many other programs.[64]

Levels of Water Use and a "Reasonable" Standard

Through an analysis based on data presented in the P&N and provided by water utilities on Colorado's Front Range, WRA calculated that average water use for a large sample of Front Range communities is 177 gpcd and the median is 184 gpcd. These figures were calculated using data from water providers from 1998-2003, the same years used in the WGFP P&N. The average and median offer a much more accurate representation of recent trends in Front Range water use by proposed WGFP beneficiaries and similarly-situated communities. *See* Table 4, below.

Table 4. 1998-2003 Front Range Municipality Consumption Data (GPCD)

Front Range GPCD							
	Total (gal)						
	1998	1999	2000	2001	2002	2003	AVG
Westminster			191	191	170	156	177
Longmont	215	195	213	201	196	180	200
Denver	213	203	221	211	192	166	201
Fort Collins	196	185	211	198	183	154	188
Greeley	218	197	220	201	192		206
Loveland	182	165	204	190	160	136	173
Broomfield	191	192	225	203	210	189	202
Lafayette	151	137	148	147	102	126	135
Louisville	183	178	193	182	133	157	171
Superior	149	127	131	125	128	120	130
Aurora	173	171	192	184	168	127	169
Multi-city Avg.	187	175	195	185	167	151	**177**
						Median =	**184**

[62] Based on a cost estimate of $2,400 per acre-foot of storage, an estimate provided Northern Colorado Water Conservancy District.

[63] Mayer, Peter et al., *National Multiple Family Sub-metering and Allocation Billing Program Study.* Aquacraft, Inc., 2004.

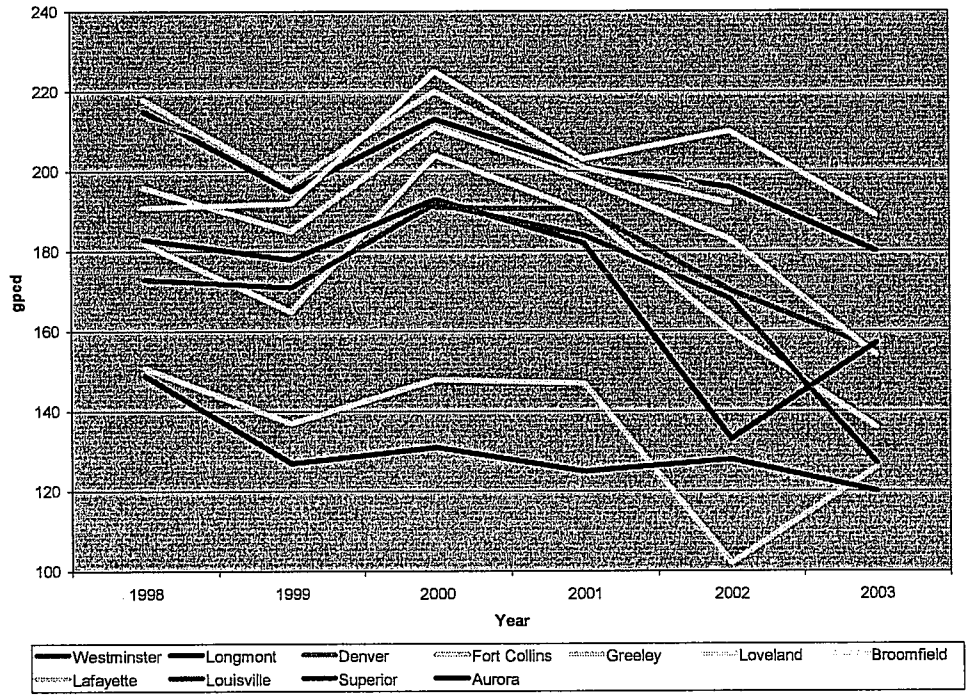
[64] Colorado Water Conservation Board, Colorado's Water Supply Future: State Wide Water Supply Initiative Phase 2. November, 2007. Table 2-1. http://cwcb.state.co.us/NR/rdonlyres/C65D6406-3EE0-4E44-9C5E-E1655D814CB8/0/S2_ConservationEfficiency.pdf

Based on the actual Front Range data depicted above, it appears cities fall into two fairly distinct groupings: those that have a 1998-2003 average gpcd of 190 or below, and those with a gpcd of 200 or above. The latter group—which includes Broomfield, Greeley and Longmont—clearly sticks out as having relatively high per capita use. The P&N should reflect this distinction and incorporate 25% per capita use reductions into these cities' projected water demand.

The colored lines in Figure 3, below, depict the same data graphically. The trend since 2000 for most Front Range communities is decreasing per capita use. For example, the city of Westminster has seen a steady decrease in their system-wide per capita water use over the last five years. Westminster's 2000 gpcd was 191 while use in 2005 was 154 gpcd—a decrease of 24%.[65] Other cities experienced similar drops.

This trend is, in part, the result of replacement of inefficient indoor fixtures, the adoption of city wide conservation goals, and the implementation of rate structures that encourage conservation. Changes such as these result in permanent water savings and do not rely upon behavioral adaptation that can dissipate after a drought is over. As a result, some Front Range cities, like Denver, have adapted their planning, using lower levels of consumption to forecast future demand.[66]

Figure 3- System Wide Consumption of Front Range Municipalities



[65] City of Westminster Department of Public Works and Utilities.
[66] Denver Water Board, Integrated Resource Plan materials and handouts, December 7, 2005

Figure 4 - Average Front Range Consumption with 5% Variability

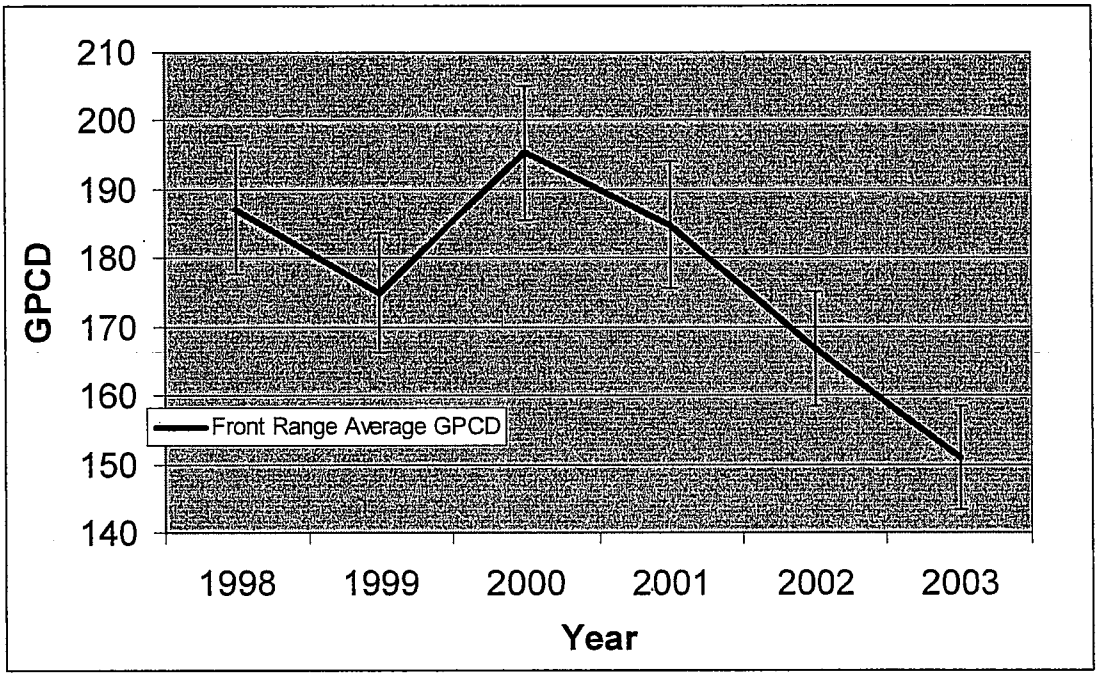


Figure 4, above, represents the average system wide per capita consumption for municipalities along the Front Range from 1998 through 2003. The brackets provide an illustration of possible variations in average levels of use given a 5% shift in either direction. Even if a 5% increase in use were to occur, the average of all Front Range cities examined is well below the "reasonableness" standard used in the WGFP DEIS.

Participants' System Wide Loss is Unreasonably High

The WGFP participants collectively have an average rate of "unaccounted for water" of nearly 14%. This not only exceeds the American Water Works Association reasonableness standard of 10%, it is also drastically higher than other nearby communities. Fort Lupton, Loveland and Louisville all have system loss levels that exceed the 10% threshold, by as much as 7%. In contrast, Berthoud and Broomfield have achieved very low levels of unaccounted for water, 2.6 and 3% respectively.[67] Reducing average system wide loss levels for all WGFP participants to five percent would provide an additional 7,800 to 9,000 acre-feet per year – that is 25-29% of the expected WGFP firm yield.[68] It is incumbent upon cities that are considering construction and payment for a large new trans-mountain diversion project to first efficiently use water that has already been developed.

[67] Western Resource Advocates, *Front Range Water Meter: Water Conservation Ratings and Recommendations for 13 Communities*, 2007, at 15.

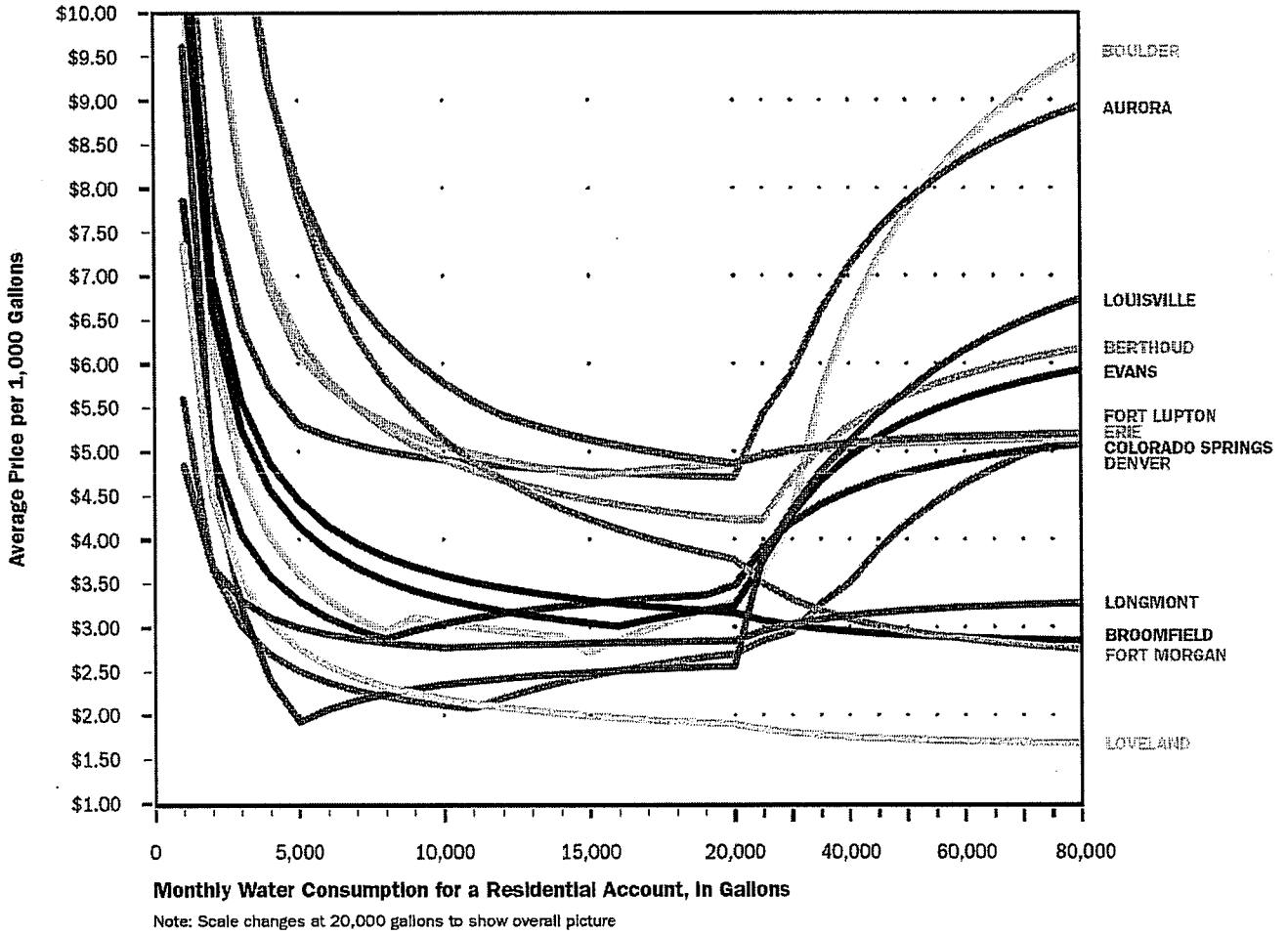
[68] Calculation by Western Resource Advocates based on data on average system loss §1.6.2.2 (pg 1-14) of the DEIS. Range is based on 2003 low of 90,000 AF loss and 2000 high of 104,400. Savings is the difference between 13.7% loss and 5%.

Proponents' Water Rate Structures are Ineffective

Many WGFP participants have ineffective pricing structures. Other participants' price structures send no conservation price signal at all. In order for inclining block rates to be an effective conservation tool consumers must understand that the more water they use the more they will pay per unit; this is reflected in a steep positive slope on the average price curve.

As illustrated in Figure 5, below, many WGFP participants such as Fort Lupton, Broomfield, Longmont and Loveland lack an effective pricing structure. Under an effective rate structure, the price per AF will rise sharply as use increases, as seen with Boulder, Aurora, Louisville, Berthoud, Denver and Evans in Figure 5. An ineffective pricing structure will rise only faintly (Fort Lupton, Longmont); not at all; or decrease as use increases, as seen in Broomfield and Loveland in Figure 5.

Figure 5: Average Price Curve[69]



[69] Western Resource Advocates, *Front Range Water Meter*. 2007, at 16.

The most important element that will alter the effectiveness of any conservation price signal is the fixed monthly service charge. If this fee is a large percentage of the bill, then consumers see little incentive to conserve because regardless of how much they reduce their consumption they will still have to pay a large service fee. In other words, large service charges penalize low volume users and remove incentives to conserve water.

As shown in Table 5, below, many WGFP participant cities have a fixed service charge that is an extremely high percentage of a bill for 10,000 gallons of consumption—thus decreasing or even negating the conservation price signal.

Table 5: Service Charge Percentage of Bill at 10,000 Gallons[70]

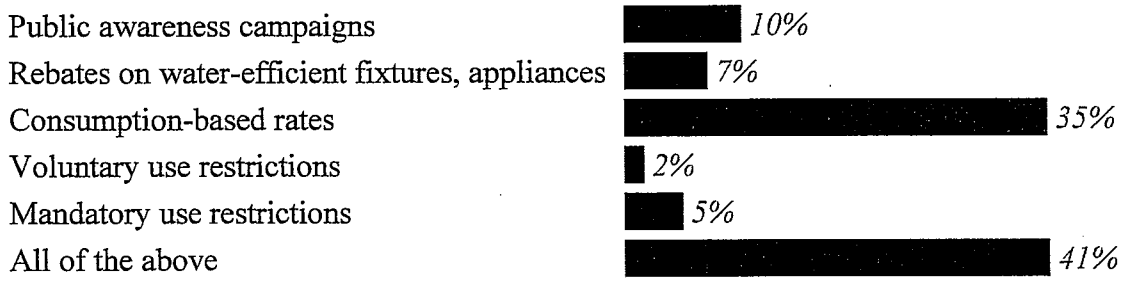
	Total Bill at 10,000 Gal.	Service Charge	% Service Charge of 10,000 Gal. Bill
Aurora	$49.00	$8.50	17.35%
Berthoud	$49.07	$13.87	28.27%
Boulder	$28.95	$8.55	29.53%
Broomfield	$35.83	$8.53	23.81%
Colorado Springs	$31.91	$5.70	17.86%
Denver	$21.07	$3.87	18.37%
Erie	$50.65	$15.00	29.62%
Evans	$33.15	$8.25	24.89%
Fort Lupton	$57.80	$22.50	38.93%
Fort Morgan	$51.34	$27.34	53.25%
Longmont	$27.60	$2.30	8.33%
Louisville	$23.40	$9.60	41.03%
Loveland	$21.75	$5.75	26.44%

Conservation pricing is an important component of any effective demand management program and should be utilized in any community seeking new sources of water. In fact, in a recent poll by the American Water Works Association, responders stated that conservation oriented rates, or consumption-based rates, were the best individual mechanism to get customers to use less water.[71] *See* Table 6.

[70] Western Resource Advocates, *Front Range Water Meter*. 2007, at 15.

[71] American Water Works Association, Results of Survey "Quick Poll" *What's the best way to get customers to use less water?* Accessed 8/22/08. http://www.awwa.org/QuickPollResults.cfm?itemnumber=1663.

Table 6: Result of AWWA Quick Poll[72]



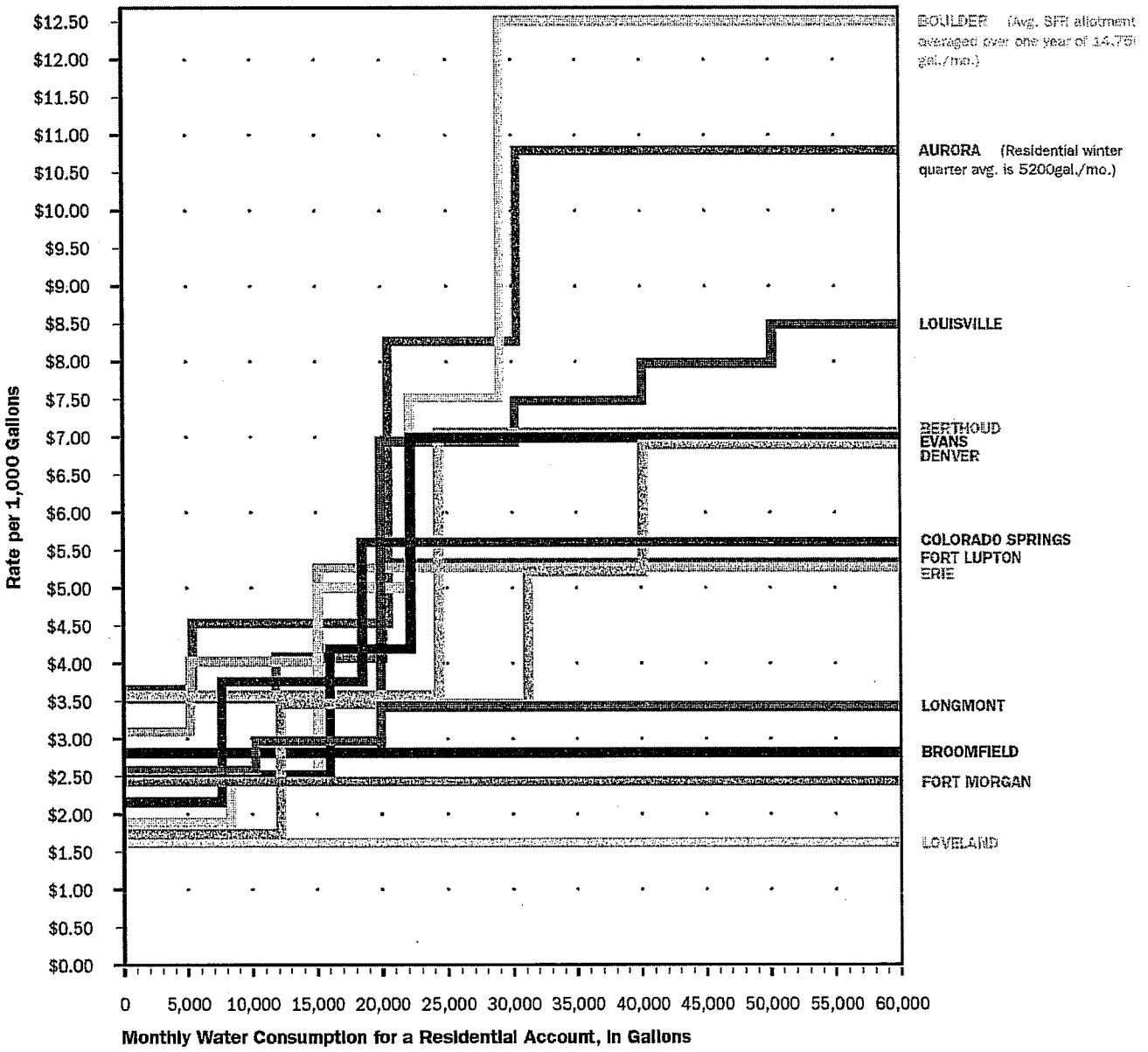
Municipalities with the most effective conservation oriented rates—i.e. structures that clearly communicate *the more you use the more it will cost per unit*—are the communities who provide an initial block of water at a low and affordable rate, and then increase rates noticeably from one block to the next.

Far too many WGFP providers have an inclining block rate structure that has a negligible price increase as marginal water use increases (Figure 6); the result is that consumers do not notice that their unit cost is greater than before and thus have no incentive to conserve. This is the case with Fort Lupton, whose large service charge and minimal consumption price increases from one tier to the next, resulting in a rate structure that acts – in essence – as a flat rate structure and provides no price signal.

SEE NEXT PAGE

[72] Id.

Figure 6: Marginal Rate Curve[73]



Conclusions for Section 3—Water Conservation and Efficiency:

Based on a close review of the P&N, the DEIS and, other relevant data, the underlying water use projections in the DEIS—and thus the "need" for the WGFP—are arbitrary and fatally flawed. The Bureau must amend the DEIS's underlying population and water demand projections; current figures are significant over-estimatations. This amendment must more accurately reflect consumption patterns specific to the Colorado Front Range, rather than using single-year data from communities in other states with

[73] Western Resource Advocates, *Front Range Water Meter*. 2007, at 14.

entirely different climates and levels of water use. More accurate average per capita use by Front Range cities—as well as the marked downward trend in recent years—substantially undercuts the need for the Windy Gap Firming Project during the proposed planning horizon. Updated data will allow individual cities to more accurately assess their need for WGFP, an expensive water supply option. This is particularly important in light of the recent economic downturn and housing foreclosures in many WGFP cities.

Conservation and efficiency has not been adequately incorporated into WGFP participant's long term planning process and savings from demand management to date have been overstated. Prior to developing the WGFP, participants must adopt more aggressive conservation measures and goals. In a recent presentation, the Colorado Water Conservation Board assumed a 25% reduction in average per capita water use between 2000 and 2030.[74] WGFP communities must adopt, at a minimum, the State's conservation objectives. With this level of reduction, the project participants' existing supplies will meet demand through 2030. When the other proposed projects in the region are considered—NISP and its alternatives, Broomfield Reservoir, and Halligan/Seaman Reservoir—firm supplies will exceed participants' demands through 2050. In light of these other projects, the WGFP No Action alternative is the most reasonable.

Incorporating many of the above-noted conservation measures would further strengthen participants' conservation programs and, consistent with the Reclamation Reform Act and state law, should be adopted prior to committing enormous financial resources to the proposed WGFP project.

4. Similar and Related Actions; Cumulative and Connected Impacts

The DEIS lacks adequate analysis of related actions—including "connected", "cumulative", and "similar" actions[75]—as well as cumulative and connected impacts from past, present, and reasonable foreseeable future projects. As discussed in our comments on the **National Environmental Policy Act**, above, identifying and evaluating these actions and impacts is a central component of NEPA. Courts are clear that action agencies often must examine several related actions inside a single NEPA document.[76]

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[74] Hecox, Eric. November 14, 2008. Presentation at the West Slope Joint Roundtable Meeting.

[75] 40 C.F.R. at §§ 1508.25, 1508.7, 1508.8.

[76] *Id.* The U.S. Court of Appeals for the Fifth Circuit held that in a cumulative impact analysis, an agency should consider "(1) past and present actions without regard to whether they themselves triggered NEPA responsibilities and (2) future actions that are 'reasonably foreseeable,' even if they are not yet proposals and may never trigger NEPA-review requirements. *See, Fritiofson v. Alexander*, 772 F.2d 1225, 1245 (5th Cir. 1985). The court noted that the applicable law "does not limit the inquiry to the cumulative impacts that can be expected from proposed projects; rather, the inquiry also extends to the effects that can be anticipated from "reasonably foreseeable future actions." *Id.* At 1243. Similarly, the U.S. Court of Appeals for the Ninth Circuit has specifically required analysis of activities on both public and private land, since both may impact federal resources; the court also found cumulative impacts analysis insufficient where it did not include foreseeable projects in the same geographical region. *See, Natural Resources Defense Council v. U.S. Forest Service*, 421 F.3d 797, 815-16 (9th Cir. 2005); *Muckleshoot Indian Tribe v. U.S. Forest Service*, 177 F.3d 800 (9th Cir. 1999).

Connected and Similar Water Projects

The inter-connectedness of WGFP with the existing Colorado-Big Thompson (CBT) project, including potential legal hurdles to such inter-connectedness, has not been adequately analyzed in the DEIS.

The inter-connections are vividly illustrated by **Figure 2-6. Chimney Hollow Reservoir connection schematic** (DEIS at 2-21) and discussed in some detail in **Section 2.4.2 (Operations,** DEIS at 2-24). Not only are the projects' facilities intimately linked, but under the prepositioning concept, their waters are commingled:

> Prepositioning would involve the use of available Adams Tunnel capacity to deliver C-BT water into Chimney Hollow to occupy storage space that is not occupied by Windy Gap water...The delivery of C-BT water from Granby Reservoir into Chimney Hollow would create space for Windy Gap water in Granby Reservoir. When Windy Gap water is diverted into Granby Reservoir, the C-BT water in Chimney Hollow would be exchanged for a like amount of Windy Gap water in Granby Reservoir. (DEIS at 2-24)

The WGFP DEIS notes that:

> Because the Proposed Action includes the storage of C-BT water in a new Firming Project facility (a concept referred to as prepositioning), Reclamation also will need to make a decision regarding accounting changes in the C-BT system to allow water storage and exchange between the two projects to occur. Implementation of prepositioning may require modification or replacement of the existing conveyance and storage contract between Reclamation, the Subdistrict, and the NCWCD. (DEIS at 1-42)

Discussions about any potential contract approvals have not been completed; indeed, it is unclear if they even have been started. Since such approvals are a prerequisite for many elements of the Proposed Action, the WGFP DEIS analysis is simply not yet complete. These contract discussions and any "contract conditions" must be subject to public review and comment.

Further, there are significant questions about whether the proposed use of CBT facilities is allowed under existing federal law. The DEIS notes

> Prior to entering into a contract that would allow use of C-BT excess capacity, Reclamation must determine that the excess capacity contract is consistent with the provisions of Senate Document 80 (SD 80) and Reclamation's authority under Section 14 of the Reclamation Project Act of 1939 (43 U.S.C. § 389). This determination will be made available at a later time and is not part of this EIS. (DEIS at 1-42)

There is, however, no support for the statement that these issues can simply be dealt with "at a later time" or that they are "not part of this EIS." To the contrary, it is critical that any uncertainties over compliance with Senate Document 80 and the 1939 Reclamation Project Act be resolved before finalizing the EIS, as the outcome could dramatically alter the EIS's analyses and conclusions.

Senate Document 80 states that the Colorado Big-Thompson Project "must be operated in such a manner as to most nearly affect the following primary purposes:

1. To preserve the vested and future rights in irrigation.
2. To preserve the fishing and recreational facilities and the scenic attractions of Grand Lake, the Colorado River, and the Rocky Mountain National Park.
3. To preserve the present surface elevations of the water in Grand Lake and to prevent a variation in these elevations greater than their normal fluctuation.
4. To so conserve and make use of these waters for irrigation, power, industrial development, and other purposes, as to create the greatest benefits.
5. To maintain conditions of river flow for the benefit of domestic and sanitary uses of this water."

DEIS at 1-42.

The WGFP's proposed prepositioning, because it will allow more water to be pumped from Windy Gap into Lake Granby and from Granby into Grand Lake, will increase sediment and nutrient loads in the latter, aggravating an existing problem and violating primary purpose #2, above, regarding preserving fishing and recreational facilities.

Furthermore, there are other features of prepositioning that must be considered as they relate to Senate Document 80. Prepositioning will require storage of C-BT water in Chimney Hollow where, at some point, it will be converted to Windy Gap water. But Senate Document 80, in its project description, identifies only three Front Range Storage facilities – Carter Lake, Horsetooth Reservoir, and Arkins Reservoir. No other storage facilities are mentioned. While Reclamation does indicate that "implementation of prepositioning may require modification or replacement of the existing conveyance and storage contract between Reclamation, the Subdistrict, and the NCWCD" (DEIS, page 1-42), it is far from clear whether, under Senate Document 80, storing C-BT water would be allowed at all in Chimney Hollow. Reclamation has defended the prepositioning concept elsewhere, by using Boulder Reservoir as an example of a Front Range reservoir not mentioned in Senate Document 80 that stores C-BT water. This example is not compelling, however, in that Boulder Reservoir, a terminal facility, is storing C-BT water for owners of C-BT shares.

Other groups, most notably Grand County, the Colorado River Water Conservation District, and Northwest Colorado Council of Governments, have raised a host of additional issues related to prepositioning (*see, e.g.,* letter to Richard K. Aldrich,

Office of Solicitor, March 22, 2004). For example, these groups argue that prepositioning, because it depends on storing C-BT water in Chimney Hollow, eventually exchanging it for Windy Gap water and thereby increasing the yield of WGFP, gives Windy Gap the benefit of some of the 52,000 AF of replacement water in Green Mountain Reservoir, a situation never contemplated by Senate Document 80 and, therefore, illegal.

The DEIS must review whether the operation of the project would violate any of the provisions of Senate Document 80 or any other agreement or requirement, e.g., the Blue River Decrees, that affect the operation of the C-BT Project. In the DEIS, Reclamation agrees that it needs to do this, but suggests this will only occur after the completion of the EIS (DEIS, pages 1-42 & 1-43).

We believe strongly that the EIS is the appropriate place to identify and analyze all of the existing agreements and constraints that pertain to Windy Gap and disclose to the public whether there will be a need to modify them in order to operate the project. In addition, the EIS must include in the baseline conditions a summary of all in-stream flow and by-pass flow requirements that control the affected streams, and must evaluate the impacts to those flows and delivery requirements. The DEIS's failure to identify and analyze all existing agreements and constraints is repeated inside the hydrologic analysis (*see* page 36 of these comments). There, the DEIS provides only averaged or snapshot assessments and fails to assess the full impact of hydrologic regime changes at a temporal and spatial resolution sufficient to evaluate habitat, aquatic, and morphologic impacts.

WGFP Must Comply with the Federal Water Supply Act

The WGFP must comply with the federal Water Supply Act (WSA), which will require congressional approval for the proposed inter-connected use of the C-BT. The WSA requires congressional approval for major conversions of existing "Federal navigation, flood control, irrigation, or multiple purpose projects" to municipal and industrial water uses. *See* 43 U.S.C. § 390b(a), (b), (d). Determining whether a project's uses are modified focuses on the *purposes* for which the federal reservoir is used. *See Southeastern Federal Power Customers, Inc. v. Geren*, 514 F.3d 1316, 1324 (D.C. Cir. 2008).

Modification of a federal reservoir project to include municipal and industrial uses, regardless of cost, requires congressional approval where such modification would: "[(1)] seriously affect the purposes for which the project was authorized, surveyed, planned, or constructed, or . . . [(2)] involve major structural or operational changes . . . ." 43 U.S.C. § 390b(d).

As provided in SD 80, Congress authorized construction of the CBT to bring water from the Upper Colorado River basin to Colorado's eastern slope to benefit lands in need of "supplemental irrigation" and to meet the "primary purposes" noted previously. The WGFP's proposed use of CBT, especially through the proposed prepositioning concept, would (1) seriously affect "the purposes for which the project

was authorized, surveyed, planned, [and] constructed" and (2) constitute a "major structural or operational change" of the CBT project. Thus, pursuant to the WSA, the WGFP requires congressional approval. The DEIS must be revised to address this.

The DEIS Fails to Analyze All Similar and Cumulative Actions and Impacts

An additional issue, also noted only briefly in the DEIS, is the overlap in the list of NISP and WGFP participants. *See* Table 3, at page 14 of these comments. For example, Erie, Evans, Fort Lupton, Lafayette, and Central Weld County Water District are involved in NISP and WGFP. If any of these communities' needs could be met through another project or projects (or an alternative to one of the currently proposed projects) it could obviate the need for their participation in WGFP.

The above example highlights a much more important issue: **the DEIS fails to discuss the connection between the WGFP and many other proposed projects that would either provide water to satisfy the same or similar northern Front Range water demands and/or tap into water from the Upper Colorado River**. The WGFP and these other proposals cannot be analyzed in isolation; to do so runs afoul of NEPA's requirement to analyze "cumulative" and "similar" actions.[77] While the DEIS does discuss some "water-based" related actions (DEIS at 2-42), the list is far from complete.

Three distinct elements must be analyzed. First, the regional water demands of many northern Colorado Front Range communities must be considered in a single NEPA process, rather than segmented into separate NEPA documents on separate project proposals, headed by separate federal agencies. Only when considered together can the applicant and lead federal agency be clear about the need for the currently proposed project, in light of other projects designed to meet similar needs.

Second, the DEIS also fails to analyze the direct, indirect, cumulative, and connected impacts that would result from new growth (e.g., commercial and urban development) facilitated by WGFP. NEPA regulations, specifically 40 C.F.R. §1508.25, and court decisions make clear that environmental analyses pursuant to NEPA must consider future actions that are "reasonably foreseeable" even if they are not yet proposals and, by themselves, may never trigger NEPA-review requirements.[78] This includes activities on both public and private land[79] and includes land-use and development decisions to be made by the project participants.

Third, the WGFP, other project proposals, **as well as existing projects**, have cumulative impacts on the Colorado River that must be fully analyzed. For example, the existing Windy Gap project, CBT project, and Moffat Tunnel all divert large volumes of water from the Upper Colorado River, with consequent impacts on streamflows, the environment, recreation, wastewater dilution flows, opportunities for municipal growth, and the quality of life on the western slope (for residents there as well as visitors). Recent

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[77] 40 C.F.R. §1508.25(a)(2). *See Thomas v. Peterson*, 753 F.2d 754, 759 (9th Cir. 1985).
[78] *Fitiofson v. Alexander*, 772 F.2d 1225, 1245 (5th Cir. 1985).
[79] *Natural Resources Defense Council v. U.S. Forest Service*, 421 F.3d 797, 815-16 (9th Cir. 2005).

proposals, including the WGFP and Moffat Tunnel Expansion, would only add to these impacts. NEPA is clearly designed to require analysis of these cumulative impacts, but the WGFP DEIS does not yet undertake sufficient analysis.

5. Construction Costs

Over the last five years, construction costs have risen dramatically. These costs have been driven upwards by fuel costs; the cost of raw materials such as steel, cement, and precious metals; and labor costs. Although in the last few months, construction costs have fallen slightly as a result of lower fuel costs and slowing demand, they have not declined to pre-2005 levels. Higher construction and capital costs provide an additional incentive for cities to invest in conservation and water use efficiency measures. As noted in WRA's comments on Conservation and Efficiency, each of the Windy Gap participant cities could achieve additional water savings.

Various factors, including rising fuel costs and rising worldwide demand, have driven construction costs upward considerably in recent years. These cost increases have exceeded the average inflation rate. As a result, many public works projects have, in the end, cost substantially more than originally projected. In the following sections, we provide a methodology and rationale for the Bureau of Reclamation to re-estimate the capital costs of the WGFP. We recommend that Reclamation re-evaluate conservation and efficiency measures, many of which are cost-competitive with the updated capital costs of the WGFP.

Background: Commodities and Labor Price Trends

The price of key elements in construction – iron, steel, cement, and copper – escalated dramatically between 2003 and 2007. Although the price escalation slowed in 2008 and fell slightly in the last few months, prices are not expected to fall to the levels seen during the 1990s or early 2000s. The Producer Price Index (PPI), developed by the Bureau of Labor Statistics, provides a benchmark for the cost of various commodities and industries. Between December 2003 and January 2008, the PPI for inputs to construction rose 30.4%, while the Consumer Price Index (CPI) rose 14.5%.[80] The cost increases have been driven in large part by increasing demand for raw materials in China and other rapidly developing countries; these countries' demand is not likely to wane in future years. (Table 7 presents annual price escalation rates of key commodities from 1986 to 2007; Figure 7 and Figure 8 illustrate the PPI for major inputs to construction and the CPI.)

[80] Simonson, Ken, March 2008. *AGC Construction Inflation Alert*, The Associated General Contractors of America, http://www.agc.org/galleries/econ/AGC_CIA08_webFinal.pdf.

Table 7. Annual Price Escalation of Key Construction Commodities.[81]

Commodity	Average Annual Escalation from 1986 – 2003	Average Annual Escalation, Dec. 2003 – April 2007	Escalation during the period Dec. 2003 – April 2007 As a Ratio of Recent Historic Average
Copper	3.30%	69.20%	21x
Cement	2.70%	11.60%	4.3x
Iron and Steel	1.20%	19.60%	16.3x
Heavy Construction	2.20%	10.50%	4.8x

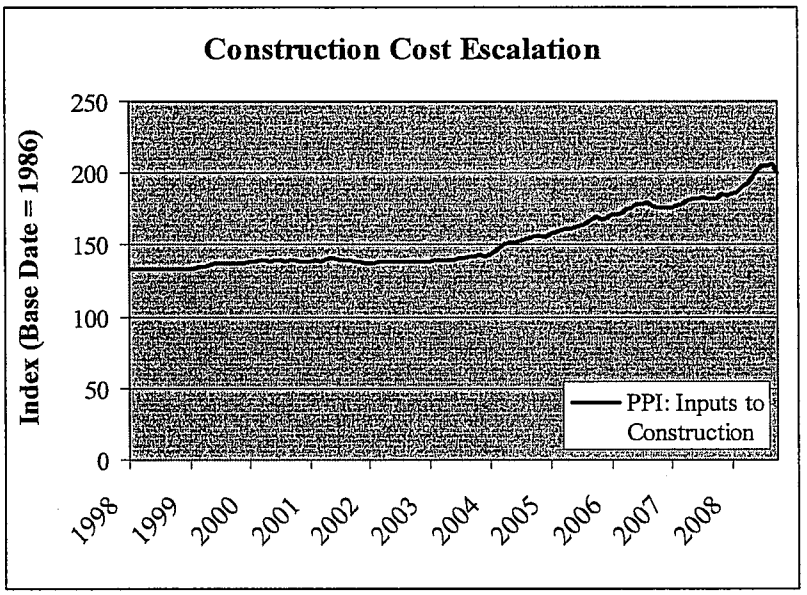

Figure 7. The Producer Price Index (PPI) of Inputs to Construction has risen sharply since 2004. The rise has outpaced inflation (see the Consumer Price Index (CPI) in the following figure). Data from the U.S. Department of Labor, Bureau of Labor Statistics. Retrieved on November 20, 2008.

[81] Table adapted from Synapse Energy Economics, Inc, 2008. *Don't Get Burned: The Risks of Investing in New Coal-Fired Generating Facilities*. Data from the Appalachian Power Company, testimony to the West Virginia Public Service Commission.

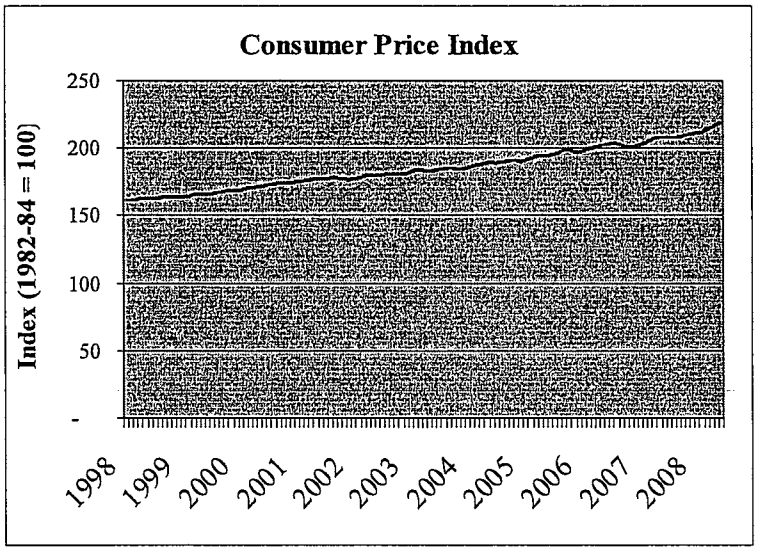

Figure 8. Consumer Price Index (for average cities, all commodities) over the period 1998 – 2008. The CPI serves as a benchmark for inflation. Data from the U.S. Department of Labor, Bureau of Labor Statistics. Retrieved on August 13, 2008.

Accurately estimating capital costs is essential – typically, agencies use the CPI or alternate measures of inflation to project future costs. As shown in Figure 7 and Figure 8, however, the cost of construction materials has escalated at a much faster rate than inflation. According to the chief economist of the Associated General Contractors of America, the growing disparity between the CPI and the PPI for construction materials "has meant that public owners have increasingly had to defer, redesign or cancel projects for which they did not budget enough money in 2003 or 2004."[82]

The experiences of other agencies in recent construction projects underscore the importance of accurately estimating costs. Construction costs for the Elkhead Reservoir expansion, completed in 2007 in Western Colorado, were originally estimated at $20 million.[83] By the time of completion, total costs had escalated to $30 million, 50% more than the original cost.[84] Similarly, the State of Utah estimated the capital costs of its proposed Lake Powell pipeline at $585 million in 2005.[85] In June of 2008, the state published a revised construction cost estimate of $1.064 billion – almost double the original cost, just 3 years later.[86]

In addition to the cost of raw materials, the cost of labor has risen, and is projected to continue rising. Wages for non-residential construction projects are projected

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[82] Simonson, Ken, March 2008.
[83] Roehm, G. W. 2004. Management plan for endangered fishes in the Yampa River Basin and environmental assessment. U.S. Fish and Wildlife Service, Mountain-Prairie Region (6). Denver. p. 75.
[84] Colorado River Water Conservation District, Elkhead Reservoir Enlargement Project website, http://www.crwcd.org/page_28, viewed August 14, 2008.
[85] Water Delivery Financing Task Force, September 2005. Water Delivery Financing Task Force Report: Financing the Lake Powell Pipeline and Bear River Projects.
[86] Utah Department of Water Resources, June 2008. *Lake Powell Pipeline Opinion of Probable Costs*, http://www.water.utah.gov/LakePowellPipeline/ProjectUpdates/default.asp.

to rise 4.5 – 5.5% in 2008, and 5 – 6% in subsequent years. Furthermore, large, heavy industrial projects are likely to have the greatest increases in labor costs. This is an essential factor in estimating total construction costs, as labor typically comprises half of a project's total costs.[87]

A Reasonable Revised Construction Cost Estimate

To underscore the impact of rising construction costs, we present revised estimates of the costs of Reclamation's proposed action. The Bureau of Reclamation estimated the cost of its proposed action at $223.4 million (2005 dollars).[88] We estimate construction costs under several alternate scenarios:

1.) A Baseline scenario, in which construction costs are escalated at the rate of inflation (assumed to be 3.15% annually, the rate of increase of the Consumer Price Index from 2004 to 2008).
2.) The Bureau of Reclamation's composite index for cost escalation over the period 2004 – 2007 (6.0% annually).
3.) An "Elkhead Reservoir" scenario, in which total project costs are 50% higher at project completion than original estimates.

For all alternate scenarios, costs are in 2008 dollars.

The impact of higher rates of cost escalation is substantial, as shown in Table 8, below. Given the Bureau's own observed cost increases over the last four years, the proposed action could cost an additional $43 million dollars (19% more than the Draft EIS estimate), if construction were to begin in 2008. By the time construction could likely begin (in 2010 or later), costs will be even higher. This estimate compares favorably with a statement in the Draft EIS: "Reservoir construction costs are estimated to have increased about 17 percent since the 2005 cost estimate."[89]

We suggest the escalation rate of 6.0% annually reflects a conservative estimate – the cost of steel rose at 7.4% annually, and the cost of cement rose almost 10.2% annually. For reference, Table 9, below, lists recent annual cost escalation rates for different types of projects for the Bureau of Reclamation. Before issuing its Final EIS, the Bureau should provide project participants with revised cost estimates. These costs should be compared to the cost of non-structural alternatives, including conservation and other short or long term leasing agreements.

[87] Simonson, Ken, March 2008.
[88] Draft EIS, p. 2-55.
[89] Draft EIS, p. 2-25.

Table 8. Estimated WGFP costs under different price escalation scenarios. All scenario cost estimates are in 2008 dollars, except the Draft EIS estimate (which is in 2005 dollars).

Escalation Rate Scenario	Annual Escalation Rate	Real Escalation Rate*	Total Project Cost (2008 dollars)	Difference, Scenario Estimate – Draft EIS Estimate	Difference, as a percent of the Draft EIS Estimate
Reference Point: Draft EIS Estimate	-	-	$ 223,400,000†	-	-
1. Baseline Escalation – CPI	3.15%	0%	$ 245,200,000	$ 21,800,000	10%
2. Bureau of Reclamation's Observed Escalation	6.0%	2.85%	$ 266,000,000	$ 42,600,000	19%
3. Elkhead Reservoir Scenario	-	-	$ 335,100,000	$ 111,700,000	50%

*The Real Escalation Rate accounts for the rate of inflation, which we assume to be 3.15%.
† The estimate in the Draft EIS reflects 2005 dollars.

Table 9. Recent escalation factors for major Bureau of Reclamation projects.[90]

Bureau of Reclamation	Average Annual Escalation Rate, 2004 – 2008*
Concrete Dams	6.9%
Pumping Plants	5.3%
Steel Pipelines	4.5%
Primary Roads	7.2%
Composite Index	**6.0%**

*Average annual escalation rates for the Bureau are for the period January 2004 to January 2008.

Other Economic Factors

The recent economic downturn could have several important implications for the Windy Gap Firming Project. Primarily—as described in prior comments on **Project Purpose and Need** and **Conservation and Efficiency**—the rate of housing foreclosures in some of the participating cities has been among the highest in the state and, indeed, the nation. Given the depth of the economic slow down, population growth rates used in the Draft EIS likely overestimate *actual* rates of growth, potentially saddling existing residents with a capital-intensive water project. Secondly, the 2008 credit crisis has made funds for all projects less available. Six of the WGFP participant cities – representing 48% of the total project costs – anticipate paying for the project through debt financing or a combination of cash and debt financing.[91] In order to secure funding, these participants

[90] Bureau of Reclamation, Technical Service Center, *Construction Cost Trends*, 2004 to 2007, and 2008, http://www.usbr.gov/pmts/estimate/cost_trend.html.
[91] Draft EIS, Table 3-138, p. 3-280. Broomfield, which will pay for approximately 28% of the total project cost, will use a combination of cash and debt financing.

may face higher bond rates, increasing the long term cost of the project. This eventually is especially true for the participants who will use tap fees (i.e., funds directly tied to real estate development) to repay bonded debt.

Conclusions on Construction Costs

In recent years, the cost of construction has risen dramatically. Prior to issuing a Final EIS, the Bureau of Reclamation must re-estimate the cost of WGFP alternatives. The DEIS notes that the cost of reservoir construction has risen 17% since original estimates[92] – by the time construction commences, costs may likely be significantly higher.

Substantial uncertainty surrounds future costs and financing. The 2007-2008 economic downturn has had global ramifications; demand for raw materials has fallen worldwide, and has been accompanied by falling prices, but the recent collapse of the finance sector in the U.S. makes loans and other financing arrangements uncertain, and likely to stay that way well into 2009. This level of uncertainty provides additional reason to invest in water conservation measures.

Using our revised estimate of conservation savings and participants' total demands, firm water supplies are sufficient for WGFP participants through 2030, and other proposed regional projects will meet demands through 2050. Given this, investing in an expensive construction project seems unwarranted. Furthermore, in an uncertain economy, conservation measures represent a robust, risk-averse strategy for water utilities to meet their future demands. Although conservation measures also require an up-front investment, they do not incur long-term debt. Furthermore, if population and demand for water supplies do not grow as rapidly as projected, cities will not be saddled with unnecessary, long-term debt burdens.

6. Hydrology, Modeling, Water Quality, Stream Morphology

Background

The DEIS purports to assess and summarize impacts on river flows. The tone of the assessment, however, is primarily of a supply infrastructure nature: average existing and predicted flows are reported, and objectives are reported in simple terms of in-stream flows or outdated sediment transport assessments. As a general matter, the DEIS does not assess natural system needs—the morphologic, aquatic and habitat needs—in terms of magnitude and variability using contemporary methods. Without this assessment it is impossible to determine whether the predicted changes will have a significant impact on factors such as channel aggradation or fish habitat. As a result, it is premature for the DEIS to provide any conclusive statements as to whether the morphologic, aquatic and habitat needs are preserved or impacted.

[92] Draft EIS, p. 2-25.

Flow Modeling is Inadequate

Upper Colorado River flows change on a day-to-day, and even hour-to-hour basis. The DEIS, however, lumps flows into averages. Thus, it masks the potential for short-term critical periods of elevated stream temperatures, the lack of sufficient peak flows for channel maintenance, and reduced flows dropping below critical thresholds for short, but significant periods. The DEIS fails to take advantage of contemporary information and methods accounting for short term variability associated with the Upper Colorado River system. This prevents the DEIS from being a valid assessment of WGFP impacts.

Phase 3 of the Grand County Stream Management Plan will include analysis of daily flows and variability prescriptions. It should be used as a tool to refine and improve the DEIS.

Stream Morphology

Assessment of whether the WGFP will push flows below levels critical for stream-channel maintenance flows cannot be adequately assessed because the WGFP DEIS lacks sufficient analysis to assess the changes in critical flow patterns. Examples include:

- Table A-15: recurrence intervals at the upper end span a wide range (10-year to 25-year). There is, however, considerable difference in the channel maintenance provided by flows of these recurrence intervals and no indication as to the distribution within these recurrence intervals. Schmidt and Potyondy (2004) recommend a 25-year interval flow so that less than 1% of sediment is left in channel, and note that limiting flushing flows to a 5-year interval will leave 10% of sediment load in the channel, contributing to stream aggradation.

- The DEIS uses potentially misleading statements regarding recurrence of peak discharges. For example, the DEIS reports that the 2-year peak discharge would decrease from 4% to 3% of the time, resulting in the 2-year peak discharge occuring 1% less frequently. However, summarizing changes in flow-occurrence, the percentage of days in the season for which the flow occurs, in this manner will tend to mislead the reader into believing there is no significant impact. In several places the DEIS dismisses changes, such as from 4% to 3% of the season, as inconsequential (Windy Gap DEIS, Table 2-6 p. 2-57 and Table 2-7 p. 2-68). Stated as a 1% change, the impact may appear insignificant, but it is a significant portion of the total number of days during which the flow does occur. For example, during a 100-day season the number of days with the target flow would drop from 4 to 3 times, a 25% drop in flow occurrence. For the assessment of stream impacts, the DEIS needs to consider impacts in the more relevant terms of the number of days that the flow occurs, rather than the percentage of the season.

- The DEIS refers to a 450 cfs flushing flow, based on calculations performed by Ward (1981), produced for the NCWCD. This single flow-level target does not

provide the range of flows necessary for channel maintenance, and is considerably less than high flows recommended using more recent methods (e.g., Schmidt and Potyondy (2004)).

Water Quality

Similar analytic shortcomings exist for water quality. For example:

- The DEIS identifies the Upper Colorado River as a gaining stream, with ground water flowing into the river from adjacent alluvium and bedrock (Water Resources Technical Report, p. 35). Bedrock ground water quality is of lower quality than the river water. The DEIS assesses potential for impact by pointing out that the average stage decrease will be on the order of inches. However, the DEIS fails to consider the potential impacts when the minimum 90-cfs flow occurs, with considerably larger stage decreases, greater potential for ground water influx and reduced dilution capacity of the river.

- The DEIS fails to stress that the impact on water temperatures are significant, potentially reaching a tipping point. Water temperature increases are evaluated on a snapshot basis for averaged flows for essentially two different conditions (WGFP DEIS, p 3-116). These average temperatures are reported as being a 0.6 degree Celsius increase (~ 1 degree Fahrenheit). The DEIS reports that MWAT values are not exceeded for an average July 25th day. However, there are at least two other critical issues to consider: (1) these numbers are based on predicted temperatures based on median values, and (2) when the 90 cfs flow condition is considered, temperatures do exceed the MWAT value of 18.2 degrees Celsius. Considering the uncertainty of the various calculations, it seems quite probable that the flow-regime changes would push temperatures past threshold levels.

References for this sub-section

Schmidt, Larry J.; Potyondy, John P. 2004. Quantifying channel maintenance instream flows: an approach for gravel-bed streams in the Western United States. Gen. Tech. Rep. RMRS-GTR-128. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 33 p.

Ward, T.J. 1981. Analysis of Aggradation and Degradation below Proposed Windy Gap Reservoir, Colorado River. Research Institute of Colorado, Fort Collins, CO. Submitted to Northern Colorado Water Conservancy District.

Ward, T.J. and J. Eckhardt. 1981. Analysis of Potential Sediment Transport Impacts below the Windy Gap Reservoir, Colorado River. Aquatic Resources Management of the Colorado River Ecosystem, Edited by V. Dean Adams and Vincent A. Lamarra. Ann Arbor Science.

7. Energy Use

According to the Draft EIS, all of the WGFP alternatives will generate more electricity than under current conditions. To maximize this potential, WRA supports in-conduit hydropower generation. The Draft EIS notes that because the Windy Gap Project has *not* historically generated as much power as it was expected to, WAPA has been forced to purchase power from other sources—primarily coal fired power plants—to replace the Windy Gap power.[93] Furthermore, the DEIS notes that with the additional WGFP generation, WAPA will reduce some of its coal-based electricity purchases. Although the WGFP will only provide a small amount of additional, annual power generation, we recommend that WAPA commit to reducing its coal-based electricity purchases by that amount. And, if or when the opportunity arises, we encourage WAPA to re-power its in-conduit hydro facilities, in order to maximize the power generated by water deliveries.

8. Range of Alternatives: No Action Alternative and Supply Options

As noted in Section 2 of these comments, the DEIS's artificially constrained Purpose and Need statement resulted in screening-out alternatives for meeting the water supply needs of the participating municipalities. The DEIS notes that the criterion used "did not eliminate potential reservoir storage alternatives, but did eliminate other types of alternatives." DEIS at 2-3. These alternatives include, but are not limited to, increasing levels of water conservation and transferring water in the South Platte basin from agricultural to municipal use. Adjusting the Purpose and Need statement to more accurately reflect the purpose of helping meet municipal water demands would enable a broader range of alternatives in the EIS.

Notably, a DEIS over 500 pages long gave scant mention of the option of meeting municipal water needs through water transfers from agriculture. DEIS at 2-6. The DEIS summarily concluded interruptible supply contracts "do not provide a long-term reliable supply of water." *Id.* Missing from this analysis was any analysis of fallowing arrangements or permanent acquisition of water from agricultural, both of which would provide a "long-term reliable supply." The DEIS must address this deficiency.

The DEIS should incorporate analysis by WRA and Save the Poudre Coalition related to the proposed Northern Integrated Supply Project (NISP), the "Healthy Rivers, Healthy Communities" report. *See* http://www.savethepoudre.org/eis_documents.html The "Healthy Rivers" alternative provides a template for meeting municipal water demands that could apply just as easily to WGFP participants as to NISP participants (as noted previously, there is a larger overlap in potential beneficiaries).

Further, for the No Action alternative the DEIS must do more than suggest most participants have no alternative plan for meeting future water demands. The DEIS notes that Longmont would pursue enlarging Ralph Price Reservoir and that Lafayette would

[93] Draft EIS, p. 3-279.

dispose of Windy Gap units and not pursue future units (DEIS 2-15). Many WGFP beneficiaries do have other contingencies, including relying upon the NISP, which would meet demands during the planning period.

9. Aquatic and other Environmental Impacts

WRA directs the BOR (and incorporates into these comments by reference) comments on aquatic and environmental impacts submitted by Grand County, Trout Unlimited, Northwest Colorado Council of Governments, and others. In short, there are considerable aquatic and environmental issues that have not been adequately addressed in the DEIS.

10. Mitigation

Mitigation for any environmental impacts is a key element of any NEPA process. However, the WGFP DEIS does not commit to any mitigation. Though several mitigation measures are discussed, it is clear there are no commitments to implement mitigation. The DEIS notes "inclusion of these mitigation measures does not imply that all measures listed will be implemented" and that mitigation measures are "under consideration." DEIS at 3-292.

By suggesting that evaluation of additional mitigation possibilities "will be conducted between the release of the DEIS and the preparation of the Final EIS" the BOR has made public comment impossible. At this stage, the DEIS simply has insufficient certainty of proposed mitigation to allow required public comment.

***

Thank you for your attention to these comments. We look forward to discussing them further.

Barbara J.B. Green
Phone: 303-355-4405 Fax: 303-322-5680
lawgreen@earthlink.net

December 29, 2008

VIA EMAIL: WTULLY@gp.usbr.gov
Mr. Will Tully
Bureau of Reclamation Eastern Colorado Area
11056 West County Road 18E
Loveland, CO 80537-9711

VIA EMAIL: chandler.j.peter@usace.army.mil
Mr. Chandler Peter, P.E.
Denver Regulatory Office
U.S. Army Corps of Engineers
9307 South Wadsworth Blvd.
Littleton, CO 80128-6901

Re: Northern Colorado Water Conservancy District, Windy Gap Firming Project
Grand County Cooperating Agency Comments:

Windy Gap Firming Project Draft Environmental Impact Statement

Gentlemen:

This letter was prepared on behalf of our client, Grand County, acting in its capacity as a cooperating agency under the National Environmental Policy Act ("NEPA") for the Windy Gap Firming Project ("WGFP") Draft Environmental Impact Statement dated August 2008 ("DEIS"). This letter synthesizes comments prepared by Lurline Underbrink Curran and Katherine Morris, Grand County; Jeff Clark, Bishop Brogden; Lane Wyatt, Wyatt and Associates; Jean Townsend, Coley/Forrest, Tom Cope and Robert Tuchman, Holme Roberts & Owen LLP; Dave Taussig, White and Jankowski; and Barbara Green, Sullivan Green Seavy LLC. This letter also incorporates by reference all written comments previously submitted by or on behalf of Grand County during the WGFP EIS process, all of which should be included in the administrative record. Such comments include those in the letters listed in Exhibit A, as well as in our letter to you dated March 31, 2008 ("PDEIS Comments"), concerning the WGFP Preliminary Draft Environmental Impact Statement ("PDEIS").

Grand County continues to be concerned that the DEIS, like the PDEIS, fails to satisfy NEPA's fundamental requirement that an environmental impact statement ("EIS") "foster both informed decision-making and informed public participation." *See Colorado Environmental Coalition v. Dombeck,* 185 F.3d 1162, 1172 (10th Cir. 1999); *accord*

EXHIBIT F

Robertson v. Methow Valley Citizens Council, 490 U.S. 332, 349 (1989). None of our concerns with the DEIS is new. The most serious concern continues to be that the DEIS fails to use *existing* (actual) hydrologic conditions against which to measure the impacts of the Windy Gap Firming Project. The Windy Gap Reservoir stream depletions used in the DEIS to describe "existing" stream conditions are over three times greater than actual depletions. Consequently, the percentage of change in depletions at the Windy Gap Reservoir as presented in the DEIS for each alternative are much smaller than the percentage of change in depletions that actually will occur. The DEIS's failure to adequately describe the significance of new stream depletions calls into question all of the analysis of impacts to the aquatic environment likely to occur in the Colorado River. Thus, the DEIS is fatally flawed. This flaw is discussed in more detail, below.

General Comments

1. The Analysis of Impacts Caused by Hydrologic Modifications is Fatally Flawed

Some of the most significant impacts to Grand County result from hydrologic changes associated with flow depletions. The analysis of hydrologic conditions in the DEIS must document changes in magnitude, frequency, duration, timing, and rate of change before the impacts of flow depletions on the aquatic environment can be adequately understood. *See* B.D. Richter, J.V. Baumgartner, J. Powell and D.P. Braun, *A Method for Assessing Hydrologic Alteration within Ecosystems,* Conservation Biology 10(4) (1996). NEPA requires EISs to contain high quality information and accurate scientific analysis. 40 C.F.R. § 1500.1(b); *see also id.* §1502.24. When relevant information is incomplete or unavailable except at an exorbitant cost, the EIS must disclose that the information is incomplete or unavailable and discuss its significance. *Id.* § 1502.22.

To the extent that information on actual impacts to the Upper Colorado River Basin from the existing Windy Gap Project is available or readily obtainable, it should be used in preference to predicted impacts from modeling. Because Windy Gap diversions have occurred primarily in May and June, and only in specific years, the analysis should focus on actual stream conditions when the Windy Gap Project actually operated. An understanding of the actual impacts of the Windy Gap Project requires at a minimum a comparison of pre-Windy Gap Project conditions with *existing* conditions. Only then could predictions of future conditions be potentially reliable. Moreover, it is important to recognize that all models have limitations that information on actual impacts does not:

> I sometimes think we place too much faith in models -- computer programs, or similar patterns -- rather than

> walking the ground, looking, seeing, feeling. Models, rather than improving thought, often impose a barrier to thought. We get so wrapped up in our analogue we forget that *it is reality we seek to describe.*

Utahans for Better Transportation v. U.S. Department of Transportation, 180 F. Supp. 2d 1286, 1290 (D. Utah 2001) (emphasis added).

There are several problems with the way that the analysis of hydrologic impacts has been approached. A discussion of some of the key problems follows. For a more thorough discussion of problems with the model *see Report on Windy Gap Firming Project Hydrology Technical Report* by Bishop-Brogden Associates ("*BBA Report*"), attached to this letter as Exhibit B, and *Memo on Windy Gap Firming Project DEIS Aquatics Resources Technical Report* by Lane Wyatt ("*Wyatt Memorandum*"), attached to this letter as Exhibit C.

1.1 **The significance of hydrologic modifications is under-reported and therefore, the accuracy of the impact analysis is called into question.**

a. The amount of existing diversions are over-reported. The DEIS does not use actual existing diversions to determine baseline conditions, so the "existing" diversions from Windy Gap Reservoir are over-reported. Table 3 on page 22 of the DEIS Water Resources Technical Report states that the existing average diversions at the Windy Gap Reservoir total **11,080** af per year. (See column labeled "Total" and row labeled "Average".) This number is very close to the diversion records maintained by the Office of the State Engineer, so we believe it is reasonably accurate. On Table 3-2 on page 3-9 of the DEIS, however, the "existing" average annual diversions from Windy Gap Reservoir are reported as **36,532** af per year. (See column labeled "Existing Conditions/Average Annual Flow" and row labeled "Windy Gap Diversions.") This is a discrepancy of 25,452 af per year.

b. The percent increase in diversions over existing conditions is under-reported. Because of the failure to use *actual* existing average annual diversions, the percent increase in diversions at Windy Gap for all alternatives is *under-reported.* For example, Table 3-2 calculates the percent difference between "existing conditions" for Windy Gap diversions and Windy Gap diversions for each alternative. For the Proposed Action, Table 3-2 reports that the average annual Windy Gap diversions will be 46,084 af. (See column labeled "Alternative 2/Avg. Annual Flow" and row labeled "Windy Gap diversions".) This number is compared to "existing" average annual flows of 36,532 af to derive an increase of 9,552 af in average annual diversions, which is a percent difference of **26%**. (*See* column labeled "Alternative 2/Percent Diff" and row labeled "Windy Gap

diversions".) However, if the 46,084 af of average annual Windy Gap diversions for Alternative 2 is compared to the *actual* existing average annual diversions of **11,080** af, then the increase in diversions is **35,004** af which is a percent difference of over **300%.** Consequently, the significance of the future depletions that will be caused by the Proposed Action is grossly under-reported.

c. The average annual stream flows below Windy Gap for existing conditions is under-reported. Because of the failure to use the lower *actual* existing average annual diversions, the existing average annual stream flows below Windy Gap Reservoir are under-reported. For example, Table 3-2 reports that the Colorado River below Windy Gap Reservoir is **151,358** af under existing conditions. (See column labeled "Existing Conditions/Avg. Annual Flow" and Row labeled "Colorado River below Windy Gap.") This number is simply the difference between 187,889 af at the Colorado River above Windy Gap Reservoir, and the "existing" diversions of 36,532. If, however, the actual existing average annual diversions of 11,080 are used, then the existing average annual flows below Windy Gap Reservoir would actually be **176,809** af.

d. The percent decrease in annual average stream flows over existing conditions below Windy Gap Reservoir is under-reported. Because of the failure to use the *actual* existing average diversions to calculate existing stream flows below Windy Gap Reservoir, the percent change in stream flows below Windy Gap Reservoir that would result from each alternative are incorrect. For the Proposed Action, for example, Table 3-2 reports that flows in the Colorado River below Windy Gap will be **130,075** af. (*See* column labeled "Alternative 2/Avg. Annual Flow" and row labeled "Colorado River below Windy Gap.") This number is compared to "existing" flows below Windy Gap Reservoir of 151,358 af to derive a decrease in average annual flows of **21,283** af which is a percent difference of **14%** (*See* column labeled "Alternative 2/Percent Diff" and row labeled "Colorado River below Windy Gap".) However, if Alternative 2 is compared to the *actual* existing average annual diversions of **11,080** af and the corresponding existing flow of **176,809** af below Windy Gap Reservoir, then the reported 130,074 af flow in the Colorado River below Windy Gap Reservoir for Alternative 2 represents a decrease in average annual flows of **46,734** af, or a decrease in over **26%**. Consequently, the significance of stream flow depletions that will be caused by the Proposed Action is grossly under-reported.

e. The analysis of impacts to the aquatic environment cannot be accurate. Because the "existing" diversions are over-reported and the percent decrease in stream flows for each alternative is under-reported, the analysis of the impact of these changes to the aquatic environment, recreation and water and wastewater facilities is called into question

1.2 **The model study period is inadequate to evaluate west slope impacts.** A model study period of 1950 to 1996 was used. DEIS at 3-13. This period overstates projected stream flows for the alternatives and therefore understates resulting impacts to the Upper Colorado River Basin. Extending the model study period through approximately 2005 would result in a more accurate representation of water demands, stream flows, reservoir operations, and water administration under drought-year and dry-year conditions, when impacts are more significant. *See* Hydrosphere Resource Consultants, Inc., *Upper Colorado River Basin Study, Phase II* (May 29, 2003) ("UPCO Phase II Report") at 75 (discussing impacts of 2002-2003 drought). The DEIS provides no justification for omitting 2002 from its summary of annual changes in flow for the five driest years. DEIS at 3-17. Additionally, although the Windy Gap water rights might not be in priority during drought years such as 2002, the DEIS provides no justification for ignoring the impact of such conditions when analyzing cumulative effects. *Id.* at 3-14, 3-42.

1.3 **Average annual or monthly flows are not adequate to determine impacts to aquatic environment**. As Grand County has previously pointed out, what is important is not changes in *average* annual or monthly flows or water quality (or predicted water quality on a single day such as July 25), but actual changes in *daily* flows and *daily* water quality, including temperature. Reporting average annual or monthly flows and ignoring other flow factors can mask significant impacts that may occur on a given day or series of days, thereby creating the false impression that environmental impacts are insignificant, because *on average* they appear to be insignificant. The monthly time-step may be reasonable for estimating gross-level changes in yield or reservoir storage, but it is inadequate to address daily fluctuations in river flow, stage, channel width, and other factors that affect the aquatic environment. *See, e.g., id.* at 3-67, Figure 3-29 (exceedances of weekly average temperature standard in Colorado River during July and August 2007).

1.4 **The results of the QUAL2K model are inadequate to describe water quality impacts.** The modeling of water quality impacts by the QUAL2K model are even more problematic. *Id.* at 3-90 to 3-92. Although the DEIS uses disaggregated daily flows for analyzing surface water hydrology, it does not use daily flows for analyzing surface water quality. Instead, conditions on only a single day each year, July 25, were modeled, based on the apparently untested assertion that it represents a worst case analysis. *Id.* at 3-92, 3-141. The DEIS does not adequately explain why, in any given year, a day other than July 25 might not have worse water quality conditions than those modeled for July 25. *See Wyatt Memorandum,* Exhibit C.

2. Violations of Legal Requirements

Whether an environmental impact is significant depends on both its context and its intensity. 40 C.F.R. § 1508.27. "Intensity" means "severity of impact" and is determined by evaluating a number of factors, including "[w]hether the action threatens a violation of Federal, State, or local law or requirements imposed for protection of the environment." *Id.* § 1508.27(b)(10). Here, the Proposed Action threatens violation of such laws and requirements, thereby increasing the significance of the WGFP's environmental impacts, but the DEIS fails to acknowledge these potential violations.[1] A related requirement is that the environmental consequences section of an EIS must discuss "[p]ossible conflicts between the proposed action and the objectives of Federal, regional, State, and local . . . land use plans, policies, and controls for the area concerned. *Id.* § 1502.16(c); *see also id.* § 1506.2(d). Furthermore, when such laws or requirements are violated, heightened scrutiny of environmental impacts is required, which the DEIS also fails to do. *See Maryland-National Capital Park & Planning Comm'n v. U.S. Postal Service*, 487 F.2d 1029, 1037 (D.C. Cir. 1973) ("When . . . the Federal Government exercises its sovereignty so as to override local zoning protections, NEPA requires more careful scrutiny.").

The Proposed Action threatens to violate the following Federal, State, or local laws or requirements (as have operations of the existing Windy Gap Project and the Colorado-Big Thompson Project ("C-BT") in some instances):[2]

2.1 **Senate Document 80.** Requirements of Senate Document 80, including its provisions on "Manner of Operation of Project Facilities and Auxiliary Features" will control WGFP. DEIS at 1-42 to 1-43. Connection of WGFP facilities to C-BT facilities and storage of C-BT water in non-project facilities would require Congress to amend Senate Document 80 because Senate Document 80 does not include Chimney Hollow Reservoir as a C-BT project feature.

a. <u>The Bureau of Reclamation's authority is constrained</u>. Senate Document 80 is the legal foundation of the C-BT Project. Senate Document 80 describes C-BT facilities and conditions to protect the beneficiaries of those facilities, including Grand County. Senate Document 80 contains requirements for use of C-BT water by the Municipal Subdistrict as a supplemental supply on the east slope, use of Green Mountain Reservoir for west slope beneficiaries, and provisions that specifically protect the headwaters of the Colorado River system in Grand County. Senate Document 80 is

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[1] It may be that the applicant intends to comply with all laws and requirements, but the DEIS fails to mention all applicable laws and requirements or the steps that will be taken to ensure compliance. As presented, the Proposed Action would violate several laws and requirements.

[2] Grand County has raised many of these issues in prior letters and meetings, but to no avail. Some of these violations may not necessarily involve environmental protection or land use laws or requirements, but are included because they must be addressed before the Bureau could approve the WGFP.

unique. But for the agreement between the east and west slopes contained in Senate Document 80, the project would not have been built. The 10th Circuit has described Senate Document 80 as "The Document, embodying the salient features of the project, [Senate Document 80] was Congressional sanction for a conciliation of conflicting interests of affected water users on both sides of the Rockies." *United States v. Northern Colo. Water Conservancy Dist.*, 608 F.2d 422, 430 (10th Cir. 1979) *citing*, *United States v. Martin*, 267 F.2d 764 (10th Cir. 1959). The Bureau of Reclamation's ("Reclamation") role in operating the C-BT Project is that of "a trustee responsible for the protection of West Slope interests and delivering water to northeastern Colorado." Consolidated Cases Nos. 2782, 5016 and 5017, Supplemental Judgment and Decree, p. 2 dated February 9, 1978; aff'd by *United States v. Northern Colorado Water Conservancy Dist.*, 608 F.2d 422, 429-30 (10th Cirt. 1979).

b. Any excess capacity contract that Reclamation enters with the Municipal Subdistrict must comply with Senate Document 80.

(1) Reclamation must include terms and conditions in any excess capacity contract to ensure that WGFP operations are consistent with Senate Document 80. Primary purposes of Senate Document 80 that concern Grand County are:

(a) Primary Purpose No. 1 "to preserve the vested and future rights in irrigation"

(b) Primary Purpose No. 2 "to preserve the fishing and recreational facilities and the scenic attractions of Grand Lake, the Colorado River, and Rocky Mountain National Park"

(c) Primary Purpose No. 3 "to preserve the present surface elevations of the water in Grand Lake and to prevent a variation in these elevations greater than their normal fluctuations"

(d) Primary Purpose No. 5 "to maintain conditions of river flow for the benefit of domestic and sanitary uses of this water"

(2) Senate Document 80 requires that to facilitate compliance with the stipulations in paragraphs (j), (k), and (l) a representative may be selected to represent the interests of Grand County and "will be

recognized as the official spokesman of said interests in all matters dealing with project operations affecting Grand County."

(3) Because the WGFP implicates Senate Document 80, through its use of C-BT facilities, the WGFP "deal[s] with project operations affecting Grand County", Grand County must be consulted regarding any determination on whether a C-BT excess capacity or carriage contract can be issued and must consent to any changes in operations to C-BT facilities contemplated by the WGFP.

(4) As Reclamation is aware, similar concerns were expressed by Grand County when Northern was seeking to transfer Operations and Maintenance, including water scheduling from Reclamation to Northern. In his letters dated May 14, June 1, and June 11, 2007 to Eric Wilkerson, Mr. Fred Ore made it clear that any changes in operations would require a "collaborative agreement" among all project beneficiaries due to the unique status of the C-BT Project and the mandates of Senate Document 80. The same rationale applies to the WGFP – Grand County's agreement is required for changes in project operations which includes such a major change in operations that would allow prepositioning.

2.2 **Section 402 of the Federal Water Pollution Control Act ("FWPCA"), 33 U.S.C. § 1342.** Transport of Windy Gap water through Grand Lake is an un-permitted point source discharge of pollutants (including nitrogen, phosphorus, and possibly elevated temperatures) into navigable waters, in violation of the FWPCA.

2.3 **Section 401 of the Federal Water Pollution Control Act ("FWPCA") 33 U.S.C. § 1341.** Section 401 of the FWPCA requires that in connection with issuance of a section 404 permit the State of Colorado certify that the project will not cause violations of State water quality standards. Given the water quality violations that would result from the Proposed Action, a 404 permit could not be issued.

2.4 **Water Conservancy Act, Colo. Rev. Stat. § 37-45-118(1)(b)(II).** The Act requires

> "Any works or facilities planned and designed for the exportation of water from the natural basin of the Colorado river and its tributaries in Colorado, by any district created under this article, shall be subject to the provision of the Colorado river compact, and the "Boulder Canyon Project

> Act.' Any such works or facilities shall be designed, constructed and operated in such manner that the present appropriations of water and, in addition thereto, prospective use of water for irrigation and other beneficial consumptive use purposes, including consumptive uses for domestic, mining, and industrial purposes, within the natural basin of the Colorado River in the state of Colorado from which water is exported will not be impaired nor increased in cost at the expense of the water users within the natural basin. The facilities and other means for the accomplishment of said purposes shall be in incorporated in and made a part of any project plans for the exportation of water from said natural basin of Colorado."

Each of the alternatives includes new "works or facilities planned and designed for the exportation of water from the Colorado River and its tributaries." Accordingly, facilities and other means to protect the Colorado River basin must be part of the project plan and permit conditions for the WGFP.

2.5 **Colo. Rev. Stat. § 37-60-122.2.** These provisions require mitigation of impacts to fish and wildlife.

2.6 **Grand County Areas and Activities of State Interest ("1041") Regulations**. A new or amended 1041 permit is required owing to changes in project participants and operations compared to the Windy Gap Project as originally permitted. Reclamation, however, has stated in the past that a new or amended 1041 permit may not be required for the WGFP and the DEIS continues to state that a 1041 permit will be required only if there is construction of facilities in Grand County.

2.7 **Reclamation Project Act of 1939, 43 U.S.C. § 389.** Section 14 of the Reclamation Project Act of 1939 requires a determination that a contract would be in the best interest of the United States and the project. DEIS at 1-43.

2.8 **Reclamation Act of 1902**. Section 8 of Reclamation Act of 1902 requires that the "Secretary of Interior, in carrying out the provision of this Act, shall proceed in conformity with State law" relating to the use water. *California v. US,* 438 US 645 (1978)

2.9 **Colorado Water Law.** Colorado water law requires a change of the Windy Gap water rights decree from a direct flow right to a storage right. Section 8 of the Reclamation Act of 1902 recognizes Colorado laws on the control, appropriation, use, or distribution of water and requires Reclamation to proceed in conformity with them.

See 43 U.S.C. § 383. Since none of the proposed WGFP east slope reservoirs were covered by the Blue River Decree, a change of C-BT water rights also would be required to store C-BT water in the east slope reservoirs described in the DEIS such as Chimney Hollow.

a. The Expansion of Use Doctrine. To protect water users, Colorado courts read limitations into decrees by implication. One such limitation is that an appropriator may not "**lend, rent**, or **sell** any **excess water** after completing the irrigation of the land for which the water was appropriated." (emphasis added) *Orr v. Arapahoe Water and Sanitation District*, 753 P.2d 1217, 1223 (Colo. 1988). Accordingly, if the original appropriators of the Windy Gap water rights do not have a need for the water, under Colorado law the water must be left in the Colorado River.

Pre-positioning will expand the use of the C-BT water rights. Colorado's statute on changes of use does not allow such expansion to the injury of other water rights. C.R.S. § 37-92-305(3) – (4). In *Twin Lakes Reservoir & Canal Co. v. City of Aspen*, 568 P.2d 45, 50 (Colo. 1977) the Colorado Supreme Court said the expanded use doctrine applies to water rights in the exporting basin of a transmountain diversion. The Proposed Alternative cannot be implemented without a change in the water rights decree

b. The Anti-Speculation Doctrine. Originally, the Windy Gap Project had only six participants. Presently thirteen entities are participating in the firming project, most of which are not those original six entities. *See* Exhibit D, *Windy Gap Ownership and Transfer History*. The Municipal Subdistrict proposes to use its Windy Gap water rights, with priority dates of 1968, 1976 and 1980, to serve new demands by cities that were not entitled to Windy Gap units at the time the project was built in 1985, much less when the rights were originally filed upon (and in the case of the City and County of Broomfield, not even in existence). The Municipal Subdistrict's attempt to serve these new municipalities under its 1968 priority violates Colorado's anti-speculation doctrine because the service of water to these new municipalities was not contemplated at the time the Windy Gap appropriations were made. *City of Thornton v. Bijou Irrigation Co.*, 926 P.2d 1, 37-40 (Colo. 1996) (applying the anti-speculation doctrine to municipal appropriators). Nor does the DEIS disclose any firm contracts for water service. To add these new municipalities to the Windy Gap system, the Municipal Subdistrict must (1) file for a change of water rights to change the place of use for these water rights for these new entities; or (2) seek a decree with appropriation dates reflecting the time at which it had firm contractual commitments to use the water.

2.10 **Water Supply Act.** The Water Supply Act ("WSA"), 43 U.S.C. §390b(b) provides that storage may be included in any reservoir project surveyed or constructed by the U.S. Army Corps of Engineers ("COE") or Reclamation for anticipated future

demand or need for municipal or industrial purposes. However, Section 390b(d) provides:

> Modifications of a reservoir project heretofore authorized, ...to include storage as provided in subsection (b) of this section which would seriously affect the purposes for which the project was authorized, surveyed, planned, or constructed, or which would involve **major structural or operational changes shall be made only upon approval of Congress** as now provided by law. (emphasis added).

The D.C. Circuit Court of Appeals concluded that a settlement agreement between COE, Southeastern Power Customers, Inc., a group of Georgia Water Supply providers and the State of Georgia providing for the reallocation of water stored in Lake Lanier to municipal purposes violated the W.S.A. *Southeastern Federal Power Customers v. Geren*, 514 F.3d 1316 (D.C. Cir. 2008). The Court held that the reallocation of Lake Lanier's storage capacity to local consumption constituted a "major operational change" and thus required congressional approval. *Id.* at 1325. *See also* Order and Memorandum of Decision, Dated September 25, 2008, *Lower Arkansas Valley Water Conservancy District v. United States, et.al*, Civil Action No. 07-cv-0224-EWN-MEH, United District Court for the District of Colorado at 38, "*Re Application of City and County of Denver*, 1989 WL 128576, at *5 (D. Colo. Oct 23, 1989) (noting that an application to change a "water right to a different point of diversion, use and place of use" is '[b]y definition . . . a major operational change that may only be made upon congressional approval").

The C-BT project was approved by Congress to bring water from the western slope to lands on the eastern slope greatly in need of "supplemental irrigation" using the facilities in Senate Document 80. Use of C-BT Project facilities for the delivery and storage of (1) Windy Gap municipal supplies and C-BT water rights (2) in a new 90,000 acre foot non-federal Chimney Hollow Reservoir (3) under the guise of prepositioning, all constitutes "major structural and operational change" and thus congressional approval for all of the alternatives that would rely on the C-BT.

2.11 **Warren Act, 43 U.S.C. §§ 523-525.** Warren Act of 1911 does not allow Reclamation to enter into a carriage contract for non-irrigation water. All of the proposed alternatives presented in the DEIS contemplate that there will be an Excess Capacity Contract between Reclamation and the Municipal Subdistrict. The Warren Act allows Reclamation to contract for the use of excess capacity in reclamation project facilities, but places strict limits on this authority. *Id.*, § 523. In particular, "[e]xcess capacity will

be made available **only for the storage and conveyance of non-project water to be used for *irrigation***...." *Id.*

During the 1980's, Reclamation developed principles to govern transfers of project water, including the use of excess capacity in projects owned by the Department of Interior. *See* Department of the Interior, *Principles Governing Voluntary Water Transactions that Involve or Affect Facilities Owned or Operated by the Department of Interior* (Dec. 16, 1988)("*1988 Principles*.") The policies emphasize that transactions must be agreed to among willing parties and must not adversely affect third parties. *Id.*, Preamble, § 3. The transaction must comply with applicable state and federal laws. *Id.*, § 1

In 2001, Reclamation issued a new policy - WTR-P04 - that specifically addresses contracts for excess capacity in reclamation projects. Reclamation Manual, Policy WTR-P04 (Jan. 10, 2001). The policy begins by reaffirming the 1988 Principles. *Id.*, ¶ 1. It also recites the Warren Act restriction that excess capacity is available only for irrigation. *Id.*, § 5.A (citing 43 U.S.C. § 523). . Policy WTR-P04 recites the Warren Act restriction that: "[e]xcess capacity will be made available **only for the storage and conveyance of non-project water to be used for *irrigation***...." *Id.*, § 5.A (citing 43 U.S.C. § 523) (emphasis added). According to these laws and policies, none of the proposed alternatives presented in the DEIS would be lawful because they will convey non-project water for purposes other than irrigation.

3. Purpose and Need; Range of Alternatives

As Grand County pointed out in its PDEIS Comments, the statement of purpose and need is too narrow, thereby unduly limiting the range of alternatives analyzed. This shortcoming persists in the DEIS, whose narrow range of alternative results in a document that fails to satisfy NEPA's requirement "that agencies take a 'hard look' at environmental consequences . . . ." *Robertson v. Methow Valley Citizens Council*, 490 U.S. at 350 (1989).

The DEIS states that the purpose of the WGFP is "to deliver a firm annual yield of about 30,000 af of water from the existing Windy Gap Project to meet a portion of the water deliveries anticipated from the original Windy Gap Project and to provide up to 3,000 af of storage to firm water deliveries for the [Middle Park Water Conservation District]." DEIS at 1-4. The justification for this purpose is the need "to meet a portion of the existing and future demands of the Project Participants." *Id.* The DEIS estimates future water needs of WGFP participants, which will eventually exceed water supplies available to them, due in part, but only in part, to limited historic yields from the Windy Gap Project. *Id.* at 1-20 to 1-40. What emerges from this information, however, is the

conclusion that even with the WGFP, all the participants are predicted to face significant water shortages in 2050. The total projected water demand for the WGFP participants in 2050 is 251,450 af, with an estimated shortage of 110,688 af, of which 26,138 af[3] would be met by the WGFP (excluding Middle Park Water Conservation District's 429 af of firm yield, since its water demand and shortage are not included in the 2050 totals). *See id.* Table ES-1. WGFP's contribution to meeting participants' 2050 water demand would only amount to 10% of total demand. *See id.* Figure ES-2. The remainder, 84,550 af (34% of total 2050 demand) would have to be met by new water supplies—as yet unidentified—and conservation—as yet unquantified and of doubtful efficacy because it is voluntary. *Id.* Participants' needs, therefore, are not so much to firm Windy Gap Project yields, but to obtain additional water supplies to meet their anticipated needs. *See id.* at 1-37.

Moreover, it is apparent that none of the alternatives in the DEIS will accomplish the stated purpose of the WGFP. Taking into account cumulative impacts, the Proposed Action would firm only about 24,000 af of water. DEIS Tables 3-20, 3-21. This is only 80% of the approximately 30,000 af included in the statement of purpose. The situation would be even worse for Middle Park, which would receive a firm yield of only 429 af, compared to the 3,000 af included in the statement of purpose.

One reason none of the alternatives analyzed in the DEIS satisfies the purpose and need is that the purpose and need is too narrow. Consideration of alternatives is "the heart of the environmental impact statement." 40 C.F.R. § 1502.14. Because of this, agencies may not define purpose and need "so narrowly that it foreclose[s] a reasonable consideration of alternatives." *Davis v. Mineta*, 302 F.3d at 1118. As Reclamation's NEPA Handbook explains,

> This brief statement [of purpose and need] is a critical element that sets the overall direction of the process and serves as an important screening criterion for determining which alternatives are reasonable. All reasonable alternatives examined in detail must meet the defined purpose and need.
>
> A brief background discussion may be included for additional information, as appropriate. . . . This background

[3] This actually overstates WGFP's potential contribution to meeting participants' water needs in 2050. Taking into account cumulative effects, the WGFP firm yield is predicted to be only 23,616 af (excluding 429 af for Middle Park). *See* DEIS Tables 3-20, 3-21. This represents only 9.4% of participants' total water demands.

> discussion should be general and not tied to any specific alternative.
>
> Care must be taken to ensure an objective presentation rather than a justification. A purpose and need statement will generally allow a range of reasonable alternatives. If a purpose and need statement appears to allow only one reasonable solution, the statement and the reasons for rejecting other alternatives should be re-examined and confirmed or revised, as appropriate.

U.S. Department of the Interior, Bureau of Reclamation, National Environmental Policy Act Handbook 8-5 to 8-6 (Public Review Draft: 2000) ("2000 NEPA Handbook"); *see also* United States Department of the Interior, Bureau of Reclamation, National Environmental Policy Act Handbook (Oct. 1990) 4-3 ("1990 NEPA Handbook").

As a result of the flawed statement of purpose and need in the DEIS, the range of alternatives it analyzes is unreasonably narrow. All alternatives - even the so-called "no action" alternative - rely on construction of one or more reservoirs to store water diverted from the Colorado River. The consequence of this, as the DEIS acknowledges, is that "[a]ll alternatives would result in an increase in water diversions from the Colorado River below the Windy Gap Reservoir." DEIS at 3-55. They are merely variations on the same theme. In addition, the DEIS reports that alternatives were excluded from consideration because Congressional approval would be required. Nevertheless, the Proposed Action would also require Congressional approval. Because of this, there is no way to ensure that the least environmentally damaging alternative will be selected as required under the COE's 404(b)(1) analysis.

Finally, the alternatives that are presented do not even make a significant contribution to the water needs used to justify the purpose. On the other hand, a statement of purpose and need such as the following would lead to a broader range of reasonable alternatives, some of which might even be more cost effective than or environmentally preferable to those analyzed in the DEIS: "Meet Participants' existing and future water demands to the extent of 30,000 af per year [or whatever quantity would be appropriate] by measures such as mandatory conservation measures or goals, new sources of water, firming the yield of the Windy Gap Project, and requiring that all Windy Gap water be reused to extinction." The mitigation measures listed below that should have been discussed in the DEIS could serve as alternatives, or parts of alternatives, for analysis.

4. Baseline, Cumulative Effects.

An understanding of baseline conditions in the Upper Colorado River Basin, including those that result from on-going human disturbances, is essential under NEPA. In discussions about the inadequate baseline used to measure impacts in the DEIS, Reclamation has insisted that the word "baseline" is not even mentioned in NEPA. This misses the point. NEPA requires an analysis of existing conditions, whether or not the word "baseline" is used. "Without establishing the baseline conditions which exist [before the Proposed Action occurs], there is simply no way to determine what effect the proposed [action] . . . will have on the environment, and, consequently, no way to comply with NEPA." *Half Moon Bay Fishermans' Mktg Ass'n v. Carlucci*, 857 F.2d 505, 510 (9th Cir. 1988). In this case, existing conditions consist of an aquatic environment that has been significantly altered. Not only does the DEIS fail to explain this, but it does not even accurately describe the existing hydrologic conditions. (*See* General Comments Section, above.)

The Upper Colorado River Basin has been severely degraded by human activities. On average, an estimated 65% of the water in the Upper Colorado River System is diverted to the east slope—a percentage that will increase to 85% if both the WGFP and Denver Water's Moffat Collection System Project are implemented. Graphs presented in Exhibit B, *BBA Report*, visually demonstrate the reduction in average daily stream flows at Hot Sulphur Springs before and after various water projects came online. As a result of such diversions to the east slope, the following impacts have occurred in Grand County in recent years (many of which constitute violations of Senate Document 80), largely due to C-BT and Windy Gap operations:

- reduced water quality in Grand Lake;
- insufficient flows for agricultural irrigators to pump water from the Colorado River;
- insufficient flows for Hot Sulphur Springs to pump water for its public water system;
- insufficient flows to preserve fishing on the Colorado River, despite the instream flow requirements of the June 23, 1980 Memorandum of Understanding;
- insufficient flows in late summer to maintain commercial fish ponds on some ranches;

- high temperatures in the Colorado River above Williams Fork, resulting in fish mortality;
- establishment of the didymo (rock snot) a nonnative algae that creates thick mats of moss that attach to rocks creating nuisances;
- reduction in the number of kayaking days;
- death of cottonwood trees along the river;
- increased nutrient loading and other potential impacts from birds (some nonnative, such as pelicans) attracted to the Windy Gap Reservoir; and
- spread of whirling disease.

Documentation of these conditions may be found in a number of technical reports, including the UPCO Phase II Report and Coley/Forrest, *Grand County: Its Economy & Water Resources* (July 2007).

A more detailed description of past water diversion projects and their resulting impacts (e.g., conditions before and after the C-BT, the Windy Gap Project, and Denver Water's Moffat Collection System project) is necessary to understand how these conditions came about as well as how they can be mitigated. *See Lands Council v. U.S. Forest Service*, 395 F.3d 1019, 1028 (9th Cir. 2004) (holding that EIS for a timber sale "should have provided adequate data of the time, type, place, and scale of past timber harvests and should have explained in sufficient detail how different project plans and harvest methods affected the environment.") As EPA explains:

> The identification of the effects of past actions is critical to understanding the environmental condition of the area. Knowing whether the resource is healthy, declining, near collapse, or completely devastated is necessary for determining the significance of any added impacts due to the proposed project. The NEPA document should consider how past activities have historically affected and will continue to detrimentally affect the resources of concern.

EPA, *Consideration of Cumulative Impacts in EPA Review of NEPA Documents*, EPA 315-R-99-002/May 1999, § 4.3.

A significant shortcoming of the DEIS is that it lacks a detailed description of on-going impacts from past water projects. A description of ongoing impacts to natural hydrologic conditions could enable Reclamation to develop a more defensible prediction of the likely effects of the WGFP, as well as improve the analysis of the incremental impacts of the WGFP when added to other past, present, and reasonably foreseeable future actions. Moreover, a more detailed description is especially important here because of the complex interactions among the various diversions from the Colorado River and its tributaries and the real possibility that implementation of the WGFP could be a "tipping point," resulting in disproportionately greater impacts in the river basin than otherwise would result if WGFP depletions did not occur in an already severely degraded stream system. Finally, a more detailed description would reveal that mitigation of many of the impacts associated with the existing Windy Gap Project could be mitigated by the project proponent through modifications to reservoir diversions and pumping schedules and coordination with the Denver Water Board and Reclamation.

In Grand County, existing impacts are of two kinds. The first result from permanent features constructed for past projects, such as the Windy Gap Reservoir. The second are more dynamic and result from actions that can be modified, such as the timing and quantity of diversions and of releases from reservoirs. Because existing and future hydrologic conditions—particularly the frequency, duration, and magnitude of stream depletions—are controlled, and can therefore be modified by the Municipal Subdistrict, Reclamation, and the Denver Water Board, hydrologic conditions can form the basis for an adaptive management plan that could significantly mitigate both existing and future impacts for the mutual benefit of all. Adaptive management is discussed below under mitigation.

5. No Action Alternative

Like the PDEIS, the DEIS improperly identifies the No Action Alternative (Alternative 1) as the possible future enlargement of the Ralph Price Reservoir by 13,000 af. DEIS 2-14 to 2-18. The DEIS admits that Alternative 1 "was analyzed along with the action alternatives *to provide a basis for comparison.*" *Id.* at 2-14 (emphasis added). As Table 2-6 of the DEIS illustrates, Reclamation uses Alternative 1 to advantage, by making changes in various parameters from the Proposed Action appear insignificant when compared to the changes predicted for Alternative 1. Such an approach is contrary to the purpose behind analyzing a no action alternative:

> In requiring consideration of a no-action alternative, the Council on Environmental Quality intended that agencies compare the potential impacts of the proposed major federal action to the *known impacts of maintaining the status quo*. . . .In other words, the *current level of activity is used as a benchmark.*

Custer County Action Assn' v. Garvey, 256 F.3d 1024, 1040 (10th Cir. 2001) (emphasis added).

It is true that CEQ guidance states that when "choice of 'no action' by the agency would result in *predictable* actions by others, this consequence of the 'no action' alternative should be included in the analysis." Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations, Question 3, 46 Fed. Reg. 18,026, 18,027 (Mar. 23, 1981) (emphasis added). Alternative 1 is not, however, predictable. It is speculative, because there is no assurance that the regulatory authorizations for enlargement of the Ralph Price Reservoir will be received, that Longmont will obtain funding for and actually construct the enlarged reservoir or that water rights will be properly decreed. The environmental impacts of Alternative 1 would need to be analyzed in an EA or EIS. DEIS at 2-17. In addition, a 404 permit from COE and a 1041 permit from Boulder County, as well as county location and extent review and special use review would be required. *Id.* at 2-17, 1-46. Detailed design studies for the enlargement of the Ralph Price Reservoir have not been conducted. *Id.* at 2-17. As a result, specific information on the construction, material requirements, scheduling, and cost is not available. *Id.* "To be a reasonable alternative, it must be non-speculative, and bounded by some notion of feasibility." *Utahans for Better Transportation v. U.S. Department of Transportation*, 305 F.3d 1152, 1172 (10th Cir. 2002) (citations omitted). Alternative 1 fails that test. The No Action Alternative should be maintaining the status quo. If anything, possible enlargement of the Ralph Price Reservoir should be included in the cumulative impact analysis for the no action alternative.

6. Reliance on Illegal Prepositioning

As Grand County has pointed out repeatedly, prepositioning is illegal, among other reasons, because it requires the C-BT project to be operated in violation of Senate Document 80, and requires changes in C-BT and Windy Gap water rights to allow storage in a non-federal facility on the east slope. *See e.g.,* letter dated March 22, 2004 from the Colorado River Conservation District, Grand County and Northwest Colorado Council of Governments to Richard Aldrich and John Chaffin, a copy of which is attached as Exhibit E. These concerns have never been satisfactorily addressed. The January 2007 personal communication with the Colorado State Engineer, who "indicated

that the Proposed Action to deliver and store water in Chimney Hollow Reservoir using prepositioning could be administered in compliance with current water right decrees and within the priority system," does not do so. DEIS at 3-7. The question is not whether prepositioning would pose an impediment to administering water rights under Colorado law, but whether prepositioning violates Senate Document 80 and other federal and state law. Grand County continues to believe that it is illegal.

The request by Reclamation to the State Engineer was misdirected – a declaratory judgment should be obtained. It has long been the law in Colorado that the courts – not the State Engineer - determine use rights in water. ("**Administrative action**, forbearance of enforcement or **State Engineer acquiescence** in water use practice **does not substitute for judicial determination of use rights**." (emphasis added) *Empire Lodge Homeowners' Ass'n. v. Moyer*, 39 P.3d 1139, 1156-7, (Colo. 2001). Moreover, the statement by the State Engineer is wrong. It is not within Northern's, or the Municipal Subdistrict's, or Reclamation's, or the State Engineer's discretion on whether a change of water rights application must be filed – rather it is a mandatory requirement. Colorado's Supreme Court has told the State Engineer and all water users that "[t]he change of water right and augmentation plan statutes provide that **applications for approval of the water use practices** they encompass **are mandatory, not discretionary**." (emphasis added) *Empire Lodge*, 39 P.3d at 1158.

NEPA requires that the lead agency evaluate "all reasonable alternatives." 40 C.F.R. § 1502.14(a). An illegal alternative is not a reasonable alternative. It is only a "phantom alternative." *National Resources Defense Council v. Evans*, 364 F. Supp. 2d 1083, 1116 (N.D. Cal. 2003). Because of the illegality of Alternative 2 and the DEIS's emphasis on it as the Proposed Action, the document fails to inform the public, let alone Reclamation, of a range of reasonable alternatives, thereby failing to promote informed decision making, and ultimately fails to fulfill NEPA's purposes. At a minimum, the DEIS should have analyzed an additional alternative, construction of Chimney Hollow Reservoir without use of prepositioning. This would enable Reclamation to take into account the uncertainty arising from the illegality of prepositioning and also inform the COE's section 404(b)(1) Guidelines analysis.

7. Inadequate Analysis of Socioeconomic Impacts Identified during Scoping

The west slope socioeconomic issues identified during scoping include, among others, "potential impacts to tourism and recreation industries in Grand County" (not just active recreation participants using publicly accessed facilities), "additional cost associated with the potential need to upgrade wastewater treatment plants in the Fraser River and Colorado River basins," and "economic impacts to the communities of Grand Lake, Kremmling and Hot Sulphur Springs and how each alternative would affect future

growth and real estate values." ERO Resources Corp., *Public Scoping Report* 14 (Dec. 19, 2003). While the DEIS addresses some of these potential impacts, its analysis is too narrow and excludes impacts of vital importance to Grand County and its citizens. Therefore, the DEIS fails to take the hard look that NEPA requires.

There are three types of impacts that are excluded from consideration, understated, or ignored in the DEIS's socio-economic analysis: (1) impacts referenced in ERO's Public Scoping Report and not pursued; (2) impacts referenced in the Recreation, Land Use or Visual Impacts sections of the DEIS and not pursued; and (3) impacts mentioned in earlier documents submitted by Grand County but are missing from the DEIS. Many of these impacts are discussed in sections 1.1, 1.2, and 1.3 of the memorandum dated December 15, 2008, from Coley/Forrest, *Windy Gap Firming Project - Draft Environmental Impact Report (DES 08-30)* ("*Coley/Forrest Memorandum*"), attached as Exhibit F.

7.1 **Pervasive Disregard for the Private Sector in Grand County**. Water resources and the local Grand County economy are inextricably linked, as set forth in Coley/Forrest, Inc., *Grand County: Its Economy and Water Resources* (2007) (prepared for Grand County). Although the WGFP directly impacts the environmental quality of the Colorado River, Lake Granby, Shadow Mountain Reservoir, and Grand Lake, there is a pervasive and nearly total disregard in the DEIS for private sector impacts arising from the WGFP's impacts on these surface waters. Some private sector impacts that are ignored include:

- ranchers whose irrigation systems fail due to reduced stream flow in the Colorado River;
- ranchers who rely on fishing leases along the Colorado River;
- real estate and resort developments where a healthy Colorado River is their primary or sole asset;
- lakefront and riverfront properties whose value is directly related to reservoir water clarity and water quality;
- numerous summer recreation-oriented and visitor-oriented businesses including private marinas, local motels, restaurants, recreation gear and apparel retailers, grocers and the like;
- construction-related impacts on adjacent properties and developments.

7.2 **Socioeconomic Impacts Excluded – Recreation.** The most significant exclusion arises from the DEIS's definition of recreation which is limited to active recreation where there is public access. There is a general bias in the DEIS that, if recreation is not active recreation that is accessible by the general public, then it merits no analysis. The only recreation activities quantified in the DEIS are commercial kayaking and commercial rafting on selected portions of the Colorado River and related camping. This is narrow and inadequate. While commercial kayaking and commercial rafting in selected reaches of the Colorado River are a few core summertime visitor activities, there are other more significant recreation activities that bolster the Grand County economy in the summer that are likely impacted by the WGFP. These include:

- commercial and private fishing in locations other than Reach 5 of the Colorado River;
- other commercial and private boating in reservoirs;
- camping in locations other than Reach 5 of the Colorado River, and
- passive recreation enjoyment of the Colorado River and the reservoirs.

Each of these affected recreation activities has related impacts on lodging, restaurant sales, recreation equipment, rental providers, guides or outfitters, and other related purchases.

In the summer, many out-of-state visitors come to Grand County because of Rocky Mountain National Park, a national destination, but they linger because of the fishing, boating, and scenic beauty that Grand County currently offers. The local economy relies on this recreation relationship. The water resources that are compromised by the WGFP are necessary components of Grand County's scenic beauty and tranquility and its more passive recreation venues. (See comments R-1, R-2, R-6 to R-8, R-11 in the attached *Coley/Forrest Memorandum.*)

Further, the DEIS drops certain recreation impacts from further consideration because they are "too difficult to quantify" or "unlikely to affect visitors." These are discussed in section 1.7 of the *Coley/Forrest Memorandum.* This is inconsistent with EPA *Guidelines for Economic Analyses* which provide extensive detail on how to treat qualitative or uncertain impacts. (See comments SE-3 - SE-7, SE-10, and SE-12 in the attached *Coley/Forrest Memorandum.*)

7.3 **Socioeconomic Impacts Excluded – Land Use / Agricultural Impacts.** The Land Use section (3.18) of the DEIS does not acknowledge a relationship between Colorado River hydrology and agricultural land use. Therefore, the DEIS's discussion of socioeconomic impacts does not address this important negative impact. Based on research conducted by Coley/Forrest, there are substantial potential negative relationships between further reductions in Colorado River streamflow and agricultural land uses through irrigation ditch failures, impacts to development directly dependent on river and reservoir views and usage. These are documented in communications with the Grand County ranching community. Coley/Forrest, Inc., *Grand County: Its Economy and Water Resources* (2007) (prepared for Grand County, Colorado). See *also* comments SE-1 and SE-9 in the attached *Coley/Forrest Memorandum.*

7.4 **Countywide Analysis.** The few socioeconomic impacts that are reported in the DEIS are presented on a countywide basis. This approach misses the significance of impacts that may seem small on a countywide basis, but comprise the economic lifeblood of smaller communities and some economic sectors. For example fishing and boating along some reaches of the Colorado River are significant areas of summer economic activity in the relatively small communities of Hot Sulphur Springs and Kremmling. The *Public Scoping Report* expressly mentions concerns about impacts on these communities; the DEIS ignores them.

7.5 **Cumulative Effects Analysis**. The DEIS states that the "cumulative socioeconomic effects were evaluated" but provides only the results of this analysis. DEIS at 3-286. The analytical steps are excluded from the DEIS and the Socioeconomic Technical Resource Report, so it is not possible to analyze the results.

If Reclamation had concluded that the socioeconomic issues identified during scoping were not significant or had been covered by prior environmental review, it was required to include "a brief presentation of why they will not have a significant effect on the human environment or providing a reference to their coverage elsewhere." 40 C.F.R. § 1501.7(a)(3). Therefore, the DEIS must include an analysis of *all* issues identified during scoping or an explanation of why they are insignificant or have already been analyzed. Furthermore, when the DEIS does analyze environmental impacts, it often fails to do so adequately by minimizing or overlooking impacts to Grand County. Such deficiencies are identified in this letter, the comment letters on technical reports, and the other letters that Grand County has submitted.

8. Criteria on Significance

The DEIS reports many impacts in numerical form, often without criteria for determining whether those impacts are significant and without explaining what those

numerical changes mean. For example, we are told that there would be increases in temperature, specific conductivity, ammonia concentrations, inorganic phosphorus concentrations, selenium concentrations, and aquatic plant growth and decreases in dissolved oxygen concentrations in the Colorado River on July 25; and that these changes vary by alternative. DEIS at 3-96 to 3-101. But we are not told what effect these changes would have on aquatic life in the Colorado River or whether any of the changes would be significant. Without knowing whether the changes would be significant or insignificant and the reasons therefore, it is impossible to make an informed comparison of the environmental impacts of different alternatives. Although the DEIS does refer to various water quality standards, they are not necessarily relevant to the issue of significance for purposes of NEPA. To correct this deficiency, the DEIS should include specific criteria for each impact category to determine whether a given impact would be less than significant, potentially significant, or significant, and explain the reasoning behind these conclusions It should also include a discussion of mitigation measures for impacts that are potentially significant or significant.

9. Inadequate Discussion of Mitigation

An EIS must include a discussion of "[m]eans to mitigate adverse environmental impacts . . . ." 40 C.F.R. § 1502.16(h); *see also* 73 Fed. Reg. at 61,316-17 (to be codified at 43 C.F.R. § 46.130). As the Supreme Court recognized, such a discussion is essential to ensure that agencies take a hard look at the environmental consequences of proposed actions. *Robertson v. Methow Valley Citizens Council*, 490 U.S. at 352. Furthermore,

> omission of a reasonably complete discussion of possible mitigation measures would undermine the "action-forcing" function of NEPA. *Without such a discussion, neither the agency nor other interested groups and individuals can properly evaluate the severity of the adverse effects.*

Id. (emphasis added); *see also Colorado Environmental Coalition v. Dombeck*, 185 F.3d at 1173 ("It is not enough to merely list possible mitigation measures.").

Judged by these requirements, the discussion of mitigation in the DEIS is still inadequate.[4] Many of the proposed west slope mitigation measures for the Proposed Action are too vague and uncertain to enable Reclamation, Grand County, or other

[4] The status of one mitigation measure is unclear, because it is found in the Executive Summary, but does not appear to be included in the body of the DEIS. DEIS at ES-21 ("Opportunities for improvements to aquatic life habitat in the Colorado River and mitigation of impacts to fish will be coordinated with CDOW, Grand County and other responsible agencies."), 3-145, 3-293.

interested groups and individuals to evaluate "the severity of the adverse effects." *Robertson v. Methow Valley Citizens Council*, 490 U.S. at 352. Some of the most significant west slope impacts from the WGFP would result, directly or indirectly, from reduced surface water flows. Yet the only proposed mitigation measures for surface water hydrology relate solely to Granby Reservoir. DEIS at 3-55. Even those are too uncertain to qualify as mitigation. Reclamation notes only that "*it may be possible* to modify prepositioning operations" and undertakes to conduct additional evaluations "*to determine if* changes in the timing of water deliveries to the East Slope can reduce impacts to Granby Reservoir while still meeting the purpose and need for the project." *Id* (emphasis added). As a cooperating agency, Grand County is entitled to review and comment on all such proposals and evaluations. *Memorandum of Agreement Between the Bureau of Reclamation and Grand County Board of County Commissioners for the Windy Gap Firming Project Proposed by the Municipal Subdistrict, Northern Colorado Water Conservancy District*, dated effective January 22, 2005 ("MOA"), § V.I.

With regard to surface water quality, Grand County appreciates the Municipal Subdistrict's commitment to continued participation and funding of ongoing nutrient studies in the Three Lakes System. DEIS at 3-129. Although the County also welcomes the proposal to determine whether increasing bypass flows from 90 to 135 cfs when Windy Gap is being pumped would result in reduced downstream temperatures, it is dismayed the Municipal Subdistrict would only "consider increasing required bypass flows under certain water supply conditions" if the studies are favorable. *Id.* As mitigation for recreation and socioeconomic impacts, the Municipal Subdistrict would curtail diversions from the Colorado River if flows at the Kremmling gage are less than 2,200 cfs during the annual Big Gore Race. Id. at 3-253, 3-290. While Grand County appreciates that gesture, the measure would not mitigate impacts to kayaking, rafting, fishing, and other recreational activities on days other than those on which the Big Gore Race are held, nor would it address the other significant socioeconomic impacts to Grand County discussed in these comments. *See also* comment letters dated February 11, 2008 on Draft Recreation Resources Technical Report and Draft Socioeconomic Resources Technical Report; and letter dated February 11, 2008 transmitting Coley/Forrest report on Draft Recreation Resources Technical Report and Draft Socioeconomic Resources Technical Report.

Another deficiency of the DEIS regarding mitigation is that it merely catalogs the mitigation measures included in the 1981 Windy Gap EIS, and does not include an adequate discussion of those measures. *See* DEIS at 1-7 to 1-8. What is needed is a comparison of the impacts predicted in the Windy Gap Project EIS with the actual impacts that have resulted from that project, together with an analysis of whether, and to what extent, the mitigation measures have been effective. For example, the Municipal Subdistrict paid $100,000 for a habitat manipulation project and $450,000 for biological

investigations. The DEIS should have reported on the effectiveness of the habitat mitigation project and what was learned from the biological investigations. *Id.* at 1-7. Another example is the proposal to determine whether increasing bypass flows from 90 cfs to 135 cfs when Windy Gap is being pumped would result in reduced downstream temperatures. *Id.* at 3-129. That study should have been completed before the DEIS was prepared. An analysis of the original Windy Gap mitigation could also provide a basis for Reclamation to determine whether existing mitigation measures satisfied the Municipal Subdistrict's obligation under Colo. Rev. Stat. § 37-45-118(1)(b)(II) for the original Windy Gap Project and to decide what additional mitigation measures would be necessary for the Windy Gap Project or the WGFP.

There are a number of obvious mitigation measures the DEIS should have considered, but does not. More detailed mitigation proposals are contained in Grand County's December 29, 2008 letter to COE regarding the Windy Gap Firming Project 404 Permit Application ("*404 Permit Comment Letter*"). Examples of mitigation that should have been discussed in the DEIS include, without limitation:

- Because Windy Gap water can be reused to extinction, unlike C-BT water, the DEIS should have discussed requiring WGFP participants to reuse to extinction all or a significant portion of their Windy Gap water. *See* DEIS at 1-12, 1-19.

- Although the DEIS rejects water conservation as an alternative, it does not explain why water conservation should not be proposed as an additional mitigation measure. The DEIS does, after all, recognize that "[t]o meet future water requirements will require continued improvements in water conservation in addition to the proposed WGFP." *Id.* at 1-18.

- The DEIS does not consider what would probably be the most effective mitigation measure, adaptive management of the Upper Colorado River. 73 Fed. Reg. at 61,315 (to be codified at 43 C.F.R. § 46.30) ("Adaptive management recognizes that knowledge about natural resource systems is sometimes uncertain."); 61,317 (to be codified at 43 C.F.R. § 46.145) ("Bureaus should use adaptive management, as appropriate, particularly in circumstances where long-term impacts may be uncertain . . . ."). *See generally* The NEPA Task Force Report to the Council on Environmental Quality: Modernizing NEPA Implementation 44-56 (Sept. 2003). In short, this would entail developing a stream management plan with all the major diverters. The plan would include qualitative goals, monitoring to identify whether the goals are being met, and specified triggers to require

changes in operation. A decision-making process would be established to adapt operations to achieve the management plan's goals for the benefit of all parties, when specified. The Grand County Stream Management Plan is the perfect basis for an Adaptive Management Plan.

- The DEIS does not consider integrated operations of the Denver Water Board and the Municipal Subdistrict systems to serve the City of Broomfield, a WGFP participant that wants to firm 13,739 af of water. Since the Denver Water Board and the Municipal Subdistrict both serve Broomfield, it would seem that allowing water to bypass the Denver Water Board diversion points in the headwaters of the Fraser River, be captured in Windy Gap, and then moved through the C-BT system to Broomfield could provide benefits to the Fraser River. Unlike water moved through the Moffat system which cannot be used to extinction, water provided from Windy Gap can be. This measure could provide additional water for the front range.

- The DEIS does not consider upgrading the Windy Gap Substation. Currently, Western Area Power Administration is in the process of preparing an EIS for upgrading a 69kV line to 138 kV from the Windy Gap Substation to the Granby Pump Plant. Prepositioning would require more pumping by a system that may not be able to meet future demands. This potential impact could be mitigated, at least in part, by upgrading the substation.

- Reclamation is a beneficiary of the WGFP through "shrink" water. This water could produce approximately $1.4 million in additional revenue to Reclamation, which could be used to fund the clean up of Grand Lake. If one of the short-term solutions is to draw down Shadow Mountain Reservoir, these funds should also be used to pay for the pumping and power interruption charges, so that no other agency or entity is required to bear any such costs.

10. Cumulative Actions

Cumulative actions are actions "which when viewed with other proposed actions have cumulatively significant impacts and should therefore be discussed in the same impact statement." 40 C.F.R. § 1508.25(a)(2). Although section 1508.25(a)(2) uses the word "should," courts have made preparation of a single EIS mandatory in the case of cumulative actions: "Under § 1508.25, two or more agency actions *must* be discussed in

the same impact statement where they are . . . 'cumulative' actions." *Klamath-Siskiyou Wildlands Center v. Bureau of Land Management*, 387 F.3d 989, 998-99 (9th Cir. 2004) (emphasis added). As explained in *Klamath-Siskiyou*, the environmental analysis must be done in a single document "when the record raises 'substantial questions' about whether there will be 'significant environmental impacts' from the collection of anticipated projects." *Id.* at 999. *See Blue Mountains Biodiversity Project v. Blackwood*, 161 F.3d 1208, 1215 (9th Cir. 1998) (single EIS required for five timber sales in same watershed).

The WGFP and the Denver Water Board's Moffat Collection System Expansion project are cumulative actions. The Denver Water Board proposes to develop 18,000 af of new firm yield to the Moffat Treatment Plant, primarily through diversions from the Upper Fraser River and Williams Fork River basins. DEIS at 2-42. Specifically, flows in the Fraser River and the Colorado River below the confluence with the Fraser will be reduced by average annual diversions of about 9,300 af. *Id.* at 3-42. Other impacts to the Colorado River will result from changes in the timing of flows below the Williams Fork Reservoir due to changes in the operation of the reservoir. *Id.* at 3-46. These impacts to the Colorado River are themselves significant, as are those of the WGFP. Together they are cumulatively significant and therefore must be analyzed in the same EIS.[5] 40 C.F.R. § 1508.25(a)(2). Cumulative impacts to the Platte River basin may also be cumulatively significant.

A single EIS analyzing the impacts of both projects is not a mere formality. Without such EIS, there can be no assurance that Reclamation and COE have, collectively, taken a hard look at alternatives to the simultaneous operation of the WGFP and Moffat Collection System Expansion project, the cumulative environmental impacts of those two projects (with emphasis on the hydrology, water quality, and aquatic resources of the Colorado River), and measures to mitigate those impacts. Here, a single EIS is particularly appropriate, given the complex interrelationships among present and future diversions from the Upper Colorado River Basin. *See Kleppe v. Sierra Club*, 427 U.S. 390, 413 (1976) ("Cumulative environmental impacts are, indeed, what requires a comprehensive impact statement."). Indeed such complexity argues for use of adaptive management, with development of a stream management plan and monitoring to ensure that the operation of both projects contributes to achieving the management plan's goals.

[5] The Environmental Protection Agency also suggested this in its comments on WGFP EIS scoping. Letter dated November 4, 2003, from EPA to the Bureau.

11. Wild and Scenic Designation

The DEIS notes that the Kremmling and Glenwood Springs Field Offices of the BLM analyzed river and stream segments that might be eligible for inclusion in the National Wild and Scenic Rivers System ("NWSRS") and identified several segments in Grand County that are eligible for inclusion. DEIS at 3-233 to 3-234. The DEIS also recognizes BLM's policy that when a river segment is determined to be eligible "its identified outstandingly remarkable values shall be afforded adequate protection, subject to valid existing rights, and until the eligibility determination is superseded, management activities and authorized uses shall not be allowed to adversely affect either eligibility or the tentative classification . . . ." BLM Manual § 8351.32.C (May 19, 1992); see also *id.* § 8351.52.C. But the DEIS fails to take the next step and analyze what effect the alternatives would have on BLM's interim management policy and whether Reclamation should use its own authorities to protect these segments until the eligibility determination is superseded.

In addition, "[o]nce a river is found eligible, the respective agency is committed to evaluate all actions within its control through the filter of the river's potential for designation. Some specific authorities for protecting river-related values include the Clean Water Act for free flow and water quality, the Endangered Species Act for plant and animal species within a river corridor, and the Archaeologic[al] Resources Protection Act for cultural resources." Interagency Wild and Scenic Rivers Coordinating Council, *The Wild & Scenic River Study Process* 30 (Dec. 1999). The DEIS also fails to evaluate the WGFP "through the filter of the river's potential for designation." Instead, it specifically declines to determine whether any of the alternatives would affect the suitability of the eligible segments for inclusion in the NWSRS. DEIS at 3-235.

The Nationwide Rivers Inventory compiled by the National Park Service ("NPS"), available at http://www.nps.gov/ncrc/programs/rtca/nri/states/co.html, includes a 23-mile reach of the Colorado River, from State Bridge to the Blue River. (As of December 4, 2008, the NPS webpage had not been updated to include the 5 segments BLM determined were eligible in March 2007.) "Each federal agency shall, as part of its normal planning and environmental review process, take care to avoid or mitigate adverse effects on rivers identified in the Nationwide Inventory . . . ." Presidential Memorandum for the Heads of Departments and Agencies (Aug. 2, 1979). The DEIS fails to do that. Further, "[a]gencies shall, as part of their normal environmental review process, consult with the Heritage Conservation and Recreation Service [now the NPS] prior to taking actions which could effectively foreclose wild, scenic, or recreational river status on rivers in the Inventory. *Id*; *see also* CEQ Memorandum for Heads of Agencies, Interagency Consultation to Avoid or Mitigate Adverse Effects on Rivers in the Nationwide Inventory, 45 Fed. Reg. 59,190 (Sept. 8, 1980) ("CEQ Memorandum").

Such consultation did not occur. *See* DEIS at 4-4. The CEQ Memorandum also requires that "[w]hen environmental impact statements are prepared on proposals that affect Inventory rivers, the lead agency should request HCRS and the affected land managing agency to be cooperating agencies as soon as the Notice of Intent to prepare an EIS has been published." 45 Fed. Reg. at 59,192. It does not appear, however, that Reclamation requested either the NPS or BLM to be cooperating agencies.

12. Grand County's Status as a Cooperating Agency

In its congressional declaration of policy, NEPA provides that "it is the continuing policy of the Federal Government, *in cooperation with State and local governments* . . . to use all practicable means and measures . . . in a manner calculated to foster and promote the general welfare, to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans." 42 U.S.C. § 4331(a) (emphasis added).

A cooperating agency is any federal, state, or local agency (other than a lead agency) that "has jurisdiction by law or special expertise[6] with respect to any environmental impact involved in a proposal (or a reasonable alternative) for legislation or other major Federal action significantly affecting the quality of the human environment." 40 C.F.R. § 1508.5. A cooperating agency is entitled to active and meaningful participation in preparation of an EIS. The CEQ regulations require a lead agency to "[u]se the environmental analysis and proposals of cooperating agencies with jurisdiction by law or special expertise, *to the maximum extent possible* consistent with its responsibility as lead agency." *Id.* § 1501.6(a)(2) (emphasis added).

Recently promulgated Department of the Interior regulations (based on 516 DM 1-6) also highlight the important role cooperating agencies should play in the NEPA process.[7] For example, "In accordance with 40 CFR 1501.6, throughout the development of an environmental document, the lead bureau will collaborate, *to the fullest extent possible*, with all cooperating agencies concerning those issues relating to their jurisdiction and special expertise." 73 Fed. Reg. at 61,320 (to be codified at 43 C.F.R. § 46.230) (emphasis added). Furthermore, the official of a bureau who is responsible for

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[6] "*Special expertise* means statutory responsibility, agency mission, or related program experience." 40 C.F.R. § 1508.26. Grand County's special expertise includes its 1041 permitting authority and special use permitting authority over the Windy Gap Project and any modifications thereto, as well as substantial knowledge about the west slope environmental impacts associated with the Windy Gap Project and the proposed WGFP, most of which would occur in Grand County.

[7] These regulations apply to the Bureau. *See* 73 Fed. Reg. 61,291, 61,314 (Oct. 15, 2008) (to be codified at 43 C.F.R. § 46.10(a)).

making and implementing a decision and ensuring NEPA compliance "must whenever possible consult, coordinate, and cooperate with relevant State, local, and tribal governments . . . concerning the environmental effects of any Federal action within the jurisdictions or related to the interests of these entities." 73 Fed. Reg. at 61,317 (to be codified at 43 C.F.R. § 46.155).

Grand County is a cooperating agency for preparation of the WGFP EIS pursuant to Memorandum of Agreement Between the Bureau of Reclamation and Grand County Board of County Commissioners for the Windy Gap Firming Project Proposed by the Municipal Subdistrict, Northern Colorado Water Conservancy District, dated effective January 22, 2005 ("MOA"). The MOA recognizes that Grand County qualifies as a cooperating agency because the WGFP may have impacts on the County's environment and may require the County to issue a new special use permit, a new 1041 permit, or amendments to the existing permits. MOA, § I.A, C. Among other things, Reclamation agreed to:

- Identify the County in the EIS as a cooperating agency and summarize its roles and responsibilities as a cooperating agency.
- Be available to discuss with the County any questions or issues related to County jurisdiction and special expertise.
- Use the environmental analyses and proposals of the County, where it has special expertise and jurisdiction, to the maximum extent possible, consistent with Reclamation's responsibilities as the lead agency.
- Prior to inclusion in the EIS, provide to the County for review and comment project information and study results concerning the County's jurisdiction and special expertise,[8] including:

  (1) Draft hydrology and water quality reports, data, and analyses for reservoirs, lakes and stream reaches in Grand County that may be impacted by the project and the analyzed alternatives.

  (2) Draft reports, data and analyses for environmental and social impacts within Grand County due to the project.

[8] Grand County retained the right, however, to comment on all issues relating to the EIS. MOA, § IX.C.

(3) Reports, data and analyses of alternatives to be evaluated in detail in the Draft and Final Environmental Impact Statements ("EISs").

(4) Preliminary draft Chapters of EISs describing existing conditions and impacts within Grand County likely to be caused by the project.

(5) Comment letters on the draft and final EISs that are specific to County data and impacts, for preparation of suggested responses.

(6) Mitigation proposals that address impacts that may occur in Grand County caused by the Project.

- Consult with Grand County on technical studies when the County has jurisdiction by law or special expertise associated with the resource being studied.

- Promptly inform the County of all schedule changes relative to comment deadlines and meetings.

MOA, § V.

As a cooperating agency, Grand County submitted detailed comments through its counsel, Sullivan Green Seavy LLC, on the technical reports prepared for the WGFP Preliminary Draft Environmental Impact Statement ("PDEIS"). Although Grand County submitted these comments in a timely manner, it did not learn until too late that Reclamation intended to release the PDEIS for comment before it had reviewed or, in the case of some reports before it had even received, all the County's comments. As a result, Reclamation could not have considered or taken into account in its DEIS any of Grand County's comments submitted in 2008, contrary to its responsibilities to Grand County as a cooperating agency generally, and specifically under § I of the MOA. *See* 40 C.F.R. § 1501.6(a)(2); 73 Fed. Reg. at 61,320 (to be codified at 43 C.F.R. § 46.230); *see also Davis v. Mineta*, 302 F.3d 1104, 1123 (10th Cir. 2002) ("a reviewing court may properly be skeptical as to whether an EIS's conclusions have a substantial basis in fact if the responsible agency has apparently ignored the conflicting views of other agencies having pertinent expertise.") (internal quotation marks and citation omitted); *Fund for Animals v. Norton*, 281 F. Supp. 2d 209, 227 (D.D.C. 2003) (inadequate review of public comments suggests a failure to take a "hard look" under NEPA). A list of the County's comment letters on the technical reports is provided in Exhibit A. Neither the County nor its

counsel ever received any response to these comments. From our review of the DEIS, it is apparent that Reclamation largely ignored Grand County's comments when it prepared the DEIS.

As a cooperating agency, Grand County also submitted comments on March 31, 2008 through its counsel, Sullivan Green Seavy LLC, on the PDEIS and requested a meeting to go through the comments in greater detail. Neither the County nor its counsel ever received any response to the PDEIS Comments. Nor did the requested meeting ever take place. Again, it is apparent that Reclamation largely ignored Grand County's comments when it prepared the DEIS.

More generally, Reclamation's failure to take Grand County's comments into account is contrary to Executive Order 13,352 on "Facilitation of Cooperative Conservation," which directs the Secretary of the Interior to "carry out the programs, projects, and activities of the agency . . . that implement laws relating to the environment and natural resources in a manner that: (i) facilitates cooperative conservation; . . . [and] (iii) properly accommodates local participation in Federal decision-making . . . ." Exec. Order No. 13,352, § 3(a), 69 Fed. Reg. 52,989 (Aug. 30, 2004). "Cooperative conservation" is defined as "actions that relate to use, enhancement, and enjoyment of natural resources, protection of the environment, or both, and that involve collaborative activity among Federal, State, local, and tribal governments . . . . *Id.* § 2. In the preamble to its NEPA rulemaking, Department of the Interior recognized that "an emphasis on the use of cooperating agencies may result in additional steps in the NEPA process, but is likely to lead to improved cooperative conservation and enhanced decision making." 73 Fed. Reg. at 61,301. Reclamation's actions are not consistent with these objectives.

In addition, Reclamation's lack of regard for Grand County's comments are contrary to the principle of consensus-based management, which "involves outreach to persons, organizations or communities directly who may be interested in or affected by a proposed action with the assurance that their input will be given consideration by the Responsible Official in selecting a course of action." 73 Fed. Reg. 61,316 (to be codified at 43 C.F.R. § 46.110(a)); see also Department of the Interior, Environmental Statement Memorandum ESM03-7, Procedures for Implementing Consensus-Based Management in Agency Planning and Operations (July 2, 2003). Understandably, Grand County has no assurance that its input was in fact given consideration.

Specific Comments by Section

Section 1.3.1 Municipal Subdistrict

Page 1-4

Comment. The purpose and need is drawn so narrowly as to foreclose other less environmentally damaging alternatives. The purpose is "to deliver 30,000 af of water from the existing Windy Gap Project to meet a portion of the water deliveries anticipated from the original Windy Gap Project and to provide up to 3,000 af of storage to firm water deliveries for the [Middle Park Water Conservation District]." The real purpose and need for the participants is for more water generally. The purpose and need statement might have more credibility if the original Windy Gap Project participants were the same as the WGFP participants. Instead, the DEIS ignores the fact that of the original eight cities in the original Windy Gap Project, only three are participating in the WGFP, and only one to the full extent of its ownership (Longmont 80 original and firming units).). See attached Exhibit D, *Windy Gap Ownership and Transfer History*. This Exhibit shows that only 28% of the requested storage volume is by original owners, who collectively need only 26,000 af. The City of Broomfield, the participant requesting the most storage at 25,000 af was not even located within the boundaries of Northern or the Municipal Subdistrict when the water rights were appropriated or the ROD issued for the original project.

Section 1.4.1 Colorado-Big Thompson Project

Page 1-4

Comment. Please note that the C-BT Project was approved by Congress in Senate Document 80 and decreed in the Blue River Decree for supplemental irrigation and industrial use, not municipal purposes. In addition note that the C-BT project does not allow for storage of C-BT water in Chimney Hollow Reservoir because Chimney Hollow reservoir is not a C-BT project feature approved by Congress.

Section 1.4.2.1 Windy Gap Project Environmental Impact Statement

Page 1-5

Comment. The June 8, 1981 ROD issued by the Corp of Engineers permitted a project (Application No. 6520) with a maximum diversion of 300 cfs according to Exhibit A to that ROD, which described "a pumping plant with a maximum discharge capacity of 300 cfs." The DEIS notes that diversions are limited to 600 cfs. Impacts greater than 300 cfs need to be included in this NEPA analysis and corresponding mitigation to substantially reduce impacts associated with diversions at 600 cfs.

Section 1.5.2 Windy Gap Project Delivery Shortage

Page 1-9

Comment. The actual diversions from Windy Gap averaged 11,080 af.

Page 1-10

Comment. Additional reasons that need to be added to the bullet points for lack of diversions are: (1) lack of demand by original participants; (2) sale of units to new entities which increased water demand over time; (3) power costs charged for pumping based on starting up a pump and costs to purchase "Overrun Power" at market rates which is considerably higher than the preferred rate for "Allotted Power".

Section 1.6.1 Sources of Water Supply

Page 1-11

Comment. What is the basis of the statement that extreme droughts are excluded from firm yield planning? How does the author define an "extreme drought?"

Page 1-12

Comment. The discussion of "reuse" of trans-mountain water is incomplete. First, the 404 (b)(1) Guidelines require applicants for 404 Permits to take steps to "minimize potential adverse effects" to the aquatic ecosystem. Second, Colorado law requires that: "In order to minimize the amount of water removed from Western Colorado eastern slope importers should, **to the maximum extent feasible**, reuse and make successive use of the foreign water." *Denver v. Fulton Irrigating Ditch Company*, 506 P.2d 145, 148 (Colo. 1972) (emphasis added). In *Fulton* 506 P.2 at 146-147, the Colorado Supreme Court defined the terms "reuse" "successive use" and "right of disposition" as follows: (1) "'Re-use' means a subsequent use of importer water for the same purpose as the original use." [for example treatment of sewage to potable water standards and re-cycled into the regular water system, which the Court noted that Denver's research was continuing such that in the future potable water will be extracted from sewage for delivery to the water mains] (2) "'Successive use' means a subsequent use by the water importer for a different purpose." [for example after municipal use the treated sewage is used for irrigation] and (3) "'Right of disposition" means the right to sell, lease, exchange or otherwise dispose of effluent containing foreign water after distribution through Denver's water system and collection in its sewer system." The DEIS discloses that these participants practice "successive use" and "disposition" through exchanges of some of trans-mountain water. None "reuse" Windy Gap water. To satisfy requirements of federal and state law, the discussion of reuse must be expanded.

Section 1.6.2.3 Water Conservation

Page 1-15

Comment. The DEIS notes that water conservation includes both supply-side and demand-side management. If the WGFP is to be permitted as the least damaging environmental alternative, then conservation measures need to be included as conditions to the Carriage Contract or the 404 Permit. We have proposed such a permit condition in the *404 Permit Comment Letter*.

Section 1.10 The Decision Process

Page 1-42

Comment. As noted above, the decision process will require resolution of many threshold legal questions that have not been resolved. Either execution of the Carriage Contract should be delayed until such questions can be resolved or any approvals must be contingent on resolving those questions.

Section 1.10.2 Senate Document 80 and Section 14 Analyses

Page 1-42

Comment. The DEIS notes that Reclamation's decision on whether an excess capacity contract is consistent with Senate Document 80 and other federal law will be made "later" and is not part of this EIS. Grand County reiterates that it must be included in the negotiation process for any excess capacity contract pursuant to Senate Document 80.

Pages 1-42 and 1-43

Comment. In a Reclamation study of nutrients in the C-BT system (Leiberman, 2008), there is a box and whisker plot showing the statistical similarity in secchi depths between Granby Reservoir, Grand Lake, Carter Lake, and Horsetooth Reservoir, and that also illustrates secchi depths are statistically different (shallower) on Shadow Mountain Reservoir. When Reclamation undertakes to "consider the effects of the proposed project on Reclamation's ability to continue meeting the five primary purposes of the C-BT Project and whether or not the C-BT Project can continue to be operated in accordance with lettered stipulations (a) through (l) in the Manner of Operation," please include in this consideration the fact that Grand Lake is the only natural lake of the five water bodies mentioned above, and that its trophic status prior to construction and operation of

the C-BT system was oligotrophic. This status has not been maintained, and in fact has been steadily degraded to the current conditions in which Grand Lake, contrary to the DEIS assertion that it is mesotrophic, can often be considered eutrophic.

Section 1.10.3.

Comment. Please add that Grand County will have 1041 permitting authority over all of the alternatives, not just those where there will be construction in Grand County. Grand County issued permits for the original Windy Gap Project. Each of the proposed alternatives will result in a change in the operation of and participants in the permitted Windy Gap Project thereby triggering either amendments to the existing permits or new permits.

Section 2.1.2.1 Level 1 Alternative Screening

Page 2-5

Comment. Prepositioning is carried forward as part of the preferred alternative even though it may be illegal. The DEIS does not disclose the factual or legal basis for the statements that: 1) Total allowable C-BT storage would not change; or 2) the existing C-BT water rights and diversion would not be expanded. As described above, prepositioning involves both a change of C-BT and Windy Gap water rights. Only the water court has jurisdiction to decide whether: 1) total allowable storage would not change; 2) whether C-BT and Windy Gap water rights would be expanded; and 3) what terms and conditions need to be included to protect from injury.

Page 2-6

Comment. The DEIS should explain why storage of CB-T water in Chimney Hollow Reservoir and prepositioning were not eliminated. Storage of Windy Gap water in Horsetooth Reservoir was eliminated because it would require Congressional action; Congressional action is required for storage of C-BT water in Chimney Hollow Reservoir.

Section 2.2.1 Current Windy Gap Project Operations

Page 2-14

Comment. The DEIS states that Windy Gap is not stored on the East Slope. Since the impact analysis is based on this assertion, any amendment to the Carriage Contract must

make this limitation a condition. For purposes of this condition, storage would mean that water shall not be held in any facility for more than 72 hours.

Section 2.2.2 Participant Operations under the No Action Alternative

Page 2-15

Comment. It is speculative to include the enlargement of Ralph Price Reservoir as the No Action Alternative.

Section 2.4.2 Operations

Page 2-24

Comment. The DEIS notes that Windy Gap is delivered instantaneously through the Adams Tunnel. However, in order to distinguish between Windy Gap water or C-BT water and to prevent unlawful enlargement of C-BT water rights, the Carriage Contract must require that each water right that is carried through the Adams Tunnel be accounted for separately based on actual - not instantaneous - diversion/deliveries.

Comment. The DEIS states that when C-BT water is stored in Chimney Hollow, that creates more space in Granby Reservoir. More space in Granby Reservoir creates the ability of the C-BT water rights, which are senior to Windy Gap, to store in that space. This creates the potential for expansion of use of the C-BT water rights. The DEIS says the C-BT diversions and water rights would not be expanded. We have proposed a permit condition in the *404 Permit Comment Letter* so that C-BT water rights will not be expanded.

Comment. Middle Park's 3,000 af should continue to be stored in Granby Reservoir. There is no need to deliver Middle Park's water to Chimney Hollow and then "exchange" it back Granby Reservoir for release.

Section 2.8.2 Reasonably Foreseeable Actions

Page 2-42

Comment. Add to reasonably foreseeable future projects the Colorado Springs Substitution and Green Mountain Reservoir Substitution and Power Interference Agreements as described in Grand County's letter dated October 30, 2008.

Page 2-44

Comment. (also page 3-42 and elsewhere) The reasonably foreseeable actions and cumulative effects sections should include a discussion of climate change. The United States Supreme Court has stated that the "harms associated with climate change are serious and well recognized." *Massachusetts v.* EPA, 127 S.Ct. 1438, 1455 (2007) (ruling that EPA can regulate greenhouse gases under the Clean Air Act). Therefore, global climate change must be analyzed under NEPA. See e.g. *Border Power Plant Working Group v. Department of* Energy, 260 F. Supp. 2d 997, 1028-1029 (S.D. Cal. 2007). At a minimum, the EIS could include a discussion of the influence of a 4 degree Fahrenheit temperature increase by 2050 and the possible influence on planning for increased winter precipitation matched by decreased summer precipitation as predicted in the Colorado Water Conservation Board's "Climate Change in Colorado" report. In considering climate change, Reclamation should follow the methods outline in its own document, appendix U of the "Final EIS- Colorado River Interim Guidelines For Lower Basin Shortages and Coordinated Operations for Lake Powell and Lake Mead, October 2007."

Section 2.10.2 Comparison of Alternative Impacts

Page 2-56

Comment. Table 2-6 lists average Windy Gap Diversions of 36,352 af as existing conditions. This is wrong. Actual diversions from Windy Gap have averaged 11,000 af from 1985 to 2004 (page 1-9). This is the existing condition against which to compare impacts.

Page 2-67

Comment. Table 2-7 Comparison of cumulative effects. The same error occurs in this table as in Table 2-6 with the incorrect reporting of Windy Gap diversions of 36,352 af

Chapter 3 Affected Environment and Environmental Consequences

Comment. The DEIS fails to describe that most of the alternatives are not consistent with the requirements of existing local and regional plans including the Grand County Master Plan and the NWCCOG Water Quality Management Plan.

Comment. Displaying Windy Gap Diversions of 36,352 af as "Existing Conditions" is a fatal flaw. Throughout the DEIS, Windy Gap Diversions for Existing Conditions are listed as 36,352 af as an average annual amount. This is a modeled number that is over

three times actual diversions. This flaw permeates every table, graph, text and makes it difficult to comment. See discussion in General Comments Section, above.

Section 3.3 Determination of Environmental Effects

Page 3-2

Comment. The DEIS states that "[f]or Reclamation purposes action alternatives are compared to the No Action alternative for determining effects." Reclamation should use existing conditions to compare effects.

Section 3.4 Area of Potential Effect

Page 3-3

Comment. Change "may" to "will" in the 8th line and put a period after "diminish" in the 13th line. As written, there are no bases for these statements without the changes.

Section 3.5.1.1 Affected Environment; Areas of Potential Effect

Pages 3-3, 3-4 and 3-6

Comment. For alternatives including Rockwell Mueller, affected area should include the Fraser River, which should also be considered due to impacts from the Moffat Firming Project. The statement "The Fraser River is not included in the study area because none of the alternatives affect Fraser River flows" cannot be true even during the filling of the Rockwell/Mueller Creek reservoir site.

Page 3-6

Comment. The sentence "Colorado River average monthly flow changes, as a percentage of total streamflow, would be less than 10 percent downstream of the confluence with the Blue River…" is misleading simply due to the location of the site downstream of two major confluences. Moreover, it probably is wrong owing to the inaccurate description of existing conditions discussed in General Comments Section, above. The percent change for each stream segment from the Granby Dam down to the study area boundary should be presented here in a table, or alternatively, the stream segments with the highest *and* lowest percent changes should be offered.

Section 3.5.1.3 Water Rights, Agreements and Contracts

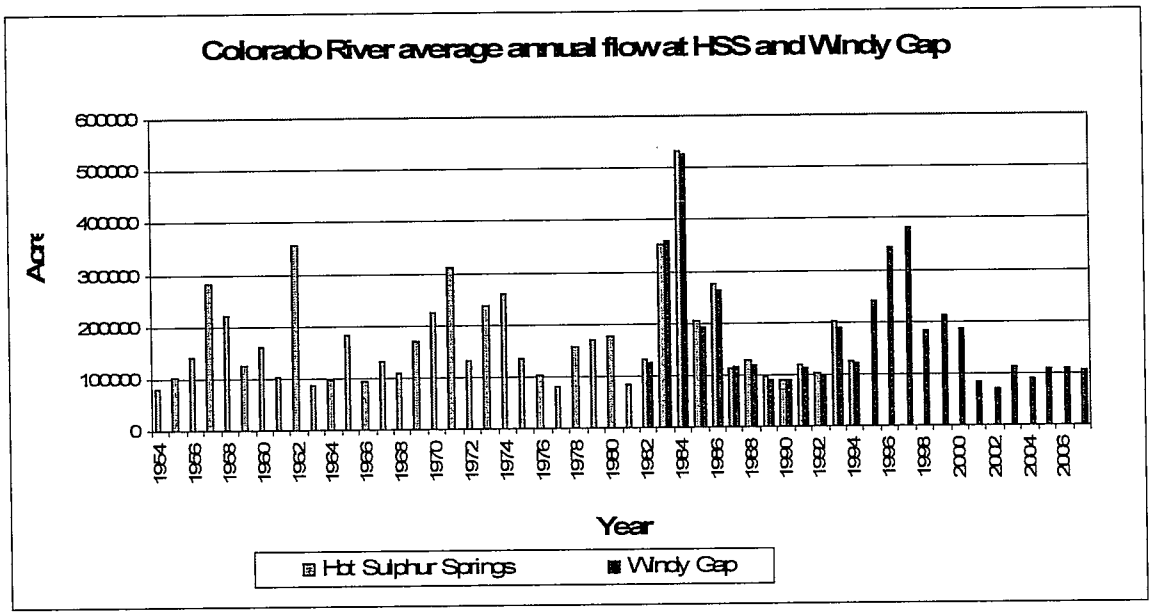
Page 3-6

Comment. As described above, there are a number of legal actions that are necessary to implement the WGFP.

Section 3.5.1.4 West Slope Surface Water Hydrology

Page 3-8

Comment. Figure 3-3. This figure should not stop at 1994, but should continue on through the latest date available. While the USGS gage at Hot Sulphur Springs was abandoned by GS, USGS continues to maintain the gage at Windy Gap, which has been proven[9] to be statistically consistent with the Hot Sulphur Springs data (see figure below). The additional period of record from 1995 to 2007 is important to show the cumulative year drought conditions during that time, in particular the driest year on record from 1905 to 2007, which was 2002. In addition, a figure ought to be included to display predicted future flows over the next 30 years with WGF.



The additional water years should be included when evaluating trends, and low flow conditions. Similarly, special consideration should be made for the years in which Windy Gap water was and was not diverted. In addition, consideration should also be made for

[9] Personal communication with Alan D. Druliner, Colorado Water Science Center, USGS, September 2008.

the fact that the last century was one of the wettest on record, and that "climate models predict a reduction of Colorado River flows ranging from 5 to 50% by mid-century".[10]

Comment. Figure 3-4 This diagram should be edited to include 2002 as the lowest water year. The difference in flow between the two years is 10,352 af (80,360.3 af versus 70,007.6). As the figure scale does not allow for adequate discernment of the changes to low flow, an additional figure should be added showing average flows from 1950-2008, the lowest flow year (2002) as represented by USGS Windy Gap gage data, and the flow due to proposed changes from the preferred alternative.

Page 3-9

Comment. Please note that the flows from the Windy Gap diversion point to the mouth of the Williams Fork River of 90 cfs is 10 cfs below the flow identified as being critical *in winter* in the Grand County Stream Management Plan, Phase II. It is 150 cfs below critical summer flow recommendations. Similarly, from the mouth of the Williams Fork River to the mouth of the Troublesome Creek, the flow of 135 cfs is 15 cfs below winter critical flows, and 115 below summer critical flows. The flushing flow recommended by the Azure Settlement is equivalent to the optimal flows recommended by the Stream Management Plan, and 300-750 cfs below that recommended for flushing flows.

In 2003, 64,200 af were diverted via Windy Gap. This is 91.7% of the annual flow in the 2002 water year.

Page 3-10

Comment. If no historic gage flow data is available, how can Reclamation plan to "bypass native flows" in the Rockwell Mueller or Jasper East areas?

Section 3.5.1.5 East Slope Surface Water Hydrology

Page 3-11

Comment. figure 3-6 Please attach year labels on the X axis.

Section 3.5.2.2 Method for Effect of Analysis

Page 3-14

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[10] Colorado School of Mines Magazine, Summer 2008

Comment. Use of a daily time step model would not require "disaggregation" to get to daily diversions.

Section 3.5.2.3 Facilities and Stream Segments Affected by Windy Gap Operations

Page 3-14

Comment. The DEIS notes that Windy Gap water that is pumped into Granby Reservoir is assessed a 10% shrink charge upon introduction. It appears that this shrink is then attributed to the CB-T decree. This operation appears to create an expanded use of the C-BT decree, because the C-BT is not decreed for diversion at Windy Gap, but water diverted from Windy Gap is attributed to C-BT. This needs to be explained further and the decree that authorizes this operation referenced.

Comment. We are not aware of any decree for either Windy Gap or C-BT that allows an exchange of C-BT water with Windy Gap water that is called an "instantaneous delivery." This needs to be explained and the legal authority for doing so under Colorado law referenced. It appears that the fiction of "instantaneous delivery" will not be operated under the WGFP, but rather water would be routed to Chimney Hollow Reservoir.

Page 3-15

Comment. Willow Creek should not be affected by WGFP, but it apparently is. This appears to be the result of an undecreed exchange of Windy Gap water to Willow Creek Reservoir, which causes Willow Creek Reservoir rather than Granby Reservoir to spill. This operation makes no sense and needs to be explained. The DEIS needs to disclose the decree that authorizes this exchange of Windy Gap water to Willow Creek Reservoir.

Page 3-16

Comment. The DEIS states that "C-BT water delivered would not exceed current amounts." The impact analysis in the DEIS is based on this assumption. Therefore, the Carriage Contract must include a condition that limits deliveries of C-BT water through the Adams Tunnel to current amounts. We have proposed such a permit condition in our *404 Permit Comment Letter*.

Section 3.5.2.5 C-BT and Windy Gap Project Operations and Diversions

Pages 3-19 through 3-21

Comment. Tables 3-2, 3-3 and 3-4 erroneously lists Windy Gap Diversions at 36,532 af (average) at 7,804 af (dry) and 38,512 af (wet). Actual diversion records are much less in all types of years. See General Comments Section, above.

Comment. Table 3-2 purports to compare average annual flow and diversion amounts. This is an example of how it is deceiving to present Windy Gap Diversions of 36,532 af as "existing conditions" rather than actual diversion when deriving differences and percentage of change. In fact *actual* diversions at Windy Gap Reservoir are show in Table 3, p. 22 of the Water Resources Technical Report. Those diversions averaged 11,080 af. That amount is the "existing conditions;" that is the amount of effect on the river since Windy Gap came on line. It is not some hypothetical modeled amount that created the existing conditions. Accordingly when one puts in the actual diversions of Windy Gap, the comparison looks much different and the impacts are staggering. See General Comments Section, above.

Table 3-2 should be revised:

Location	Existing Conditions		Proposed Action	
	Avg Ann Flow	Avg Ann Flow	Diff	Percent diff
Windy Gap Diversions (**modeled**)	36,532 af	46,084 af	9,552 af	26% increase
Windy Gap Diversions (**actual**)	11,080 af	46,084 af	35,004	316% increase

Page 3-21

Comment. (also 3-25 and elsewhere). The assertion is regularly made that Windy Gap would not divert during dry years, yet there are tables that show diversions in dry years. Correct this conflict or limit diversions to dry years as a condition of the Carriage Contract.

Page 3-24

Comment. Please discuss nocturnal pumping scheme for Windy Gap which minimizes power cost during pumping and maximizes power generation and revenues during daylight hours when power demands are high. How will the WGFP influence this

schedule? A discussion of this schedule here would be appropriate to make way for the related impacts to water quality in section 3.8.

Section 3.5.2.6 West Slope Streams and Existing Reservoirs

Page 3-26

Comment. The DEIS states that average annual flows below Windy Gap would decrease 14% from existing conditions. As stated numerous times, the so called "existing" conditions do not reflect actual diversions by Windy Gap, which are much less. In fact, the average annual flows will decrease by 26% . See General Comments Section, above.

Comment. Figure 3-12. Please break hydrograph into two time periods so that changes in flow below 200 cfs can be distinguished.

Page 3-27

Comment. Figure 3-13. Please break hydrograph into two time periods so that changes in flow below 200 cfs can be distinguished.

Comment. The table on this page shows that the Proposed Action would increase the number of days that flows dropped below 100 cfs over the 47 year study period from about 1.8 days per year in August to 2.9 days. This 47 year period does not include the extended drought conditions and lowest flow year on record, so it underestimates the true number of low flow days. According to the Grand County Stream Management Plan the critical/minimum cfs for that stretch is 250 during the summer, optimal is 450 cfs. Critical flows are defined as "that flow below which habitat is lost at the greatest rate." (GC SMP, March 2008, pA-4).

Comment. Tables 3-7 and 3-8. The DEIS should state where these figures are derived. They might be helpful once corrected to determine the low flows in the critical reach below Windy Gap. Changes in stream flows should been shown in cfs as reported for increases in east slope streams. (Tables 3-9, 3-10, 3-11.) Similar tables in cfs should be prepared for West Slope streams where the decreases (impacts) will occur.

Page 3-28

Comment. Willow Creek is already seeing below standard levels of dissolved oxygen for its stream classification. The DEIS must describe how the reduction in flows will exacerbate this situation.

Page 3-30

Comment. Please explain what "reintroduction shrink" means; what percentage is charged in each East Slope firming reservoirs; which decree it is charged to; and the basis for a reintroduction shrink.

Section 3.5.2.9 Windy Gap Firming Project Yield

Page 3-41

Comment. Table 3-13. The WGFP does not satisfy the purpose and need statement. The firm yield reported is 26,600 af rather than 30,000 af. The WGFP also does not meet the Purpose and Need for Middle Park's firm yield of 3,000 af. Instead, it is reported that only 429 af of firm yield is generated for Middle Park.

Section 3.5.3 Cumulative Effects

Page 3-42

Comment. The additional foreseeable actions described for Section 2.8 above need to be added to the cumulative impacts section.

Section 3.5.3.1 Summary Comparison of Hydrologic Changes

Page 3-42

Comment. The cumulative impacts section demonstrates the need to use the same model to identify the impacts of the WGFP and the Moffat Collection System Expansion project. There are a number of assumptions on how the Denver Water Board may operate. Use of the Denver Water Board's daily point flow model would ensure those assumptions are accurate and applied to both projects. For example, when the Big Lake Ditch lease expires, that would take the call off of the Denver Water Board's Jones Pass Tunnel, and more water is likely to be diverted out of the Williams Fork River by the Denver Water Board, PLUS there is the lack of return flow down Reeder Creek. The timing of when those impacts occur is also critical. It is not adequate to look at the impacts on an average annual basis.

Section 3.5.3.2 Facilities, Streams and Lakes Affected by Reasonably Foreseeable Actions

Pages 3-43 through 3-45

Comment. The comparisons in Tables 3-14, 3-15, 3-16, are wrong because they start from the wrong baseline for Windy Gap diversions of existing conditions of 36,532 af rather than the actual diversions of 11,080 af. See General Comments Section, above.

Page 3-47

Comment. The Shoshone call reduction needs to examined more closely. In fact, when that agreement went into effect in 2003, that was also the greatest year of diversion by Windy Gap of 64,200 af. The report is replete with statements that Windy Gap will not divert during a dry year, but there is no analysis of the effects from the Shoshone call reduction.

Section 3.5.3.4 West Slope Streams and Existing Reservoirs

Page 3-50

Comment. Figure 3-25 excludes the months of December through March. In addition, the resolution is inadequate in the months shown where flow is below 200 cfs to be able to distinguish one condition from another, rendering the figure relatively useless for understanding much of the water year.

Page 3-51

Comment. Figure 3-26 excludes the months of December through March. In addition, the resolution is inadequate in the months shown where flow is below 200 cfs to be able to distinguish one condition from another, rendering the figure relatively useless for understanding much of the water year.

Page 3-52

Comment. The potential consecutive dry year reduction in the surface elevation of Granby Reservoir of 33 feet means that when compared to the average depth at full pool of 74 feet, the reduction will be 44%. When compared to the maximum depth at full pool of 221 feet, the reduction will be 15%. With such a significant potential reduction, the inclusion of a bathymetric map, with an evaluation of regions of the reservoir where water levels might be reduced significantly enough to prohibit access is necessary. In addition, a calculation of the potential reduction in water surface also would be instructive.

Comment. Please develop area-elevation curves for Granby Reservoir under different scenarios, similar to what was done for the Shadow Mountain Reservoir drawdown, showing reservoir surface area versus reservoir stage or area of reservoir bed exposed versus reservoir stage.

Comment. Please develop a figure to project future Granby Reservoir elevations under consecutive dry year, moderate, and wet year scenarios that can be compared side-by-side with, or that also includes historical elevations like those shown in figure 3-6, and that makes clear how the historical elevation fluctuations might be exacerbated.

Comment. Reductions in water surface elevation, water surface area, increases in exposed reservoir sediment surface areas call for accompanying discussions and mitigation in sections concerning water quality (3.8), recreation area, access to boat ramps (3.19), and air quality (due to potential dust issues) (3.16), and probably other sections as well.

Comment. All of these same issues may also be true for Willow Creek Reservoir and should be discussed both here and in other appropriate sections in the document.

Section 3.5.4 Proposed Mitigation.

Page 3-55

Comment. See the discussion of mitigation in the General Comments Section, above. Numerous additional mitigation conditions are required as detailed in the *404 Permit Comment Letter*.

Section 3.6.1.3 West Slope Ground Water Hydrology and Quality

Page 3-56

Comment. Water quality results are reported from: 1) Apodaca and Bails 2000, a survey study that looked at water quality in 12 Colorado counties in addition to Grand County. Sampling sites in Grand County were 5, maybe 6 in number: 2 on the upper Fraser, 2 in the extended Grand Lake area, 1 at the confluence of the Colorado River with the Blue River, and one, potentially in Grand County, on the Blue River. 2) Topper 2003, a survey of ground water in the entire state of Colorado, and *which relies upon data from the Apodaca and Bails article* for the upper Colorado River 3) Bauch and Bails 2004, which studied the Fraser River watershed with sites located only as far downstream as Tabernash. Based upon these resources it is difficult to understand from where water quality values specific to the Colorado River in the study area in question may have come

from. The Topper publication states that ground water quality in the Colorado River *can vary widely.*

Comment. The discussion of impacts to ground water is inadequate. For example, there is no analysis of potential degradation and influence from coal formations which extend just west of the Granby area, nor analysis of the influence from the hot springs in Hot Sulphur Springs. Also omitted is a discussion of potential degradation from leaking underground storage tanks which have been identified in Grand Lake, Heeney, Hot Sulphur Springs, Kremmling, Parshall, and Winter Park (Colorado Ground Water Atlas 2000). Any discussion of impacts to ground water quality from reduced flows in the Colorado River are missing.

In order to discuss ground water quality in the study area with any degree of certainty a study would have had to have been conducted, because without such a study, the data is entirely too sparse to draw any reliable conclusions.

Section 3.6.2.3 Ground Water Hydrology

Page 3-57

Comment. Please quantify the "temporary changes in ground water levels near the reservoirs" that might be expected due to "the occasional large decreases in reservoir elevations during a series of dry years" and account for the number of homeowners who would lose access to their water supplies, if any.

Comment. It is difficult to understand how the potential consecutive dry year reduction in the surface elevation of Granby Reservoir of 33 feet mentioned on p3-52 coincides with the statement "The historical variation in the lake surface elevation of Granby Reservoir (nearly 90 feet) is larger than the expected change due to any alternative." How can this variation be accounted for with a mean reservoir elevation of 74 feet? Again, a thorough examination of the issues identified in the comment for p3-52 are required to understand the increases in variations.

Section 3.6.2.4 Ground Water Quality

Page 3-58

Comment. In section 3-10 the statement is made that the Colorado River is a gaining river throughout most of the study area. The ground water section would be a good place to discuss this as well, in particular where the Colorado River is *not* a gaining river, and under what conditions. To say that changes in river stage and hence ground water levels,

due to the project, especially with attenuation over distance, would be insignificant compared to what currently exists ignores the fact that ground water quality in certain regions of the study area may already be unacceptably degraded. Without having accurate measurements of the current condition (measured water quality parameters), it is impossible to understand what "some changes in water quality that could increase as much as 38 to 45 percent" means.

Comment. "There may be some changes in water quality that could increase as much as 38 to 45 percent in some parts of the Colorado River. Similar changes in alluvial ground water quality along the Colorado River would be expected." The preceding statements suggest that ground water quality has been evaluated only as an extrapolation of surface water quality. This is inadequate because the effects to ground water quality are likely to be more strongly felt due to increasing influence from bedrock aquifers and decreasing contributions from recharge or any potential periods when the stream might switch to a "losing stream" due to excess flow. The requisite "hard look" requires an evaluation of carefully selected ground water samples on a regular basis.

Section 3.7 Stream Morphology and Floodplains.

Comment. The DEIS recognizes the need for channel maintenance flows ranging from 80 percent of 1.5-year discharge to the 25-year peak flow (p3-60). These flows maintain the physical characteristics of the river channel, banks and floodplain and to maintain unimpaired flow in the channel. In addition the channel will need periodic flushing flows to remove sediment and accumulated interstitial debris. These are two different functions.

Comment. Page 3-62 of the DEIS establishes the channel maintenance flows as the 2-year peak discharge (i.e. the lower end of the range previously identified), which the DEIS equates to about 1,240 cfs at Hot Sulphur Springs. The DEIS then indicates that under existing conditions this necessary channel maintenance flow is exceeded about 4% of the time, and with WGFP this would be reduced to about 3% frequency of exceedance, and a similar analysis for cumulative effects. The PDEIS concludes this change is about 1% less than existing conditions and so is a minor change and not an impact. This conclusion is completely unsupported.

(1) A change from 4% exceedance interval to a 3% exceedance interval is a 25% change, so describing it as occurring 1% less frequently is grossly inaccurate.

(2) The 2-yr peak discharge (1240 cfs) is based the current flow levels, not those that initially formed the channel, and so the flow criteria used is irrelevant and the conclusion is flawed.

(3) This issue is dismissed (p3-60) because aerial photos from the 1970's, 1990's and 2005 indicate only minor channel changes in river morphology, and the fact that the channel is currently fairly stable in spite of significant C-BT that started in 1947. The DEIS also dismisses the need for evaluation channel maintenance and flushing flows between Granby Reservoir and Windy Gap and the potential WGFP impacts from changes to these flows because flows in this reach are "controlled by instream flows; therefore, it is difficult to define a range of channel maintenance flows based on peak flow events" (p3-63).

(4) No mitigation is proposed (p3-65); we assume this is because the proposed action will maintain the existing requirement for 450 cfs sediment flushing flow for 50 hours once every three years (p 3-62). Flushing flows are different than channel maintenance flows.

Section 3.7.1.4 West Slope Stream Morphology and Sedimentation

Page 3-60

Comment. The statements that the Colorado River has continued to convey sediment without aggradation or degradation of the stream channel and that the river is a morphological stable stream are not supported by any data.

Comment. Please explain in quantitative terms what the following sentence means for this system: "The lower limit of channel maintenance flows has been defined as 80 percent of the 1.5-year discharge and the upper limit as the 25-year instantaneous peak flow."

Section 3.7.2.3 West Slope Streams

Page 3-62

Comment. The DEIS says that flushing flows were based on a 1981 study. This should be updated. Grand County's Stream Management Plan recommends a flushing flow of 750 to 1200 cfs for a 3 day duration with a frequency of 1 in 2 years during the May to late June period. Flushing flows are critical to transport the sediment. Tubifex worms thrive in sediment.

Section 3.7.3 Cumulative Effects

Page 3-65

Comment. A reduction of 1.5 in the current 4 percent exceedences rate of the 2-year peak discharge is a difference of 37.5%. Please correct and quantify reductions at the Kremmling gage similarly.

Section 3.7.4 Proposed Mitigation

Page 3-65

Comment. The argument in the mitigation section on this page ignores the fact that stream flows are already too low for healthy channel maintenance. The preceding discussion said nothing about pool depth, interconnectivity between pools, the influence of flow volumes and channel depth on water temperatures, or refuge. The assumption that everything's fine and that the status quo will prevail is inadequate. The channels either need increased flows, or they need rehabilitation.

Section 3.8 Surface Water Quality: General comments regarding issues with the DEIS modeling approach for Colorado River. (*See also BBA Report*, Exhibit B)

Comment. The DEIS concludes (p 3-129) that the only adverse impacts to streams in Grand County associated with WGFP diversions are an increase in stream temperatures and concentrations of ammonia, inorganic phosphorus, and total dissolved solids for the Colorado River. Proposed mitigation is to "consider increasing required bypass flows under certain water supply conditions" if it can be show that increases would result in measurable benefits to the trout fishery. Both statements are wrong.

The reason the DEIS only identifies minor stream impacts in the Colorado River is because of the inappropriate choice of the steady state QUAL2K model for the purpose of evaluating changes from WGFP alternatives and issues with the input parameters used for the modeling. The use of QUAL2K to model temperature impacts demonstrates this issue. QUAL2K evaluates increases in Colorado River temperature resulting from diversion of water at Windy Gap for a single day, July 25th, and considers both the average diversion for that day, and a diversion to the point where only the 90 cfs mandatory bypass flow remains in the Colorado River below Windy Gap. According to the DEIS this approach would represent worst case conditions (DEIS page 3-92 and

page 51, Stream Water Quality Technical Report). The conclusions from this modeling approach are flawed for many reasons including:

(1) The actual result from QUAL2K is that Colorado River temperature would increase as much as 4.0 degrees to a maximum of 18.9 just upstream of the Williams Fork confluence when average stream flows (approximately 425 cfs) are reduced to 90 cfs by WGFP diversions on the single day, July 25 given median meteorological conditions. QUAL2K does not consider a more realistic extended timeframe. For example, if the temperature is predicted to increase 4.0 degrees when flows are reduced from 425 cfs to 90 cfs on July 25, then the temperature of the Colorado River will continue to increase above 18.9 several days later if river flows are maintained at minimum levels due to WGFP diversions and the meteorological conditions (air temperature and sunlight) remain relatively unchanged. Depending on daily weather conditions, there would be a gradual warming of the river downstream from Windy Gap over time, not a single spike in temperature. QUAL2K cannot handle this, a dynamic model would be more appropriate.

(2) The DEIS concludes that WGFP will only increase temperature to exceed the temperature standard under worst case conditions, but this would not occur on average (p3-96). This statement cannot be supported. This statement is based on the median July temperature of 14.3 degrees as ambient conditions for input to QUAL2K. The source of this data is USGS grab samples which are collected 1 or 2 times per month (p3-67). Median data for 1 to 2 samples per month has no relevance to Colorado Water Quality Control Commission temperature standards which are determined as the Maximum Weekly Average Temperature (MWAT). Inputs to the QUAL2K model for many water quality parameters were based on the median value of measured water quality data for the period of record for July. The median value means that half of the data is greater than that value, which is why the State of Colorado defines existing quality as the 85th percentile for most parameters (5 CCR 1002-31, Section 31.5(20)).

(3) Despite the QUAL2K model conclusions that WGFP diversions will rarely be of a magnitude to result in exceedance of temperature standards (page 3-96), there are already instances where increased stream temperatures in the Colorado River below Windy Gap in summer exceed standards. Existing MWAT data for Colorado River near Windy Gap indicates water temperature is already at or exceeding the water quality

standard (MWAT standard = 18.2 degrees) in July and August (p3-67 and 68, Figure 3-29). Moreover, all of the conclusions assume less reductions in flows from current conditions than actually will occur. *See* General Comments Section, above.

(4) Conclusions about changes in temperature based on QUAL2K are shown in tenths of a degree Celsius (and concentrations of other water quality constituents are shown in tenths of a microgram per liter). This level of resolution is beyond the capabilities of QUAL2K Model. This shortcoming is demonstrated in the sensitivity analysis in the May 2008 Stream Water Quality Modeling and Methods Report (see for example Figure 14, p 21 MM Report).

Comment. QUAL2K is a steady-state model, meaning it simulates water quality based on a multitude of inputs and assumptions for a single instant in time and thus is not dynamic over time. The condition of a steady-state instant (day) that the DEIS assessment considers is July 25 for "average" streamflow years. The concept was that this date is when the Colorado River experiences low-flows and hot and sunny summertime conditions, and it is also when Windy Gap could be diverting. (Note that although the DEIS chose July 25 of an average year to represent a worst case for temperature exceedances and impacts on aquatic life, there is no history of the temperature influence of Windy Gap pumping on aquatic life in July, because between 1984 and 2006 Windy Gap has only diverted one time (in 1985) in the month of July).

Comment. The approach to evaluating Willow Creek water quality is different and found at page 3-92. SSTEMP was chosen to evaluate stream temperature changes in Willow Creek and a mass balance approach was used to evaluate changes in concentrations of ammonia, copper and iron on a single day, July 15. First of all, ammonia is not a conservative parameter and disassociates based on temperature and pH, so mass balance analysis is inappropriate. Further it was assumed that the WWTP plant discharge would not change pH or temperature as effluent becomes a greater percentage of the streamflow because Willow Creek Reservoir releases are reduced under WGFP alternatives (Stream Water Quality Technical Report, page 54). These assumptions are completely unjustified for the following reasons:

(1) The Preferred Alternative would reduce Willow Creek streamflow by 36% in July of average years (see Table D-15, Water Resources Technical Report Appendices).

(2) The DEIS assumes average Three Lakes WWTP flows (0.53 cfs) for Three Lakes WWTP (see page 36, Water Quality Monitoring and Methods

Technical Report) is continuous steady discharge when evaluating both alternatives and cumulative impacts (Stream Water Quality Technical Report, page 116). However, the Three Lakes Service Area population is projected to increase from 8,230 in 2005 to 12,821 by 2020. In addition, peak flows for Three Lakes Sanitation District occur typically in July, so average WWTP discharge flows are not appropriate. For example, the Stream Water Quality Technical Report (page 25) states the monthly average discharge from Three Lakes WWTP between 2003 and 2006 ranged from 0.46 cfs to 1.34 cfs.

(3) Existing noncompliance with current water-quality standards in Willow Creek (Stream Water Quality Technical Report, p. 26) are noteworthy and must be considered in the assessment of impacts.

Section 3.8 Surface Water Quality: General comments regarding issues with the DEIS modeling approach for Lakes and Reservoirs.

Comment. The DEIS (p 3-129) describes only minor adverse impacts to lakes and reservoirs in Grand County from WGFP. The identified impacts are lower dissolved oxygen resulting in manganese concentrations that would continue to exceed water quality standards, nutrient concentrations would increase in the Three Lakes system, and clarity in Grand Lake would decrease (0.1 meters). As with the DEIS stream impact analysis, this conclusion is a result of a flawed approach to evaluating impacts. The minor impacts to the Three Lakes system summarized by the DEIS in Tables 3-48 to 3-55 are based on modeling by the Three Lakes Water Quality Model and are problematic for many reasons, including:

(1) The DEIS describes increases in annual average nutrient concentrations (Table 3-47, p 3-103). However, impacts from nutrients are primarily related to algae growth and eutrophication in these waterbodies (page 3-93) which is a seasonal problem. Nutrient concentrations during the algae growing season are more relevant than annual averages. The growing season primarily coincides with the pumping of Colorado River water into Three Lakes which will increase with the WGFP, so actual impacts will be greater than depicted by annual averages.

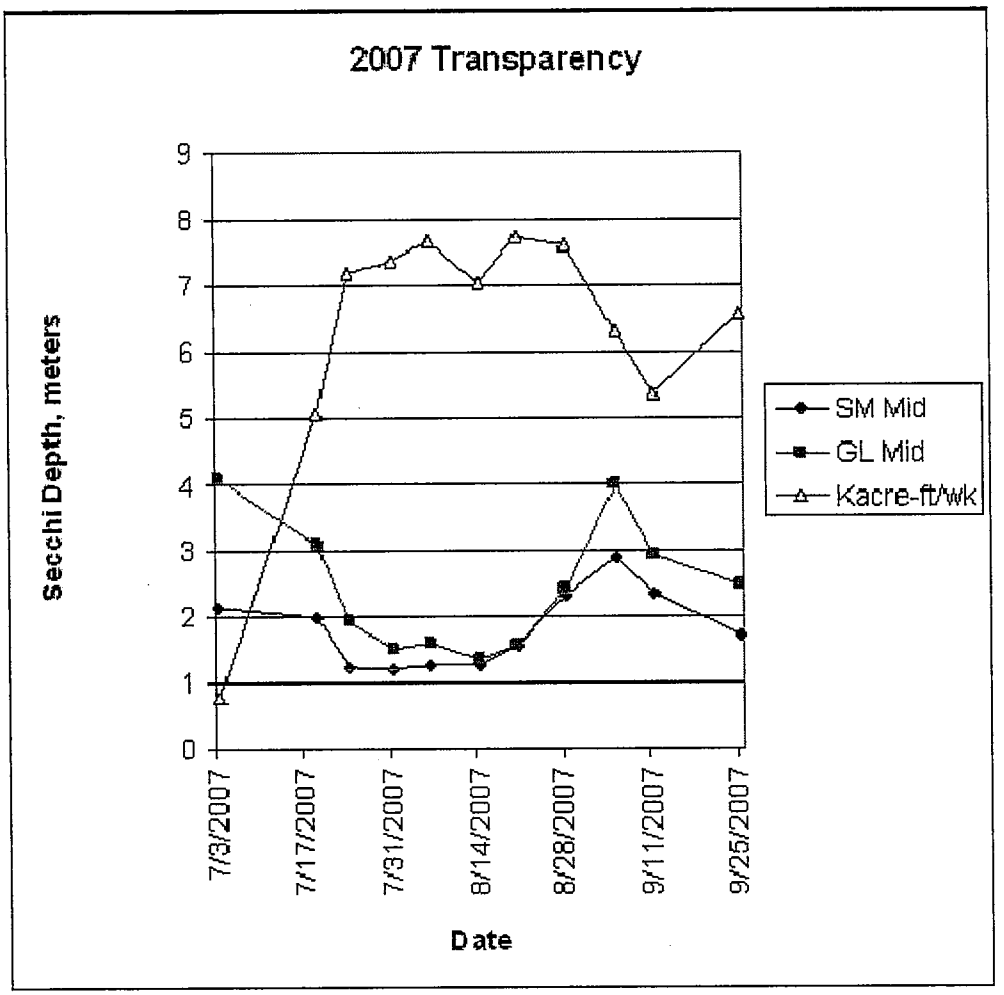
(2) Future nutrient concentrations used as input to the Three Lakes Water Quality Model for waters pumped by Windy Gap are based on completely unrealistic projections of nutrient concentration, particularly phosphorus, discharged from WWTPs in the Fraser River watershed. Fraser River water is then pumped by Windy Gap into the Three Lakes system (page 30

Stream Water Quality Modeling and Methods Report). Therefore, both the in-lake concentrations and the algal response are underestimated. Since the conclusion that WGFP alternatives create no nutrient related impacts to streams or the Three Lakes System is based on the assumption of advanced treatment, then the WGFP project beneficiaries should be responsible for building the WWTP improvements necessary to make this assumption real.

(3) Conclusions regarding changes in trophic Status Index are based on average chlorophyll *a* concentrations (p 3-93). Evaluating impacts of WGFP on Three Lakes should be weighted by pumping schedules instead of averaging.

Comment. The overall approach to evaluating impacts to the Three Lakes system is flawed. The assessment of impacts from WGFP is focused on eutrophication and does not consider the exacerbation of the existing problems associated with the discharge of pollutants into the 3-Lakes from C-BT pumping. Eutrophication is the increase in productivity of a waterbody, meaning the acceleration of algae and aquatic weed growth as a result of the addition of nutrients or other elements otherwise limiting this growth. Eutrophication is associated with decreased clarity and dissolved oxygen and potential increased concentrations of certain metals. It is usually associated with the gradual worsening of water quality.

The pumping of pollutants problem manifests itself in Grand Lake. It is seasonal in nature and can be best demonstrated by the following example from 2007.



The graph shows a period of about three months in late summer of 2007. Transparency in Shadow Mountain Reservoir ("SMR"), as measured by Secchi Disk depth, begins to decline in July. This is probably because of eutrophication of the SMR, the well documented seasonal blooms of algae and rooted aquatic vegetation in SMR. It is also documented that pollution levels in Grand Lake are a affected by water quality in SMR (see Page 37, US Bureau of Reclamation Report *Nutrients, Chlorophyll a and Secchi Disk Transparency of Five Reservoirs on the Colorado Big Thompson Project, 2005 to 2006*, Davine Lieberman, April 2007; "This late season peak [of total phosphorus] does not occur in Lake Granby, indicating that SMR and Grand Lake are linked by the overflow of SMR water flowing into the epilimnion of Grand Lake during pumping operations.").

From the graph it is obvious that as C-BT pumping begins in earnest in late July, Grand Lake clarity is diminished and essentially matches that of SMR. In early September the SMR bloom begins to die off, pumping is reduced and Grand Lake regains its 4 meter clarity briefly. Transparency of SMR again is diminished and the pumping increases toward the end of September and the transparency of Grand Lake responds accordingly.

The average of the Secchi disk depth in Grand Lake during this period is 2.45 meters. This is almost the same value as what is shown as the average annual value of the 15-Year modeling period for both existing conditions and projected alternatives in the WGFP water quality assessment (see Table 45, page 103 of the Lake and Reservoir Technical Report). Although there is a seasonal reduction in Grand Lake's 4 meter clarity by over 65% during this same period as a result of pumping, on *average* there is little change. The approach to analysis of projected impacts focuses on annual averages and fails to incorporate the real problem of seasonal impacts to the 3-Lakes from pumping, and so the DEIS fails to project how WGFP will really affect this existing water quality problem.

Comment. Note that predicted changes for both SMR and Grand Lake for water quality parameters associated with algae growth and affecting clarity are slightly worsened for all WGFP alternatives *on average* (DEIS Table 43 page 91 and Table 46 page 103 of Lake and Reservoir Water Quality Report, July 2008). Given that slight worsening *on average*, it is reasonable to expect that this seasonal polluting of Grand Lake associated with pumping will get significantly worse. The Three-Lakes Water Quality Model does not account for this situation.

Comment. The model assumes instantaneous dispersal of constituents introduced into 3-Lakes (page 65 of WGFP Lake and Reservoir Water Quality Report, July 2008). However, it has been shown that because of temperature differences SMR waters "tend to slide over the surface waters of Grand Lake when water is being pumped down the Adams Tunnel" (see page 8, US Bureau of Reclamation Report *Physical Attributes of Five Reservoirs on the Colorado Big Thompson Project, 2005 to 2006*, Davine Lieberman, undated). This confirms that physical circumstances related to pumping in Grand Lake, at least, partially limit the possibility of eutrophication because pollutants are stripped out of the Lake instead of mixing. It also confirms that the DEIS may be looking at the wrong problem, using incorrect assumptions about mixing, and drawing faulty or misleading conclusions about impacts. Given this, the proposed mitigation to continue participation in ongoing Nutrient Studies in the Three Lakes system is meaningless.

Comment. In the surface water quality section, the statement "Windy Gap Reservoir is a small in channel reservoir and would have water quality similar to that of the Colorado River; therefore it was not evaluated separately" is unsupportable; monitoring on the reservoir was only begun in earnest in 2008. Windy Gap Reservoir slows and heats discharges from both the Fraser and Colorado Rivers, promoting the growth of algae and vast amounts of aquatic plants. In addition the contributions of migratory and summer populations of water fowl are at this time unknown. The effects to water quality from these influences can only be negative, and warrant further study and separate consideration. (An example of this is the low dissolved oxygen values mentioned below Windy Gap on p 3-66).

Section 3.8.1.3 West Slope Affected Environment

Page 3-66

Comment. The didymo (rock snot algae) also has effects on irrigators and water diverters because it plugs their pumps and intakes. The (Spaulding 2007) cite is not included in the references.

Comment. The statement "Colorado River water is generally of good quality throughout the study area" was grafted from p21 of the Stream Water Quality Technical Report and *refers to water quality data presented for the Colorado River below Baker Gulch, a site on the Colorado located in Rocky Mountain National Park that is of exceptional water quality and is not representative of conditions in the study area.* Data for the Baker Gulch site is presented on p16 of the Stream Water Quality Technical Report and in the cases of specific conductivity, dissolved oxygen, pH, ammonia, nitrate and nitrite, sodium, manganese, and selenium, nearly all of the upper range values are considerably lower than any reported in table 3-23 of the DEIS, and some of the ranges are entirely below those reported in 3-23.

This statement and presentation of the water quality data from that site as being representative of the whole region or even as being inside the study area is deliberately misleading. The statement should read that Colorado River water quality is quite variable throughout the study area.

Comment. While it is the convention of sanitation plants and associated permits to use the units of gallons per day or per minute, these units are inconsistent with the cubic feet per second and acre feet per year units used elsewhere in this document, making this section unintelligible.

Comment. The Three Lakes Water and Sanitation District should be included in the listing of dischargers to the Colorado River here, and their effluent should be considered a part of the water quality modeling if it was not, as it will be included in the total Windy Gap nutrient load that is returned to the Three Lakes.

Page 3-67

Comment. Figure 3-29. As discussed above, water temperature standards are currently being exceeded. The Proposed Action will make things worse.

Comment. Table 3-26. Water Quality standards are not being met for Granby Reservoir for: dissolved oxygen; chronic summer temperature; and manganese.

Page 3-68

Comment. Table 3-24 for Willow Creek water quality demonstrates that water quality in the study area is variable and quite different from that of Baker Gulch, which has better water quality in nearly all parameters than that of Willow Creek.

Comment. A hard look requires an analysis of the impacts of pumping on the Three Lakes paying particular attention 1) to how the WGFP will reduce flexibility in the system to turn off pumping to stop the export and feeding of algae blooms in Shadow Mountain Reservoir to Grand Lake, 2) to how pumping to optimize nighttime energy consumption when power costs are low and daytime releases through the Adams Tunnel to maximize revenues from energy generation influences water quality.

Comment. For the section including surface water quality and the Three Lakes region, please discuss the fact that 1) the west slope water bodies are more productive than the east slope water bodies (higher chlorophyll α), and 2) the west slope water bodies produce bluegreen algae where the east slope do not. Please include in this discussion 1) why this might be, 2) and what these circumstances mean operationally for the system, and 3) what special challenges they pose to operating in a fair and equitable manner on both sides of the Continental Divide.

Page 3-74

Comment. Grand Lake is not only the largest natural lake in Colorado, it was specifically protected by Senate Document 80 as a primary purpose of the CB-T project: 2. To preserve the fishing and recreational facilities and the scenic attractions of Grand Lake . . ." (emphasis added). "Preserve" is defined as

> 1. To keep safe, as from injury or peril: PROTECT. 2. To maintain unchanged. 3. To keep or maintain intact. Webster's II New College Dictionary (1999).

The DEIS demonstrates that water quality has not been preserved in Grand Lake. Instead it has been degraded. The DEIS needs to analyze the alternatives beginning with this key existing problem. The DEIS should explain whether and to what extent the WGFP will "preserve" the water quality in Grand Lake, or whether pumping more polluted water from the Colorado River into Lake Granby, through Shadow Mountain, and into Grand Lake will exacerbate the existing water quality concerns.

Comment. Please update the discussion of dissolved oxygen in Shadow Mountain Reservoir to include what we know to be true, that dissolved oxygen standards are regularly exceeded in the southern end of the reservoir, also updating your table, and especially including a thorough discussion and consideration of the impacts to water quality beyond the mere statement that "Low DO concentrations can be a concern because of the potential release of orthophosphate, ammonia, iron, and manganese from the sediments under anoxic conditions."

Comment. Algae and Trophic State. The statement "All microcystin results received through July 24, 2007 for Shadow Mountain Reservoir have been below the detection limit" tells a partial truth because it stops short of the date for which we do have a value above the detection limit. Results for 8/6/2007 indicate a microcystin toxin value of 1.15 micrograms per liter by ELISA in Shadow. While HPLC results do not corroborate this value, it is not certain that they would, and in any case would likely have required sample concentration techniques, the need for which were unknown at the time. As such, the ELISA value, while acknowledged to be subject to false positives, is the best value we have from the time and should be mentioned with explanation of its limitations.

Comment. Algae and Trophic State. If Ms. Leiberman's data is used, 7.3 micrograms per liter of chlorophyll is an inaccurate average, and peak concentrations have risen to 28 micrograms per liter, or nearly double the value cited here. Nonetheless, a value of 7.3 micrograms per liter does not define the lake as mesotrophic, but rather places it on the meso/eutrophic boundary. Using Ms. Leiberman's averages instead for 1, 5, or 1-5 meter sample collections puts the lake squarely in the eutrophic category, which is unacceptably degraded over pre-Windy Gap and especially pre-C-BT values. Please see comment regarding Jahnke, 1981 document in Lake and Reservoir Water Quality Technical Report section.

Comment. Nutrients. "No recent bioassays have been conducted to determine if this situation has changed." is untrue. Davine Leiberman has completed her three year study

on the Three Lakes and from my understanding the final report has been submitted to Northern. Data from this report is new, more thorough than what was provided previously to the EIS process, and should be brought to bear on the document.

Comment. Grand Lake. "The residence time…is short due to the operation of the C-BT Project and varies according to operations." This cannot be true for the entire volume of the lake, particularly with the strong stratification that is acknowledged to occur during the summer. Please see comments on p3-93. Again we have a case where it is very inappropriate to use an averaged value, in this case residence time, to represent such a complex system with any degree of accuracy.

Discussion of microcystin toxin in Grand Lake is improved over the PDEIS but still leaves out ELISA value of 1.48 ug/L for 8/6/2008. This value is potentially more reliable than the HPLC values which most likely require concentration of the sample, concentration that did not occur, before they can accurately be relied upon for quantitative values, if at all. Though the ELISA is susceptible to false positives, far better to state this than to omit a potentially significant value. In addition a concentration of 0.19 ug/L was detected in the lake on 8/20/08, and a Grand Lake homeowner's tap checked in at 0.19 ug/L on 8/14/07.

Comment. The section on clarity notes that Grand Lake clarity has varied between 1.8 meters and 5.6 meters. The 5.6 meter Secchi depth measurement is the second best measurement ever documented on Grand Lake (second only to Pennak's 9.2 meter measurement in 1941). That data was taken in November of 2006, at a time when water temperatures had cooled, summer algal blooms had died off, and C-BT pumping had ceased three weeks earlier to facilitate the draw-down of Shadow Mountain reservoir for weed mitigation. Only East and North Inlet stream flows were providing water to Grand Lake during that time period. These circumstances serve to highlight the fact that pumping schedules and seasonal algae blooms have a very substantial effect on water quality especially in terms of clarity.

Section 3.8.2.2 Regulatory Requirements

Page 3-86

Comment. The need for a 401 Certification from the State of Colorado as part of the 404 permit and an anti-degradation review by CDPHE are noted. However, in spite of conclusions throughout the DEIS regarding exceedances of water quality standards, the DEIS analysis is not consistent with the approach used by CDPHE for evaluating compliance with standards or the anti-degradation review. The DEIS typically considers median water quality values and average flow conditions, which is not the approach

CDPHE uses for determining compliance with standards (5 CCR 1002-82) or in an anti-degradation review (5 CCR 1002-31.8(3)). The DEIS is inadequate to form the basis of the 404 permit.

Pages 3-87 and 3-88

Comment. The requirement to obtain a 404 permit applies to alternatives that construct reservoirs in waters subject to the jurisdiction of COE.

Section 3.8.2.3 Method for Effects Analysis

Page 3-93

Comment. The representation of flow down the Adams Tunnel as coming entirely from the epilimnion is incorrect. For this concept we are working from a diagram found in a Reclamation document entitled "Hydraulic Lab Report Number 151: Model Studies of the Alva B. Adams Tunnel Inlet Control Structure..." dated September 21, 1944. Some of what follows is contingent on this diagram accurately representing or at least approximating the actual structure of the current Adams Tunnel Inlet.

According to this diagram, the inlet mouth is about four feet high, spanning a distance from roughly 7.4 feet to 12 feet below water surface, calculated from the top possible elevation of the water surface. The location of the Adams Tunnel inlet between the North Inlet and the East Inlet is ideal for maximizing capture of the clean water that flows into Grand Lake from these two very pure rivers. In addition, we believe that the elevation of the Adams Tunnel inlet structure is well placed to "high grade" (to borrow a term from mining) the good quality water that flows into Grand Lake for much of the summer.

In the spring after ice-off the lake turns over and is well mixed. Stratification begins immediately, and an epilimnion, metalimnion and hypolimnion begin to develop. During May, June and possibly all of July (depending on the time of ice off), these layers are thin enough that the water flowing into the inlet is either derived entirely from the mixed waters, the diluted hypolimnion which at this time of year has desirable water quality roughly the same as the mixed waters, or from the very high quality metalimnion, into which we believe the rivers flow once stratification has become established. It is not until roughly late July or early August that the epilimnion has become wide enough (about 4 meters or 16 feet at that time of year) that it is finally able to span the entirety of the Adams Tunnel mouth. At this time all of the water flowing down the Adams Tunnel does appear to be coming from the epilimnion, which is believed to be composed almost entirely of the poorer quality water pumped in from Shadow Mountain Reservoir. From late July or early August, until fall turnover in either October or November, sediment and

algae laden water from Shadow Mountain Reservoir is thought to spread out over the entire epilimnion, some of which is siphoned off by the Adams Tunnel.

At the time of fall turnover, Grand Lake is capped with a layer of low transparency, high algae and sediment content water. When turnover occurs, this load is incorporated into the whole of Grand Lake, and again the diluted mixed waters are made available to the Adams Tunnel. The flow down the Adams Tunnel is composed of water from Shadow Mountain Reservoir only about three months out of the year, rather than six.

The continual loading of the epilimnion in summer, as well as of the entire mixed water body in winter, year after year, can only mean that Grand Lake has had to arrive at, or continues to approach, a new equilibrium which reflects those undesirable contributions from Shadow Mountain Reservoir. This is evident, among other indicators, in reduced clarity, increased algae growth, and the formation of a significant delta at the channel entrance.

Pages 3-104 and 3-107

Comment. The argument is made that increased pumping will decrease residence times in the three lakes, thereby reducing impacts from increased nitrogen concentrations. This argument appears to be erroneous at least for Grand Lake, but probably also for Granby Reservoir, when according to Davine Leiberman's 2008 study, algae blooms persist in Grand Lake even when pumping is high and flushing rates increase to within the range of days.

Section 3.8.3 Cumulative Effects

Page 3-115

Comment. Pine-bark beetle infestation and climate change must be considered as part of the cumulative impacts for lake and reservoir water quality report and for stream water quality.

Comment. The use of one day of July 25th as a worst case scenario makes no sense.

Section 3-8.3.1 West Slope Cumulative Effects

Page 3-121

Comment. Granby Reservoir. "Phosphorus concentrations would be lower than in the direct effects analysis due to anticipated advanced wastewater treatment in the Fraser

River basin in the future." If the analysis of phosphorous concentrations in the DEIS is based on the assumption that treatment plants will be upgraded, then the Carriage Contract must be conditioned on such upgrades being constructed by the applicant for the predictions about phosphorous to be accurate.

Comment. There is no discussion of how the possible consecutive dry year reduction in water levels of up to 44% from the mean depth of 74 meters, 15% difference from the maximum depth (p3-53 WGFP DEIS), will influence water quality. Repeated freezing and thawing of exposed sediments is likely to increase nutrient and potentially metals loading in the reservoir which is not accounted for in any way.

Section 3.9 Aquatic Resources

Comment. The conclusions in the Aquatic Resources section are based on the information contained in the Aquatic Resources Technical Report dated July, 2008. The conclusions brought forward into the DEIS are inaccurate because of the many problems with that technical report. Please refer to the *Wyatt Memorandum*, Exhibit C for a detailed discussion of the inadequacies of the aquatic resources impact assessment. In addition, all of the conclusions about impacts to aquatic resources are called into question by the failure to use existing conditions to measure the significance of stream depletions. See General Comments Section, above.

Comment. This section should refer to Grand County's Stream Management Plan. See comment under Chapter 5, below.

Page 3-137

Comment. The reduction of 24% habitat for fishery is significant and is likely to be far more significant if the impacts were measured against actual *existing* stream flow conditions. *See* General Comments Section above.

Section 3.9.3 Cumulative Effects

Comment. Senate Document 80, the document that controls operation of the C-BT, states that one of the primary purposes of C-BT is "[T]o preserve the fishing and recreational facilities and the scenic attraction of Grand Lake, the Colorado River..." As part of discussion of the cumulative effects, there should be a discussion of whether fishing and recreation actually have been preserved under current conditions. The DEIS also should make reference to the 1951 report prepared by the US Fish and Wildlife for Reclamation which detailed the devastating effects of Granby Dam on the Colorado River. We are aware of two scientific assessments of the stream reach below Granby

Reservoir the 1951 United States FWS report and the Grand County Stream Management Plan. Exhibit G attached shows comparisons of the flows below Granby Reservoir. There is no assessment whether existing bypass flow requirements below Lake Granby and Windy Gap are appropriate for protection of the environment or whether prolonged durations at those flow levels as a result of WGFP alternatives will have an adverse impact.

Section 3.9.4 Proposed Mitigation

Page 3-145

Comment. The discussion of mitigation of impacts to aquatic resources is inadequate.

Section 3.13.2.2 Methods for Effects Analysis

Page 3-195

Comment. If the original Windy Gap was purported to divert an average of 56,000 af why is only 18,779 af of average depletions being paid for under the Fish and Wildlife Service Programmatic Biological Opinion for recovery of endangered fish?

Section 3.18 Land Use

Page 3-216

Please see attached *Coley/Forrest Memorandum*, Exhibit F pg 7 section 1.6, and page specific comments at pg 28 section 2.1 for a complete discussion of the problems with the land use impact assessment.

Section 3.19 Recreation

Page 3-230

The discussion of impacts to recreation is inadequate to satisfy the "hard look" test. Please see attached *Coley/Forrest Memorandum*, Exhibit F pg 9 section 1.7, and page specific comments at pg 29 section 2.2 for a complete discussion of the problems with the recreation impact assessment.

Section 3.21 Visual Quality

Page 3-265

The discussion of impacts to visual quality is inadequate to satisfy the "hard look" test. Please see attached *Coley/Forrest Memorandum*, Exhibit F pg 24 section 1.8, and page specific comments at pg 33 section 2.3 for a complete discussion of the problems with the visual quality impact assessment.

Section 3.22 Socioeconomics.

Page 3-272

The discussion of socioeconomic impacts is inadequate to satisfy the "hard look" test. Please see attached *Coley/Forrest Memorandum*, Exhibit F pg 25 section 1.9, and page specific comments at pg 35 section 2.4 for a complete discussion of the problems with the socioeconomics impact assessment.

Chapter 5 References

Comment. The DEIS fails to consider or discuss *Grand County's Stream Management Plan, Phase 2, Environmental and Water Users Flow Recommendations*, April 2008 and mitigation.

Grand County has been involved in an ongoing effort to provide a scientific study for the analysis and recommendation for preferred flow regimen for streams and rivers in Grand County. Phase 2 of that study focused among other things on an environmental flow regimen "determined to best maintain the ecological needs of the stream in relation to fisheries." *Grand County's Stream Management Plan, Phase 2, Environmental and Water Users Flow Recommendations*, April 2008, ES-1. ("GCSMP"). The GCSMP has been and is still on the Grand County website. Although the DEIS was completed months after Phase 2 of the GCSMP, the DEIS does not cite this study as a reference or discuss the findings and recommendations for environmental flows. The DEIS needs to be supplemented to include the information from the GCSMP and to include a discussion of potential mitigation measures developed in the GCSMP.

The stream reaches that are affected by the proposed alternatives included in the GCSMP are:

- CR3, Colorado River – Granby Reservoir to Windy Gap.
- CR4, Colorado River – Windy Gap to Williams Fork.
- CR5, Colorado River - Williams Fork to KB Ditch.

- CR6, Colorado River - KB Ditch to Blue River Confluence.
- CR7, Colorado River - Gore Canyon to Grand-Eagle County Line.
- WC, Willow Creek – Willow Creek Reservoir to Colorado River.
- BR, Blue River - Green Mountain Reservoir to Colorado River.

We would look forward to a meeting to discuss these concerns at any time.

Sincerely,

Barbara J.B. Green

cc: Board of County Commissioners of Grand County
Lurline Underbrink Curran
J. Scott Franklin (via email: j.scott.franklin@usace.army.mil)
Deborah Lebow-Aal, EPA

EXHIBIT LIST

Exhibit A
List of Grand County comment letters on WGFP Technical Reports

Exhibit B
Report on Windy Gap Firming Project Hydrology Technical Report, by Bishop-Brogden Associates (*BBA Report*)

Exhibit *C*
Memo, *Windy Gap Firming Project DEIS Aquatics Resources Technical Report*, by Lane Wyatt (*Wyatt Memorandum*)

Exhibit D
Table, *Windy Gap Ownership and Transfer History.*

Exhibit E
Letter dated March 22, 2004 from the Colorado River Conservation District, Grand County and Northwest Colorado Council of Governments to Richard Aldrich and John Chaffin (p 21)

Exhibit F
Memo, *Windy Gap Firming Project - Draft Environmental Impact Report (DES 08-30,* by Coley/Forrest (*Coley/Forrest Memorandum*)

Exhibit G
Table Comparing Flows Below Granby Reservoir

STATE OF COLORADO

Bill Ritter, Jr., Governor
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF WILDLIFE
AN EQUAL OPPORTUNITY EMPLOYER

Thomas E. Remington, Director
6060 Broadway
Denver, Colorado 80216
Telephone: (303) 297-1192
wildlife.state.co.us

For Wildlife-
For People

December 29, 2008

Will Tully
Bureau of Reclamation
11056 West County Rd. 18E
Loveland, CO 80537

Mr. Tully,

Thank you for the opportunity to evaluate the proposed Windy Gap Firming Project. We have reviewed the Windy Gap Firming Project (WGFP) Draft Environmental Impact Statement (DEIS) and have the following comments. Alternative 1 (No Action) has the least negative impacts on wildlife. We have also provided other mitigation recommendations in the event the Bureau selects a different alternative. The impacts of the WGFP must be considered in the context of current conditions on impacted streams which have resulted from the larger CB-T project.

The Colorado River through Grand County offers a highly valuable public fishery resource. It is nationally known as a quality trout stream and provides significant economic value to a rural area. We believe the CB-T Project has had dramatic impacts on the Colorado River since being built. 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 river was 21 trout per acre longer than 14 inches. This data supports the popular notion among the angling public that the quality of fishing on this reach of river has steadily declined since the construction of the Windy Gap project. We understand that Senate Document 80 originally enabled the development of the project. However, that document also stated that the project was "to preserve the fishing and recreational facilities and the scenic attractions of Grand Lake, the Colorado River, and Rocky Mountain National Park." We feel that the existing project has decreased the recreational fishery value of the Colorado River by limiting fish population biomass and numbers principally through: reduced aquatic insect production; exacerbating whirling disease and diatom blooms; and reduced flows inadequate for channel maintenance and sediment transport which result in elevated water temperatures in portions of the Colorado River.

In 1987 whirling disease was detected in the river. The density of the whirling disease pathogen in the Colorado River immediately below Windy Gap has been among the highest ever observed in the state. CDOW aquatic researchers found that the proliferation of the disease, which eliminated natural recruitment and thus decimated the rainbow trout population, was greatly exacerbated by the presence of Windy Gap Reservoir.

Based on multiple studies discussed below, we now know that the minimum flows that were established by the Azure Settlement Agreement of June 23, 1980, are inappropriate for maintaining aquatic resource integrity and are often not even met. Minimum flows in place for the section of the river between Granby reservoir and Windy Gap are even more inappropriate. These statements are supported by multiple documents and studies, dating as far back as 1951 with the report entitled "Recreational Use and Water

EXHIBIT G

Requirements of the Colorado River Fishery Below Granby Dam," sponsored by the U.S. Bureau of Reclamation and prepared by the U.S. Fish and Wildlife Service. We have conducted electrofishing surveys in various parts of the river during periods of minimum flow and observed significant sections with extremely high width-to-depth ratios, which are devoid of adult fish. At minimum flows these specific river reaches become unusable to adult fish. The same 1951 report also prescribes appropriate flows to maintain the aquatic resources below Granby Dam. The flows delineated in the 1951 report correspond with the flows recommended in the Grand County Stream Management plan. After more than 50 years and many advances in the science of river geomorphology and hydrology, the conclusions are still the same: there is not enough water in the main stem of the Colorado River to maintain aquatic resources over the long term.

The minimum flows currently in place on the river were determined from limited data which was collected when the original Windy Gap project was imminent. Grand County has invested significant resources in recent years to study appropriate flows in the river with the most current available science. This is the most thorough study of stream morphology that has been conducted in this area to date. CDOW expects to be party to renegotiation of those minimum flows as a condition of the mitigation plan which will be developed pursuant to 37-60-122.2, Colorado Revised Statutes. We view the Grand County Stream Management Plan as a critical document in determining the future condition of the upper Colorado River. Its conclusions regarding appropriate flows support our observations of the fish population. We recommend that this document be taken into consideration when assessing the impacts of the WGFP, the Moffat firming project, and the cumulative effects of both projects.

Among the many insights contained in the 1951 report referenced above, is a description of food organisms available to trout in the section of the Colorado River between Granby Reservoir and the Fraser River confluence. There is an observation that large stoneflies, locally known as "willow flies," belonging to the genus *Pteronarcys*, "emerged in tremendous numbers during the last week in June and the first week in July." Currently, the willow fly hatch is not reliable at all anywhere upstream from Kremmling. It does appear sporadically, but not reliably, in some years as far upstream as Hot Sulphur Springs. For the hatch to appear above Windy Gap Reservoir is virtually unheard of since the closure of the Granby dam. We believe that the reduction in this important trout food and famous insect hatch is directly related to the unnaturally low flows now occurring in the system.

Under current conditions, the Colorado River between Windy Gap and the Williams Fork confluence frequently fails to meet state temperature standards established by the Colorado Water Quality Control Commission. These high temperatures usually occur in August when flows have dropped to near base level and nighttime air temperatures remain high. In 2008, which was not a particularly hot summer and when the river enjoyed relatively good flows, there were four days (August 6-9) in which temperatures in the river (measured at the County Road 3 bridge) failed to meet the chronic temperature standards contained in state regulations. In 2007, a more typical year, water temperatures failed to meet this standard for 32 consecutive days (July 25 – August 25). We suspect that certain population parameters such as the declining number of quality-size trout may be tied to these high temperature/low-flow occasions. There is no question that these events do increase the level of stress that the fish populations must endure.

The proliferation of the diatom *Didymosphenia geminata* ("Didymo") has been observed throughout this same river reach. This nonnative organism has the potential to permanently alter processes such as nutrient cycling, food web dynamics and invertebrate production in waters where it is established. It often forms "nuisance blooms" which consist of dense benthic mats which can entirely cover the substrate of a river channel. Didymo appears to thrive in streams with regulated flow regimes and an inverse relationship has been observed between the proliferation of the diatom and the frequency of channel maintenance flows. A further reduction in the frequency of channel maintenance flows which accomplish

sediment transport in the upper Colorado River due to project operation will likely exacerbate this situation and lead to further negative fish and aquatic invertebrate population impacts.

The DEIS recommended alternatives are likely to cause further decline in the number of quality size trout and threaten the Gold Medal status (at least 12 fish longer than 14 inches per acre) of this reach of the Colorado River.

Flow Related Issues – West Slope

We know that the Moffat Firming Project includes plans to increase water diversions from the Fraser River during runoff flows, which will coincide with plans to increase water diversions by the WGFP. The flow projections and analysis contained in the DEIS for the Colorado River below Windy Gap do not account for the implementation of the Moffat Firming Project, for which a DEIS is expected to be released in the near future. As a result, the analysis of impacts to the aquatic environment contained in the WGFP DEIS for that portion of the Colorado River are minimal since the two projects together present a major cumulative impact.

We are concerned that the descriptions of the WGFP DEIS existing conditions overstate the water diversions. On table ES-2 and table 2-6, existing average annual Windy Gap diversions are stated as 36,532 acre-feet of water. The average annual diversion through Windy Gap Reservoir from the inception of the project has been 13,829 AF. In the 23 years that Windy Gap has operated, the volume of diversions has met or exceeded the figure of 36,532 AF in only three of those years. To use this figure as an Existing Condition in the document seems misleading, and it minimizes the potential impacts of additional diversions by excessively lowering the baseline. In addition to the concerns stated above, this also calls into question all the stated impacts analyzed in this document.

Figure 3-13 in the DEIS depicts average daily flows in the Colorado River below Windy Gap under each alternative. The drop in peak flow from current conditions to the proposed alternative is significant. Through the work reported in the Grand County Stream Management Plan, we know that the annual high flow required for channel maintenance and sediment transport is at least 750 cubic feet per second (CFS) and possibly as high as 1,200 CFS. Recent, but as yet unpublished, work conducted on this section of river will refine these maintenance and sediment transport flow calculations. The drop in peak flows depicted in Figure 3-13 could very well represent a large reduction in the frequency of channel maintenance flows. The situation becomes more serious when considering that this flow information does not take into account Moffat Firming Project diversions.

Under all the alternatives (including No Action), the river will see slight decreases in average flow during August, and because of the close relationship between flow and water temperatures, we anticipate an exacerbation of high temperatures in this reach. Increasing the frequency and duration of these high water temperature occurrences will only increase the likelihood of negative population-level impacts. Figure 3-38 in the DEIS illustrates the large contribution to high temperatures that Windy Gap Reservoir makes during a period of diversion. Further increases in stream temperatures caused by the WGFP will increase the likelihood of this reach of the Colorado being listed as impaired by the Colorado Water Quality Control Commission.

Flow Related Issues – East Slope

East Slope impacts to fisheries are not as detrimental. Impacts of water delivery downstream of Chimney Hollow are still being studied; our understanding is there would be moderate changes in flow regime in some Front Range creeks in order to deliver this water. Alternative 1 identifies increasing the size of Ralph Price Reservoir (Buttonrock). This would have limited impact on the North Saint Vrain River as the increased water would only be in the river channel for 2 miles below the dam and not impact the sensitive native species area downstream of Lyons. The lake currently is and would continue to be most suitable for rainbow trout, brown trout and splake, though a reservoir enlargement may allow the addition of kokanee salmon.

The DEIS states that "The Subdistrict would coordinate with the CDOW to establish a sport fishery in Chimney Hollow Reservoir. CDOW would be responsible for the establishment and management of the fishery." The CDOW welcomes the opportunity to establish a new public access fishery which would use similar species as in Ralph Price Reservoir, but with that comes some concerns. Our hatchery system cannot currently support increased production for an additional reservoir on the Front Range. We will address this more specifically in the mitigation section.

We recommend consultation with Larimer County Parks regarding boating recreation on Chimney Hollow Reservoir. A wakeless speed rule rather than a restriction on size or motor type will increase safety and allow boaters to exit the water efficiently if emergency conditions arise.

Terrestrial Resources

The Chimney Hollow and Dry Creek Valleys, located in the hogback west of Carter Lake are similar in topography, hydrology, vegetation, and land use. Both sites are relatively undisturbed and are therefore increasingly important for wildlife in light of the intense development on surrounding lands. Interspersion of escarpments, ponderosa pine woodlands, native grasslands, foothills shrub lands and riparian habitat on these parcels creates ideal habitat for many species. Of the two sites Chimney Hollow offers the best overall habitat and interspersion for wildlife. Both sites are listed in the report as overall and summer range for mule deer with winter concentration areas in near proximity. Both sites are also listed as winter range for elk. However with shifting patterns in land use in surrounding areas coupled with impacts due to several years of drought at the turn of the century, these valleys have assumed increasing importance for deer and especially elk during the last several years. Elk herds that once wintered in the Mariano Buttes area to the northeast of Carter Lake and from sites west of Chimney Hollow now tend to winter out in these hogback valleys, as their former wintering sites have dwindled due to development or change in plant stands and quality caused by drought. During our last winter aerial count CDOW biologists counted approximately 200 elk in the Chimney Hollow Valley. Chimney Hollow and Dry Creek now provide one of the last places in this area where elk and deer can forage without being disturbed by human activity and threats by automobiles year around. Because of relatively intense use by ungulates these valleys in all likelihood provide high quality habitat for mountain lions. Both sites are also designated in the technical report as being located within black bear fall concentration areas. With increasing conflict between bears and humans caused by development pressure in southern Larimer County it is essential to maintain intact, high quality bear habitat. These valleys offer the best of the best for black bears bulking up for winter hibernation. Both valleys also provide potential habitat for northern leopard frogs, and common garter snakes, both of which are designated as species of concern. Inundation of one or both of these valleys would result in loss of habitat and would likely force elk, deer, lions and bears to adjacent areas with lower forage value, higher opportunity for conflict with humans and increased chance of becoming victims to road strikes feral dogs and other calamities that occur when wildlife are forced into compromised habitat. Alternative 1 would have the least impact on high quality habitat for terrestrial species in the Chimney Hollow, Dry Creek, Jasper East and Rockwell Mueller sites.

Expansion of Ralph Price Reservoir, a steep banked mountain reservoir surrounded predominantly by coniferous woodlands, would have a less significant impact on terrestrial wildlife habitat than creation of new reservoirs at the alternative sites.

The DEIS states that development near the proposed Jasper East reservoir site is around 3005 acres; it is inconclusive if this includes the Orvis-Shorefox property which is 1500 acres. Combining this with the development of the reservoir would affect 1.5% of the elk winter range in Game Management Unit (GMU) 18 and 1.2% of the moose winter range in GMU 18. The creation of Rockwell/Mueller would be even greater. Rockwell/Mueller has approximately 4770 acres of future development combined with the creation of the reservoir would impact approximately 5105 acres of wildlife habitat. Approximately 3173 acres would be elk winter range. The effects to elk winter range would be approximately 4.1% of the elk winter range in GMU 18. These are large landscape impacts that are within the foreseeable future. While the DEIS quantifies the acreage lost per alternative based on species activity maps, it does not mention cumulative effects of what losing 24 acres of elk winter range if Jasper East was constructed except for "elk movement could shift." Jasper East construction will likely impact elk movement from Rocky Mountain National Park and Grand Lake to the riparian areas around the Colorado River/Fraser River junction. What the scope of this impact or shift in movement patterns will be is hard to say. Elk could move west to cross 125 to get to Dexter Ridge or they could cross highway 34 to get to the Bussey Hill area. Either way, the general shift in movement will most likely cause increased vehicular problems along highway 34, which the DEIS largely ignores. Likewise, construction of Rockwell/Mueller could displace elk from that property onto Grand Elk Golf Course or onto adjoining private property in the area increasing game damage conflicts.

Management of the proposed Jasper East and Rockwell/Mueller reservoirs is not addressed. If built, public access should be allowed to provide recreational opportunities (hunting, fishing, and watchable wildlife). Currently, Windy Gap Reservoir provides watchable wildlife opportunities without traditional hunting and fishing access. Fencing as is present at Windy Gap limits free movement of many species of wildlife.

There are a number of potential impacts from the proposed West Slope reservoirs to Greater Sage-Grouse (GrSG). As a point of clarification this species was removed as a candidate for federal listing in January 2005. However, since that time a ruling found the 2005, 12-month finding to be arbitrary and capricious under the Administrative Procedures Act. The GrSG is undergoing another 12-month status review that should be completed by early 2009. To also clarify another statement in the DEIS regarding the abundance of GrSG in Grand County we recommend using the following statement; "Sage grouse are uncommon in east Grand and common in west Grand." The Executive summary states that about 300 acres of GrSG habitat will be lost if Rockwell/Mueller reservoir is built. This accounts for 5% of GrSG habitat in the area and surrounding the Linke Lek. The accumulative loss of 740 acres of GrSG habitat accounts for over 12% of the GrSG habitat surrounding the Linke Lek. As stated in Table 2-7 on page 2-72, this loss of habitat could result in the complete loss of GrSG from the area. We also add that in 2008 the CDOW counted no sage grouse on the Linke Lek and a total of 9 grouse (3 males and 6 females) in an area we are calling the Horn West Lek.

Decrease in water flow will directly impact terrestrial species such as beaver, mink and river otter in the area. River otter is a Colorado state Threatened Species and a species of concern because of its relationship to healthy aquatic environments. Reduced flows and fish abundance will have a negative impact on otters. It has been documented that river otters are sensitive to water quality and that poor water quality and habitat can inhibit otter movement through a particular stretch of river and thereby affect the gene flow by isolating a group of animals. River otters currently inhabit all areas of river habitat surveyed in Grand County. Diminished flows below Windy Gap could preclude movement of river otters through that stretch of the river. Boreal toad is a state endangered species. There is suitable

habitat for boreal toads near Granby, but they have not been documented to occur there. Extensive surveys should occur before any new reservoir construction occurs.

Mitigation

We understand the Bureau will be developing mitigation strategies as part of the EIS process, and the Division looks forward to working cooperatively on a mitigation plan pursuant to 37-60-122.2, Colorado Revised Statutes. We offer general guidance on mitigation strategies that may be employed to mitigate impacts that we have identified. We believe that highest priority for any mitigation must be placed on improving flows below Windy Gap, and secondarily improving flows below Granby Reservoir. We are aware of ongoing discussions regarding water rights in the Red Top Ditch above Shadow Mountain Reservoir. If the WGFP is implemented, this water could be stored in Granby Reservoir and used to increase Colorado River flows.

To adequately protect aquatic resources, flows should be maintained that sustain minimum temperature standards. This may require installation of one or an array of real-time temperature gauges on the Colorado River. Data collection to date has been informative but delayed in nature due to the fact that the data must be retrieved in the field from electronic logging devices after it has been collected. Because of this, it is not immediately apparent when the river has exceeded chronic temperature standards. Real-time temperature sensors would enable managers to know immediately when temperature standards are exceeded, and arrange for releases of flow mitigation water from Granby dam.

There are locations in the Colorado River within the project area where width-depth ratios are extremely high at low flows. Some of these sites appear to have potential for large-scale in-stream habitat projects to reduce the width-depth ratio. These potential projects could also increase habitat availability for larger trout and enhance the carrying capacity of the river for quality-sized fish.

The idea of a complete bypass of Windy Gap Reservoir while pumping is not occurring has been discussed in the past and should continue to be considered, as this would remove many possible deleterious effects of Windy Gap Reservoir such as increases in temperature and nutrient loading.

Mitigation offered for numerous proposed water projects on the Front Range include fishing recreation days. Conceptually, this is beneficial and we support it as a mitigation option. However, because these types of reservoirs do not sustain significant fish reproduction, there is a significant underlying need which must be addressed - the source and cost of the fish which will need to be stocked to provide this mitigating fishing recreation. The Division's hatcheries, even as currently supplemented by some federally stocked fish, are not always capable of meeting the numbers of fish needed to stock waters currently open for fishing.

There are a number of proposed water projects currently under consideration in Colorado including Windy Gap, Glade Reservoir, the enlargement of Chatfield, Halligan and Seaman Reservoirs in the South Platte Basin and the Southern Delivery System in the Arkansas River Basin. If these water projects are added to the acres of water the Division currently stocks to support public fisheries, our current hatchery infrastructure cannot produce enough fish to meet the required stocking necessary to create or maintain sport fishing opportunities. This is probably not a traditional view of cumulative effects, but if fishing recreation benefit is going to be proposed as mitigation for water development, mitigation needs to provide for the production of the necessary fish. These costs can be broken down into two categories: production facilities and ongoing production. The recognition that this is a cost of the project and the mitigation plan is not new to Colorado. The Division's Pueblo hatchery was constructed as partial mitigation for the Fryingpan-Arkansas project. In addition, long term operation of hatcheries to produce fish required is a much larger cost, and this requires funding the Division cannot provide alone. We

propose that all water projects provide capital construction and operation funds either for current state hatcheries capable of expanding or for the purchase, construction and operation of new hatchery space to meet these fish production needs.

Public fishing access on rivers is limited in the area of eastern Grand County. Any increase in stream mileage that is open to public fishing would have great benefits. We recommend that acquisition of new public fishing access on rivers in Grand County be considered as part of project mitigation.

There is no mention of any sort of mitigation action for loss of big game habitat. If one of alternatives 2-5 is selected for development, CDOW would recommend significant mitigation measures be incorporated in the development plan and construction of this project in an effort to reduce negative impacts to essential wildlife habitat inundated by the WGFP. The only mention of habitat is the bullet point "a variety of BMPs will be implemented...and protect or avoid important wildlife habitat". Cumulatively there is approximately 3000 acres of foreseeable development on winter range with the Jasper East alternative and well over 5000 acres of foreseeable development with the Rockwell/Mueller alternative.

During the critical fall and winter the Chimney Hollow and Dry Creek valleys should have restricted human use. Creation of reservoirs and year around recreation at these sites would make this crucial area for wildlife less attractive for deer, elk and bears, and force them into alternative sites that are already developed. Recreation tends to slow in fall and winter and there are currently alternative sites for hikers, bikers and anglers to use nearby. Fishery management for the reservoir/s created by this project could emphasize species maximally available in spring and summer. Development of reservoirs in these valleys with subsequent recreational development should be accomplished in a manner that provides adequate protection for golden eagle nest sites and other raptor use areas. CDOW suggests you refer to our recommended guidelines for setback and seasonal disturbance for raptors at this web site: ftp://wildnet/documents/WL%20Conservation/Raptors/CDOW%20Raptor%20Buffer%20Guidelines%2002_2008.pdf

Sites in and around any of the newly created reservoirs should remain open for hunting. Harvest of deer, elk, bear and lion is an integral component in successful management of those species. If necessary CDOW could assist in developing mechanisms for limited hunting that could successfully achieve harvest goals while protecting public safety.

In closing we would like to thank you for the opportunity to comment on your project proposal and represent wildlife in your evaluation. We look forward to hearing from you as you prepare for the next step in this process.

Sincerely,

Thomas E. Remington

Thomas E. Remington
Director

Cc: Konishi, Ver Steeg, Velarde, Yamashita, Gerlich, Kahn

Detailed Comments
Public Notice No. 200980523
Windy Gap Firming Project DEIS

Compliance with the CWA Section 404(b)(1) Guidelines

Compliance with the Guidelines requires that impacts to aquatic resources be first avoided and minimized, and compensatory mitigation should be used only for impacts that cannot be avoided or minimized. These requirements are essential to meeting the overall objective of the Clean Water Act to restore and maintain the chemical, physical and biological integrity of the nation's waters. EPA believes that alternative water supply options exist that would meet the basic project purpose while avoiding the impacts to the Colorado River associated with firming existing Windy Gap water rights. The applicant must demonstrate that all appropriate and practicable steps to avoid and minimize adverse impacts to the aquatic environment have been taken.

40 CFR §230.10(a) Alternatives Analysis:

The DEIS states that the purpose and need of the proposed project is, in part, "to deliver a firm annual yield of about 30,000 AF of water from the existing Windy Gap Project to meet a portion of the water deliveries anticipated from the original Windy Gap Project" (see DEIS p.1-1). Despite the applicant's intent to improve the yield from the existing Windy Gap project and to exercise existing Windy Gap water rights, the Corps of Engineer must make an independent evaluation of the basic project purpose (i.e., overall project purpose) to adequately evaluate alternatives to determine the least environmentally damaging practicable alternative (LEDPA).

EPA agrees with the Corps that the basic project purpose for the project is water supply (Public Notice of Permit Application). However, the Corps also states that the overall project purpose is to "deliver a firm annual yield of approximately 30,000 AF of water from the existing Windy Gap Project to provide a portion of the water deliveries anticipated from the original Windy Gap Project and to provide up to 3,000 AF of storage to firm water deliveries for the Middle Park Water Conservancy District." As detailed in the EPA's Final Determination of the CWA Section 404(c) veto of the Two Forks Water Supply Impoundments (November 23, 1990 at p. 2, footnote 2), EPA has determined that the terms "basic purpose" and "overall project purposes" are to be used interchangeably and are not intended to have distinct meanings. The DEIS and Corps Public Notice for this project have interpreted basic and overall project purpose(s) to have different meanings which artificially narrows the scope of the alternatives. EPA believes the project purpose is to meet a portion of the existing and future water supply demands of the project participants and thus additional less environmentally damaging practicable water supply-oriented alternatives that address this purpose should be analyzed and disclosed in future NEPA documentation for the edification of both the public and decision makers.

Both NEPA and the Section 404(b)(1) Guidelines require evaluation of reasonable alternatives, which must be rigorously explored and objectively evaluated. It is also essential to

the decision making process to present a reasonable range of alternatives in a manner that provides a clear and consistent comparison (40 CRF 1502.1. 1502.14(b)). Alternatives that are reasonable or practicable may include alternatives that are outside the capability of the applicant and are feasible from a technical and economic standpoint, rather than simply desirable from the standpoint of the applicant. The preamble to the Guidelines states that practicable alternatives must be "reasonably available or obtainable" but the mere fact of ownership does not necessarily determine reasonable availability. The regulation states that *"(a)n alternative is practicable if it is available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes. If it is otherwise a practicable alternative, an area presently not owned by the applicant which could reasonably be obtained, utilized expanded, or managed in order to fulfill the basic project purpose of the proposed activity may be considered."* 40 CFR 230.10(a)(2). This regulation also states that if inadequate information is presented in the DEIS for the evaluation of alternatives under the Guidelines, the Corps of Engineers may need to supplement the DEIS with additional information (40 CFR 230.10(a)(4)).

According to the Guidelines, the Corps may not permit a project if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences (40 CFR 230.10(a)). The DEIS does not provide an appropriate alternatives analysis regarding the availability of less damaging practicable alternatives. The alternatives evaluated in the DEIS are limited to providing storage or firming for all or a portion of the existing junior water rights of the Windy Gap Firming Project for current and future municipal and industrial supply. Water rights are considered vested property rights and can be transferred or conveyed in the same manner as property rights. The intent of Section 404 of the CWA is that no discharge of dredged or fill material should be permitted, unless it can be demonstrated that such a discharge will not result in unacceptable adverse impacts to the aquatic ecosystem. In addition, where a discharge is proposed for a special aquatic site (such as the wetlands and riffle and pool complexes in the Upper Colorado) all practicable alternatives to the proposed discharge which do not involve a discharge into a special aquatic site are presumed to have less adverse impact on the aquatic ecosystem, unless clearly demonstrated otherwise. The proposed use of junior Windy Gap water rights present a more damaging alternative for water resource development when compared to more senior rights and other less damaging alternatives for water supply. The DEIS described the process of evaluating a broad range of alternatives including structural and nonstructural water supply alternatives and that the screening process resulted in the elimination of the majority of alternatives in order to comply with the Guidelines. However, the DEIS does not sufficiently explain how the Guidelines criteria were applied.

Despite the screening criteria used in the DEIS to eliminate alternatives, other reasonable and less damaging practicable alternatives may be available to meet current or future demand when used alone or in combination with other alternatives. Such alternatives include, but are not limited to: 1) water conservation including active municipal, industrial (M&I) and agricultural efficiency measures; 2) acquisition of more senior water rights including water rights that have been available to the project proponent since the original Windy Gap project; 3) agricultural transfers including permanent, interruptible and rotating/fallowing transfers; 4) use of short-term agricultural leases for immediate temporary water supplies; 5) conjunctive use of surface water

and groundwater; and 6) M&I reuse, including water rights exchanges, non-potable reuse, and indirect potable reuse. Although the DEIS discusses common reuse and conservation practices by both the Provider and municipalities involved in this project, it does not explore additional conservation opportunities and quantities of water (i.e., supply alternative) that could be conserved with state-of-the-art water conservation/re-use programs in combination with smart growth land use principles directed towards more sustainable water use. These water supply alternatives are detailed in the State of Colorado Statewide Water Supply Initiative, Phase II Report (SWSI) CDM 2004; http://cwcb.state.co.us/IWMD/AlternativeAgriculturalWaterTransfersGrantProgram/. EPA understands the State of Colorado considers these alternatives viable to address Colorado's water supply needs.

The DEIS states that each participant has developed a unique portfolio of water supply sources to meet existing and anticipated water needs and that a diversity of water supply sources is generally preferred to ensure reliable deliveries (see DEIS p. 1-11). The additional alternatives identified above may provide comparably diverse water supply opportunities or potentially more reliable and efficient options for water supply for the Participants than the proposed project and should be critically explored. An alternative that is aggressive on conservation (alone or in combination with other alternatives identified above) will not only disclose valuable information for the decision makers and the public to compare the magnitude of environmental effects of the alternatives, but will also reduce costs and dramatically reduce environmental impacts and energy use.

With population projections in Colorado increasing approximately 65% by 2030, sustainable water supply project alternatives, including urban and agricultural conservation measures, are critical strategies for meeting new water supplies because saving water can produce immediate new water supply with less adverse impacts to Colorado's rivers. Conservation measures in highly populated basins in Colorado, including modest reductions in indoor/outdoor residential use, are estimated to save enough water to satisfy as much as 25% of the state's anticipated growth in M&I water needs by the year 2030 (Trout Unlimited et al., 2005). Conservation measures already employed by the Participants were built into the water demand projections in the DEIS with the assumption that the recent lower demand levels will continue. The DEIS should have included information about how conservation demand figures were factored into decreasing the demand for Windy Gap water. Future conservation supply alternatives analysis should include both "existing" conservation demand reduction calculations and "conservation oriented" smart growth/agricultural/urban efficiency water supply programs (e.g., water rate structures, landscaping ordinances, appliance rebate programs, turf replacement rebate programs, retrofits programs for old construction) for current and future infrastructure served by the project. The cost associated with the active financial investment in conservation approaches relative to the cost of the proposed alternatives should also be evaluated and disclosed in future NEPA documentation. Urban and agricultural efficiency programs (inherent in a water conservation alternative) should not be discounted as a future water supply alternative for the short–term and long-term and should be the basis for any other alternatives (including a combination of alternatives) that meet water supply objectives and may be potentially less damaging than the proposed action.

Less environmentally damaging alternative water supplies potentially available to the applicant should focus on water supply methods that are both cost effective and prevent chronically low flows or dewatering from critical water resources supporting both ecological and recreational values in the Colorado River Basin. Agricultural transfers, both temporary and permanent, may be available to the applicant for water supply in both basins, and may be less damaging to the aquatic environments affected by this project. All action alternatives evaluated in the DEIS are limited to existing junior water rights – water rights that by definition are the last in time, last in line, and typically require larger storage projects due to low reliability and yield requirements for consecutive years. Acquisition of more senior water rights may provide more flexibility and less adverse impacts to aquatic resources with proper management.

The alternatives identified above may provide diverse water supply opportunities, or potentially more reliable and efficient options for water supply for the Participants than the proposed project and should be critically explored. Because other potentially less damaging practicable alternatives were not adequately considered or evaluated in the DEIS, the Corps of Engineers needs to supplement the NEPA document, or further evaluate alternatives under the CWA Section 404 permit review process, to adequately demonstrate compliance with the Guidelines.

40 CFR §230.10(b) Water Quality Impacts

High potential exists for the WGFP to exacerbate existing water quality impairments in East Slope and West Slope water bodies. The DEIS predicts increased nutrient loading and consequent dissolved oxygen (D.O.) reductions to both East and West Slope rivers and reservoirs, several of which are already impaired. Carter Lake and Horsetooth Reservoir are on the State of Colorado's 2008 Clean Water Act Section 303(d) List of Water-Quality-Limited Segments as impaired for their Aquatic Life Use due to mercury bioaccumulation in fish tissue (associated with nutrient enrichment and reduced oxygen environments). In addition, Horsetooth Reservoir is listed for D.O. impairment. Granby Reservoir, Shadow Mountain Reservoir, and Grand Lake are all acknowledged as exceeding applicable water quality standards (WQS). Projected instream temperature increases are also a significant stressor to aquatic life, and a significant impact of the project. High temperature and nutrient levels (and consequent low D.O. levels) may lead to additional, more severe, or further impairments throughout these watersheds, which will be difficult to remedy through point source controls alone. Further, any worsening of these conditions increases the future required efforts and costs associated with remediation and restoration. The proposed action appears to have the potential to directly impact the assimilative capacity for high temperatures and nutrients in all of the downstream reservoirs and streams, exacerbating the difficult cleanup plans and wasteload allocations required in any forthcoming "Total Maximum Daily Loads" (TMDLs).

Please see our enclosed detailed comments on the DEIS submitted to BOR on December 19, 2008 (pages 12-18) regarding water quality concerns for additional information.

40 CFR §230.10(c) Significant Degradation

The project, as currently proposed, will likely cause or contribute to significant degradation of waters of the U.S. The impacts of greatest concern to the EPA include the potential for adverse changes to water quality, stream morphology and aquatic life following the removal of additional flows from the Colorado River due to this proposed action, as well as other major water diversion projects currently proposed in the upper Colorado River Basin. Additional wetland impacts resulting from reasonably foreseeable projected changes in land use, construction and development under the proposed action could result and thus should be evaluated and disclosed as cumulative impacts. A thorough analysis of these potential effects is necessary to gauge the overall proposed project impacts, to evaluate the availability of less damaging practicable alternatives and to determine the feasibility and appropriateness of mitigation.

Determination of cumulative effects on the aquatic ecosystem

The DEIS states that the project's direct and secondary impacts to stream morphology, water quality and aquatic life as minor, and that cumulative effects are similar to, or slightly greater than the direct and secondary effects. EPA believes that the impacts of this project, in combination with past and reasonably foreseeable actions, are significant and unacceptable to an aquatic resource of national importance. It is likely that the proposed project will have serious adverse effects on aquatic ecosystem diversity, productivity and stability of the Colorado River which are not analyzed sufficiently in the DEIS.

According to the DEIS, the WGFP will result in flow reductions to the upper Colorado River, the majority of which are projected to occur between May and August. From this project alone, the Colorado River average annual flow below the Windy Gap diversion is estimated to decrease by 14% from existing conditions under the action alternatives. Other projects analyzed in the cumulative effects portion of the DEIS, in combination with Windy Gap, are estimated to reduce the Colorado River annual average flow below the Windy Gap diversion by 21% in a wet year (1% in a dry year). EPA has significant concerns with the reduction in flows to the Colorado River below Windy Gap (as well as at other points on the Colorado River, listed on Table 3-16, DEIS p. 3-45) associated with the action alternatives and cumulative impacts.

It is important to note that the DEIS states that average annual stream flow in the Colorado River at Hot Sulphur Springs (approximately 10 miles below WGP) declined from 486,209 AF in 1905-1949 to 175,264 AF in 1950-1994 (see DEIS p. 3-7), a decline in average annual stream flow of 64% due, in part, to historical diversions from the Moffat Collection System (Moffat), Colorado-Big Thompson Project (C-BT) and Windy Gap Project diversions. Thus, this project, in combination with other reasonably foreseeable future actions, including additional diversions proposed with the Moffat expansion, will remove an additional 21% of the remaining 36% of the average annual flow, leading to further incremental and adverse impacts to the river from manmade diversions.

Existing remnant peak flow conditions on the Colorado River are very different from historical conditions (Figure 1, Table 1), due in large part to the cumulative effect of numerous water diversion projects including the C-BT, Moffat, WGP and other water development in the basin. EPA is concerned that further proposed reductions to the existing hydrograph from additional water diversion (the proposed and future projects) will reduce the resiliency of the aquatic ecosystem and place it at a much higher risk of substantial and irreversible changes to the aquatic community.

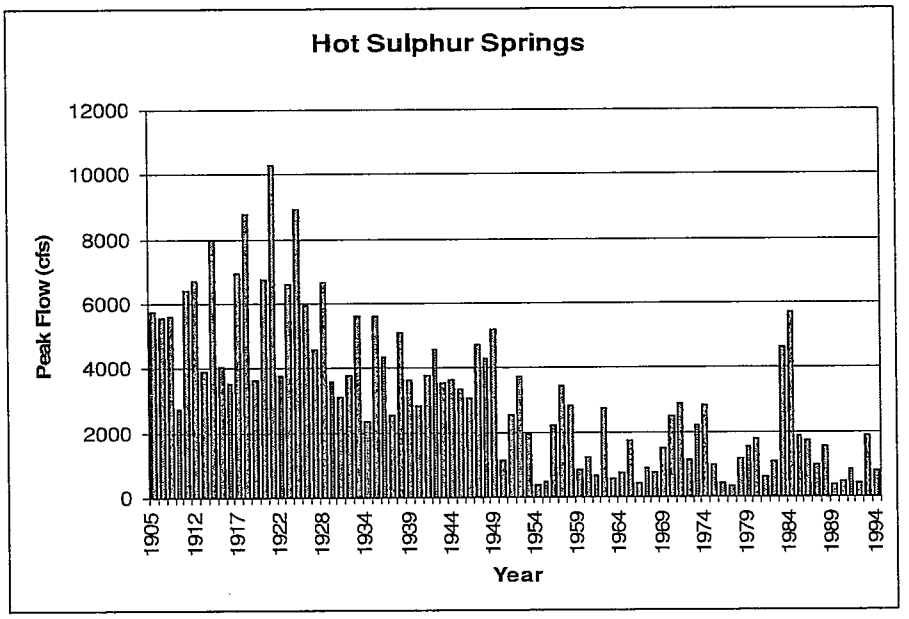


Figure 1: Instantaneous peak flows from the USGS gage at Hot Sulphur Springs from 1904-1994. The study period for WGFP hydrologic analyses began in 1950.

Table 1: Instantaneous peak flow return intervals from USGS gage at Hot Sulphur Springs for 1904-1949 and 1950-1994 calculated by EPA using a Log-Pearson Type III Distribution. Flow is displayed in cubic feet per second (cfs).

Return Interval (years)	1905-1949 Flow (cfs[1])	1950-1994 Flow (cfs)
2	4,629	1,232
5	6,302	2,297
10	7,440	3,176
25	8,909	4,483
50	10,026	5,598
100	11,166	6,831
200	12,334	8,199

This project's impacts to the Colorado River, coupled with other reasonably foreseeable actions, will have significant and unacceptable adverse effects on the aquatic ecosystem, and therefore critical attention must be given to the cumulative impacts of water diversions on the Upper Colorado River. Although the impact of a particular discharge may constitute a minor change in itself, the cumulative effect of numerous such piecemeal changes can result in a major impairment of the water resources and interfere with the productivity and water quality of existing aquatic ecosystems (40 CFR 230.11(g)).

Furthermore, EPA is concerned that the cumulative effects analysis did not consider the potential for threshold (non-linear) responses within the Colorado River. Nor did the cumulative effects analysis address the potential impacts of climate change in a meaningful way. The impacts of the project are exacerbating current hydrologic conditions associated with the operation of diversion within the Upper Colorado Basin. Additional incremental or piecemeal impacts of proposed diversions towards a reduced hydrograph with altered timing of flows increases the likelihood for the aquatic ecosystem to approach a threshold point, or tipping point, beyond which the ecosystem may exhibit dramatic and unacceptable changes, potentially including loss of native fish species. Also, it is reasonably foreseeable that with projected climate change, minimum stream flows supporting less aquatic habitat and productivity will occur much more often than occur now. Climate change, coupled with the reduced hydrograph due to water diversions, will likely cause and contribute to significant adverse impacts to the portions of the upper Colorado River impacted by this project.

The DEIS does not provide adequate information to assess the severity of cumulative impacts on a larger scale. A broader cumulative impact analysis is necessary to assess the long-term cumulative impacts and uncertainty associated with all major water diversions in the upper Colorado Basin, as well as the potential for threshold responses and uncertainty associated with projected climate change. EPA believes at a minimum, the applicant should provide a cumulative effect analysis that addresses the collective effects of major water diversions (past, present and reasonably foreseeable) in the upper Colorado Basin, including C-BT, Moffat and Windy Gap, and also models the impacts of a scenario where flows are reduced substantially due to climate change. EPA is willing to work with BOR, the Corps and the applicant to identify the appropriate scope and methodology for a cumulative impacts analysis to adequately determine and disclose the projects' cumulative adverse impacts for consideration of compliance with the Section 404(b)(1) Guidelines.

Stream Morphology/Aquatic Life Concerns

The DEIS states that flushing flows in the Colorado River, equal to or greater than 450 cfs, occur about 45 days in an average year and 103 days in a wet year per year under existing conditions (see DEIS p. ES-11). Under the proposed action, these flushing flows would occur only 36 days in an average year (35 days for the other action alternatives) and only 93 days in a wet year for all action alternatives (see DEIS Table 3-22) (20% and 9% reductions respectively). In addition, stream morphology impacts were assessed by comparing the frequency of bankfull discharge (equal to or greater than 1,240 cfs at Hot Sulphur Springs) under existing and proposed conditions and by comparing changes in the range of channel maintenance flows. The DEIS

states that the frequency of flushing flows and bankfull discharge would remain adequate to transport sediment and prevent deposition, and therefore no mitigation for stream morphology impacts is proposed. Furthermore, the DEIS states that the differences in channel maintenance flows would be small and unlikely to measurably alter channel morphology or sediment movement. EPA is concerned that these analyses do not adequately characterize potential significant adverse impacts to the stream morphology and associated ecological communities of the Colorado River.

The DEIS states that channel maintenance flows are the flows considered necessary to maintain the physical characteristics of a stream channel and provide benefits to the stream ecosystem by conveying water and eroded materials, preventing vegetation establishment in the channel, sustaining aquatic ecosystems, temporarily storing flood flows on the floodplain, and maintaining healthy streambank and floodplain vegetation (see DEIS 3-60). The DEIS presents an analysis of channel maintenance flows consistent with the Schmidt and Potyondy (2004) methodology. EPA is concerned that this methodology has been inappropriately applied to assess changes in channel maintenance flows from the proposed project. According to Schmidt and Potyondy (2004), "(t)he approach is appropriate for quantifying channel maintenance flows on perennial, ***unregulated***, snowmelt-dominated, gravel-bed streams with alluvial reaches" (emphasis added). As stated in the DEIS and illustrated in Figure 1 and Table 1 of this letter, the flow regime under existing conditions is already substantially altered through regulated water diversions in the basin. For example, the peak flow with a return period of 25-years in the period of record from 1904 to 1949 has, under existing conditions, increased to a return interval of 200 years so this peak flow is much less frequent(see Table 1 above). Both the magnitude and frequency of flow events are substantially altered compared with unregulated conditions on the Colorado River, and as such, applying this methodology likely significantly understates the potential impacts to stream morphology from this proposed project.

As stated in the Water Resources Technical Report to the DEIS, the frequency, magnitude and duration of flow events affects channel dynamics. In snowmelt dominated systems like the Colorado River, much of the work on the channel is done by the spring snowmelt peak flows, where channel geometry and complexity respond to these dominant, or bankfull discharges of water and sediment. The river stage associated with bankfull discharge is considered to be the point at which the river begins geomorphic "work" on the entire channel system, and higher flows extend the duration and magnitude of this work. The additional withdrawal of flows from the Colorado River due to the proposed project will likely cause bankfull stage and flow to be reached less frequently, resulting in less capacity within the river system to maintain adequate conditions for aquatic ecosystem integrity (e.g., temperature, D.O., channel habitat, back-water areas for juvenile amphibians, fish, endangered species, etc.).

The diversion of water from the Colorado River to meet water supply needs will further adversely impact the natural hydrology downstream of the diversion point, thus affecting the aquatic ecosystem downstream. Diversion of the snowmelt peak flows in wet and average years will reduce the frequency of medium and high flow events, which will likely, in turn, affect stream morphology, instream water quality, the physical habitat of downstream aquatic communities, food web structure, spawning, egg hatching, migration cues for fish, and the ability

for riparian species recruitment and inundation of backwater and floodplain habitats. To truly understand what the diversion will mean for the aquatic ecosystem and hydrology downstream of the diversion point, EPA suggests that the following analyses be performed:

- Establish/characterize the relationship between bankfull discharge and river stage at monitored points, e.g., at two gauged points downstream from the withdrawal point on the Colorado River;
- Model the stage of the river and projected effects of the project alternatives on stage at these gage locations;
- Document the current pattern of river stages and consequent (existing) habitat availability, temperature and D.O. levels. Then model, with the expected decreases in flow and resultant decreases in river stage, the change in frequency that stream temperature and D.O. meet (or conversely exceed) water quality criteria and that physical habitat parameters are maintained;
- Assess the potential for threshold responses of the aquatic community.

These analyses should be done both within the context of the direct and secondary impacts of this project as well as cumulative impacts of this and other reasonably foreseeable actions (e.g., Moffat Collection System Project and climate change).

Project-induced changes in flow characteristics will likely impact aquatic life in the upper Colorado River Basin ecosystems due to changes in aquatic habitat, including changes in stream morphology and water quality. In the DEIS, impacts to aquatic life were concluded to be minor, or in some cases beneficial. However, the analysis did not adequately consider potential impacts to aquatic communities due to changes in water quality or physical habitat. Increased nutrient loading, reductions in D.O. and instream temperature increases are all impacts disclosed in the DEIS, and may result in an inability to support aquatic life use standards due to expected changes in ambient environmental conditions. Changes in these conditions can influence the abundance and distribution of native and sport fish, macroinvertebrate and algal communities, and will likely lead to a community dominated by species tolerant of degraded water conditions.

The DEIS states that project-induced changes to channel morphology and sediment movement are minor. However, the DEIS analyses do not adequately characterize potential impacts to the stream morphology and associated ecological communities of the Colorado River. Spawning site availability for fish, habitat heterogeneity (e.g., riffle and pool complexes) and refugia for aquatic macroinvertebrates is largely influenced by changes in substrate characteristics and channel complexity associated with the timing, frequency and magnitude of flow events. Furthermore, peak flows that mobilize and transport medium sized sediments (sands and gravels) abrade periphyton assemblages from larger substrates, and loss of this abrasive ability with reduced flows will facilitate periphyton growth and survival and alter the algal and macroinvertebrate assemblages. It is important to note that project-induced reductions in habitat availability are based upon existing conditions, which represent a substantially altered and regulated flow regime. Further, piecemeal impacts due to this project and other reasonably foreseeable actions have the potential to significantly and permanently reduce the quality of habitat for aquatic communities. EPA recommends that a more complete analysis of impacts to

aquatic resources be conducted, including a meaningful integration of water quality and stream morphology impacts. Ecological modeling and analyses should be conducted using a daily time-step, instead of the DEIS's monthly time-step that may mask discharge values that occur for only a few days within any given month.

Reasonably-foreseeable development impacts

The DEIS fails to evaluate cumulative impacts to wetlands and other waters resulting from reasonably foreseeable growth inducing effects from the proposed action. Firming of Windy Gap water will likely provide more reliable water supply to both the Front Range communities and the West Slope Participants. This proposed water supply will affect future development growth rates, population density and changes in land use patterns. These potentially significant cumulative effects from land development and construction should be evaluated and disclosed to determine the potential adverse impacts to wetlands and other waters and not just related to development near the proposed reservoirs. An analysis similar to the one used in the Northern Integrated Supply Project DEIS should be used to calculate cumulative adverse impacts to wetland acreages resulting from construction and development in a broader study area. However, it should not be assumed that Clean Water Act Section 404 permits including mitigation will be required for all reasonably foreseeable development impacts because certain wetlands and other waterbodies in Colorado do not require permits or mitigation due to their locations on the landscape.

<u>40 CFR § 230.10(d) Mitigation:</u>

Compliance with the Guidelines requires a determination of no significant degradation to waters of the United States, including the biological, physical and chemical characteristics of the aquatic ecosystem and human use characteristics (e.g., recreational and commercial fisheries, water-related recreation and aesthetics). EPA recognizes that compensatory mitigation may allow an applicant to reduce the impacts below the threshold of significance; however, an adequate characterization of the impacts is required to apply an appropriate level of mitigation. Although the DEIS states that effects to the water quality, aquatic resources and stream morphology of the proposed action are minor, EPA believes that these effects, while stated to be minor, have the potential to be significant, and monitoring and mitigation measures should be disclosed and required for unavoidable impacts to waters of the United States.

The DEIS acknowledges the importance of bankfull and channel maintenance flows in the DEIS. EPA suggests that BOR address a minimum mitigation that is equivalent to that flow volume (e.g., 1,240 cfs for bankfull discharge) instead of the 450 cfs of the existing mitigation.

Pursuant to 33 CFR §332.4 and 40 CFR §230.94, *Compensatory Mitigation for Losses of Aquatic Resources*, a compensatory mitigation plan must be submitted and approved by the Corps before the District Engineer can issue an Individual CWA Section 404 permit. This plan must address a number of critical details regarding the mitigation project including: clearly articulated project goals and objectives; project site selection criteria; site protection instruments (e.g., conservation easements); detailed quantitative and qualitative baseline information

describing both the impact and compensation sites; a detailed discussion of the mitigation project's credit determination methodology and results; a maintenance plan; ecological performance standards used to evaluate the degree to which the compensation projects are replacing lost functions and area; detailed monitoring requirements; a long-term management plan describing necessary long-term stewardship of the compensation sites and who is responsible for performing this stewardship; an adaptive management plan; and financial assurances to ensure project construction, implementation, and long-term management.

Aquatic Resource of National Importance

The upper Colorado River is an aquatic resource of national importance (ARNI). The upper Colorado River provides a valuable habitat for many aquatic organisms and supports four federally listed fish species further downstream. In addition, the upper Colorado River is a valuable commercial and recreational resource, providing significant economic benefits to Colorado's western slope communities. Segments of the Colorado River downstream of the Windy Gap diversion are moderate to steep gradient and are characterized by riffle and pool complexes, special aquatic sites under the Guidelines (40 CFR 230.45). Wetlands comprise approximately 1-2% of the arid landscape in Colorado. Over the last two centuries, Colorado has lost an estimated 50% of its wetlands. The riparian wetland complexes associated with the upper Colorado River, which are also special aquatic sites under the Guidelines, (40CFR 230.41) therefore provide a rare and unique habitat.

The Colorado River has a drainage area of 642,000 km^2, covering nearly 8% of the United States, including parts of Colorado, Wyoming, Utah, New Mexico, Arizona, Nevada and California. Beginning in the high mountains of Colorado and Wyoming and flowing through the intermountain plateaus of the American Southwest to its confluence with the Gulf of California, the Colorado River is the seventh longest river corridor and has the seventh largest drainage area in North America. For purposes of water allocation, the Colorado River is divided into the upper and lower basins at the confluence with the Paria River near Lees Ferry, Arizona (Cushing and Benke 2005).

The Colorado River Basin is one of the most regulated rivers in the world, with over 40 flow regulation structures, 4 large mainstem reservoirs and numerous diversions. It is estimated that 64% of the runoff from the Colorado River system is used for irrigation and an additional 32% is lost through reservoir evaporation (Dynesius & Nilsson 1994). Because of water scarcity throughout the western U.S., 40% of the virgin annual discharge of the Colorado River is diverted out of the basin (Dynesius & Nilsson 1994). For example, the C-BT project diverts a substantial volume (over 370 million m^3/year) from the upper Colorado River across the Continental Divide to Colorado's eastern slope communities of the Mississippi River drainage (Cushing and Benke 2005). The Windy Gap Project and proposed Windy Gap Firming Project utilize C-BT infrastructure to divert additional flows from the upper Colorado River to the other side of the Continental Divide (i.e., transbasin diversion).

The upper Colorado River headwaters are located primarily in Grand County, Colorado, and the mainstem flows originate in the alpine meadows of Rocky Mountain National Park. The upper Colorado River and its tributaries experience widely variable seasonal fluctuations in flows, with the largest flows resulting from snowmelt. Approximately 75% of the total annual flow occurs during the spring and early summer runoff period of May through mid-July. Average daily flow and instantaneous peak flows (see Table 1 and Figure 1) in the upper Colorado River have decreased since about 1950 as the result of the C-BT project, the Moffat Collection System, the Windy Gap Project, and other water development in the basin.

The geology of the upper Colorado River from Granby Reservoir to Gore Canyon is variable and relatively complex (ERO and Boyle 2006). In general, the width of the floodplain and the thickness of the alluvium are controlled by the bedrock geology. In reaches of the river that flow through areas of erosionally resistant bedrock units, the floodplain tends to be narrow, relatively straight, and contains little if any alluvium. In areas of less resistant bedrock geology, the floodplain is relatively wide, meandering, and contains significant thickness of alluvium. The Colorado River floodplain varies between ¼ to ½ mile wide, depending on the resistant bedrock units. Above 6,561 feet above mean sea level (amsl), riparian communities at consist of alder, dogwood, birch, elderberry, Rocky Mountain maple and willows. Between 5,905 feet amsl and 6,561 feet amsl, cottonwoods and willow dominate and the invasive salt-cedar is present (Cushing and Benke 2005).

In the Windy Gap Project area, the Fraser River is the largest tributary of the Colorado River above the Windy Gap Reservoir. Approximately 50% of the Fraser River headwater flows are diverted to the East Slope for Denver's use. Despite these significant diversions, the fishery below the Windy Gap dam is a State of Colorado designated Gold Medal Water which produces at least 60 pounds of trout/acre and at least 12 trout, 14 inches or longer per acre. This Gold Metal Water is a 20-mile reach of the Colorado River with a self sustaining brown trout population. The aquatic ecosystem in the Colorado river below WGP supports an extremely diverse fish assemblage for a cold water river (Email from Colorado Division of Wildlife to EPA on December 19, 2008). These fish species include: brown trout, rainbow trout, Colorado River cutthroat trout, cutthroat x rainbow trout hybrid, longnose, white, bluehead and flannelmouth suckers, hybrids of white and other suckers, mountain whitefish, speckled dace, mottled sculpin, Iowa darter, creek chub, and northern pike.

The lower reaches of the upper Colorado River Basin have historically supported 14 indigenous fish species. Four of these species are federally listed as endangered, including the bonytail chub, Colorado pikeminnow, humpback chub and razorback sucker. In 1988, the U.S. Fish and Wildlife Service established the Upper Colorado Endangered Fish Recovery Program, a partnership of public and private stakeholders working to balance recovery of these fish species with current and future water needs (http://www.fws.gov/coloradoriverrecovery/). Flow regulation and diversion in the Colorado River Basin have restricted fish to about 25% of their former range and have blocked some of the spawning migration routes of the Colorado pikeminnow and other species. In the upper Colorado River Basin, the remaining habitat has been changed considerably, with reduced access to riparian wetland and backwater habitats. Riparian wetlands have filled or been disconnected from the river by dikes, and many of the

river's backwater and floodplain habitats have disappeared. Within these wetland areas, juvenile native fish have higher growth rates due to the beneficial habitat conditions and ample food source.

The bonytail chub, considered by some scientists to be functionally extinct, was once one of the most abundant fish species in the basin, but now occurs in only a few locations. Current recovery efforts include reintroducing populations through stocking of the Colorado, Green and Yampa Rivers. Management of non-native species is another necessary step towards recovery (http://www.fws.gov/coloradoriverrecovery/).

Dams and diversions restrict the distribution of Colorado pikeminnow, a large predatory and highly migratory fish species with a life span of 40 plus years. Currently, populations of the Colorado pikeminnow in the upper Colorado River Basin are relatively stable. In the Green River, evidence suggests that Colorado pikeminnow populations may be on the rise, largely because of operational changes of the Flaming Gorge Dam. Restoration efforts for the Colorado pikeminnow include establishing and maintaining more natural flow hydrographs by releasing more water to mimic spring snowmelt peak flows and stabilizing flows in late summer for juvenile fish. Also, efforts are being made to ensure that stocking of non-native fish does not conflict with endangered fish recovery and to build fish ladders around certain dams to allow endangered fish to migrate up and down the river (http://www.fws.gov/coloradoriverrecovery/).

The humpback chub, which lives primarily in canyons with swift currents, historically, inhabited canyons of the Colorado River and four of its tributaries, the Green, Yampa, White and Little Colorado Rivers. Currently, two small but stable populations remain at Westwater Canyon in Utah and Black Rocks, in Colorado. The largest known population is in the Little Colorado River in the Grand Canyon, where there may be up to 10,000 fish. No population estimates are available for the rest of the upper Colorado River Basin. Recovery efforts include establishing and protecting more natural spring snowmelt peak flows, monitoring fish population numbers and managing stocking of non-native fish to avoid conflict with endangered fish recovery (http://www.fws.gov/coloradoriverrecovery/).

The razorback sucker was once widespread throughout most of the Colorado River Basin, but in the upper Colorado River Basin, they are currently found in only the upper Green River, the lower Yampa River and occasionally in the Colorado River near Grand Junction. In the upper Colorado River Basin, it is estimated that approximately 500 adult suckers remain, most of which are thought to be greater than 25 years old. Current recovery efforts include releasing hatchery-raised razorbacks into the Colorado, Green, Gunnison and San Juan Rivers. Also, because these fish grow significantly faster in backwaters and wetlands than they do in the river channel, and these wetland habitats are necessary for the survival of young razorback suckers, efforts are currently underway to acquire access to riparian wetlands for these endangered fish. Management of non-native species is another necessary step towards recovery (http://www.fws.gov/coloradoriverrecovery/).

Current instream flow requirements include releases from Grandby Reservoir mandated by the 1961 Secretarial Decision Document that vary seasonally from 20 cubic feet per second (cfs) in September through April, 75 cfs in May through July and 40 cfs in August, and are flexible pending low flow predictions. In 1980, the Azure Settlement Agreement mandated instream flows on the Colorado River of 90 cfs from the Windy Gap diversion to the Williams Fork confluence, 135 cfs from the Williams Fork to Troublesome Creek confluence, 150 cfs from Troublesome Creek to the Blue River confluence. The agreement also mandates a flushing flow release from Windy Gap Reservoir of 450 cfs for 50 consecutive hours once every 3 years within the months of April, May or June. Those instream flows are needed to help maintain fish populations, the aquatic ecology, and geomorphology of the river. The proposed project will likely make it more difficult to maintain these flows with increased diversions.

The Colorado River (including segments downstream of the Windy Gap diversion) is intensively used by the public for recreational activities and represents a valuable commercial and recreational resource. Five segments of the Colorado River downstream of the Windy Gap diversion are currently being evaluated for designation under the Wild and Scenic Rivers Act as Recreational. The outstanding remarkable values of these five segments include: recreational (fishing, floatfishing, scenic driving and other recreation), wildlife, scenic, historic, geological, paleontological and cultural.

December 29, 2008

TROUT UNLIMITED

VIA EMAIL: WTULLY@gp.usbr.gov
Mr. Will Tully
Bureau of Reclamation Eastern Colorado Area
11056 West County Road 18E
Loveland, CO 80537-9711

VIA EMAIL: chandler.j.peter@usace.army.mil
Mr. Chandler Peter, P.E.
Project Manager
Denver Regulatory Office
U.S. Army Corps of Engineers
9307 South Wadsworth Blvd.
Littleton, CO 80128-6901

Re: Windy Gap Firming Project - Draft Environmental Impact Statement

Dear Mr. Tully and Mr. Peters,

Trout Unlimited, Colorado Trout Unlimited, and the Colorado Headwaters Chapter of Trout Unlimited (jointly referred to as "Trout Unlimited") offer the attached comments on the draft Environmental Statement (DEIS) for the Windy Gap Firming Project (WGFP) for your consideration. Trout Unlimited is a non-profit conservation organization with approximately 150,000 members nationally, approximately 10,000 in Colorado. Our Headwaters Chapter, based in Grand County, counts with 100 very active members. Our mission is to conserve, protect and restore coldwater fisheries and their habitat.

In addition to these comments, Trout Unlimited joins in the separate comments provided by Western Resource Advocates, the National Wildlife Federation, Grand County, and the Colorado River Water Conservation District, to the extent not inconsistent with these comments.

Thank you for the opportunity to comment. Do not hesitate to contact me at 720.470.4758 if you have any question or would like to further discuss the project.

EXHIBIT H

Sincerely,

/s Amelia S. Whiting

Amelia S. Whiting, Legal Counsel
Trout Unlimited, Colorado Water Project
P.O. Box 1544
Pagosa Springs, CO 81147
720.470.4758
mwhiting@tu.org

/s David Nickum

David Nickum, Executive Director
Colorado Trout Unlimited
1320 Pearl Street, Suite 320
Boulder, CO 80302
303.440.2937
dnickum@tu.org

cc: U.S. EPA
U.S. Fish and Wildlife Services
Colorado Division of Wildlife
Colorado Water Conservation Board
Colorado Water Quality Control Division
NCWCD

SCOPE OF COMMENTS

It is our understanding that the DEIS has been prepared to fulfill the requirements of the National Environmental Policy Act (NEPA) to inform two primary distinct and separate federal decisions:

(1) A decision by the Bureau of Reclamation (Reclamation) on whether to enter into a carriage contract agreement with Northern Colorado Water Conservancy District (Northern) and its Municipal Subdistrict (Subdistrict) allowing the use of Colorado-Big Thompson (C-BT) facilities and C-BT water as part of the WGFP and, if so, under what conditions.

(2) A decision by the U.S. Army Corps of Engineers (Corps) on whether to grant a Clean Water Act, § 404 permit for the WGFP and, if so, under what conditions.

It is further our understanding that, depending on the outcome of the NEPA process, Reclamation may enter into negotiations with Northern and the Subdistrict over the terms of an excess capacity, carriage contract, and that such process will be subject to additional public notice and comment.

The DEIS includes an Appendix entitled "Section 404(b)(1) Analysis, Windy Gap Firming Project" (Appendix B). It is our understanding that this constitutes the Corps' analysis of the project's compliance with CWA § 404(b)(1) guidelines.

These comments address the analysis and findings of the DEIS in light of NEPA requirements. Separate comments are being submitted to the Corps with respect to the CWA § 404(b)(1) guidelines analysis in Appendix B. Trout Unlimited expects to provide comments on Reclamation's contractual activities, if any, associated with the WGFP upon notice. **Trout Unlimited requests to be directly notified of any such contractual activity.**

SUMMARY OF COMMENTS

Over the last few years, Trout Unlimited has increased its focus on the upper Colorado River - in particular, the reaches of the river between Granby Reservoir and the Blue River. A designated Gold Medal trout fishery and eligible Wild & Scenic Rivers Act segment for most of its length, this reach of the river is showing signs of degradation due largely to the cumulative impacts of transmountain diversions - including C-BT Project diversions - that take over 50% of the native river flows to the Front Range and Northern Colorado. Oxygen-robbing algae and high stream temperatures are a source of concern. In late summer of 2006, local irrigators with senior water rights warned that

sections of the Colorado River were going dry. This triggered a flurry of communications between Trout Unlimited, Grand County, fly fishing outfits, irrigators and others, on the one hand, and Reclamation and the Secretary of the Interior's office on the other. Some of the main sources of the problem, including current operation of the C-BT Project, are yet to be addressed.

The Proposed Action alternative for the WGFP would use C-BT Project facilities and C-BT Project water to increase depletions that could further impact these valuable fisheries. Operation of WGFP and other projects could significantly alter the River's hydrograph, reducing high peak flows, extending periods of low flows, and increasing dry-year conditions in the river. While, the DEIS states that WGFP would operate mostly during late spring and early summer months, the information presented shows that the most significant percentage increase in diversions would occur in July and August – months when flows are lower and high stream temperatures are of concern. These diversions would occur immediately before C-BT Project operations cause Colorado River flows below Granby Dam to drop to a mere 20cfs. At some point, the combination of stressors could cause a significant decline and even the demise of these valuable fisheries. Before any decisions are made that will further aggravate the conditions of the river, a thorough analysis of the direct, indirect and cumulative impacts of the WGFP on these aquatic resources and their habitat is imperative. Measures designed to prevent such impacts must be adopted. Unfortunately, as described in detail in our comments, the DEIS fails to do so.

Reclamation's first duty is to operate the C-BT Project in a manner that furthers the primary purposes of the project. Preservation of the Colorado River's fisheries is identified in SD 80 as a primary purpose of the C-BT Project. Facilitating projects such as WGFP is not. Accordingly, unless the evidence clearly shows that WGFP will not harm the Colorado River's fisheries, or strict conditions are imposed that will ensure that no such harm will result, Reclamation must deny the Subdistrict's request. As discussed in detail in our comments, the DEIS fails to provide the information and analysis needed to enable Reclamation's decision, other than denial, in this regard.

Aside from deficiencies in the DEIS' analysis, Trout Unlimited has serious questions about the legality of the Proposed Action. As further discussed in Section III of our comments, below, implementation of this alternative, as currently proposed, could significantly and illegally expand the C-BT project. Serious legal questions remain about the proposed use of CB-T Project facilities and water absent Congressional approval. Moreover, Reclamation's storage of CB-T water in Chimney Hollow, as currently proposed, would violate Colorado water law. Finally, the Proposed Action alternative is illegal unless it is proven to be consistent with Senate Document 80. Instead of evaluating the legality of the Proposed Action Alternative, the DEIS simply assumes it.

These are fundamental flaws which render the DEIS unfit to satisfy NEPA's dual goals to (1) insure that the agency has carefully and fully contemplated the environmental effects of its action, and (2) that the public has sufficient information to challenge the agency. *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 349 (1989). The information provided makes it impossible for the federal agencies to take "a hard look" at the environmental consequences of their actions. *Robertson,* 490 U.S. at 350-51. The information fails to provide information needed to evaluate the legality of the Proposed Action, compliance with Senate Document 80, and compliance with the requirements of the Clean Water Act. The information also fails to explain how acknowledged violations of State law will be addressed. Therefore, any further agency action with respect to WGFP must be postponed pending preparation of a supplemental environmental impact statement that addresses the DEIS's shortcomings and an opportunity for additional public review.

NEPA

NEPA represents the Nation's sweeping commitment to "prevent or eliminate damage to the environment and biosphere." *Marsh v. Oregon Natural Resources Council*, 490 U.S. 360, 371 (1989). The statute accomplishes this goal by focusing government and public attention on the environmental effects of proposed agency action." *Id.* By doing so, NEPA "ensures that important effects will not be overlooked or underestimated only to be discovered after resources have been committed or the die otherwise cast." *Id.*

Accordingly, NEPA requires all federal agencies to prepare an environmental impact statement (EIS) prior to major federal action significantly affecting the quality of the environment. *42 U.S.C. § 4331; Robertson,* 490 U.S. at 348. An EIS must include a detailed statement of (1) the environmental impact of the proposed action; (2) any adverse environmental effects which cannot be avoided should the proposal be implemented; (3) alternatives to the proposed action; (4) the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity; and (5) any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented. *Id.* at 348-9; *citing 42 U.S.C. § 4332.*

"The sweeping policy goals announced in § 101 of NEPA are thus realized through a set of 'action-forcing' procedures that require that agencies take a 'hard look' at environmental consequences" before resources are committed. *Id.* at 350-51.

Information provided in an EIS must be of high quality and must include accurate scientific analysis. *40 C.F.R. § 1500.1(b).* "The NEPA process is intended to help public officials make decisions that are based on understanding environmental consequences, and take actions that protect, restore and enhance the environment." *40 C.F.R. § 1500.1(c).* "When an agency is evaluating reasonably foreseeable significant adverse

effects on the human environment in an environmental impact statement and there is incomplete or unavailable information, the agency shall always make clear that such information is lacking." *40 C.F.R. § 1502.22.* If the information cannot be obtained because the overall costs would be exorbitant or the means to obtain the information unknown, the agencies must explain the relevance of the incomplete or unavailable information, provide a summary of existing credible evidence, and evaluate the impacts based on theoretical approaches or research methods generally accepted in the scientific community. *40 C.F.R. § 1502.22(b).*

To fulfill the essential purposes of NEPA, federal agencies are required, to the fullest extent possible, to "use all practicable means, consistent with the requirements of the Act and other essential considerations of national policy, to restore and enhance the quality of the human environment and avoid or minimize any possible adverse effects of their actions upon the quality of the human environment." *40 CFR § 1500.2.* These means include (1) avoiding the impact altogether by not taking the action; (2) minimizing the impacts by limiting the degree or magnitude of the action and its implementation; (3) rectifying the impact by repairing, rehabilitating, or restoring the affected environment; (4) reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; (5) compensating for the impact by replacing or providing substitute resources or environments. *40 C.F.R. § 1508.20.* Mitigation measures must be fully discussed in the EIS. *40 CFR §1502.14(f) and 40 CFR § 1502.16(h).*

COMMENTS

I. THE DEIS FAILS TO TAKE A HARD LOOK AT THE DIRECT, INDIRECT, AND CUMULATIVE IMPACTS OF WGFP ON THE COLORADO RIVER AQUATIC RESOURCES AND TO OTHERWISE MEET NEPA REQUIREMENTS.[1]

The DEIS evaluates impacts to the Colorado River's aquatic resources by attempting to predict changes in available juvenile and adult trout habitat and in stream water quality due to increased Windy Gap project pumping under the various alternatives. *DEIS at p. ES-14.* The DEIS also looks at the potential reduction in peak flows and effects on macroinverterbrates in a cursory manner. Habitat availability, water quality, and maintenance of peak flows are critical factors in assessing potential impacts on aquatic resources. Yet, the analysis of these factors in the DEIS is fundamentally flawed, the information provided inadequate for meaningful analysis, and impacts

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revealed are arbitrarily dismissed. Other factors, such as exacerbation of whirling disease problems, are not analyzed at all. These deficiencies, discussed in detail in what follows, are fundamental deficiencies that preclude a meaningful review, much less the required "hard look" at the impacts of the WGFP alternatives on the aquatic resources of the Colorado River.

A. WGFP has the potential to dramatically change the hydrology of the Colorado River.

Appendix A of the DEIS includes a series of tables that reflect modeled projections of additional diversions, and concomitant Colorado River flow reductions, that would result from operation of the WGFP. Inadequate as these figures are to evaluate some of the most damaging potential impacts on the river's aquatic resources, they forecast dramatic changes in the Colorado River's hydrology. According to the DEIS, operation of the Proposed WGFP alternative would increase Colorado River diversions by 109% in July and by 144% in August. *DEIS, Appendix A, Table A-6 at p. A-11.* July diversions in a wet year would increase by 1,639%. Under current conditions, the river has experienced no Windy Gap diversions in August of wet years. The Proposed WGFP would increase those diversions from zero to an average of 3,636 acre-feet per year. *Id.*

Flows below Windy Gap reservoir, expected to be the most severely impacted reach of the river, are projected to decrease by 23% in July and by 16% in August of an average year. *DEIS, Appendix A, Table A-10, at p. A-17.* Under the cumulative impacts scenario, flows are expected to drop by 24% in July and by 20% in August in an average year. *DEIS, Appendix A, Table A-33, at p. A-40.*

As discussed in what follows, these modeled, anticipated changes are significantly understated and fail to capture some of the most damaging hydrological changes likely to occur as a result of operation of WGFP and other reasonably foreseeable projects. Nevertheless, as flawed as they are, these figures provide a glimpse at the magnitude of changes the Colorado River will experience and, therefore, at the project's potential to significantly impact the aquatic resources of the river. These figures, which indicate that the greatest percentage increases in river depletions caused by operation of WGFP will occur in July and August, also belie the DEIS's repeated assertion that impacts to aquatic resources will not be significant because the project would seldom operate during these critical months. *See e.g. DEIS at ES-14.*

B. The DEIS fails to take a "hard look" at how operation of the WGFP and other foreseeable projects will change the Colorado River's hydrograph and how those changes will impact the river's aquatic resources.

As recognized in the DEIS, hydrological changes can have significant impacts on the river's aquatic resources. Flows affect the availability of habitat, water quality, and water temperature of the stream. They also affect the stream's ability to serve functions that play a critical role in supporting a healthy aquatic ecosystem, such as channel creation and maintenance and cleansing of sediments lodged in spawning beds. While recognizing the importance of adequately predicting expected flow conditions to properly assess the project's impacts on aquatic resources, the DEIS in fact fails to do so.

1. The DEIS analysis relies on a hydrological model that is inadequate as a tool to predict and assess impacts on aquatic resources.

The DEIS estimates predicted changes in available juvenile and adult rainbow and brown trout habitat within the stream using estimated flow scenarios supplied by a model prepared by Boyle Engineering (Boyle Model). *Aquatics Technical Report at 36; DEIS at 3-134.* The Boyle Model estimates flow changes at particular locations in the Colorado River based on pre-defined average dry, average, and wet year conditions. Dry and wet year conditions are defined by averaging the five driest and the five wettest years of the study period, respectively. Average year conditions are defined based on the averaging of all years within the study period. While perhaps adequate for municipal water development and planning purposes, the model is inadequate to estimate impacts to aquatic resources.

The Model Yields Average Flow Values. The model reports flow estimates in terms of monthly and annual averages. These values are, in turn, used in the DEIS to report how much habitat will be lost and water quality impacts. While average values may work well for water supply development and planning purposes, they do not work to assess impacts to aquatic resources.

Monthly averages can mask important stream flow changes that may have significant impacts on river ecosystems, generally, and fish species in particular. For example, flows throughout August may be very low, but a single, large flood event may elevate the month's average. Accordingly, while looking at the average flow values may not reveal a potential problem, the average may be masking harmful flow conditions that occur for most of the averaged period. As the National Academy of Sciences so aptly noted in a recent report, "planners operate on a monthly basis, but fish live on a daily basis". (*National Academy Science Report, 2007*). Indeed, the Academy considered Reclamation's use of monthly average flows to be a fatal flaw in its *Natural Flow of the Upper Klamath River* study. Given that fish and other aquatic organisms respond to changes in flow that occur on much shorter time scales, it is inappropriate to evaluate changes in habitat availability using monthly averages.[2]

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[2] The DEIS appears to attempt to deal with this problem by trying to estimate daily flows by using a mathematical process referred to as "disaggregation" to convert monthly values into daily values. This method of analysis uses gages that are, sometimes, far removed from the affected river reaches. In addition

The Model Understates Anticipated Changes. As discussed in detail in Grand County's comments, the DEIS's overestimates existing Windy Gap pumping. Modeled diversions for Windy Gap under existing conditions are over three times the amount of actual diversions as reflected in the Colorado State Engineer's records. This discrepancy taints most aspects of modeling including, but not limited to, the predicted percentage increases in diversions and reduction in flows due to WGFP. By overestimating existing conditions, the DEIS understates the anticipated changes in the river's hydrograph due to WGFP and their impacts on aquatic and other resources.

The Model Overestimates Anticipated Flows. The Model's use of averages is likely artificially inflating predictions of flows that will be available to the fisheries and other aquatic resources in a dry, average and wet year. Because stream flow time-series tend to be positively skewed (i.e., high flows tend to be much larger than low flows) the average, mean annual runoff tends to be higher than the median annual runoff (Smakhtin 2001). By using average annual discharge values in its impacts analysis, the DEIS overestimates the amount of water flowing through the river in a typical year. Median discharge values should have been used.

This problem is compounded by the fact that the data used to estimate average annual flows in wet and dry years were also included in estimates of discharge in the average year. Estimates of the average flow based on the entire 46-year record are higher than they would have been if only the 36 years that were not included in the wettest five

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to its reliance on data from removed gages, the use of disaggregated monthly flows to evaluate daily impacts of the various WGFP alternatives is flawed for at least two reasons. First, the use of long-term averages to represent daily flow conditions in a highly variable river like the upper Colorado is inappropriate and leads to highly inaccurate results. Figure 1 (attached) illustrates this problem. In this example, "disaggregating" the mean monthly flow of 74 cfs based on an average daily flow distribution is unlikely to capture the true extreme high (123 cfs) and extreme low (29 cfs) flows that were actually experienced on the Colorado River in August 2002. Flows within this section of the Colorado River vary widely, even when comparing average years to average years or wet years to wet years. Because the daily pattern of flows within a given month is unlikely to be the same from year to year, long-term averages are not representative of true daily flow conditions. Second, the approach fails to model the temporal sequencing of annual flow events (wet/average/dry years). For example, the DEIS states that WGFP diversions would not increase in dry years. However, dry years create deficits in reservoir storage and diversions to fill these deficits are likely to increase in average or wet years following dry years. The right approach would be to evaluate impacts of the various project alternatives in a series of average or wet years that occur in the period following a dry year. In addition, the output from the habitat analysis is summarized in numerous exceedence charts, but these charts cannot be used to evaluate seasonal impacts of the various project alternatives. For example, what are the impacts of back-to-back dry years followed by an average to wet year on habitat availability during the most critical days in August? Relatively small impacts during the most critical times of the year can have devastating implications for aquatic species that are already at risk from low stream flows and elevated water temperatures. Consequently, the hydrologic model is inadequate as a tool to predict and assess impacts on aquatic resources.

or driest five were used. In other words, by double counting the extreme years, the DEIS further overestimates the discharge of an average year. This may not have been a problem if the DEIS had focused on median discharge values.

The Model Yields Isolated Dry, Average and Wet Years Data. One of the most critical deficiencies rendering the Boyle Model incapable of producing data necessary to assess the impacts of the WGFP alternatives on aquatic resources, is the fact that the model estimates flows during each dry, average and wet year in isolation. It does not look at how often operation of the WGFP alternatives will turn what have historically been average years into dry years or wet years into average years. Nor does it look at the distribution of expected dry, average and wet years over time. Because the model does not provide the required information, the DEIS cannot and does not evaluate the most probable and potentially devastating impacts operation of the WGFP will have on the river's aquatic resources: the creation of dry year conditions, extension of low flow conditions during average and wet years, and prolongation of drought (back-to-back dry year) conditions across the years. As further discussed in what follows, failure to evaluate this critical information renders the aquatic resources impacts analysis fatally flawed.

2. The DEIS fails to evaluate the most probable and potentially harmful hydrological changes operation of WGFP and other reasonably foreseeable projects would cause.

The DEIS aquatics impacts analysis focuses on average and wet year conditions as those conditions are defined in the Boyle Model. Dry year impacts are glossed over because Windy Gap is not expected to divert during dry year conditions. *See e.g., DEIS at 3-23, 3-27, 3-92 and 3-3-137.* Dry-year conditions can have significant impacts on aquatic resources, particularly when they occur in consecutive years. As discussed in what follows, operation of the project alternatives is likely to increase the incidence of dry-year conditions and prolong drought conditions in the river. The DEIS does not ask whether or how often these dry-year and extended drought conditions will occur as a result of operation of the WGFP alternatives, or what impacts such conditions will have on aquatic resources. Rather, the DEIS looks at historical average and wet year depletions in general and anticipates water and aquatic resource impacts in isolation. In so doing, the DEIS fails to evaluate some of the most probably and potentially damaging effects of the project.

Low flows and dry year conditions are particularly harmful to aquatic life. Dry year conditions can create particularly harmful bottle-necks for aquatic life; especially in late summer and early fall as stream flows decline to critical levels. Low stream flows cause reductions in available aquatic habitat as more of the stream channel becomes desiccated and the remaining aquatic habitat becomes marginal as velocities and depths are reduced. In addition, stream temperatures fluctuate more rapidly at low flows thereby

increasing the probability of exceeding both daily maximum and weekly average temperature standards. The Colorado River below Windy Gap already experiences low stream flows and high water temperatures during most dry and some average water years. WGFP could significantly exacerbate these existing problems by prolonging low flow periods in average years, increasing the frequency of dry year conditions and effectively creating prolonged drought conditions.

The DEIS fails to evaluate the frequency with which WGFP would increase the incidence of dry year conditions and resulting impacts to aquatic resources. While it is perhaps accurate to say that Windy Gap would not likely be pumping in dry years, as defined in the Boyle Model, the project would be pumping during average years. Diversions during average years, particularly in those years at the lower end of the Boyle Model average year range or following a dry year, could cause Colorado River stream flows to dip into a dry year condition, resulting in a reduction of habitat which would have been available in the absence of the project. The DEIS does not evaluate these potential impacts.

The DEIS fails to evaluate the frequency with which WGFP would prolong periods of drought and resulting impacts on aquatic resources. The likelihood that operation of the WGFP alternatives will change the river hydrograph by increasing the incidence of low flow, dry year conditions is particularly high following a very dry year or series of moderately dry years. Because Windy Gap cannot divert during dry years, the need to maximize diversions in the year immediately following a dry year would be high. Other reservoirs in the area would also be maximizing their diversions at the time. From the stream's standpoint, operation of WGFP and other projects under these conditions could significantly prolong drought conditions. The drought of 2002 provides a telling example of these circumstances. WGFP could not pump during the 2002 drought. However, in 2003, the year after the drought, Windy Gap recorded its largest diversions since the project was built. *Water Resources Technical Report, Table 3 at p. 22.*

The DEIS does not ask how often these conditions will re-occur as a result of WGFP, nor does it evaluate what impacts the conditions will have on the river's aquatic resources. The DEIS ignores these conditions altogether. Telling is the DEIS's decision to exclude the drought of 2002 and subsequent years from its study period and the explanation given for the exclusion. The explanation given is that the data is not relevant because WGFP would not be diverting during 2002 conditions. This conclusion entirely misses the point. Windy Gap pumping did not impact the river in 2002, it did so in 2003 and subsequent years. The impacts in 2003 and subsequent years was greater both because of the 2002 reservoir draw-downs and because the fish had already been stressed by the drought. Had the Proposed WGFP, with its additional 93,000 acre-foot reservoir, been on line, the impacts in years following the 2002 drought would have increased dramatically. By failing to include post-2002 conditions in the analysis, the DEIS not

only ignores one of the most severe droughts on record, it completely disregards the role of WGFP and other reasonably foreseeable projects in extending the duration of drought conditions and the impacts this would have on the Colorado River's aquatic resources.

The DEIS recognizes the impacts of multiple years of exposure on trout populations but ignores impacts due to increased drought conditions. The DEIS's failure to evaluate the potential for extended drought conditions due to the operation of the project is particularly troublesome given the agency consultants' recognition that multiple-year exposures can impact the fish population. The Aquatics Resources Technical Report notes: "Trout in the study area have a maximum age of approximately 6 or 7 years. Impacts that happen to trout often during their life span (e.g. 4 out of 10 years) may affect populations." *Aquatic Resources Technical Report at p. 46.* Clearly extending droughts across multiple years is analogous to increasing the frequency of droughts. In fact, it may be worse as trout that are impacted in one year will not have a chance to recover in subsequent years. By failing to evaluate WGFP's potential to increase drought conditions, the DEIS severely underestimates its impacts on aquatic resources.

3. Review of the Moffat Tunnel Extension Project and WGFP in a single DEIS would have avoided many of these problems.

Several of the problems identified thus far would have been avoided by the use of a daily time-step model. There are at least two projects currently being evaluated by the Corps which use such models: Moffat Tunnel Extension and Halligan-Seaman. The Moffat Project will deplete the same critical reach of the Colorado River impacted by the proposed WGFP.

CEQ regulations provide that a single EIS should be prepared for two or more projects that involve "cumulative" or "similar" actions. *40 CFR § 1508.25(a)(2) and (3)*; *Klamath-Siskiyou v. BLM*, 387 F.3d 989 (9th Cir. 2004). Cumulative actions are actions that "when viewed with other proposed actions have cumulatively significant impacts and should therefore be discussed in the same impact statement." *40 C.F.R. § 1508.25(a)(2).* Similar actions are actions which "when viewed with other reasonably foreseeable or proposed agency actions, have similarities that provide a basis for evaluating their environmental consequences together, such as common timing or geography." *40 C.F.R. § 1508.25(a)(2).* Sometimes these actions must be considered together to prevent an agency from "dividing a project into multiple 'actions,' each of which individually has an insignificant environmental impact, but which collectively have a substantial impact." *Thomas v. Peterson,* 753 F.2d 754, 758 (9th Cir.1985).

The anticipated Moffat Tunnel Extension Project and WGFP are both "common" and "similar" actions which should be evaluated in a single EIS, particularly, in light of the fact that they affect the same aquatic resources in the same geographic region.

Scoping comments from the public and not one but two letters from the U.S. Environmental Protection Agency strongly recommended review of both projects under a single EIS. *See letters from Larry Svoboda, U.S. EPA to Will Tully, Bureau of Reclamation, dated November 4, 2003 and January 6, 2006 (copy to Chandler Peters, U.S. Army Corps of Engineer).* Had the agencies followed the urged course of action, the daily time-step PACSM model could have been used to evaluate the impacts of both projects. The agencies' failure to do so results in a fatally flawed DEIS.

C. The DEIS fails to take a "hard look" at the impacts of habitat availability reduction on the Colorado River's aquatic resources.

As described in Part B, above, the DEIS underestimates expected hydrological changes and altogether fails to evaluate the most likely and critical hydrological changes caused by operation of WGFP and other foreseeable projects: an increase in the extent and frequency of low flow periods, dry year, and drought conditions. This failure translates into fatal flaws in the DEIS's habitat availability analysis. Simply put, evaluating available habitat losses or gains is not possible absent an adequate assessment of current conditions and expected flow changes, and an understanding of the extent and frequency of expected low flow, dry year conditions created by the project. The DEIS's habitat availability analysis is deficient in other ways.

The analysis fails to evaluate the seasonality of habitat loss. Neither the proffered 380 graphs representing expected habitat availability changes, nor any other information presented in the DEIS can be used to answer the critical question: will fish habitat be available during times when fish need it? In some instances, large amounts of habitat may be available during a time of year when it is not being used by fish. Conversely, there may be other times of the year when habitat is critical but not available, thereby creating a bottleneck to fish populations. A small loss in habitat during these critical times can be immensely more significant than larger losses at other times. The DEIS provides no information from which the project's seasonal effects on fish habitat can be evaluated.

This is particularly troubling because, while admitting that the most severe percentage increases in diversions from operation of WGFP would occur in July and August, when Colorado River low flows are known to be a problem, the DEIS provides no analysis or quantification of habitat reduction or impacts during these shoulder, low flow periods. Simply stating that the largest reductions in habitat are expected to occur during high flows when habitat is plentiful and, therefore, less harmful, does not amount to taking a "hard look" at the aquatic habitat availability impacts of WGFP.

The analysis reaches a number of unexplained, unsupported, and arbitrary conclusions. The DEIS concludes that "[t]he predicted maximum periodic decreases in fish habitat are unlikely to substantially impact fish populations at most locations." *DEIS*

at p. 3-140. The DEIS does not provide the basis for this conclusion, nor does it provide a criteria defining what constitutes "substantial impact" to fish populations. In fact, the conclusion appears to be directly contrary to information indicating that a large portion of the studied river reach will experience 24 to 30% decreases in fish habitat in 4 out of 10 years. It would be very hard to believe that such large habitat decreases, even in wet and average years, would not have a significant impact on trout populations.

The DEIS also concludes that "[t]he more frequent habitat reductions above the Williams Fork confluence could result in a *slight* decrease in rainbow trout population." *Id. (emphasis added).* The DEIS fails to quantify such decrease, explain the basis for such conclusion, or define what is meant by "slight."[3] Finally, the DEIS concludes that "[r]eductions in brown trout habitat and the frequency of those changes are unlikely to impact current populations." *Id.* No rationale or explanation for the conclusion is provided. Does this mean that no habitat reduction is expected? Clearly, this is not the case. Does it mean that habitat will be reduced but such reductions will not affect populations? If so, how was this conclusion reached? What criteria were used to decide at which point habitat reduction affects populations and at what point it does not? Were expected flow reductions in late July and August evaluated? Neither the DEIS nor the attached reports provide information to support such conclusions.

The DEIS improperly concludes that large flows are harmful to fish. Because the DEIS's estimates of changes in weighted usable area (WUA) are limited to the stream channel, the report does not account for the large increases in habitat that are produced when large flows overtop the banks and inundate the floodplain. By creating new habitat, large flows provide fish with refugia during peak discharge that allows them to survive periods of high flows. Because the report does not evaluate these habitats, it concludes that habitat declines as flows increase beyond a local maximum. For example at Breeze, brown and rainbow trout adult habitat is maximized at approximately 500 cfs. However, it is likely that habitat increases again once flows over-top the banks. Because this increase in habitat was not evaluated, the DEIS incorrectly concludes that very large flows are universally bad for fish. *DEIS at p. 3-140.*

The DEIS's conclusion that large flows are harmful to fish, and implication that WGFP's flow reduction may actually improve fish habitat, is particularly troublesome because over-the bank, habitat-producing flows were historically available to the river but were dramatically reduced by operation of transmountain diversions, including C-BT. Indeed, native peak flows were reduced from an average of around 3500 cfs to less than 1000 cfs by 1950. *Water Resources Technical Report, Figure 3 at p.17.* Peak flows were further reduced when Windy Gap came on line. Yet, the DEIS arbitrarily begins the study period in 1950, in essence ignoring the impacts this huge reduction in peak flows

[3] The comment is also meaningless, as rainbow trout populations were decimated by operation of the original Windy Gap project. It is assumed that this statement refers to the impacts of habitat reduction on potentially restored rainbow trout populations.

has had on the river and its aquatic resources. The DEIS's conclusion is particularly problematic because it uses the void in analysis created by the agencies' arbitrary decision to disregard the impacts of C-BT and other projects on current conditions to argue that WGFP may cause an improvement in fish habitat.

D. The DEIS fails to take a hard look at the impacts of reduced peak flows on aquatic resources.

Peak flows are critical for maintaining healthy aquatic ecosystems. Floods of varying magnitude, duration and frequency perform different ecosystem functions such as building floodplains, forming and maintaining the active channel and scouring sediments from gravels to enhance trout spawning and macroinvertebrate habitat. The DEIS acknowledges that "[p]eak flows are an important component for creating and maintaining stream habitat for aquatic life," *DEIS at p. 3-140.* Yet, it fails to adequately evaluate how these flows and stream processes will change as a result of operation of WGFP and other reasonably foreseeable projects, or how these changes will impact the river's resources.

The DEIS does not adequately account for the benefits of large flows. As described in Part C, above, the report does not account for or quantify the large increases in habitat that are produced when large flows overtop the banks and inundate the floodplain.

The DEIS improperly defines channel maintaining flows on the basis of current hydrology. The DEIS defines channel maintaining flows on the basis of the current hydrology. This is inappropriate as the channel was created by flows significantly greater than those currently observed. Moreover, large rivers are formed by rare events. The DEIS improperly assumes that the Colorado River is a "morphologically stable stream" that is not subject to these changes, based on the fact that aerial photos taken between 1972 and 1974 and again in the 1990's and in 2005 show few changes in its morphology. *DEIS at 3-60.* Yet, failure to evaluate historical information about river changes does not justify a conclusion that the river is morphologically stable. It is likely that flow reductions have altered the fluvial dynamics so significantly that fluvial processes like channel migration have been severely curtailed. However, from the river's perspective, even a 60-year period of stability is not an indication that the river is no longer geomorphically active. An analysis of the flows that produced the river and which are needed to maintain both channel form and habitat diversity is needed.

The DEIS incorrectly assumes that currently measured 2-year peak flows are channel-maintaining flows. The DEIS incorrectly assumes that the 1,240 cfs flow which currently occurs at Hot Sulphur Springs every 2 years is a channel maintaining flow. *DEIS at p. 3-62.* Whether or not a 1,240 cfs is actually a bank-full discharge is uncertain from the data presented. In any event, current conditions did not create the channel so it

is highly unlikely that today's 2-year peak discharge will maintain a channel formed under a significantly higher channel-forming flow.

The DEIS arbitrarily concludes that WGFP will result in "little change in peak flow magnitude and recurrence intervals." First, the DEIS's conclusion is the result of the agencies' arbitrary decision to ignore pre-1950 conditions as part of the analysis.[4] Second, the conclusion relies on an analysis that, as described in Grand County's comment letter, significantly overestimates current Windy Gap diversions and, therefore, underestimates hydrological changes due to WGFP. Third, even when compared to modeled, existing conditions, a decrease in the frequency of occurrence from 4 to 3% is not a 1% decrease in the frequency of peak flows, as the DEIS indicates. It is a 25% decrease in frequency of peak flows. This is by no means a "little" or "insignificant" change in expected peak flows.

The DEIS fails to evaluate impacts on other stream functions. Not only does the DEIS fail to properly characterize the anticipated reduction in large, channel forming flows due to operation of WGFP, the DEIS entirely fails to evaluate the impacts of reducing the amount and frequency of smaller but more frequent high flows that serve other stream functions, such as cleansing sediments from spawning beds.

E. The DEIS fails to take a hard look at the water quality impacts of WGFP and at how those impacts will affect the aquatic resources of the Colorado River.

Elevated stream temperatures are a significant concern in the upper Colorado River. As the DEIS indicates, stream temperature at various locations periodically exceeds levels deemed to be safe for the fisheries.[5] As discussed in these comments, operation of WGFP has the potential to significantly change the Colorado River's current hydrograph by prolonging periods of low flows in average and wet years, by creating more frequent dry-year river conditions, and by extending drought conditions across the years. These changes could not only reduce fish habitat, they could significantly aggravate existing stream temperature conditions, increasing the length of time and frequency with which fisheries and other aquatic resources are exposed to the stress of high stream temperatures. Accordingly, a thorough evaluation of the impacts of the project on stream temperatures and of the impacts such increases will have on the river's aquatic resources is critical. Unfortunately the DEIS fails to do so.

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[4] This is part and parcel of the DEIS's failure to evaluate the impacts C-BT and other pre-1950 projects have had on the river as part of its cumulative impacts analysis, as further discussed in Part G, below. The DEIS's failure to look at available, pre-1950 hydrological information also indicates a failure to use the proper baseline for the analysis.

[5] Current operation of the C-BT Project is likely to significantly contribute to the problem.

The DEIS relies on the QUAL2K Model to predict how anticipated flow reductions in the Colorado River will change stream temperatures in the river at various locations. *DEIS at 3-92.* The QUAL2K Model is a "steady state" model that simulates future conditions based on data inputs for a single instant in time – in this case, a single day: July 25. The model was run under two different flow scenarios. One scenario uses modeled stream flows for July 25 in an average year. The other scenario assumes July 25 stream flows that approximate the 90 cfs minimum flows beyond which WGFP would not be able to divert. *Stream Water Quality Technical Report at 51.* Model results are reported in terms of percentage of stream temperature change expected on that single day. *DEIS at p. 3-141.* These stream temperature change predictions are compared with stream temperatures standards adopted by the State of Colorado, and conclusions with respect to potential impacts to aquatic resources drawn.

The DEIS's analysis is deficient in three critical ways. First, it relies on a steady state, single-day model that is inherently incapable of accurately predicting stream temperature increases either on a single day or over time. Second, the DEIS compares modeled increases against the wrong State stream temperature standards deemed to be protective of cold water biota. Third, even though the model establishes that operation of WGFP will cause the State's chronic stream temperature standards to be exceeded, the DEIS arbitrarily concludes that aquatic resources will not be impacted. These deficiencies, described in detail in what follows, are fundamental deficiencies that render the DEIS incapable to inform the agencies' decision, much less enable them to meet the "hard look" requirements of NEPA.

1. The DEIS fails to take a hard look at how stream temperatures will change as a result of WGFP.

The QUAL2K Model looks at temperature changes as a result of operation of WGFP and other projects on a single day. The model does not look at how diversions affects flows and stream temperatures in previous days or how it will affect stream temperature in subsequent days. This limitation has a number of serious consequences. First, it precludes an accurate assessment of stream temperatures on the single modeled day. Second, it precludes an assessment of stream temperature changes over time and, consequently, an evaluation of chronic stream temperature impacts. Third, it precludes an assessment of the cumulative effects operation of WGFP will have, when combined with continued diversions by other projects, including C-BT, Moffat, and the reasonably foreseeable Moffat Expansion.

The DEIS fails to accurately predict stream temperature increases due to WGFP operation on the single modeled day. Stream temperatures fluctuate more rapidly when flows are low. Therefore, when low flow periods are extended, the probability that both daily maximum temperatures and weekly average temperatures will be exceeded increases. Diversions by WGFP and future projects would increase periods

in which stream flows are reduced not only on the single, modeled day, but also in previous days. If these flow reductions have caused stream temperatures to gradually increase, a single day's diversion can increase temperatures to a point where they are harmful to aquatic life. Yet, because the model looks at neither predicted flows nor predicted temperature conditions as a result of operation of WGFP and future projects before the single modeled day, it fails to assess the projects' impacts on stream temperature and, therefore, on aquatic resources.

The DEIS admits this limitation of the model when it states that State standards could be exceeded "if the existing conditions temperatures during that week were already near or above the standard." *DEIS at 3-96.* However, the DEIS fails to evaluate the extent and frequency of these conditions. Absent this information, it is impossible to draw conclusions as to the potential impacts of the WGFP and other projects on the river's aquatic resources.

The DEIS fails to evaluate how stream temperatures will increase over a series of days. The DEIS predicts that stream temperatures will increase by up to 0.6°C on an average July 25 day under the Proposed WGFP. *DEIS at p. 3-96.* Based on this prediction, the DEIS concludes that operation of WGFP will not cause exceedences of the State standards under the average July 25 scenario. *Id.* However, the DEIS does not explain how this information translates into stream temperature changes in subsequent days. If the Proposed Action causes stream temperatures to increase by 0.6°C on July 25, does that mean that temperatures will also be increased by 0.6°C on July 26, resulting in a total 1.2 °C increase? Will this exceed acute or chronic tolerance thresholds? What will the increase be in July 27? Will that increase exceed those thresholds? And so on. Because the DEIS relies on a steady state, single-day model, it cannot answer these critical questions.

The DEIS fails to evaluate the potential for stream temperature conditions that have chronic impacts on aquatic resources. Because the model cannot predict stream temperature changes over a period of time, the DEIS does not evaluate the extent to which operation of WGFP and other projects will cause increases in stream temperature that create chronic conditions harmful to the river's aquatic resources. Chronic conditions include effects which, while not immediately lethal, have the potential to devastate fisheries - such as reduced growth, reduced reproduction, and reduced survivorship. As further described below, the State has adopted standards that reflect temperature levels trout fisheries can tolerate, both on a daily basis (acute) and over a period of time (chronic). Chronic standards are expressed as maximum weekly average tolerance levels (MWAT). To assess whether operation of WGFP and other projects will cause increases in stream temperature that will exceed chronic tolerance levels, the agencies must be able to evaluate how stream temperatures will change on a weekly basis. A steady state, single-day model which can only make predictions based on conditions for the single modeled day, cannot do this.

The DEIS draws conclusions with respect to the project's predicted impacts on these chronic exposure levels, *DEIS at 3-96*. However, neither the DEIS nor the Stream Water Quality Technical Report on which it relies explain how these conclusions were derived or how single-day model predictions were translated into weekly values. In the end, the DEIS simply admits that chronic levels could be exceeded if existing stream temperature conditions during the week are already near or above the standard. *See DEIS at p. 3-96; Technical Report at 62.* Neither the DEIS nor the Technical report evaluate the expected frequency of this condition. As a result, the DEIS fails to assess whether and how often operation of the WGFP and other projects will cause stream temperatures to exceed the State chronic temperature standards or otherwise create chronic conditions that harmful to the river's aquatic life.

The DEIS fails to evaluate the impacts of cumulative stream temperature increases caused by operation of WGFP, combined with projects that will continue to operate when WGFP ceases to pump. Even more alarming is the DEIS's failure to evaluate the combined effects on stream temperature (and consequent effects on aquatic resources), caused by the combination of WGFP pumping and continued diversions by other project after WGFP operation ceases. Projects such as C-BT, Moffat Tunnel and the reasonably foreseeable Moffat Tunnel Expansion are not subject to the same limitations that restrict WGFP pumping (i.e., junior priority of water rights and minimum 90 cfs flows). Accordingly, these projects can continue to reduce stream flows well after WGFP ceases diversions. If operation of WGFP causes stream temperatures to increase, such increases will be further aggravated by continued diversions by these projects. Yet, the DEIS completely fails to evaluate such combined effects.

2. The DEIS fails to evaluate the most harmful stream temperature changes that would occur as a result of operation of WGFP and other projects.

The DEIS indicates that the two modeled runs (i.e., the average year July 25 run and the 90cfs July 25 run) were selected to capture a "worst case" scenario. *DEIS at p. 3-141, n. 2.* Presumably, evaluation of these worst case scenarios obviates the need to assess impacts that may occur under other scenarios. The DEIS's assumption that the modeled scenarios are worst case scenarios is unsupported. The DEIS fails to look at the truly harmful effects of the project.

The assertion that an average July 25 represents a worst case scenario is unfounded. From a hydrological and climate perspective, WGFP diversions in August would clearly present a worse scenario. The DEIS indicates that, under the Proposed Action alternative, WGFP will increase Windy Gap diversions by 144% in an average August. *DEIS, Appendix A, Table A-6, at p. A-11.* Moreover, the cumulative impacts of WGFP pumping will likely be much greater after July 25, when other projects, including C-BT, Moffat Tunnel and the reasonably foreseeable Moffat Tunnel Extension continue

to deplete the Colorado River, further increasing stream temperatures already increased due to operation of WGFP.

WGFP's reduction of flows to 90 cfs is not, by far, the worst case scenario for the Colorado River's aquatic resources. A very alarming and, unfortunately, real scenario that is not considered anywhere in the DEIS, is the operation of WGFP down to 90cfs, followed by continued flow reductions caused by operation of projects that are not restricted by the 90 cfs instream flow right held by the Colorado Water Conservation Board (CWCB). As discussed above, diversions by C-BT, Moffat Tunnel, Moffat Tunnel Expansion and, perhaps other reasonably foreseeable projects, are not restricted by the 90 cfs CWCB instream flow right. As a result, WGFP's reduction of flows down to 90 cfs is not, by far, the worst case scenario. Operation of these projects after WGFP has ceased pumping is.[6] Matters can get even worse as a result of climate changes – a cumulative impact the DEIS glosses over. Indeed, reducing flows down to 90cfs is not, by far, the worst case scenario the Colorado River fisheries would endure. The worst case scenarios are neither identified nor considered anywhere in the DEIS.

3. The DEIS compares modeled stream temperature as a result of operation of the WGFP and reasonably foreseeable future projects to the wrong State Standards.

In January of 2007, the Colorado Water Quality Control Commission, the State agency charged with adoption of water quality standards under the Clean Water Act, adopted regulations that define the levels of stream temperature beyond which harm to aquatic life is anticipated (State Standards). *See Basic Standards and Methodologies for Surface Water, 5 CCR 1002-31.*[7] For cold water biota, standards were adopted based on stream temperature levels deemed to be protective of trout fisheries. Maximum daily (DM) and weekly average (MWAT) levels were established to protect all life stages of trout from acute and chronic effects. While both acute and chronic standards were adopted, the chronic (MWAT) standard was established on an interim basis, pending hearings to assess whether the established levels of protection were necessary to protect biota within specific streams in the State. *See 5 CCR 1002-31.45; 5 CCR 1002-33.41.*

In June of 2008, the Commission held hearings and proceeded to adopt regulations applying final acute and chronic temperature standards to streams within the

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[6] Indeed, while any continued diversions below 90 cfs would make a bad stream temperature situation even worse, the combination of WGFP pumping down to 90 cfs, followed by C-BT's reduction of Granby releases to 20 cfs on September 1 and continued diversions by Moffat and Moffat Expansion, would present perhaps the worst case scenario, potentially leading to a catastrophic event.

[7] The referenced State's stream temperature regulations and policy documents are available from the Colorado Water Quality Control Commission's offices and on the web, at http://www.cdphe.state.co.us/op/wqcc/StatutesRegsPolicies/StatRegsPols.html

Colorado River basin, including the reach of the Colorado River impacted by the WGFP alternatives evaluated in the DEIS. *5 CCR 1002-33; 5 CCR 1002-33.44.* For that reach, the Commission adopted the following stream temperature standards:

Temperature	TEMPERATURE TIER	TIER COD	SPECIES EXPECTED TO BE PRESENT	APPLICABLE MONTHS	TEMPERATURE STANDARD (°C)	
					(MWAT)	(DM)
	Cold Stream Tier II	CS-II	brown trout, rainbow trout, mottled sculpin, mountain whitefish, longnose sucker, Arctic grayling	April – Oct.	18.2	23.8
				Nov. – March	9.0	13.0

5 CCR 1002-33.6(3). These temperature standards were adopted following years of intense evaluation of available scientific literature, studies and data by the Commission's staff in conjunction with a widely represented technical advisory panel. *See 5 CCR 1002-31.44(H); 5 CCR 1002-31.45; Temperature Criteria Methodology, Policy Statement 06-1.* Accordingly, they represent the best science and consensus available at the time.

The DEIS's surface water quality analysis attempts to compare modeled stream temperature increases due to operation of WGFP and other reasonably foreseeable projects to the State Standards. Unfortunately, it uses the interim standards of 2007, not the final standards adopted in 2008. As a result, the DEIS entirely fails to evaluate the extent and frequency with which operation of WGFP and other projects will increase temperature levels beyond the acute, lethal tolerance levels reflected in the Commission's regulation adopted in 2008. The DEIS also fails to evaluate the impacts of WGFP and other projects on the State's stricter acute and chronic stream temperature standards applicable for the November through March time period.

5. Finding that operation of WGFP will exceed State Standards, the DEIS either ignores the exceedences or arbitrarily concludes that such violations will not impact the river's aquatic resources.

The DEIS's surface water quality analysis predicts that maximum weekly average stream temperatures in the Colorado River upstream of Williams Fork will reach 18.9°C when pumping under the Proposed Action alternative reduces flows to 90 cfs. *DEIS at 3-96.* This level exceeds the maximum, chronic thermal tolerance levels deemed for rainbow and brown trout established by the Commission.

Likewise, modeled maximum daily temperatures are expected to increase to 25.5°C - well in excess of the 23.8°C acute (lethal) levels deemed safe by the State. *Stream Water Quality Technical Report, Table 26 at 63.*

Because it uses the wrong State Standards, the DEIS entirely ignores the projected violation of the State's acute, lethal standard. The DEIS's stream water quality analysis does acknowledge that State chronic standards will be exceeded. However, the DEIS proceeds to disregard it, arbitrarily concluding that such temperature standard violations are "unlikely to measurably impact fish populations." *DEIS at 3-141.* .

The DEIS appears to base this conclusion on three rationales. First, the DEIS finds that "temperature of about 19°C is well below lethal and chronic [tolerance] levels for rainbow cutthroat, and especially brown trout." *DEIS at p. 3-141.* Second, the DEIS states that the conclusion is based on "observed water temperatures, which occasionally exceed 19°C under current conditions, and the healthy fish populations that exist in this reach of the river." *DEIS at p. 3-141.* In the end, the DEIS simply concludes that WGFP will infrequently divert to 90cfs when air temperatures are high and, therefore, no "measurable impacts to fish populations" will result. *DEIS at p. 3-141.* The DEIS's reasoning is scientifically flawed and ignores well-supported standards legally adopted by the State in accordance with and under the authority of the Clean Water Act. As such, the DEIS conclusion is arbitrary and capricious and contrary to law.

The DEIS arbitrarily establishes thermal tolerance levels that are inconsistent with levels established by the State after rigorous scientific review and formal rulemaking. State regulation states that the summertime chronic thermal tolerance level for adult and juvenile cutthroat trout is 17°C and 18.2°C for juvenile and adult rainbow and brown trout. For this segment of the Colorado River, State regulation establishes rainbow and brown trout tolerance levels as the State Standard. Defining thermal tolerance levels for aquatic life is challenging, to say the least. Hundreds of studies and papers on the subject are available expressing widely varying conclusions – not all of which meet the highest scientific standards. The State Standards were adopted after rigorous review and selection of literature and other data on the subject, a multi-year, open process involving a panel of experts with widely varying perspectives.

In contrast, the DEIS summarily concludes that stream temperatures that exceed the State Standard are "well within" tolerance levels, citing a handful of studies. Neither the DEIS nor the Technical Report explain why these particular studies, among the myriad of studies and information, were selected.[8] The data set on which the State

[8] The DEIS's conclusion that chronic temperatures of 19°C MWAT are within tolerance levels "especially for brown trout" is particularly aggravating, as the statement disregards the impacts of these higher temperature levels on rainbow trout, which were decimated in this section of the Colorado River by operation of the original Windy Gap project and are subject to intense reintroduction efforts by the State.

Standards are based was adopted after rigorous analysis and an open, public process. It represents the best estimate of the thermal tolerance for those fishes. The DEIS's disregard of these formally adopted State Standards is arbitrary and capricious. Moreover, should a legitimate disagreement with the State Standards, adopted under the authority of the Clean Water Act, arise the proper means to address such differences is by requesting the State Commission to adopt different standards after a formal rulemaking hearing process that is open to the public.

The DEIS's conclusion that modeled temperature exceedences are not harmful to the fisheries because occasional exceedences currently occur and the fisheries appear to be healthy lacks any scientific basis. That an apparently healthy fish population persists where temperatures occasionally are high enough to produce chronic impacts is not proof that these chronic impacts are not being felt. Instead it merely indicates that, to date, the existing data set is incapable of detecting these sub-lethal, chronic effects. Indeed, it is the difficulty of demonstrating these in the field that necessitates the adoption of standards that prevent sub-lethal impacts. Yet, the DEIS appears to be arguing the converse: that the inability to detect sub-lethal effects obviates the need for the adopted standards. This is patently false.

Increasing the frequency and or duration of low flow events and associated high water temperatures is likely to increase the severity of these sub-lethal effects, perhaps to the point where they are easily detectable in the fish population. The rationale behind the recently adopted temperature standards is a desire to protect the fishery and avoid measurable population impacts, impacts that may only be easily detectable when they are very, very large. The DEIS's disregard for the State Standards and conclusion that impacts do not exist because they have not been measured is arbitrary and capricious, unsupported by science and is contrary to duly adopted State regulations.[9]

6. The DEIS's conclusion that WGFP will not "significantly" impact the aquatic resources of the Colorado River because WGFP will infrequently divert in July and August is arbitrary and capricious and contrary to the information presented.

After extensive discussion of potential stream temperature changes, spanning dozens of pages and significant (although not particularly helpful) technical analysis, in the end, the DEIS simply concludes that "measurable impacts to fish populations are not

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[9] Before claiming that impacts to fish populations are not currently detected because the impacts either do not exist or are too small to detect, the DEIS should have at least bothered to engage in a power analysis. A power analysis is a statistical determination of how large or small an effect must be before it can be detected with a given data set. Without such an analysis, the observation that there have been no measurable impacts of temperature on fish in the Colorado River is merely evidence that the reviewed data set is inadequate – i.e., that the agencies have failed to look for those impacts hard enough.

expected because flow reductions in July and August would be infrequent." *DEIS at p. ES-14.* The scientific bases for this critical conclusion are not explained. Its basic premise – i.e., that WGFP will not divert in July and August, is contrary to specific DEIS findings. The assumptions it reflects are unfounded and contrary to State regulation. As such, the conclusion is arbitrary and capricious, contrary to law, and renders the DEIS fatally flawed.

The conclusion that the project will infrequently divert in July and August is in direct conflict with the DEIS findings, as reflected in Appendix A of the DEIS. As discussed in Part A of these comments, Table A-6, Appendix A of the DEIS indicates that WGFP diversions under the Proposed Action alternative will increase current diversions by as much as 109% in July and by as much as 144% in August on average years – this, compared to estimated diversion increases of 13% in June, 5% in May, and 0% during the rest of the year. On a wet year, the DEIS estimates a 1639% increase in July, compared to an estimated 13% increase in diversions in June, 4% in April, and 0% for the rest of the year. *DEIS, Appendix A, Table A-6.* Model outputs also estimate that the greatest Colorado River flow reductions below Windy Gap as a result of operation of the Proposed WGFP would occur in July, when flows will be reduced by 23% in an average year. Flows in August would be reduced by as much as 16%. In a wet year, flow reductions caused by operation of the Proposed Action alternative would be the highest in August, when flows below Windy Gap would be reduced by as much as 33%. July reductions would be the next highest, at 26%. *DEIS Appendix A, Table A-10.* Indeed, the DEIS's reported hydrological model outputs belie the DEIS's conclusion and indicate that the effect of WGFP will be to significantly increase July and August diversions.

The assumption that stream temperature reductions outside of July and August would not have an impact on the river's aquatic resources is groundless. As discussed above, the model and information provided in the DEIS and associated technical reports is incapable of supporting this or any other conclusion with respect to the magnitude of or frequency in which WGFP operations will cause exceedences of stream temperature standards, or otherwise increase temperature to levels that are lethal to the aquatic resources.

The DEIS fails to describe the criteria by which the "frequency" of a stream temperature exceedence is deemed to yield a "measurable" impact for purposes of the NEPA analysis. The acute and chronic stream temperature standards adopted by the State define not only the levels, but also the frequency of exposure that results in lethal (daily) and chronic (weekly) impacts to trout fisheries. The DEIS's conclusion entirely disregards these standards, established by the State of Colorado after extensive analysis and formal hearings. The DEIS fails to provide <u>any</u> explanation as to why the State's frequency standard was disregarded, or what other criteria the agencies' relied upon to

conclude that no "measurable" impacts resulted. The conclusion is arbitrary and capricious, and contrary NEPA and well established State law.

F. The DEIS fails to evaluate other critical impacts of WGFP and other reasonably foreseeable projects on trout fisheries and entirely fails to evaluate impacts on other fish species.

Changes in WUA and stream temperature are not the only mechanisms by which fish can be impacted. Trout can be impacted if changes in flow lead to a collapse of important food resources like the stonefly, *Pteronarcys californica*. In addition, if reduced peak flows cause additional sediments suitable for the tubificid worm, *Tubifex tubifex*, to accumulate along the Colorado River below Windy Gap, problems with whirling disease may be exacerbated. The DEIS fails to adequately evaluate these impacts or explain why these obvious effects of changes in flows have been ignored.

1. The DEIS fails to take a "hard look" at potential impacts to macroinvertebrates.

The DEIS simply states that the "habitat needs of the macroinvertebrates . . . are similar to those of the trout species" and that "species, abundance, and distribution of macroinvertebrates should remain similar to existing conditions under all alternatives based on the anticipated changes in flow and minor changes in water quality." *DEIS at p. 3-142*. However, no evidence is presented to support these conclusions. In fact, the habitat needs of fish and aquatic invertebrates are quite different since fish generally live within the water column, while invertebrates spend most of their lives on the surfaces of and in the spaces between rocks and cobble found on the streambed. Water quality conditions may change significantly at low flows as acknowledged by the Aquatic Resources Technical Report's statement that "[l]ower flows could increase the potential for exceedence of the weekly maximum average temperature for standard aquatic life." *see Aquatic Resources Technical Report at p. 38.*. As such, the DEIS conclusion that aquatic macroinvertebrate species and distribution are not expected to change is unsubstantiated.

2. The DEIS fails to evaluate impacts to other fish species.

The DEIS focuses on two non-native trout species to the exclusion of other fish species. The DEIS states that two native species of sculpin are present within Colorado River and Willow Creek study areas. In addition, non-native dace, chub darter, and sucker can also be found in these study areas. *See Table 2, Aquatic Resources Technical Report at p. 14*. The DEIS fails to evaluate impacts of WGFP on these other native and non-native fish species.

3. The DEIS fails to evaluate impacts of WGFP and other reasonably foreseeable projects on whirling disease and, consequently, on the Colorado River, west slope reservoirs, and east slope streams and reservoirs fisheries.

The DEIS's aquatic resource impacts analysis entirely fails to address WGFP's potential to exacerbate the impacts of whirling disease on the aquatic resources of the Colorado River, west slope reservoirs, and east slope reservoirs and streams. This, in spite of admitting that "CDOW identified Windy Gap Reservoir as some of the most suitable habitat (low-velocity water and silt or mud substrate) for *T. tubifex*, especially those lineages that are most susceptible to infection by *M. Cerebralis* (Beauchamp et al. 2002), *DEIS at 3-133,* that "potential biological limiting factors in the Colorado River include the presence of whirling disease and its impact on rainbow trout," *Aquatic Resources Technical Report at 78*, and that Windy Gap Reservoir has historically been considered a major source for TAM production in this drainage (Nehring and Thompson 2003)." *DEIS at 3-133.*

Tables 6 and 7 of the Aquatic Resources Technical Report further supports the conclusion that rainbow trout have declined dramatically since 1988. Accordingly, prior to 1988, rainbow trout generally comprised 70%-80% of the fish population in biomass, total numbers and fish over 35 cm in length. Since 1988, the rainbow population has declined to comprise only around 20% of the total population, 20%-30% of the total biomass and 25% to 50% of the fish over 35 cm in length. *Aquatic Resources Technical Report at 19-20.*

In spite of these findings, the DEIS fails to evaluate the likelihood that further reduction in flows will prolong or even aggravate whirling disease conditions either in the Colorado River itself or in west slope reservoirs and east slope streams where additional Windy Gap water will be pumped. Rather, the DEIS cursory dismisses the issue, concluding that whirling disease is no longer an issue. *See DEIS at 3-133; Technical Report at 29* (citing only a "personal communication" between "B. Nerhing and Don Carlson," a Northern employee).

Failure to consider the potential impacts of increased WGFP pumping on whirling disease and, therefore, on the survival of trout populations both in the Colorado River and in west slope and east slope reservoirs and streams, renders the DEIS fatally deficient. Such failure is particularly aggravating, given the acknowledged fact that approval of the original Windy Gap project was directly responsible for wiping out the rainbow trout population of the Colorado River below Windy Gap reservoir in the first place.

G. The DEIS fails to take a hard look at the cumulative impacts operation of the WGFP, combined with past, present and future reasonably foreseeable projects will have on the aquatic resources of the Colorado River.

So far, these comments have highlighted several DEIS deficiencies that preclude the agencies' required "hard look" at both the direct and the cumulative impacts of the WGFP. Not only does the DEIS fail to look at the cumulative impacts of WGFP combined with past, present and reasonably foreseeable future projects, it fails to look at the impacts of WGFP, either alone or in combination with other projects, across the years. Instead, the analysis focuses on individual, isolated, average days, months and years. This approach ignores the most potentially damaging impacts of WGFP on the aquatic resources of the river and renders the DEIS fatally defective.

The DEIS's cumulative impacts analysis is deficient in other ways. First, it fails to evaluate the impacts ongoing project operations, including C-BT, Moffat Tunnel and Windy Gap, have had on the river's aquatic resources. Second, it fails to take into account the impacts of all reasonably foreseeable projects. Third, it fails to evaluate the cumulative impacts of reasonably foreseeable future events, such as global warming, on the Colorado River's hydrology and its aquatic resources. These deficiencies render the DEIS fatally defective.

1. The DEIS fails to evaluate the impacts ongoing project operations, including C-BT Project operations, have had on the Colorado River resources.

The DEIS's cumulative impacts analysis does not evaluate the impacts large transmountain diversions, such as C-BT and the Moffat Tunnel, have had on the resources of the Colorado River. The DEIS acknowledges that these and other diversions have had a profound impact on the hydrologic regime of the river. For example, the DEIS notes that flows at Hot Sulphur Springs have been reduced from 486,209 acre-feet per year during the period from 1905-1949, to only 175,264 acre-feet per year for the period from 1950-1994. *DEIS at p. 3-7.* Yet, the DEIS fails to evaluate the impacts these changes have had when assessing the cumulative impacts of the WGFP and other foreseeable actions on water and aquatic resources. Instead, the cumulative impacts analysis only looks at expected future changes as compared to existing conditions. *See e.g., DEIS at p. 3-1.* If the Colorado River is to avoid a death of 1,000 cuts, future changes must be placed in the broader context of the alterations that have occurred to date.

The DEIS does not explain the rationale for this decision. At most, in describing the environment affected by the project, the DEIS states that "[t]he affected environment reflects any past activities that have affected the resources and that contributed to the current status of the resource." *DEIS at 3-1.* However, acknowledging that the Colorado River has been impacted by past activities is not the same as actually evaluating those impacts.

Perhaps an assumption is being made that, if current flows support a healthy fishery, the changes to date have not significantly impacted the aquatic resources of the

river. If this is the case, the assumption would have no empirical support. Indeed, it is much more reasonable to presume that the changes resulting from diverting nearly two-thirds of the native flow from the basin have been significant. The resilience (Holling 1996) of the system has almost certainly been compromised.

The critical question the DEIS must answer is not how much of a change will the WGFP and other future projects will have on the Colorado River of today, but whether the Colorado River can withstand any further impacts without being pushed into an alternative state, one that cannot support healthy fish populations and other aquatic life. This question is critical to evaluating the impact of future projects and has not been asked.

Ecologists have long recognized that many ecosystems exhibit nonlinear behavior in response to human perturbations. In other words, a continuous change in an independent variable (e.g., a continuous 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 can not. The term "ecological resilience" has been used to describe the amount of disturbance required to propel the ecosystem across a threshold and into an alternative stable state (Holling 1996). Riverine ecosystems are strongly affected by external factors like stream flow, sediment, and temperature (Groffman et al. 2006). Indeed, the quantity and timing of stream flow are critical components responsible for maintaining the ecological integrity of river ecosystems (Poff et al. 1997) and stream flow is often considered a "master variable" that limits the distribution and abundance of riverine species (Resh et al. 1988, Power et al. 1995). Continued reductions in stream flow quantity and changes in stream flow timing have the potential to fundamentally alter how the Colorado River ecosystem functions. Potential non-linear responses to the continued reduction in stream flow have not been considered in the DEIS, and this is a significant omission.

Because many ecosystems such as the Colorado River's exhibit hystereses, the change required to restore the ecosystem may need to be much greater than the change that produced the change in state. The best know examples of this phenomenon are from lakes where continuously adding nutrients has little impact on water clarity before a threshold is crossed and the lake flips from a clear-water state to a cloudy, phytoplankton-dominated state (Scheffer and Carpenter 2003). Restoring the lake frequently requires not only ending the input of nutrients, but removing much of the nutrients that have accumulated in the lake. Thus, the challenge for managers is to recognize the existence of such a threshold before it is crossed. Not only does the DEIS fail to recognize the potential for these thresholds, but by evaluating cumulative impacts as the change from current conditions rather than the change from the native state, it fails to acknowledge the likelihood that the historic reductions in flow have already pushed the river close to any existing threshold.

2. The DEIS fails to evaluate the cumulative impacts of reasonably foreseeable projects.

Green Mountain Reservoir Substitution and Power Interference Agreement. Reclamation is currently in the process of evaluating a proposal by Colorado Springs Utilities (CSU) and Western Area Power Administration to enter into a Substitution and Power Interference Agreement for Green Mountain Reservoir (Green Mountain Reservoir Agreement). http://www.usbr.gov/gp/nepa/quarterly.cfm#ecao. According to the draft EA, released in September of 2008, the proposed 40-year Agreement would allow CSU to use Wolford Mountain Reservoir and Homestake Reservoir releases to substitute Blue River diversions at times when Green Mountain Reservoir does not fill. Currently, CSU is only allowed to meet its substitution obligations by releasing water from Williams Fork Reservoir or storage sources in the Blue River.

As acknowledged in the draft EA, the proposed Agreement would impact the reach of the Colorado River between its confluence with Williams Fork and its confluence with the Eagle River. *See Draft EA, Figure 3-1.* Impacts include reduction of flows within the reach. *See Draft EA, Chapter 3.* Yet, the DEIS entirely fails to include the Green Mountain Substitution and Power Interference Agreement in the list of reasonably foreseeable projects, to include in any way evaluation of this project in its cumulative impacts analysis, or to explain why the project was not included – this, in spite of the fact that the project is currently being considered by the lead federal agency for the WGFP.

Northern Integrated Supply Pipeline (NISP). Likewise, the Corps is currently evaluating a CWA § 404 permit application for the Northern Integrated Supply Project. https://www.nwo.usace.army.mil/html/od-tl/eis-info.htm. Although the primary identified sources of water for the project are located in the east slope, use of upper Colorado River sources for initial fill and/or storage at times when east slope sources are not available seems to be contemplated. Yet, neither the project's draft EIS, nor the DEIS for WGFP evaluate the potential cumulative impacts of such potential diversions. The DEIS determines that NISP is not a reasonably foreseeable project because "identified sources of water and storage locations for the NISP Project indicate that this project would have little or no interaction or overlap with the area of potential effect for the WGFP." *DEIS, Table 2-4 at 2-53.* If such remains the case and the Corps specifically prohibits NISP's use of west slope water, then evaluation of the project in the context of WGFP is not necessary. Otherwise, the project and its potential cumulative impacts must be evaluated.

3. The DEIS fails to evaluate the cumulative impacts of climate change and global warming and mountain pine beetle killed trees.

The DEIS recognizes that "climate change and global warming may affect the WGFP" and that records and models indicate "higher temperatures which can result in earlier snowmelt and runoff, higher evaporation rates and increased water demands" *DEIS at 2-44*. However, the DEIS fails to evaluate these potential impacts and simply states that "there is no accepted science for transforming the general concept of variations in global temperature into incremental change is stream flow at particular locations". Moreover, the DEIS fails to acknowledge the potential impacts of global warming on exacerbating already anticipated stream temperature problems.

A recent report prepared by CU-NOAA Western Water Assessment for the Colorado Water Conservation Board (CWCB) reports that recent hydrologic studies of the Upper Colorado River Basin project multi-model average decreases in runoff ranging from 6% to 20% by 2050 compared to the 20th century average.[10] The report concludes that "[a] warming climate will amplify Colorado's water related challenges, with potential reductions and seasonal shifts in water availability. While most water resource planning has been based on past hydrology, ***water users can no longer assume that future conditions will reflect the past. Although there are uncertainties regarding aspects of the science, enough information is available to support adaptation planning for risks associated with climate variability and change*** [emphasis added].[11] Clearly, acceptable science is currently available and the DEIS should utilize this science to evaluate how climate change may affect its assumptions regarding impacts to stream flows and stream temperature.

The DEIS also recognizes that pine beetle killed trees may have implications for the upper Colorado River such as increased rate of nitrification and increased wildfire risk resulting in increased runoff, sediment and nutrients *DEIS at 2-44* but the DEIS fails to quantitatively evaluate these impacts, particularly in terms of sedimentation and sediment transport problems, or to acknowledge potential impacts on stream temperature.

H. The DEIS fails to take a "hard look" at the effects of WGFP and other reasonably foreseeable projects on the special State and Federal designations of the affected reach of the Colorado River.

The Colorado River reaches impacted by the proposed WGFP and other foreseeable projects are subject to special designations by both the State and the Federal government. The reach between Windy Gap Reservoir and the river's confluence with Troublesome Creek is a Gold Medal Trout fishery, designated by the Colorado Wildlife Commission. This designation is reserved to outstanding fisheries that meet specific fish

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[10] *Climate Change in Colorado. A Synthesis to Support Water Resources Management and Adaptation. A Report by the Western Water Assessment for the Colorado Water Conservation Board. 2008. Page 2.*

[11] *Id. at p. 43.*

population and size requirements.[12] There are only 10 designated Gold Medal streams in the State of Colorado. The reach of the river between Gore Canyon and State Bridge is a designated "Wild Trout" stream. This designation is based on the presence of naturally reproducing, wild trout.[13]

In addition to the State's Gold Medal and Wild Trout designations, these reaches of the river are "eligible" reaches for Wild & Scenic Rivers Act (WSA) designation. *Final Wild and Scenic River Eligibility Report for Kremmling and Glenwood Springs Field Offices, Colorado (March 2007).* The reaches have been deemed to be eligible under the WSA because they exhibit "outstandingly remarkable values" (ORVs) that merit protection. These values include outstanding fishing recreation. BLM manages these and other eligible rivers so as to not adversely affect their values pending potential WSA designation by Congress. *BLM Policy 8351 (Dec. 22, 1993).* In addition, over the last year, a stakeholders group has been working diligently to develop a plan for the management of the upper Colorado River (including the reach between Gore Canyon and State Bridge), to protect the ORVs of the reach. Reclamation staff has been attending these meetings.

The DEIS acknowledges most of these designations in its Recreation analysis. *See DEIS at 3-3-231 to 234.* Yet, the DEIS's analysis entirely fails to evaluate the direct, indirect and cumulative impacts of WGFP on these designations, focusing the recreation impacts analysis almost exclusively on boating recreation (e.g., rafting and kayaking). At most, the DEIS' recreational analysis makes conclusory statements regarding the anticipated impacts on fishing recreation, but provides no supporting analysis. *See DEIS at 3-26 and 3-246* ("Potential effects to aquatic resources from changes in streamflow and reservoir storage on the West Slope and East Slope as discussed in Section 3.9 are unlikely to adversely impact sports fishing under any alternative based on estimated effects to fish habitat and communities.").

As discussed at great length in these comments, the aquatic resources impacts analysis on which the DEIS's conclusions rely is fatally flawed and, therefore, cannot provide the basis for such conclusion. Moreover, while the aquatic impacts analysis discusses potential impacts to fisheries, it does not evaluate the impacts of the project on

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[12] The Colorado Wildlife Commission defines a Gold Medal Water as a lake or stream that supports a standing stock of at least 60 pounds per acre, and contains an average of at least 12 quality (14" or longer) trout per acre. *See Colorado Wildlife Commission's "Wild and Gold Medal Trout Management Policy" September 18, 1992 (Revised June 12, 2008).*

[13] The Colorado Wildlife Commission defines Wild Trout Water as a lake or stream that contains a wild trout population; a wild trout population is one that can sustain itself through natural reproduction and recruitment and a wild trout is a trout that completes its entire life cycle in a lake or stream. *Colorado Wildlife Commission's "Wild and Gold Medal Trout Management Policy" September 18, 1992 (Revised June 12, 2008).*

the quality of those fisheries for recreational use.[14] For example, the size of fish plays as critical a role in the State's designations as their numbers. Yet, the aquatic impacts analysis only describes potential impacts to fish populations. Because BLM's outstanding recreational fishing designation is largely based on the State's designation criteria, the aquatics analysis also fails to yield the information needed to assess potential impacts on designation under the WSA.

Even more alarming is the fact that the DEIS reaches the same conclusions with respect to impacts of the project on fishing recreation downstream of Gore Canyon, even though the aquatic resource impacts analysis does not look at impacts to fisheries in that reach. Indeed, relying on an inadequate hydrological analysis, the aquatic resource impacts analysis ends its review at the Colorado River's confluence with the Blue. *See DEIS at 3-6 and 3-130.* Yet, even under inadequate hydrological modeling used in the aquatic resources impacts analysis, on an average, operation of WGFP and other reasonably foreseeable projects will reduce flows in the reach below Gore Canyon by 13%. This, compared to an average of 20% flow reduction below Windy Gap Reservoir. *DEIS, Table 2-7 at 2-67.* Operation of WGFP and other reasonably foreseeable projects would reduce stream levels below Gore Canyon by a foot. *DEIS, Table 2-7 at 2-67.* This is by no means an insignificant reduction. And, while during high flow conditions the impacts on aquatic resources may not be as great, they could be quite significant during low flows. Unfortunately, the DEIS only provides annual average information. It does not explain what the anticipated reductions would be from month to month or, even more importantly, from day to day. As such, DEIS's failure to evaluate aquatic resource impacts downstream of Gore Canyon renders the analysis fatally flawed and the DEIS's determination that fishing recreation values in that reach are unlikely to be impacted arbitrary and capricious.

Finally, it should be noted that BLM has already forewarned Reclamation of concerns with respect to the cumulative impacts of WGFP and other reasonably foreseeable projects on the Colorado River, both upstream and downstream of its confluence with the Blue River. In its comment letter regarding Reclamation's consideration of the Green Mountain Agreement, BLM expresses concern with the cumulative impacts of individual projects, including WGFP, on the reach of the Colorado downstream of Gore Canyon, noting that "[n]one of the in *individual* projects appear to have overwhelmingly negative impacts on the ORVs . . . however, *collectively*, the reasonably foreseeable projects could have substantial impacts on the ORVs over time."

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[14] It should be noted that the Recreation Technical Report simply cites "Miller Ecological 2008" as sole support for its repeated assertions that no impacts to fishing recreation or Gold Medal fisheries would result. *See e.g., Technical Report at 43 and 51.* Presumably, this cite refers to the Aquatic Resources Technical Report prepared in connection with the DEIS. Yet, like the DEIS, the Aquatic Resources Technical Report reaches no conclusions with respect to impacts to either fishing recreation or State designations.

Memorandum dated October 14, 2008, from David Stout to Kara Lamb (emphasis in the original).

I. The "no action" alternative evaluated in the DEIS is speculative and the associated analysis misleading.

NEPA requires federal agencies to evaluate all reasonable alternatives to a proposed action, including the option of taking no action. *Silverton Snowmobile Club v. U.S. Forest Service*, 433 F.3d 772, 780 (10th Cir. 2006).

The DEIS defines the "no action" alternative for the WGFP as follows:

> "Under this alternative, Participants would maximize delivery of Windy Gap water according to their demand, water rights, availability of storage in Granby Reservoir, and existing Adams Tunnel conveyance constraints. The City of Longmont would enlarge Ralph Price Reservoir by raising the dam and increasing storage capacity by 13,000 AF (Figure ES-3)." *DEIS at ES-5.*

The DEIS goes on to estimate future diversion scenarios by Windy Gap project participants, in the absence of WGFP, and reaches conclusions regarding anticipated impacts of such diversions on the environment, including aquatic resources. These estimated impacts are then compared with the predicted impacts associated with the action alternatives, as well as to existing conditions. As further explained below, the DEIS's assumptions regarding these future scenarios are speculative and its estimated impacts artificially inflated when compared to the action alternatives. As a result, the DEIS fails to properly evaluate the impacts of opting to take no action.

1. The "no action" alternative defined by the DEIS is speculative.

To be reasonable, an alternative must be non-speculative. *Utahans for Better Transportation v. U.S. Department of Transportation*, 305 F.3d 1152, 1172 (10th Cir. 2002). The "no action" alternative defined in the DEIS is speculative.

First, the "no action" alternative assumes enlargement of Longmont's Ralph-Price reservoir based on a statement by the City of Longmont that it may pursue such enlargement should the WGFP not be approved. Yet, the feasibility of such project as well as conditions that may significantly restrict its development are not evaluated in the DEIS. Indeed, enlargement of Ralph-Price Reservoir would require CWA § 404 permits and other approvals, the evaluation of which would raise environmental impacts considerations, and potential restrictions, similar to those raised by the proposed WGFP. The DEIS does not evaluate such potential restrictions but, rather, assumes that the project would allow diversions to the full extent requested by Longmont. This assumption is simply unreasonable and so is the assumption that, given potential

restrictions, reservoir enlargement would remain an economically feasible prospect for Longmont.

The agencies themselves conclude that such an endeavor is speculative when they decline to evaluate the cumulative impacts of enlarging Union Park Reservoir, another Longmont project, as too speculative. *See DEIS, Table 2-4 at p. 2-52.* The DEIS neither discusses nor evaluates whether enlargement of Ralph-Price Reservoir is more or less likely or the basis for such determination. As further discussed below, the agencies' arbitrary selection of assumptions for the action and no action alternatives artificially inflates the impacts of the no-action alternative while at the same time minimizing the impacts of the action alternatives.

Second, the "no action" alternative assumes that, in the absence of WGFP, participants will find ways to fully utilize their Windy Gap shares and projects future diversions, and resulting impacts, accordingly. Yet, the DEIS finds this very same exercise too speculative for cumulative impacts analysis. *See DEIS, Table 2-4 at p. 2-53 (Firming Remaining Windy Gap Project Units).* As a result, the impacts of future share development are reflected in the "no action" alternative, but they are not reflected in the action alternatives. As further discussed below, such arbitrary approach artificially inflates the impacts of the "no action" alternative, while minimizing the potential impacts of the action alternatives.

Third, the DEIS fails to evaluate the economic feasibility of the no action alternative when compared with less costly means potentially available to participants to meet their future water needs. Indeed, as discussed in comments submitted by Western Resource Advocates, adoption of the conservation measures consistent with the State's conservation objectives would enable project participants to meet their demand through 2030. When other projects currently proposed and involving several of the WGFP participants is considered, firm supplies will exceed participant demands through 2050. Indeed, the original Windy Gap project, approved over 20 years ago, anticipated the need for 90,000 acre-feet of storage but assumed that such storage would be supplied by the project participants. Such assumption did not come to fruition, hence the proposed WGFP. The DEIS's assumption that, absent WGFP, project participants will choose the high cost of pumping Windy Gap water over conservation and other solutions is both unsupported and highly speculative.

2. The DEIS relies on inconsistent assumptions that artificially inflate the impacts of the no action alternative and understate the impacts of the action alternatives.

The environmental impacts of the WGFP action alternatives and, as currently defined, the "no action" alternative are directly tied to the amount and timing of additional Colorado River and Willow Creek diversions expected under each alternative.

The more water diverted, the greater the likelihood and extent of impact – particularly at times when stream flows are low. Accordingly, the DEIS impacts analysis relies on a hydrological model that attempts to predict the amount and timing of future diversions expected under each alternative. While the approach is reasonable, the DEIS arbitrarily uses a different set of assumptions when predicting future diversions associated with WGFP action alternatives than those used to predict future diversions under the no action alternative. As a result, the diversions (and impacts) of the no action alternative are artificially inflated and the diversions (and impacts) of the action alternatives artificially reduced, thus creating the misleading impression that, should the agencies choose to do nothing, the environmental impacts would still be quite large.

The DEIS improperly and arbitrarily uses two different participants' "demands" to evaluate anticipated future diversions under the action and the no action alternatives. According to the DEIS, the hydrological model predicts future diversions under both the action and no action alternatives using the project participants' estimated future "demands." The term is not defined anywhere in the DEIS or associated technical reports. Under common usage, "water demand" is the amount of water requested by users to satisfy their needs. As such, the water demands of project participants are in no way tied to the availability of Windy Gap water supplies or how those supplies are delivered. As a result, water demands under both the action and no action alternatives should be the same.

Under the DEIS, they are different. Indeed, the DEIS estimates that demands under the no action alternative will be twice as much as the demands under the action alternatives. *See e.g., Water Resources Technical Report at 81.* Under the no action alternative, it assumes that all Windy Gap unit holders, including non-project participants, will divert as much water as they can to satisfy their needs. Under the action alternatives, the DEIS only assumes diversions by WGFP project participants necessary to satisfy their firm yield. The bases for this inconsistent approach are not explained.

The DEIS's no action alternative analysis assumes future diversions that the agencies specifically rejected as too speculative for inclusion in their action alternatives impacts analysis. As the language cited above indicates, the DEIS's "no action" alternative analysis assumes that both WGFP participants and Windy Gap unit holders that are not participating in the project, will strive to fully divert under their shares. *See also Water Resources Technical Report at p. 51* ("No Action reflects the estimated future full demand by all Windy Gap unit holders, including those entities not in the WGFP."). Yet, when evaluating whether to include full development by Windy Gap unit holders in its cumulative impacts analysis, the DEIS concludes that such development is too speculative to include in the evaluation. *See DEIS, Table 2-4, at 2-53.* As a result of this arbitrary disparity of treatment, increased diversions by Windy Gap shareholders are taken into account in the no action alternative but appear to be omitted from the action alternatives analysis. Thus, the DEIS artificially inflates diversions and

resulting impacts under the no action alternative while at the same time understating the true impacts of the action alternatives.

3. The DEIS fails to provide needed information to enable the agencies' or the public's evaluation of the adequacy of modeled predictions under the "no action" alternative analysis.

The DEIS fails to explain critical assumptions used in modeling anticipated future diversions under the no action alternative. According to the DEIS, the model assumes that most project participants will try to maximize their Windy Gap diversions within existing project constraints (e.g., junior priority of water rights and limits in C-BT system capacity). However, the DEIS does not describe how most project participants would do so, by how much, or the assumptions used regarding Windy Gap water availability and participant system capacity and need.

Indeed, the DEIS attributes the additional diversions under the no action alternative strictly to Longmont's storage in Ralph Price Reservoir. *See DEIS at 3-22 and 23.* If this is the case, and the increases in Windy Gap diversions under the no action alternative are strictly attributable to enlargement of the reservoir, then Longmont's future needs would be the only needs properly modeled. The assumptions used in the model regarding such needs are not described or explained. Based on the DEIS estimates of Longmont's water demands, even under a worst case scenario, estimated future no action alternative diversions far exceed Longmont's projected Windy Gap needs. *See DEIS at 1-30 and 3-22 and 23.*

If, on the other hand, the model assumes other participants' increased future diversions under the no action alternative, the assumptions used in the model remain unexplained. What portion of modeled future diversions are attributable to Longmont, and what portion to other participants? Are future diversions by Lafayette assumed, given the city's announcement that it would drop from Windy Gap if WGFP is not approved? What assumptions were made with respect to the system capacity of participants to handle the diversions? Does the model assume water plant enlargement? Does it assume increased storage?[15] What assumptions were made with respect to the timing of available supply and project participants needs? Municipal water demands can be considerably lower during wet years, which appears to be when the majority of no action alternative diversions are estimated. Does the model take into account the timing of project participants' needs, or does it assume full diversion regardless of need? If diversions are assumed regardless of need and not storage is assumed, where would participants put the water?

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[15] Inclusion of additional storage assumptions in the model without discussion of specifics, including assumptions regarding size, location, etc., would render the no action alternative's analysis fatally flawed – particularly in light of the DEIS's lengthy discussion of the potential enlargement of Ralph Price Reservoir.

In addition, the assumptions used in the model regarding availability of C-BT system capacity are not explained and appear to be inconsistently applied. First, the DEIS indicates that the model assumes continuation of existing system restrictions and repeatedly states that additional diversions under the no action alternative could be accomplished when Granby is full "as long as there is space in the Adams Tunnel . . ." *DEIS at 3-22.* Was the availability of tunnel capacity under the no action alternative modeled? Second, the DEIS's predicts that wet year diversions under the no action alternative will increase by an average of 25,400 acre-feet from existing conditions. *DEIS at 3-23.* Yet, the DEIS states that "under . . . the No Action alternative, Windy Gap diversions would be limited or curtailed in most wet years" because "there is no conveyance or storage capacity in the C-BT system for Windy Gap water when Granby Reservoir fills." DEIS at 3-14. Does this mean that the anticipated 25,400 acre-foot average diversions under the no action alternative will not take place in most years? How does this affect the no action alternative impacts on aquatic resources?

Finally, the DEIS indicates that the "no action" alternative modeling assumes that exchange capacity in St. Vrain is available to accomplish delivery to Ralph Price Reservoir. Has this assumption been verified? Quantified? Is it reasonable? What basis?

A full disclosure of the assumptions built into the "no action" alternative modeled projections is critical, first, because of the inherently speculative nature of the exercise and, second, because of the risk that using arbitrary assumptions will under-estimate the impacts of WGFP and over-estimate the effects of doing nothing. Full disclosure is also particularly important given the relatively small difference between modeled future diversions under the no action and action alternatives. That a 93,000 acre-foot, $3__ million reservoir can accomplish so very little improvement in diversions over a 13,000 acre-foot, $33 million enlargement is simply counter-intuitive, and brings into question the economic feasibility and viability of the WGFP.

4. The "no action" alternative does not provide the baseline against which WGFP impacts can be evaluated and is otherwise inconsistent with NEPA.

The purpose of requiring federal agencies to include a "no-action" alternative is to enable them to "compare the potential impacts of the proposed major federal action to the known impacts of maintaining the status quo." *Custer County Action Assoc. v. Garvey,* 256 F.3d 1024, 1040 (10th Cir. 2001). For the no-action alternative, the current level of activity is used as a benchmark. *Id.*

The no action alternative against which the proposed WGFP is compared does not reflect either the "status quo" or the "current level of activity" (i.e., water diversions in the study area today). Rather, the "no action" alternative consists of speculative guesses as to what may occur in the future, absent development of the WGFP. As discussed

above, such predictions are not only speculative, but the assumptions on which they are based remain largely unexplained and lead to counter-intuitive results.

Perhaps in recognition of the speculative nature of the exercise and other shortcomings, the DEIS also compares the WGFP action alternatives to existing conditions. However, the DEIS does not reveal which predictions are being used by the agencies as the "baseline" against which WGFP impacts are compared. Without establishing a baseline, there is no way for the agencies to determine what effect the proposed action will have on the environment and, consequently, no way to comply with NEPA. *Half Moon Bay Fishermans' Mktg Ass', v. Carlucci*, 857 F.2d 505, 510 ((9th Cir. 1988). Without disclosure regarding the baseline used by the agencies, NEPA's dual goals to (1) insure that the agency has carefully and fully contemplated the environmental effects of its action, and (2) that the public has sufficient information to challenge the agency. *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 349 (1989). Moreover, if existing conditions are being used by the agencies as the benchmark against which the action alternatives are measured, evaluation of the no action alternative appears to serve no purpose other than to artificially minimize the impacts of the Proposed WGFP, a purpose which would bring into question whether the outcome of the Proposed WGFP has already been decided.

J. The DEIS's characterization of the "unavoidable impacts" of WGFP on the aquatic resources of the Colorado River is arbitrary and capricious and fails to meet NEPA and CWA §404(b)(1) review requirements.

The DEIS describes the expected unavoidable impacts of WGFP on the aquatic resources of the Colorado River as follows:

> "The additional diversions under all alternatives would result in a decrease in available fish habitat in the Colorado River below Windy Gap Reservoir and Willow Creek below Willow Creek Reservoir. The greatest effect to fish habitat would occur in the reach between Windy Gap Reservoir and the Williams Fork River; however, no significant impacts to fish populations are likely. Additional Windy Gap diversions from the Colorado River are likely to result in more exceedances of the aquatic life temperature standard, primarily when diversions occur in July and August." *DEIS at p. 3-145 (emphasis added).*

With respect to exceedences of temperature standards, the DEIS further concludes that "measurable impacts" to fish populations are not expected because flow reductions in July and August would be infrequent. *DEIS at p. ES-1.*

The DEIS's description fails to meet NEPA requirements, reflects unsupported, arbitrary and capricious conclusions, and is based on the DEIS's failure to take a "hard

look" at the potential impacts of WGFP and other reasonably foreseeable projects on the aquatic resources of the Colorado River.

1. The DEIS's unavoidable impacts description fails to meet NEPA's requirement to inform both the decision-making agencies and the public.

The DEIS describes unavoidable impacts in a cursory manner, without describing the basis for its conclusions or whether they reflect an evaluation of proposed mitigation measures. Even more troubling is the fact that, the DEIS reaches critical conclusions with respect to the "significance" of identified, unavoidable impacts, but fails to explain the basis for those conclusions. Without such description, it is impossible for the agencies' decision-makers or the public to evaluate the soundness of the conclusions or the true nature of the unavoidable impacts the project will have. This leaves the decision-makers and the public with the only option of wading through the thousands of pages of DEIS and technical reports, and the hundreds of unexplained graphs, to at best guess the basis for the preparer's conclusions. As such, the DEIS fails to meet the most basic purposes of NEPA – i.e., to inform the decision-making agencies and the public, and violates the specific requirements of CEQ regulations.

2. The DEIS's determination that unavoidable impacts are not significant is arbitrary and capricious and contrary to NEPA.

NEPA regulations specify the criteria by which the "significance" of an environmental impact is to be evaluated by a federal agency. *See 40 C.F.R. § 1508.27.* The DEIS summarily concludes that identified impacts are not "significant" or "measurable," but does not conduct the required analysis in accordance with CEQ regulations. In fact, the DEIS fails to describe any criteria used to arrive at such significance determinations. In addition, as discussed at length in these comments, the information provided in the DEIS and associated technical reports is inadequate to support any conclusions regarding the significance of the impacts of WGFP and other projects on the river's aquatic resources, much less a determination that identified impacts are not significant. As such, the DEIS significance conclusions are both arbitrary and capricious and inconsistent with NEPA requirements.

3. The DEIS's determination that no other unavoidable impacts will result is arbitrary and capricious and contrary to NEPA.

The same lack of adequate information and analysis, as described in these comments, precludes a determination that the identified impacts are the only unavoidable impacts resulting from the project. For example, the DEIS's failure to properly analyze how the impacts of WGFP on the Colorado River hydrograph precludes the agencies from taking a "hard look" at the impacts of reducing peak flows and less-than-peak flows that serve key aquatic habitat functions, such as cleaning spawning beds. The DEIS'

inadequate analysis of macroinverterbrates and the impacts potential low flows and high stream temperatures will have on these organisms precludes a determination of whether these aquatic organisms will be impacted and, in turn, whether the fisheries will be affected by a reduction in food supply. The DEIS's failure to evaluate potential impacts of increased pumping on whirling disease and, therefore, on the survival of the trout fisheries, precludes a determination that the exacerbating effects of whirling disease are not unavoidable impacts. As a result, whether WGFP will result in other unavoidable impacts cannot be ascertained at this time and the DEIS's conclusions in this regard, arbitrary.

K. The DEIS fails to present an adequate mitigation measures analysis.

NEPA requires that mitigation measures be fully reviewed in the NEPA process. "[O]mission of a reasonably complete discussion of possible mitigation measures would undermine the action-forcing function of NEPA. Without such a discussion, neither the agency nor other interested groups and individuals can properly evaluate the severity of the adverse effects." *Robertson v. Methow Valley Citizens Council*, 490 U.S. at 352. CEQ regulations require that the agencies include in the EIS a discussion of appropriate measures to mitigate adverse environmental impacts. *40 CFR §1502.14(f) and 40 CFR § 1502.16(h).* Agencies must also state whether all practicable means to avoid or minimize environmental harm from the alternative selected have been adopted, and if not, why they were not. *40 CFR §1505.2(c).* Mitigation must be discussed in sufficient detail to ensure that environmental consequences have been fairly evaluated. *Carmel-By-The-Sea v. Dept. of Transportation*, 123 F.3d 1142, 1154 (9th Cir. 1997). A mere listing of mitigation measures is insufficient to qualify as the reasoned discussion required by NEPA. *Northwest Indian Cemetery Protective Association v. Peterson*, 795 F.2d 688, 697 (9th Cir. 1986). Broad generalizations and vague references to mitigation, which fails to specify whether any mitigation measures would in fact be adopted or to provide an estimate of their effectiveness or why such estimate is not possible, do not meet NEPA requirements. *Neighbors of Cuddy Mountain v. U.S. Forest Service*, 137 F.3d 1372, 1380-81 (9th Cir. 1998)

The only two discernable mitigation measures proposed to address impacts to the aquatic resources of the Colorado River are as follows:

- The Subdistrict will work with Grand County, CDOW, and others to determine if increasing bypass flows in the Colorado River from the existing minimum flow of 90 cfs to 135 cfs while Windy Gap is pumping during July and August would result in temperature reductions downstream of Windy Gap that would measurably benefit the trout fishery. If studies indicate that increased bypass flows would be effective, Subdistrict would consider increasing required flows under certain water supply conditions.

- Opportunities for improvements to aquatic lie habitat in the Colorado River and mitigation of impacts of fish will be coordinated with the CDOW, Grand County and other responsible agencies.

DEIS at ES-21. The DEIS's description of proposed mitigation measures fails to meet NEPA's requirements.

1. The DEIS's description of mitigation measures fails to meet NEPA requirements.

First, the description of mitigation measures is vague, generally announcing an intent to study potential, as-yet-unsubmitted, mitigation ideas. Second, the DEIS fails to describe when, where or how "improvements" opportunities would be explored and implemented. Third, the DEIS completely fails to explain how these to-be-studied mitigation measures will address impacts to aquatic resources or how effective they will be in affecting such impacts. Fourth, the DEIS makes no commitment to actually implement such measures. Rather, it vaguely states that "opportunities" for habitat improvement (if any) would be coordinated, and that the Subdistrict "may consider" implementing bypass measures. Fifth, the DEIS offers no mitigation whatsoever to address impacts to Willow Creek. As such, the DEIS's mitigation measures description fails to meet NEPA requirements.

2. The DEIS fails to support the adequacy or effectiveness of the suggested "bypass flow" to address aquatic resources impacts and omits proposed mitigation of impacts as a result of reduced fish habitat.

The DEIS's aquatic resources impacts analysis indicates that the optimum flows for adult rainbow and brown trout habitat are 500 cfs. *DEIS at 3-135.* Yet, mitigation proposed would, at most, restrict WGFP pumping to times when Colorado River flows below Windy Gap are reduced to 135 cfs and further restricts potential implementation of such restrictions to a showing of benefits to the fisheries due to stream temperature reductions. The DEIS fails to explain how such dramatic reductions below trout habitat needs would avoid or minimize impacts to aquatic resources, or the impacts of such reduced flows on these Gold Medal, Wild and Scenic Rivers Act eligible fisheries.

3. The DEIS's suggested "bypass flow" mitigation measure is subject to conditions that are scientifically unworkable and unjustified.

Requiring proof that bypassing 135cfs "would result in temperature reductions downstream of Windy Gap that would measurably benefit the trout fishery" is scientifically unworkable. Thankfully, all trout do not die each and every time a certain stream temperature level is reached. Instead, they begin to suffer sub-lethal effects (e.g., reduced growth, reduced reproduction, as well as reduced survivorship) which increase in

magnitude as both the severity and duration of temperature exceedences increase. If temperatures increases are high enough, all the trout will die. Indeed this is why trout are not found in warm-water streams. However, demonstrating the benefit of a specific instance in which exposure to temperatures that produce sub-lethal effects was avoided in the field is very difficult if not impossible to do. Instead, we adopt protective standards based on controlled studies and attempt to avoid exceeding the standards. **This is why the State has adopted stream temperature standards, based on extensive and well vetted studies.** Even assuming such demonstration is possible, developing the required information would be, at best, prohibitively expensive. In either case, the condition would pretty much ensure that no flow mitigation is ever done.

Moreover, requiring such effort is scientifically unjustifiable. Flow is one of the critical factors determining how quickly a stretch of river warms (or cools) on a given day. Higher flows change temperature more slowly than lower flows.[16] It is unquestionable that increased bypass flows will result in smaller temperature swings throughout the day and lower average temperatures at any given location. We know that trout are negatively impacted by high daily maximums and by prolonged exposure to high temperatures. Indeed, the State went through a rigorous and protracted evaluation of the available science to determine what temperatures would be protective of trout. Requiring that the avoidance of a given temperature exceedences be correlated with a measurable benefit for the trout fishery is recreating the wheel. We know that temperature exceedences harm trout. This is why temperature standards were adopted. A demonstration of the specific benefit of any avoided temperature exceedences in these specific reaches of the river is not needed.

The DEIS's proposed mitigation is vague, unsupported, and imposes conditions that are unnecessary and virtually impossible to meet. Accordingly, the DEIS's mitigation analysis is fatally flawed.

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[16] There are two reasons for this and they both come back to mass. The greater the volume of water that is being heated, the more energy it needs to absorb or release to change temperature. This is essentially the first law of thermodynamics: "the increase in internal energy of a system is equal to the amount of energy added by heating the system, minus the amount lost as a result of the work done by the system". When discharges are higher, there is more water in the river that needs to be heated (or cooled) for any given swing in temperature. Because velocity is also related to discharge in that the average water velocity of a river increases with increasing discharge, the turnover time of the river is also greater. This means that water in a river reach is replaced more frequently when discharge is high than when it is low. This, too, contributes to the total amount of water than needs to be heated to produce a swing in temperature. Another way to think about this is that all else being equal, when water velocity is high a slug of water travels further downstream before it absorbs enough heat to produce a given increase in temperature. Since much Colorado River Water begins as snowmelt at 0 °F this means that when velocity is high, water travels further before it is heated to temperatures that are stressful for trout.

L. The DEIS fails to comply with NEPA requirements and agency guidance requiring evaluation of consistency with Federal, State, regional or local laws.

NEPA regulations require federal agencies to identify and evaluate possible conflicts between the proposed action and federal, regional, State and local laws. *See 40 CFR §§ 1502.16(c) and 1506.2(d).* Where an inconsistency between the proposed action and State and local laws exists, the regulations require the agencies to describe "the extent to which the agency would reconcile its proposed action with the plan or law." *40 CFR § 1506.2(d).* In addition, Reclamation and the Corps operate under specific guidance for compliance with NEPA regulations. *See Reclamation's Environmental and Planning Coordination Office, D-5100; 33 CFR Part 320 and 325 (Corps).* The DEIS fails to meet NEPA requirements and guidance as set forth in CEQ regulations and the agencies' respective guidance and regulations.

First, the DEIS lists "[p]rincipal federal, state and local environmental compliance requirements associated with implementation of [WGFP]." *DEIS at 1-43; see DEIS, Table 1-7 at 1-44 to 1-46; see also DEIS at 3-130 (specific to aquatic resources and recreational fisheries).* However, while summarily listing such requirements, the DEIS fails to evaluate whether approval of WGFP would conflict with these requirements or how, if such conflict exists, the agencies propose to reconcile approval of WGFP with such requirements. Based on the information provided by the DEIS, and as discussed in these comments, it is clear that, at a minimum, approval of WGFP would conflict with State law establishing stream temperature Standards for the protection of cold water biota. The DEIS could also conflict with Colorado's management of fisheries within the affected segments as Gold Medal and/or Wild trout fisheries, the goals of the Fish and Wildlife Coordination Act, and Executive Order 12962 (established to "conserve, restore, and enhance aquatic systems to provide for increased recreational fishing opportunities nationwide."). The DEIS does not discuss how the agencies propose to reconcile approval of WGFP with such conflicts.

Second, the DEIS fails to identify State water laws as a requirement with which approval of WGFP must comply. Colorado water laws establish a system to administer and protect the water rights of its citizens, including instream flow water rights held by the CWCB for "protection of the natural environment to a reasonable decree." [CITE]. As further discussed in Section III of these comments, approval of WGFP absent a change of water rights by a Colorado water court would violate the State's water right laws. Yet, the DEIS neither identifies nor addresses potential conflicts with such laws.

Finally, the DEIS improperly restricts the requirement for compliance with Grand County's 1041 regulations to actions that require construction of reservoirs in the west slope. *See DEIS, Table 1-7, at 1-46.* Trout Unlimited refers to Grand County's comments in this regard.

The DEIS fails to identify and evaluate potential conflicts with Federal, State and local laws as required by CEQ regulations and agency guidance. Accordingly, the DEIS fails to meet NEPA requirements.

II. THE DEIS FAILS TO PROVIDE INFORMATION NECESSARY FOR THE AGENCIES' EVALUATION OF COMPLIANCE WITH FEDERAL, STATE AND LOCAL LAWS.

Before the agencies decide on a course of action regarding the proposed WGFP, they must evaluate whether their actions will comply with Federal, State and local laws and they must consult with the U.S. Fish and Wildlife Service (USFWS) regarding potential impacts to aquatic resources.[17] The information provided in the DEIS is inadequate to enable the agencies' determination in this regard. The DEIS is also inadequate to enable the U.S. Fish and Wildlife Service to provide recommendations under the Federal Wildlife Coordination Act (FWCA) or for the State of Colorado to issue a certification under CWA § 401. Accordingly, Reclamation and the Corps should stay any decision with respect to WGFP until such time as a supplemental EIS providing the required information is prepared.

A. The DEIS fails to provide information necessary for Reclamation's evaluation of compliance with Senate Document 80 and other Reclamation laws and policies.

Senate Document 80 (SD 80) imposes upon Reclamation an affirmative duty to protect the Colorado River's fisheries.[18] It provides that the project must be operated "to most nearly effect" the C-BT Project's primary purposes. SD 80 specifically identifies preservation of the Colorado River's fisheries as one of those purposes. *SD 80 at pp. 2.* SD 80 further stipulates that the project shall be operated so as to "insure an adequate supply for irrigation, for sanitary purposes, for the preservation of scenic attractions, **and for the preservation of fish life.**" *SD 80 at p. 5 (emphasis added).*

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[17] The DEIS acknowledges the agencies' obligation to make consistency determinations with respect to other laws, but states that such determination "is not part" of the DEIS. *DEIS at 1-42.* Accordingly, these comments are not intended to provide a comprehensive analysis in this regard. Rather, they are intended to provide initial input with respect to the sufficiency of the information and analysis provided in the DEIS to enable such decisions. Trout Unlimited will provide comprehensive comments regarding the consistency and legality of Reclamation's proposed contractual actions upon notice, as required by Federal regulations and Reclamation's policy. *See e.g., 43 CFR § 426.22; Reclamation Manual, PEC P06 (Oct. 3, 2006) and WTR 04-01(Nov. 11, 2000).* **Trout Unlimited again requests to be directly notified with respect to any proposed contract action by Reclamation in connection with WGFP.**

[18] Senate Document 80 is the legal foundation of the C-BT Project. The Project was authorized by the Appropriations Act of August 9, 1937, 50 Stat. 564, 595, which requires that the project be built and operated in accordance with Senate Document 80.

Enabling projects such as WGFP is not a primary, secondary, or tertiary purpose of the project. Indeed, enabling such projects is not a purpose of the C-BT Project at all. At most, reclamation's approval of the WGFP carriage contract would be a voluntary Reclamation action "to assist in improving the management of the West's water resources." *See Reclamation Manual, WRP P04 (Jan. 10, 2001).*

Assuming that using C-BT Project facilities and water for such purpose is allowable under SD 80, an assumption that as further discussed Section III remains in question, if operation of WGFP results in negative impacts to the river's fisheries or recreation resources, Reclamation must either impose conditions that will protect the river's resources or it must deny use of C-BT Project facilities and water to accomplish WGFP purposes.[19] The information provided by the DEIS is insufficient to support Reclamation's decision in this regard.

First, the DEIS fails to evaluate the impacts the C-BT Project is already having on the Colorado River fisheries. Rather, the DEIS simply assumes that past impacts are reflected in existing conditions. While in philosophical sense this may be true, as discussed in detail in Section I of these comments, such analysis is insufficient to understand the extent to which the Colorado River fisheries have been compromised by past operations, including C-BT Project operations and, therefore, the extent to which additional diversions by WGFP may push the river system over the brink, causing significant degradation, or even the total collapse of these valuable fisheries.[20]

Second, the DEIS fails to assess the true impacts of WGFP on the Colorado River's aquatic resources and recreational values. As discussed at length in Section I of these comments, the DEIS fails to evaluate the most likely and damaging impacts of the project and arbitrarily dismisses impacts that are identified – including anticipated

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[19] Reclamation's failure to do so would not only violate SD 80, but also the Warren Act and Reclamation's policy implementing it. See *e.g., Reclamation Manual, WRP P04 (Jan. 10, 2001);* and *Principles Governing Voluntary Water Transactions That Involve or Affect Facilities Owned or Operated by the Department of the Interior (Dec. 16, 1988) (1988 Principles).* See discussion in Part III of these comments, below.

[20] The DEIS makes passing reference to the "Principles to Govern the Release of Water at Granby Reservoir Dam to provide Fishery Flows immediately downstream ." (Principles). While these principles may have at one time been intended to provide flow protection downstream of Granby Reservoir, more recent information, including information provided by the Grand County Stream Flow Management Plan and even information presented in the DEIS, shows that those flows are insufficient for the purpose. Moreover, available information also indicates that the flows established in 1961 are inconsistent with the recommendations made by the USFWS. *See Fish and Wildlife Service and Bureau of Reclamation Joint Report Concerning Fishery Flows below Granby and Willow Creek Dams, Colorado Big Thompson Project.*

violations of stream temperature standards adopted by the State of Colorado for the projection of aquatic life.

Third, the DEIS fails to propose firm mitigation measures, or to evaluate the extent to which mitigation measures that may be evaluated in the future will protect the fisheries.

Reclamation's first duty is to operate the C-BT Project in a manner that meets the primary purposes identified in SD 80, including the primary purpose of preserving the fisheries and recreation opportunities of the Colorado River. Even if such duty allows room for Reclamation's facilitation of projects like WGFP, Reclamation may not do so at the expense of fulfilling its primary obligations under SD 80. The DEIS fails to provide information necessary to enable Reclamation's determination in this regard. Accordingly, Reclamation may not approve WGFP until such time as adequate information is developed or strict conditions that will ensure that the river's fisheries and recreation opportunities will not be harmed are developed.

B. The DEIS fails to provide information needed to enable the Agencies compliance with the Federal Wildlife Coordination Act.

The Federal Wildlife and Coordination Act (FWCA) requires federal agencies to consult with the USFWS and the State's fish and wildlife agencies when evaluating approval of projects that will impound, divert, or otherwise modify a stream or other water body. *16 U.S.C § 662(a).* The purpose of this requirement is to ensure that "wildlife conservation shall receive equal consideration with other features in the planning of Federal water resource development programs . . . putting fish and wildlife on the basis of equality with flood control, irrigation, navigation, and hydroelectric power in our water resource programs. . ." *S.Rep. No. 1981, 85th Cong.2d Sess. (July 28, 1958). 1958 U.S.Code Cong. & Admin.News, pp. 3446, 3448, 3450.1958 U.S.Code Cong. & Admin.News, at 3450.*

Consultation with the fish and wildlife agencies must occur before the agencies make decisions. *See, e.g. Zabel v. Tabb*, 430 F.2d 199 (5th Cir. 1970), and their recommendations must be given proper consideration and weight. *See e.g., Sierra Club v. Alexander,* 484 F. Supp. 455, 470 (N.D.N.Y. 1980). To enable consultation, federal agencies must give the fish and wildlife agencies a meaningful opportunity to comment. *Sierra Club v. U.S. Army Corps of Engineers, 935 F. Supp. 1556, 1580 (S.D. Ala. 1996).*

The DEIS provides sufficient information to warrant a determination by the USFWS and the Colorado Division of Wildlife that the proposed WGFP will have unacceptable impacts to aquatic resources – in particular, given the acknowledged violation of State stream temperature standards. However, for the reasons summarized in Part B, above, and described in detail in Section I of these comments, the DEIS fails to

provide adequate information to understand the full impacts of the project or from which recommended mitigation can be developed. Accordingly, the agencies have failed to provide a meaningful opportunity for the WSFWS and the Colorado Division of Wildlife's comments, in violation of the FWCA.

C. The DEIS fails to provide information needed to enable the Agencies to evaluate compliance with Executive Order 12962.

Executive Order 12962 (EO 12962), issued on June 7, 1995, requires federal agencies to take actions designed to improve aquatic resources to provide increased recreational fishing opportunities. In this regard, EO 12962 provides, in pertinent part:

> Federal agencies shall, to the extent permitted by law and where practicable, and in cooperation with States and Tribes, improve the quantity, function, sustainable productivity, and distribution of U.S. aquatic resources for increased recreational fishing opportunities by . . . *b)* identifying recreational fishing opportunities that are limited by water quality and habitat degradation and promoting restoration to support viable, healthy, and, where feasible, self-sustaining recreational fisheries; *c)* fostering sound aquatic conservation and restoration endeavors to benefit recreational fisheries . . . *f)* implementing laws under their purview in a manner that will conserve, restore, and enhance aquatic systems that support recreational fisheries . . . *h)* evaluating the effects of Federally funded, permitted, or authorized actions on aquatic systems and recreational fisheries and document those effects relative to the purpose of this order.

EO 12962, § 1. The order further creates a National Recreational Fisheries Coordination Council, of which the Department of the Interior, the Department of Defense and EPA are members. The council is directed to, among other things, "ensure that the social and economic values of healthy aquatic systems that support recreational fisheries are considered by Federal agencies in the course of their actions." *EO 12962, § 2(a).*

Not only does the DEIS fail to evaluate the extent to which approval of WGFP will further and not conflict with the directives of EO 12962, for the reasons summarized in Part B, above, and discussed in detail in Section I of these comments, the DEIS fails to supply the information needed for the agencies evaluation of consistency with EO 12962.

D. The DEIS fails to provide information needed for the State of Colorado's determination of compliance with CWA § 401.

Section 401 of the Clean Water Act requires § 404 permit applicants to provide a State certification of compliance with state water quality standards. *See 33 USC § 1341(a).*

In spite of its inadequacies, the DEIS already establishes that operation of WGFP will violate stream temperature standards established by the State of Colorado for the protection of cold water biota. As described in Section I of these comments, these acknowledged violations may only reflect the "tip of the iceberg" with respect to the extent to which operation of WGFP may aggravate stream temperature problems. Due to inadequacies of the model and analysis, the DEIS fails to evaluate the full extent to which operation of WGFP, combined with past, present and future reasonably anticipated projects, will cause violations of the State Standards. The DEIS further fails to propose firm mitigation measures that will prevent either acknowledged or as yet undetermined violations of these State Standards. As a result, the information provided by the DEIS is insufficient to enable the State to do anything other than to deny CWA § 401 certification.

5. The DEIS fails to provide information needed for the Corps' determination regarding compliance with CWA § 404.

Trout Unlimited's comments in this regard are incorporated in its comments to the Corp's proposed CWA § 404, attached to these comments as Attachment __ .

III. THE WGFP ACTION ALTERNATIVE, AS PROPOSED, WOULD VIOLATE FEDERAL AND STATE LAW.[21]

NEPA requires consideration of *reasonable* alternatives. *Utahans for Better Transportation v. U.S. Department of Transportation*, 305 F.3d 1152, 1172 (10th Cir. 2002). An illegal or unauthorized alternative cannot be considered reasonable. *Utah v. Norton, 2006 WL 11798 (slip opinion).* The Proposed WGFP Action alternative, as proposed, would violate Federal and State law.

A. Reclamation laws.

1. Use of C-BT Project Facilities.

The Warren Act provides Reclamation's general authority to enter into contracts allowing the use of Reclamation project facilities for storage and conveyance of non-project water (excess capacity contracts), subject to strict requirements designed to protect the beneficiaries of the Reclamation project. The proposed WGFP carriage contract would be an excess capacity contract.

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[21] Trout Unlimited's comments are not intended to provide comprehensive input as to the legality of the agencies' action in this regard. Rather, they are intended to provide input regarding the legality of the proposed alternative in the context of the NEPA analysis. Comprehensive comments will be provided by Trout Unlimited upon notification of agency action.

In 1985, an investigation of practices approving excess capacity contracts under the Warren Act revealed that many such contracts could not be administered under the Act.[22] As a result, Reclamation developed a number of policies addressing the conditions under which Reclamation would approve excess capacity contracts. *See, e.g. 1988 Principles; Reclamation Manual, Policy WTR-P04 (Jan. 10, 2001); Reclamation Manual, Policy WTR P03 (Jan. 10, 2001).* The Policies apply to amendments and extensions of previous excess capacity contracts as well as to new contracts.

These policies prohibit Reclamation from entering into excess capacity contracts unless specific conditions are met. They include, but are not limited to, the following provisions:

- "Excess capacity will be made available only for the storage and conveyance of non-project water to be used for irrigation, except in the case of the projects identified in section 305 of the Drought Relief Act or in other project-specific legislation." *Policy WTR-P04 at p. 3.* According to the Policy, this limitation is imposed by the Warren Act. *Policy WTR-P04 at p. 3, n. 2.*

- "Reclamation will not allow the use of Reclamation project facilities for the storage and conveyance of nonproject water unless excess capacity exists and project operations and Reclamation's contractual obligations to its project contractors, O&M contractors, or others can and will be protected." *Policy WTR-P04 at p. 3.*

- "The storage and conveyance of non-project water will be allowed only if this will not impair Reclamation's ability to protect the water rights for and the yield of its projects and to meet its statutory or regulatory obligations." *Id.*

- "Reclamation will not enter into contracts for the use of excess capacity unless and until the requirements of contracts applicable to project service from the facilities involved, of Federal reclamation law (including, but not limited to, the requirements, restrictions, and limitations of the Warren Act and, if applicable, section 305 of the Drought Relief Act), and of all other applicable Federal laws (including, but not limited to, NEPA and the Endangered Species Act) are met." *Id. at p. 4.*

- Reclamation may enter into excess capacity contracts only when doing so can be accomplished without diminution of services to those parties being served by the

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22 *See Memorandum from Keith Eastin, Associate Solicitor, Division of Energy and Natural Resources, Dept. of Interior, to Commissioner, Regarding Application of Reclamation Reform Act of 1982 to Contracts Executed Pursuant to the Warren Act of 1911, at 7 (Aug. 28, 1985).*

project and there are no third-party consequences, those consequences are addressed in appropriate forums, or the consequences will be mitigated to the satisfaction of the affected parties. *1988 Principles, §§ 2 and 3.*

- "Primacy in water allocation and management decisions rests principally with the States. Voluntary water transactions under this policy must be in accordance with applicable State and Federal laws." *1988 Principles, § 1.*

2. Use of C-BT Project Water.

Neither the Warren Act nor these policies authorize the use of project water for non-project purposes. With respect to the use of project water for non-project purposes, Reclamation has adopted a specific policy, which states:

> "Effective immediately, no new contracts for the sale or use of project water or surplus project water from a Reclamation project shall be entered into based upon the Warren Act of 1911 (43 U.S.C. 523-525). Rather, all future contracts for the sale or use of project water or surplus project water shall be entered into based upon the Reclamation Project Act of 1939 and/or other applicable authorities."

Reclamation Manual, WTR P03 (January 10, 2001). Indeed, the DEIS indicates that Reclamation will evaluate the extent to which using C-BT Project water for non-project purposes will meet the requirements of § 14 of the Reclamation Project Act of 1939. *See DEIS at 1-43.* However, it is unclear whether such Act applies to these circumstances and, if so, whether use of C-BT Project water for WGFP purposes is "necessary and in the interests of the United States and the project," as required by the act - particularly in light of the potential impacts such use will have on the primary purposes of the C-BT Project, as stated in SD 80.

In addition, the storage facilities where C-BT Project water is to be stored are specifically identified in SD 80 and the Blue River decree, the water rights decree under which the C-BT Project operates consistent with State water law. Neither SD 80 nor the Blue River decree authorizes storage of C-BT Project water in non-project facilities, such as the proposed Chimney Hollow Reservoir. Whether storage of C-BT Project water can be accomplished consistent with SD 80 restrictions is questionable. As further discussed in Part B, below, storage of C-BT Project water in a new reservoir, absent a change of water right duly decreed by the court, would most certainly violate State water law.

Moreover, as further described in Part B, below, major modifications to Granby Reservoir may be needed to ensure that implementation of the Proposed Alternative will not illegally expand C-BT Project diversions. Such changes, as well as storage of C-BT

Project water in an unauthorized facility, appear to constitute "major changes" requiring Congressional approval under the Reservation Projects Act. *43 U.S.C. § 390b(d).*

Serious questions remain as to the legality of the Proposed WGFP Action, as currently proposed. Accordingly, before the agencies proceed, they must take a close look as to whether the Proposed Action alternative is legal and, therefore, meets NEPA requirements. In accordance with NEPA, such review must be made available for public review.

B. Colorado water law.

1. Absent a change of water rights decree, Reclamation's storage of C-BT Project water in Chimney Hollow Reservoir would violate Colorado water law.

The WGFP Proposed Action alternative relies on temporary storage of C-BT Project water in the new Chimney Hollow Reservoir – a concept described in the DEIS as "prepositioning." Reclamation would store C-BT Project Water in the new, proposed Chimney Hollow Reservoir, thus creating space in Granby for storage of Windy Gap water when in priority.

Storage of C-BT Project water in Chimney Hollow reservoir is not authorized under the Blue River decree, the court decree authorizing diversion and storage of C-BT Project water under its senior, 1937 priority.[23] Under Colorado law, the owner of a decreed water right has the right to change the place where decreed water will be stored, or to add places of storage. *See Trail's End Ranch v. Colorado Division of Water Resources,* 91 P.3d 1058, 1061 (Colo. 2004); *C.R.S. § 37-92-103(5).* However, to do so, the owner must obtain a decree from the water court approving the change of water rights. *Trail's End Ranch*, 91 P.3d at 1061; *Empire Lodge Homeowners' Ass'n v. Moyer,* 39 P.3d 1139 (Colo. 2001); *Farmers Reservoir and Irr. Co. v. City of Golden,* 44 P.3d 241, 246 (Colo. 2002). The purpose of the requirement is to ensure that the change in the use of the decreed water right will not result in injury to the water rights of others.[24]

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[23] *See Final Decree for Consolidated Civil Case Nos. 2782, 5016 and 5017, in the U.S. District Court for the District of Colorado. While water right decrees in Colorado are usually adjudicated in State water courts, as the decree explains, the Blue River decree was issued by Federal district court because the case was removed by the United States from state court. However, in ruling on the matter, the federal court must use and is bound by Colorado water law.*

[24] As further discussed below, Trout Unlimited is particularly concerned with the injury the proposed change of C-BT Project water rights will have on the instream flow water rights held by the CWCB, in trust, for the people of the State of Colorado, to preserve the natural environment to a reasonable decree. For example, the CWCB instream flow rights are junior to the C-BT Project water rights. Accordingly, to the extent the change in water rights increases C-BT Project diversions beyond what is legally allowed under the Blue River decree, the CWCB's junior instream flow rights will be injured.

Empire Lodge Homeowners' Ass'n, 39 P.3d 1158; *Farmers Reservoir and Irr. Co. v. City of Golden,* 44 P.3d at 246. The requirement is mandatory, not discretionary. *Id.* Accordingly, unless Reclamation obtains a decree amending the Blue River decree to authorize storage of C-BT Project water in Chimney Hollow reservoir, storage of C-BT Project water in that reservoir would be illegal under State law.

The DEIS indicates that the Colorado State Engineer "indicated that the Proposed Action to deliver and store water in Chimney Hollow Reservoir using prepositioning could be administered in compliance with current water right decrees and within the priority system." *DEIS at 3-7 (citing January 17, 2007 personal communication between then State Engineer Simpson, H.D. and Fred Ore, DEIS at 5-12).* However, Colorado water law is crystal clear in that the Colorado State Engineer does not have the authority to make this type of determination. Only the water court does. *See e.g., Empire Lodge Homeowners' Ass'n,* 39 P.3d at 1147; *Simpson v. Bijou Irrigation Co.*, 69 P.3d 50 (Colo. 2003).[25]

The DEIS further indicates that to "prevent the C-BT Project from storing more water in Granby Reservoir than it could without prepositioning," C-BT would stop storing water at Granby Reservoir when "the total C-BT contents in Granby and Chimney Hollow combined reaches 539,568 AF, which is the physical capacity of Granby Reservoir." *DEIS a 3-24.* Presumably, this limitation would prevent expansion of the C-BT Project water rights to the injury of others. However, even if Reclamation were to incorporate such limitation in its carriage (excess capacity) contract, Reclamation would be violating Colorado water law unless it obtains the mandatory change of water rights decree from water court.

Far from a mere formality, the requirement of water court approval of changes of water rights "provides and important protection for potentially affected decree water rights holders." *Trail's End Ranch,* 91 P.3d at 1063. "They are designed to provide notice and the opportunity for potentially affected decreed water rights holders to participate in proceedings in order to protect their rights." *Empire Lodge Homeowners' Ass'n,* 39 P.3d at 1158. Reclamation may not substitute its authority for the authority of the water court, granted by the State of Colorado, and having primacy over federal law.

Moreover, the proposed restriction is ineffective in protecting water rights held by others from injury caused by the proposed prepositioning. First, the suggested volumetric limits would allow diversion of C-BT Project water in excess of what is authorized in the Blue River decree. Under the Blue River decree, Granby Reservoir's total storage

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[25] Nor does the fact that C-BT Project water would be stored in a reservoir located in a different basin from where the water is diverted changes the strict, mandatory requirement to obtain a change decree imposed by Colorado water law. *See e.g., Twin Lakes Reservoir and Canal Co. v. Aspen,* 596 P.2d 45 (Colo. 1977); *Cities of Aurora and Colorado Springs v. Division 5 Engineer*, 799 P. 2d 33 (Colo. 1990).

capacity is 543,758 acre-feet. However, only 469,568 acre-feet are active storage. By storing water in an additional, undecreed reservoir, and restricting storage to 539,568 AF, the Proposed Action alternative may illegally expand existing C-BT Project water rights.[26] In fact, to the extent the proposed limit permits increases in Granby's current operational capacity, prepositioning would illegally expand such water rights and potentially injure the water rights of others.

Second, the suggested volumetric limits could allow an expansion of the historical diversions associated with the C-BT Project. To the extent storage in Chimney Hollow Reservoir allow an increase of C-BT Project diversions beyond that which has occurred historically, such expansion of historical use would violate Colorado water law. *See Santa Fe Trail Ranches Prop. Owners Ass'n,* 44 P.3d 46 (Colo. 1999). To the extent such expansion in the historic diversions injures the water rights of others, including the CWCB's instream flow rights (e.g., by reducing the amount of Colorado River water available, in priority, to other water rights), such would also violate Colorado water law. *Id.*

Third, by storing C-BT Project water in Chimney Hollow reservoir and, then, "exchanging" it for Windy Gap water when the latter is available in priority, prepositioning would increase the length and frequency with which Windy Gap water rights can divert from what has occurred historically. Indeed this is one of the very goals of prepositioning. In doing so, WGFP would improperly expand the existing, decreed Windy Gap water rights, potentially injurying water rights that are junior to the C-BT Project water rights, but senior to the Windy Gap decreed water rights (such as the CWCB's instream flow rights).

Fourth, the suggested storage limitation is worthless unless it can be enforced – e.g., unless storage in Granby Reservoir can be prevented once the sum of water stored in Granby and in Chimney Hollow exceeds the proposed volumetric limits. The proposed combined storage limitation would create a "paper fill" situation, whereby room for storage will be physically available in Granby even after it is declared officially "full" as a result of implementation of the proposed limitation. If Granby is in this condition into the runoff season, Granby will continue to physically fill, whether it is entitled to or not. Unless the physical means are available to release flows into the Colorado River in excess of what the "paper fill" entitles C-BT to store, the proposed limitations will not be physically enforceable and the downstream water rights, including the CWCB's instream flow water rights, will be illegally injured. There seems to be some indication that the outlet works for Granby may not be sufficient to handle the release of excess, out of

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[26] In fact, the Blue River decree's identified storage capacity for Granby Reservoir is inconsistent with the lesser capacity identified in SD 80. Yet, the Blue River decree purports to give effect to and, in fact, incorporates the "manner of operation" (including structure capacity descriptions) set forth in SD 80 by reference. This potential inconsistency would have to be resolved by the court upon consideration of a change of water rights decree.

priority, storage water – which during runoff has been as high as 3,000 cfs. Reclamation must closely look at Granby's spill and outlet release capabilities. If the capabilities are not there, the proposed limits could not be implemented and injury to vested water rights could result, in violation of Colorado water law.

Reclamation law and policy requires operation of Reclamation projects in strict compliance with State water laws. Moreover, Reclamation law and policy specifically prohibits Reclamation from entering into excess capacity contracts unless such contracts can be carried out in accordance with State water laws. *See, e.g. Warren Act; 1988 Principles; Reclamation Manual, Policy WTR-P04 (Jan. 10, 2001); Reclamation Manual, Policy WTR P03 (Jan. 10, 2001).* Thus, Reclamation may not approve the Proposed WGFP unless obtains a decree amending the Blue River decree, which decree imposes conditions to prevent injury to the water rights of others and ensures that the proposed change of water rights otherwise complies with Colorado water law. As proposed, the WGFP Action alternative, which includes prepositioning, does not require Reclamation's application for a change of the Blue River decree. Accordingly, the Proposed Action alternative is illegal, in violation of Colorado water law.

2. Absent a change of water rights decree, storage of Windy Gap water in Chimney Hollow or the other action alternative reservoirs would violate Colorado water law.

Diversion of Windy Gap Project water rights is authorized pursuant to a decrees issued by Colorado water court (Windy Gap decrees).[27] The Windy Gap decrees do not allow storage of Windy Gap water anywhere except in Windy Gap reservoir (in the amount of 1546.14 acre-feet) and in Jasper Reservoir (in the amount 11,292.58 acre feet). All WGFP action alternatives provide for storage of up to 93,000 acre-feet in reservoirs that are neither identified nor decreed in the Windy Gap decrees. Only alternative 3 includes a decreed storage reservoir, Jasper Reservoir, but in amounts that far exceed the decreed amount. Thus, for the reasons discussed above, in the absence of a change of the Windy Gap water rights, the WGFP action alternatives identified in the DEIS would violate Colorado water law.

It should be noted, in this regard, that while the Windy Gap decrees authorize in priority diversions of large direct flow rights, under Colorado water law, a direct flow water right cannot be stored, absent a decree authorizing such storage. *See e.g., New Loveland & Greeley Irr. & Land Co. v. Consolidated Home-Supply Ditch & Res. Co.,* 62 P. 366 (Colo. 1900); *Board of Arapahoe County Comm'rs v. Upper Gunnison River Water Conservancy Dist.*, 838 P. 2d 840, 852 (Colo. 1992). This is the case even if the same structure diverting the direct flow rights is used to fill the reservoir. *New Loveland & Greeley Irr. & Land Co.* at 368. Moreover, the fact that water is diverted from the

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[27] *See Civil Action No. 1768, Grand County District Court; W-4001, District Court, Water Division 5, and 80CW108, District Court, Water Division 5.*

basin of origin for storage in a different basin does not change the need, under Colorado law, to obtain a decree authorizing such storage and including terms and conditions to prevent injury to the water rights in the basin of origin. *See e.g., Twin Lakes Reservoir and Canal Co. v. Aspen,* 596 P.2d 45 (Colo. 1977); *Cities of Aurora and Colorado Springs v. Division 5 Engineer*, 799 P. 2d 33 (Colo. 1990).

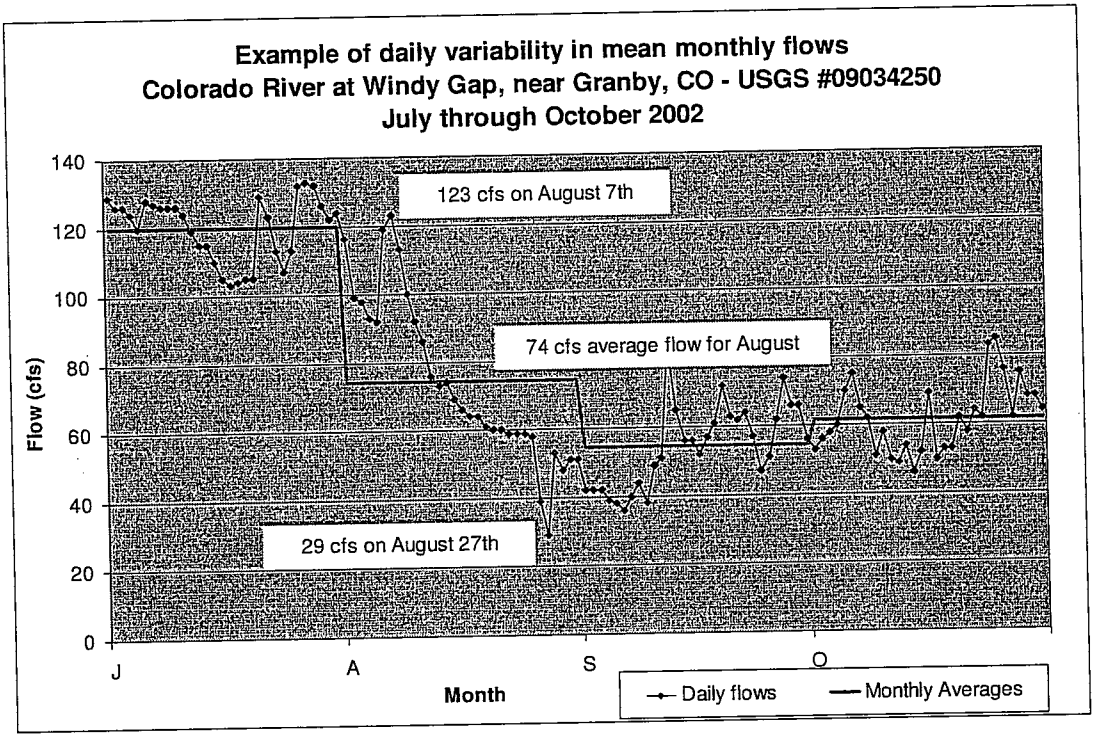
Because they contemplate storage of Windy Gap water under the Windy Gap decrees, and such decrees do not authorize storage in location and/or amounts identified in the decrees, the WGFP action alternatives are illegal unless a change of water rights decree is obtained in accordance with Colorado water law.

CONCLUSION

For the reasons described in detail in this letter, Trout Unlimited believes that the WGFP may not be approved until such time as the agencies prepare a supplemental EIS which resolves the problems raised, and an adequate opportunity for public comment is provided as required by NEPA.

Thank you for the opportunity to comment.

Figure 1. Daily flows vs. mean monthly flows
(USGS Colorado River at Windy Gap, near Granby, CO gage - #09034250)



Moffat Expansion and Windy Gap Firming Project: Impacts of Mitigation
Colorado Wildlife Commission Hearing, May 6, 2011
Western Resource Advocates

Summary

A mitigation fund to avoid environmental impacts to depleted headwaters streams would add an insignificant cost to the proposed Windy Gap Firming and Moffat Expansion projects. Spread over a large customer base, mitigation funds will increase annual water bills and/or tap fees by a tiny amount. For example, if $5 million in mitigation and enhancement costs for the Moffat Expansion project were passed-through to existing Denver Water customers, the typical household would experience an annual increase of $ 0.53, or $ 0.23 per person.

In the following sections, we review anticipated project costs and present data on the insignificant effect of a mitigation fund on water rates and tap fees.

Project Cost

The Moffat Expansion project is expected to total almost $140 million in capital costs and deliver a firm yield of 18,000 AF/yr.[1] The Windy Gap Firming Project is expected to cost approximately $237 million and provide 30,000 AF/yr of firm yield.[2] The unit cost for each project is approximately $7,800/AF and $7,900/AF, respectively. Based on the history of other large water projects, the ultimate cost may exceed these amounts.

Capital projects can be funded in different ways: new growth can pay for the project through tap fees (often called plant investment fees), or existing residents can pay for the project through water bills. For WGFP and Moffat, we expect project participants will likely pursue some combination of the two strategies. Below, we present the effects of each strategy on ratepayers.

Water Bills

Water providers may choose to spread the cost of a new supply over current and future residents' water bills. Figure 1 (on page 3) illustrates a household's annual water bill for a number of Front Range cities, assuming the annual use of 130,000 gallons of water. Prices paid by WGFP participants vary widely, from less than $300/year (Loveland) to almost $900/year (Fort Lupton).[3] Denver Water customers have some

[1] U.S. Army Corps of Engineers. 2009. Draft EIS. Executive Summary, p. 42. This cost reflects capital construction costs only, not annual operating and maintenance (O&M) costs, and are not escalated for inflation.
[2] Northern Colorado Water Conservancy District. Windy Gap Firming Project Fish and Wildlife Mitigation Plan, p. 20. This cost reflects capital construction costs only; total project costs are higher, at $273 million.
[3] The typical household in any given city may use more or less than 130,000 gallons/yr, but for an apples-to-apples comparison, all cities are evaluated under the same assumptions.

EXHIBIT I

of the lowest rates in the region; the average household can expect to pay $446 for 130,000 gallons of water in 2011, up from 2010, when the average household paid $396 for the same volume of water.[4]

Assuming that Denver Water's existing 1.3 million residents[5] pay for the Moffat Expansion through their monthly water bills, the cost per household would be approximately $15 *per year* for 30 years. Mitigation costs of $5,000,000 would increase household costs by $0.53 per year.[6] In other words, the cost of $5,000,000 in mitigation would amount to less than one-tenth of 1% of a household's annual water bill. If Denver Water does not fund mitigation through long-term bonds, it could instead raise the money with a one-time charge to customers of approximately $8.73/household. Even at higher levels of mitigation, the costs are negligible. For example, $15,000,000 in mitigation for Moffat would increase a household's annual water bill by $1.60.

According to the Windy Gap Firming Project DEIS, project participants (excluding Platte River Power Authority) served a population of 456,000 people in 2004.[7] If WGFP participants fund project costs by charging existing customers through water bills, the average household would pay $76 per year for a 30-year period.[8] An additional $5,000,000 in mitigation would increase an average household's costs by $1.60/year over the same period. This cost would be a very small portion (significantly less than 1%) of a household's annual water bill. Alternatively, WGFP could charge a one-time fee of $31.69 per household to cover the costs of mitigation. As with the Moffat Expansion project, the cost impacts illustrated here are examples only; the actual cost of mitigation could be much higher. Even at a higher cost, the effect on residents' bills is small. A mitigation cost of $15,000,000 would cause the average household's annual water bill to rise by $4.81.

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[4] Denver Water, 2011. Denver Water 2011 Budget, available at http://www.denverwater.org/docs/assets/510D4037-A162-78FE-1F51FBDAC42F6A43/BudgetBook2011.pdf. . Figure reflects customers within Denver Water's service territory; rates are higher for customers outside of the service area.

[5] Figure includes DW's suburban wholesale customers.

[6] This calculation assumes that Denver Water pays for Moffat Expansion and mitigation costs with 30 year bonds at an interest rate of 4.45% (a typical municipal bond rate). The annual cost of these bonds would be approximately $8.84 million. The calculation assumes that *existing* customers pay for all of the cost (new customers' bills are not factored in, for simplicity). Distributing the cost among existing *and* future customers would reduce the annual impact.

[7] Note that populations in many WGFP cities have grown since 2004, which would reduce the estimated impact of project costs on residents.

[8] This calculation reflects several assumptions:
1) total costs are weighted to exclude the Platte River Power Authority's (PRPA) portion of costs;
2) WGFP participants pay for the project with 30 year bonds at an interest rate of 4.45%;
3) an average of 2.7 residents live in a household; and
4) no costs are allocated to future residents, for simplicity.
Under these assumptions, the annual bond payment would be $11.98 million for WGFP participants, excluding PRPA.

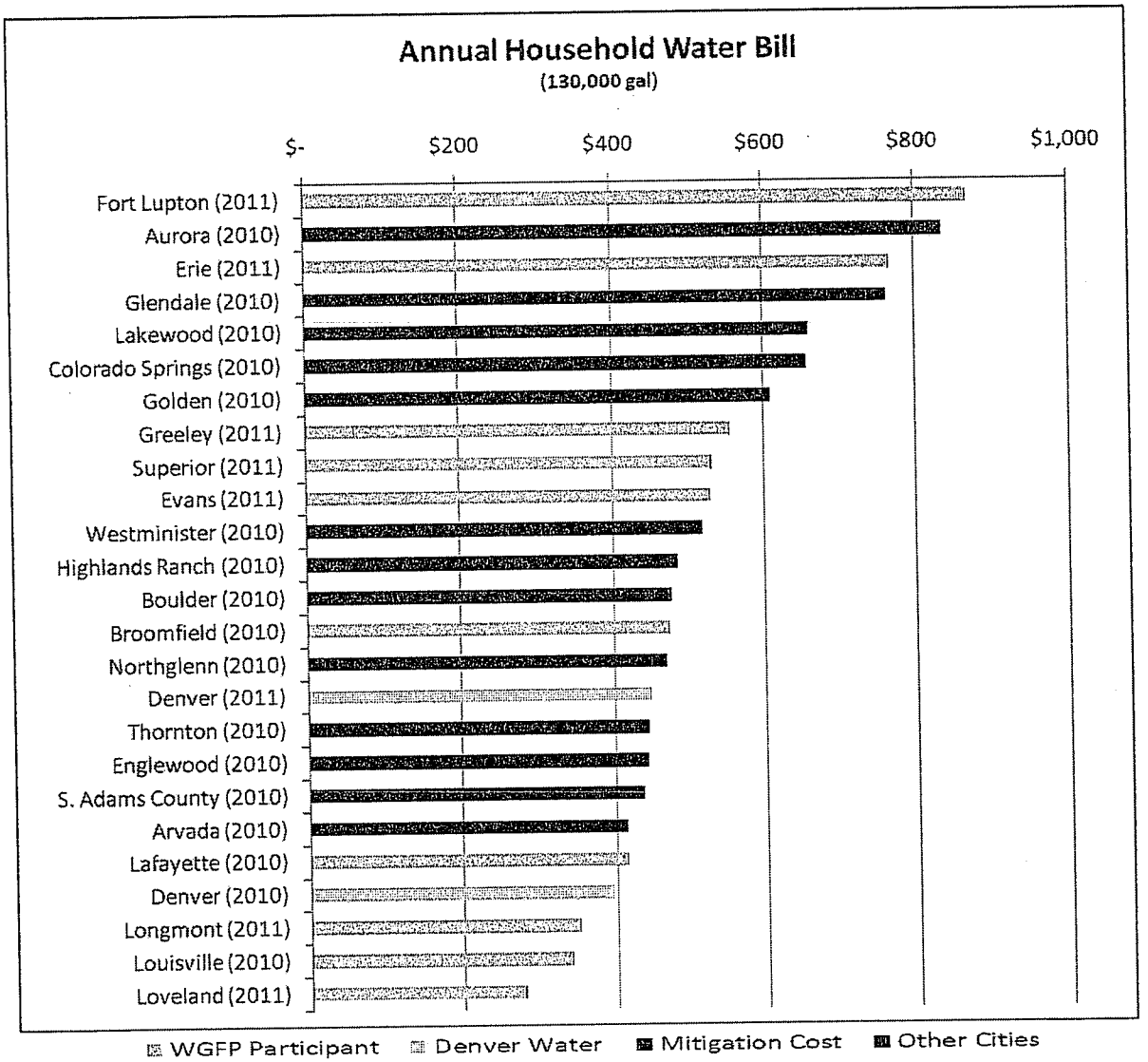


Figure 1. Figure illustrates the estimated annual household bill for numerous cities along the Front Range. WGFP participants' estimated annual bill costs are in green and Denver Water customers' costs (both 2010 and 2011) are in yellow. The red bar illustrates the effect of $5 million in mitigation costs. (Note: List does not include two WGFP participants.)

Tap Fees

In theory, a tap fee should cover the cost of developing a new water supply (acquiring water rights, building new pumping and treatment infrastructure, etc.) and the cost of installing a meter and connection for a new household. In reality, tap fees also reflect political considerations such as whether to encourage or discourage new population growth. A tap fee reflects a commitment to serve water to a household in perpetuity, and is therefore based on the amount of water a household uses. For example, Santa Fe, NM, assumes a household uses only 0.25 AF/yr, while most cities in Colorado assume 0.4 – 0.5

AF/yr. Table 1, below, reflects the impact of the Moffat Expansion and WGFP capital costs on tap fees.[9] If new taps, instead of monthly water bills, cover the cost of mitigation, tap fees will increase by relatively small amounts: a $5,000,000 mitigation fund (per project) would add $129 to residential tap fees in Denver and $67 to the tap fees of WGFP participants.

Current tap fees vary considerably throughout the region. Denver Water, for example, charged $5,345 for a residential tap in 2010, while Louisville has one of the most expensive tap fees in the region, at almost $24,000 per tap. We are unable to determine whether DW and WGFP participants' tap fees already include the cost of developing new supplies.

Table 1. The cost of project construction could increase tap fees by several thousand dollars in Denver and WGFP participant cities. The added cost of mitigation would increase tap fees by a relatively small amount.

	Effect of Project Construction on Tap Fees	Sample Mitigation and Enhancement (M&E) Cost	Effect of M&E Funding on Tap Fees
Moffat Expansion	$ 3,595	$ 5,000,000	$ 129
WGFP	$ 3,160	$ 5,000,000	$ 69

Conclusion

In sum, the cost of mitigation is very small relative to the capital costs of the projects. While this presents the effects of $5 million in mitigation for each project, the effect of larger amounts of mitigation – $10 million, $15 million, or $20 million – would still pale in comparison to the projects' capital costs.

In all likelihood, water providers will fund proposed projects through a combination of water bills and new tap fees. Project participants have numerous options for funding mitigation – through existing customers' rates (either a one-time fee or a long-term cost, embedded in construction bonds) or through tap fees levied on new customers. Most participants will pursue a combination of these approaches. The costs of mitigation are negligible, but represent an essential insurance policy to protect the Upper Colorado, Fraser, and Williams Fork Rivers.

[9] We assume that a tap fee represents a commitment to serve 0.46 AF/household in Denver (Source: Denver Water. 2002. Integrated Resource Plan, p. 41.). DW assumed a residential household will use 413 gallons/day; this figure may have fallen since 2002. If the Moffat Expansion provides 18,000 AF/yr, it will serve approximately 39,000 taps, at a cost of $3,595 each. A typical tap fee for WGFP participants represents a commitment to provide a household with 0.4 AF/yr. WGFP will deliver 24,850 AF/yr to project participants (excluding PRPA), at a cost of approximately $185,000,000 (weighted to exclude PRPA). In other words, WGFP will serve an estimated 62,000 new households at $2,979/tap fee.

November 07, 2011

Dear Governor Hickenlooper:

Tourism is the lifeblood of Colorado's economy and the economies of small communities. Visitors travel across the country and across the world to fish our gold medal streams, raft and kayak our free-flowing rivers, ski picturesque mountain peaks, and hunt elk, moose and waterfowl found in abundance throughout the Colorado River basin. Outdoor recreation alone generates $10 billion annually throughout our state, supporting over 100,000 jobs and accounts for almost a half billion dollars in state tax revenues.

As members of Colorado's business community, we are writing today to express our concern over two water projects that could have devastating long-term impacts on the recreation opportunities our industry, communities and families depend on for our livelihoods.

The Moffat Expansion and Windy Gap Firming Project together threaten to reduce the Colorado River to a fraction of its natural flow. The Moffat Expansion project will do the same to the Fraser River and tributaries. Measures offered by the project proponent are not enough to protect the rivers or to ensure the Upper Colorado River and its tributaries like the Fraser River continue sustaining and supporting robust populations of fish and wildlife into the future.

Without healthy rivers, fish and wildlife decline as do the anglers, hunters, rafters, skiers and hikers that invest millions into our communities through recreation. Whether we own a resort, fly shop, or real estate firm; our income is tied to the health of the Colorado River. As we saw in 2002-2003, years of dry streams can lead to a collapse in the demand for our products and services. Like everyone else, our businesses have been hit hard by the recent recession. While **Colorado's economy is showing slow signs of recovery, we cannot afford to lose what little progress we have made. We cannot afford unbalanced policy decisions that permanently alter the condition of our river.** Without healthy rivers and recreation opportunities, our shops will be forced to close, local manufactures face lay-offs, and thousands of employees will be without work.

As currently proposed, the Moffat Expansion and Windy Gap Firming Project will significantly reduce flows, increase water temperatures, and deposit tons of silt and sand that suffocates streambeds. **The lack of safeguards that protect this important resource is not only dangerous for our environment; it is unacceptable to the men and women in our industry that depend on these rivers for our economic livelihoods. Killing the Upper Colorado River and Fraser River kills Colorado tourism and Colorado jobs.**

Project proponents can take very concrete steps to protect the rivers. They can make sure diversions do not violate state stream temperature standards that protect fish. They can leave enough water in the rivers to flush sediment and silt. And they can commit sufficient funds to monitor the rivers' health and for restoration work to help streams adjust to the lower flow conditions. None of the agreements and state actions taken to date provide for these basic, critical safeguards.

We have chosen to make our lives in this community, to grow our families and our businesses here, and today we are concerned that mismanaging one of our state's greatest resources will lead to the eventual collapse of the streams and rivers our economies rely upon for future growth and success. As a leader who has a proven record for successfully seeking collaborative solutions to difficult problems like these, we ask that you take this opportunity to do everything in your power to ensure the Upper Colorado River, the Fraser River and their tributary streams remain healthy for our state's fish, wildlife, recreation economy, and families.

Sincerely,

EXHIBIT J

Dave Lawrence, Dave Lawrence A Healthy Connection LLC,
Toni Hallgren Toni Hallgren Trutone DBA Crooked Creek Saloon
George Bernardi George Bernardi Active Images
David Peterson Subway Winter Park And Granby CO.
Kelly Simpson KC + Co. Winter Park Co Kelly Simpson
Dave Hazelrigg Dave Hazelrigg Ready Rollers Painting Co.
Curt Bass Curt Bass Renegade Dirtworks Winter Park CO Winter Park, Co
John Decicco John Decicco Carquest Auto Parts Granby Co.
Richard L. Crager Budget Tackle Granby CO 80446
Margaret J. Crager Budget Tackle Granby CO 80446

Christy Downing Christy Downing Java Lava Cafe, Granby, Co 80446
Donna L Zahn Mtn Munchies Granby, Co

Veronica Callinan V. Callinan Sharky's Eatery Fraser, Co.

Jill Klauke Jill Klauke Klauke & Cook, Attorneys At Law
Bart Smith Bart Smith Dillon, Co Plumbsmith Inc

Carol Holzworth-Moore Elizabeth Moore Coffee & Tea Market, Winter Park

Greg Harris Greg Harris Fraser Valley Ace Hardware

Shelly Neibauer Shelly Neibauer Kurt Neibauer State Farm Insurance

Roger Hall Roger Hall Home James Transportation
Eric Pietz Eric Pietz North Forty River Restoration
Mitch Kirwin Mitch Kirwin McHenry's Trout Shop
Tim Day Day Omnicity PC
Jill Klauke & David Cook Klauke & Cook, Attorneys At Law

Tim T. Schawalter. Independent Oil Producer

Karen S. Vance, Karen S. Vance Artworks, etc, inc.

Scott Linn Scott Linn Winter Park Optical Fraser, Co.

Ken Hilton Ken Hilton Middle Park Glass Granby, Co

Tim Moreland Power to the People Electric Tabernash, Co

Henry Kirwan Henry Kirwan Mc Henry's Trout Shop

Scott Emery Scott Emery Rocky Mountain Moonshine, CO.

Chris Moore Chris Moore Fontenets Fresh Seafood and grill

Jay E. Elliott Jay E. Elliott Joyful Painting, Fraser, Colorado

Don Skaar Don Skaar Chillcoats Construction, Tabernash Co.

Ed Narby Ed Narby Rocky Mountain Interiors, Granby, Co.

Andrew D. Nyder Andrew D. Nyder M3 Property Service Inc. Fraser Co 80442

Julie Kerswell Julie Kerswell 887 3320 Copy Cat Office Granby

Ann Poulson Ann Poulson Mari-Lelite

HSS:

Robin Vibas Robin Vibas Vibas Service

Kent Whitmer Kent Whitmer Grand County Title

Jim Kemp Jim Kemp The Parshall Inn

Jake Wiley Jake Wiley Mad Adventures

High Country Treasures
Jackie Crandall
Jackie Crandall

Full House Pawn
Zach Schultz
Zach Schultz

O'Aces Liquor
Reva Groff
Reva Groff

The Moose Cafe
Anita O'Neill
[signature]

Kremmling Moose
[signature]
Brad Bunker

(Fishin Hole Sporting Goods
[signature])

VICK CAYLOR [signature] ALLINGTON INN & SUITES

Zach Schultz [signature] Full House Pawn

KYLE HARRIS [signature] CEO - GRANBY REALTY HOLDINGS LLC

[signature]
SPAULDING GOETZE JR.
G AND S ENTERPRISES, INC.
(OWNER)

[signature]
MC BRANSTETTER
C+M GUNS
420 [illegible]
Hot Sulphur Springs CO 80451

Clifford [illegible]
P.O. BOX [illegible]
Granby CO 80446
Lakeside [illegible]

[signature]
Summer Shuster
The Depot & The Barking Dog Pub
(Operator)

[signature]
Angus Simpson
The Canyon Motel

HELENA D. TWARDZIAK - [signature] - HAIR BY HELENA

MICHAEL J. BROOKS [signature] DR. BROOKS VETERINARY SERVICE

Debbie Muenster - [signature] - Icebox Mountain Sports

Denise Cook - [signature] - Paradise Home Solutions

Dianne Hickman
Janice Hickman McDonough
Mini's Cafe

Jeneen R Kitchen
Jeneen R. Kitchen
Ute Trail Motel
(Owner)

P.O. Box 79
Hot Sulphur Springs, CO 80451
Alpine Trailblazing

Dianne Hickman
Dianne Hickman
Taste of the Rockies, Inc
Hot Sulphur Spgs Candy Company

Olney Klewer
Olney Klewer
O-A Bistro LLC

Crabtree Company
LM Simpson
LISA SIMPSON

GRAND LAKE WINE & SPIRITS
KEN JENSEN

SPIRIT LAKE LODGE
KRYSTINA SOBON
Krystina Sobon

Rocky Mountain Outfitters
JIM GASNER
Jim Gasner

High Altitude Sporting Goods
Scott Brad

Cabin Quilts & Stitches
Judy K. Jensen
Judy K. Jensen

Olney Klewer
Olney Klewer
O-A Bistro LLC

THC Enterprises, Inc
Olney Klewer
President

Gifts Unlimited
Main Street
David Dalbey

Grand Heath Inc.
Judy Burke

El Pacifico Jesus Varela

Stage Coach B+B/Cafe
Hot Sulphur Springs
Christine Kruse

Bob's Blade Service
Bob Mulder

Joes Auto Repair LLC
Joe R Mulder
Joe R Mulder

Granby Chamber of Commerce
Sharon Brenner
Sharon Brenner

TRAIL RIDERS MOTEL
TRACY DOUGLAS
Tracy Douglas

Sean M. Dee Agency
Sean M. Dee
Sean M. Dee

Crafter's Corner
Penny Caldwell
Penny Caldwell

Cross Contractors, INC
Pete C Cross

LAMAN CONTRACTING INC
Donald C Laman

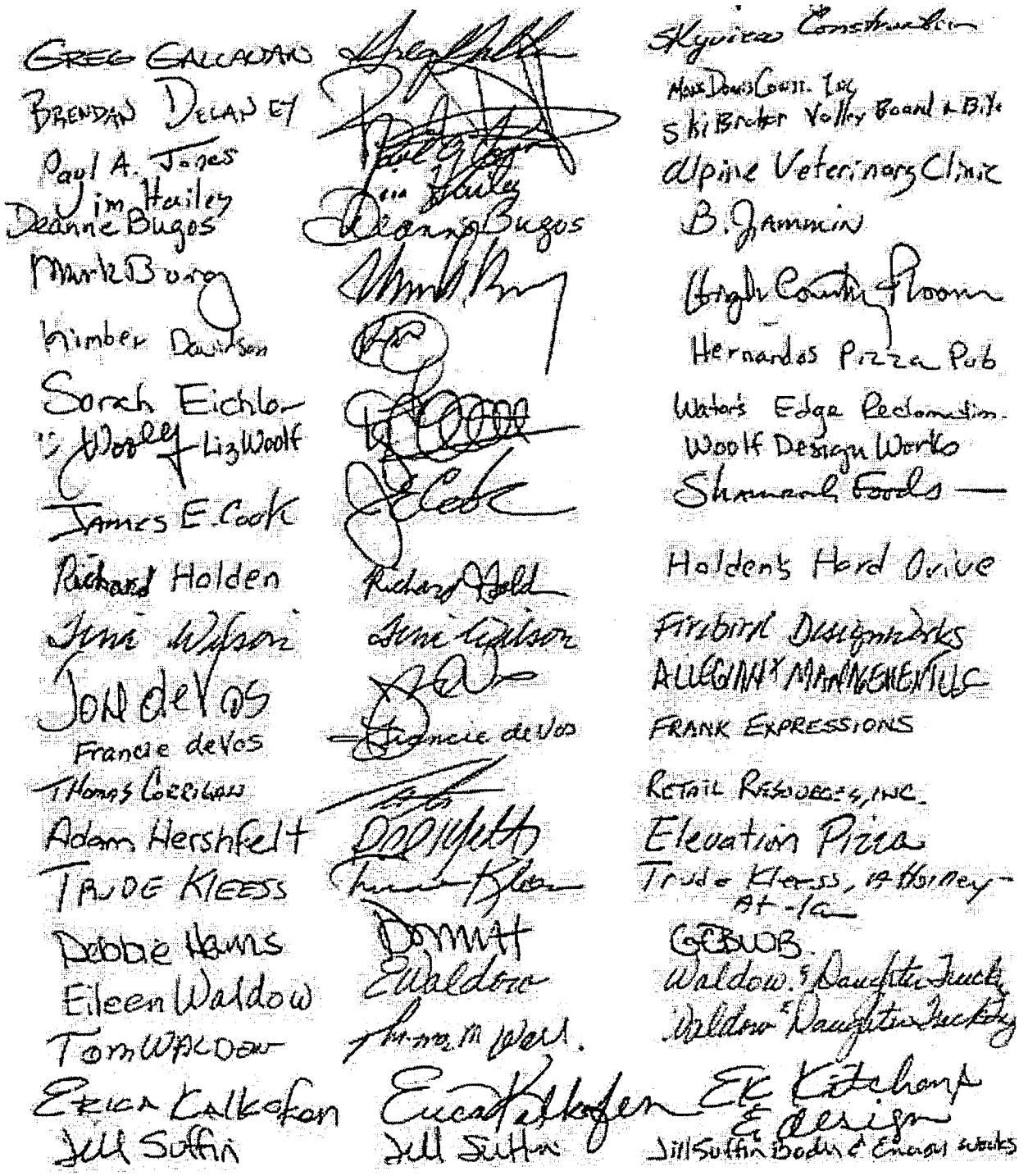
7-Eleven GRANBY
Jeanne Prater Ass Mang
Jeanne Prater

GRANBY MART
RAY SAMUELSON
Ray Samuelson

Hot Sulphur Springs Resort & Spa
Jon Lange - Manager
Jon Lange

Cliffside Inn (Kramming)
Samantha Watson
Samantha Watson - manager

The Glory Hole Cafe
Marty Witzman
Marty Witzman


Greg Calcagno
Brendan Delaney
Paul A. Jones
Jim Hailey
Deanne Bugos
Mark Burg
Kimber Davidson
Sarah Eichler
Liz Woolf
James E. Cook
Richard Holden
Jeni Wilson
Jon deVos
France deVos
Thomas Corrigan
Adam Hershfelt
Trudy Kleess
Debbie Hanns
Eileen Waldow
Tom Waldow
Erica Calkofen
Jill Suffin
Skyview Construction
Mark Davis Const. Inc
Ski Broker Valley Board + Bike
Alpine Veterinary Clinic
B. Jamison
High Country Floors
Hernandos Pizza Pub
Water's Edge Restoration
Woolf Design Works
Shamrock Foods
Holden's Hard Drive
Firebird Designworks
Allegiant Management LLC
Frank Expressions
Retail Resources, Inc.
Elevation Pizza
Trudy Kleess, Attorney-at-Law
GEBWOB
Waldow & Daughter Trucking
Waldow & Daughter Trucking
EK Kitchens & Design
Jill Suffin Body & Energy Works

Grumpy's Saloon	Dustin Bowers
GRAND LAKE BREWERY	John Fleming
Never Summer Mtn. Products	Tim Rundell
The Red Sled	Pat Jones PAT JONES
Lakeview General Store	Melissa Zeleznikar
Trail Ridge Marina	josh jann
Blue Bird Motel	Tonia Rozinel
Black Bear Lodge	Thomas A Brukner
Colorado Cabin Adventures	JP PARKER
DAVE PARRI'S OUTFITTING & GUIDE SER.	DAVID PARRI
Spirits + Things Liquor — Co-Manager	Brian M Ryzaulski
Coulter House Engraving — Owners	Nona R Crane
Coulter House ENGRAVING — "	
Mtn Munchies — OWNER	D. Zehm
IAN's Mtn Bakery — owner	IAN Dougherty
Alpine Motor Sports — owner	Erik C. Wong
NORTHWEST RANCH SUPPLY — OWNER	Jani K Mentkennett
The JUNK TRUNK — OWNER	MARCIA BLEVINS
Big Shooter Coffee — owner	Stephanie Schall
Ghostwood Interiors Remodeling — owner	Wayne W Johnson

BRIAN STUART

Champion Pursuit Training Tactics.

THE CARWASH LLC
DAVID SAMMONS

TRI-RIVER ACE HARDWARE
JOANNA O. CARPENTER

KUUMA GO
Starla Quinn

VISION INK LTD
LISA SIMPSON

MCELROY RANCH LLC
DAVID SAMMONS

MIDDLE PARK MEAT CO.
Mike Sidler
Fee Gaston

GRAND LAKE LANES - GRAND LAKE
MARGUERITE TOMPKINS

President
Grand Lake Area Chamber of Commerce
Rancho & LEFTY'S RESTAURANT,
Rapids Lodge & Restaurant
Candy Cane gift shop
Donna Ready Mountain Lake Properties
AVIS GRAY Bookstore, G.L.
CASCADES OF THE ROCKETS
MARY E. CERVENKA
grand lake, Co.
grand lake ART gallery
MTN Arts ZACHARY ROWAN
Sagebrush Bbq & Grill DAVID-FREEMAN.
Grand Mountain Trading Co Kelly Neco
Polly's Sweet Shop - Vicky Harriman Vicky Harriman
Jackstraw Gallery
Gifts Unlimited Rianna Hilton

Stage Coach B+B/Cafe
Hot Sulphur Springs
Christine Kruse

Bob's Blade Service
Bob Mulder

Joes Auto Repair LLC
Joe R Mulder
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Granby Chamber of Commerce
Sharon Brenner
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TRACY DOUGLAS
Tracy Douglas

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Sean M. Dee
Sean W. D[illegible]

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[illegible]
[illegible]

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Donald C Laman

7-Eleven GRANBY
Jeanne Prater Ass Mang
Jeanne Prater

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Joni Lange - Manager
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Samantha Watson
Samantha Watson - manager

The Glory Hole Cafe
MARTY WITZMAN
Marty Witzman

Grand River Supply, Inc
Audrey McWhorter
Audrey McWhorter

Alpine West Business Products
Audrey McWhorter
Audrey McWhorter

Java Lava Cafe, Inc
Christy Downing
Christy Downing

Country Cupboard Cafe
Sharyn L. Overholt
SHARYN L. OVERHOLT

Margaret J. Crager
MARGARET J CRAGER
Bridget Tadder
Richard L. Crager
Richard L. Crager

Maverick's Grille
Sean P Richardson
[illegible]

High Country Motors
Mike Garrett
Mike Garrett

Broken Antler Outfitters
Mike Garrett
Mike Garrett

Mtn. McGyver Antiques LLC
[illegible]
DAVID A. CARVER

Sheri Lock
Sheri Lock
B&J Plumbing & Heating, INC

STEVE BRENNER
Steve Brenner
Homestead Motel

(Evan Skifalides
Timberline treescaping)

WESTERN GUNCRAFT
William M. Hertel
140 E. Agate Avenue
Granby, CO 80446-0068
970-887-3928 Fax 970-887-9281
westgun@comcast.net
William M. Hertel

First Class Auto Centre
David Miller

R & J Liquors Granby
Kimberly Cantrell
Kimberly Cantrell

Roxane's
Roxane Hughes
ROXANE HUGHES

Edgewater Realty LLC
Becky Brosh, Manager
Becky Brosh

Roxane's

CD Watkins Construction Svcs
Becky Brosh, Manager
Becky Brosh

Grand Royal, Inc.
Becky Brosh, President
Becky Brosh

Middle Park Agency
Tyler J. Arnold

Grand Mountain Trading Com.
Granby
Marty Moffatt

Chuck Wagon Cafe + Bar
Carol Turner
Remington's Restaurant
Tim Luksh
NAPA Auto Parts
Todd Gant

Gambles
Garrett Salberg

ROD'S GARAGE
P. O. BOX 1077
GRANBY, CO 80446
970-887-3900

Rodney T Moore
Rodney T Moore
OWNER

Rocky Mtn
Resource
Patty Peterson

BROOKS VETERINARY SERVICE
MICHAEL J. BROOKS, D.V.M.
P.O. Box 705 PH. 970-887-2417
12 Agate Ave
Granby, CO 80446

Granby Ace Hardware
627 W Agate
Granby, Co 80446

Amy Kopnicz

Legacy Building Specialties, Inc.
P. O. Box 709 • 17 Ten Mile Dr.
Granby, CO 80446-0709
Phone 970-887-3600
www.LegacyCWD.com

(Brad White)

Bar Lazy J
Jerry Helnicki
Jerry J. Helnicki

The Roofing Company
Justin Lindo
General Manager

WRANGLER TIRE & TUNE, INC
P.O. BOX 970
585 EAST AGATE AVENUE
GRANBY, COLORADO 80446
[signature]

BRICKHOUSE 40
320 E. AGATE
GRANBY CO 80446
[signature]

Beth Wilderman	[signature]	Rocky Mtn Roastery
Doug Horton	[signature]	Totally Wired Cyclery
Paul A. Jones	[signature]	Ski Broker
Cynthia McCoy	Cynthia McCoy	Radio Shack of Fraser
George Wylie	[signature]	Wylie's Paint Store
Rob Peeters	[signature]	Naked Aspen Designs
Marsha Peters	Marsha Peters	Doyle Associates PC
Stewart Goldenberg	[signature]	Farmers Insurance
Richard Holden	Richard Holden	Holden's Sand Drive
[signature]	Kenneth Lipsk	CARQUEST Fraser
	Michael Schuver	Michaels Audio/Video
Amy Weeks	[signature]	Bella Vita
Sheila Romans	Sheila Romans	Coldwell Banker Mtn. Prop.
[signature]	Art Olson	Jasco
Marian Waldron	Marian Waldron	CBMP

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 8
1595 Wynkoop Street
DENVER, CO 80202-1129
Phone 800-227-8917
http://www.epa.gov/region08

Ref: EPR-EP

FEB 06 2012

Tim Carey
Denver Regulatory Office
U.S. Army Corps of Engineers
9307 South Wadsworth Blvd.
Littleton, Colorado 80128

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

EXHIBIT K

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

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

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.

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.

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.

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.

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. 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

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

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.

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

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

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

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

effects was provided to the BOR, and this memo is attached.

Recommendation: The suite of potential temperature changes indicated by the model as a result of the proposed action need to be evaluated. This evaluation should include an analysis of expected changes in June and August in each of the five hydrologic years that were modeled. The effects analysis should not be restricted to evaluation of the increased exceedance of numeric water temperature standards, as compliance with the narrative standard should be evaluated as well.

Climate change effects:

In the FEIS, discussion of the role of future climate change in contributing to cumulative effects on the water quality of the Colorado River is limited to a qualitative discussion on pg. 3-196. In this discussion, the FEIS summarizes:

> *"Overall, it is difficult to predict the effects of climate change on water quality due to the uncertainty associated with the range of predicted climate change effects on air temperatures, precipitation, and runoff response. As a result, climate change effects on water quality are discussed qualitatively."*

In the list of climate-related scenarios that could affect water quality in the Colorado River found in the FEIS, 7 out of 8 address potential changes in basin hydrology. While changes in hydrology resulting from climate change are certainly a consideration for future water quality in the Colorado River, what is known with a high degree of certainty is that increases in air temperature are likely to result in increases in water temperature (e.g. Stefan and Preud-homme 1993). Although many climate variables in addition to air temperature are well known to influence water temperatures, there is scientific evidence that justifies the relationship of water temperature relationship with air temperature as a surrogate for net heat exchange (Stefan and Preud-homme 1993). The FEIS acknowledges this important relationship in its discussion of the selection of 2007 meteorological data for temperature model runs, stating "because of the strong influence of air temperature on stream temperature, stream temperatures would be lower under average climatic conditions than those used in the temperature model runs with the 2007 meteorological data (FEIS, pg. 3-134). Further, the FEIS acknowledges that air temperatures will be warmer in the future, with an "average year round air temperature increase of about 1.8°C". Though the source of this temperature projection is not cited, comparable numbers can be found in Appendix A of the CWCB's Colorado River Water Availability Study- Phase I Report, which projects average annual air temperature increases from historical air temperatures of 1.83 and 3.1°C (for 2040 and 2070, respectively) at a site near Grand Lake, CO. Importantly, all modeled scenarios for the area surrounding the upper Colorado River suggest that air temperatures will rise significantly within the life-span of the WGFP. A resultant upward shift the instream thermal regime will narrow the margin between existing instream water temperatures and the fixed water temperature water quality standards. Because the upper Colorado River is currently listed on Colorado's 303(d) list as being impaired by high water temperatures, this shift in instream thermal baseline will increase the probability that the proposed WGFP will result in more frequent exceedances of these water temperature thresholds, with consequences for the aquatic life use. A comprehensive assessment of the impacts of the WGFP should include an evaluation of how base water temperature regimes are likely to change in response to changes in climate parameters predicted during the life of the project (2070 and beyond).

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.

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.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 8
1595 Wynkoop Street
DENVER, CO 80202-1129
Phone 800-227-8917
http://www.epa.gov/region08

February 6, 2012

Ref: EPR-N

Michael J. Ryan, Regional Director
Great Plains Regional Office
Bureau of Reclamation
P.O. Box 36900
Billings, Montana 59107-6990

Re: EPA Comments on Windy Gap Firming Project Final Environmental Impact Statement; CEQ # 20110413

Dear Mr. Ryan:

In accordance with the U.S. Environmental Protection Agency's (EPA's) responsibilities under the National Environmental Policy Act (NEPA), 42 U.S.C. Section 4332(2)(C), and Section 309 of the Clean Air Act, 42 U.S.C. Section 7609, EPA has reviewed the U.S. Bureau of Reclamation's (BOR) Final Environmental Impact Statement (FEIS) for the Windy Gap Firming Project (WGFP). The purpose of the proposed firming project is to provide more reliable water deliveries to Colorado's Front Range, and to a lesser degree, West Slope communities and industry from the existing Windy Gap Project. The goal is to increase Windy Gap operational capabilities to deliver a firm annual yield of approximately 30,000 acre-feet (AF) to 14 water providers and users.

The FEIS evaluated five alternatives including the No Action alternative. The proposed project (Alternative 2), which is identified as the BOR's preferred alternative, includes the construction of a 90,000 AF Chimney Hollow Reservoir near Loveland, Colorado. A new pipeline connection to existing Colorado-Big Thompson (C-BT) facilities would be used to convey water to the new reservoir. This would provide the ability to store or preposition C-BT water in the new reservoir. The BOR also developed associated WGFP operational changes in this alternative as part of the proposed mitigation for projected adverse environmental effects.

The EPA has been working with the BOR to address key technical issues identified in our review of the Draft EIS. We participated in workgroups that focused on four main areas of concern: temperature, nutrients, stream morphology and aquatic resources. We appreciate the opportunity through these technical discussions to better understand the project and to work toward an improved impacts analysis and disclosure in the FEIS. As this project moves toward implementation, we offer our continued support in designing monitoring and mitigation plans to assure that adverse impacts are avoided and minimized as much as possible.

In the FEIS, the BOR provided supplementary information from existing sources and developed new modeling in an effort to improve the NEPA documentation presented in the Draft EIS. For example, the BOR developed a new dynamic temperature model to better characterize the potential impacts of the project. Other technical enhancements, such as the inclusion of figures and tables to better illustrate the modeling results and projected cumulative impacts to lakes and reservoirs, are the result of our mutual commitment to work through issues and

EXHIBIT L

arrive at an agreed upon resolution when possible. The agencies did not reach agreement in a number of areas. Where we did reach agreement on how to assess impacts, the result sometimes reduced the underlying resource concern and sometimes highlighted resource impacts and the need for mitigation. With this letter, we outline our remaining concerns with the analyses and conclusions in the FEIS, as well as our recommendations for monitoring, mitigation and management actions to be included in the Record of Decision (ROD) to verify impact projections and to reduce and offset the foreseeable impacts to the environment.

Our FEIS review identified remaining resource concerns in two main areas: 1) water quality concerns with lakes and reservoirs; and 2) aquatic life/stream morphology concerns within the Colorado River Basin. It is our view that there remain issues with the data, methodologies and conclusions presented in the FEIS regarding these resources. Our enclosed Detailed Comments describe instances where analyses or conclusions overstate the quality of current resource conditions and underestimate water quality and resource impacts associated with the proposed project.

Our focus regarding lakes and reservoirs is on water quality issues associated with excess nutrient loads that are impacting waterbodies affected by this project, including Granby Reservoir, Shadow Mountain Reservoir, Grand Lake, Horsetooth Reservoir and Carter Lake. Because most of these waterbodies are currently experiencing water quality problems, the EPA closely examined the analyses that assess baseline conditions and nutrient load projections for the project. Where significant uncertainty remains based on the FEIS conclusions, we offer recommendations for the ROD to assure the project will not cause or exacerbate water quality degradation.

Regarding aquatic life and stream morphology impacts in the Upper Colorado River ecosystem, including the effects of the project on sediment transport and temperature, the EPA is concerned that conclusions in the FEIS are inconsistent with existing data. Our concern is heightened by new information available relevant to the characterization of current conditions and impacts to aquatic life. The EPA offers monitoring and mitigation recommendations for the ROD to better protect these valuable resources.

Following release of the BOR's Record of Decision (ROD) for this project, the U.S. Army Corps of Engineers (Corps) will be reviewing this project for a CWA Section 404 permit decision. The Corps may rely, in part, on the FEIS to meet their compliance obligations under the CWA Section 404(b)(1) Guidelines. In our interest to resolve issues as soon as possible to avoid any delay in the permitting process, the EPA has reviewed the FEIS for compliance with CWA Section 404. While we have summarized most of our comments in this letter, we will provide greater detail regarding our concerns to the Corps as we work with them through the permitting stage of the project.

We hope that our comments on the FEIS will facilitate future dialogue with the BOR to assure that the project avoids unintended impacts through monitoring, mitigation and management. We remain available to work with the BOR to design mitigation and monitoring to meet project goals for avoiding and minimizing impacts. If you have any questions regarding our comments, please contact me at (303) 312-6776, or you may contact Suzanne

Bohan, NEPA Compliance and Review Program Director at (303) 312-6925, or Bert Garcia, Ecosystems Protection Program Director at (303) 312-6670.

Sincerely,

o/s/b

Martin Hestmark
Acting Assistant Regional Administrator
Office of Ecosystems Protection and Remediation

cc: Tim Carey, U.S. Army Corps of Engineers, Denver Regulatory Office

Encl: EPA's Detailed Comments on the Windy Gap Firming Project FEIS

EPA's Detailed Comments on the Windy Gap Firming Project FEIS

Overarching Concerns with Analyses and Presentation of Impacts

The EPA has concerns with the analyses and the presentation of impacts in the FEIS. We are concerned that these analyses lead the document to overstate the existing condition of many ecosystem components while also underestimating resource impacts associated with the proposed project. In most cases, the FEIS does not utilize data more recent than 2007, the publication date of the DEIS. While a cutoff date had to be established for the analyses, much of the post-2007 data differ from pre-2007 data and are likely to be more representative of current conditions for some waterbodies. Our review cites concerns with the treatment of data, methodologies and statistics.

For example, the EPA is concerned with the use of averaging in the FEIS, and cites examples in the analysis of water quality, fish habitat and channel maintenance flows. In these cases, averaging removes the ability of the analyses to present short-term or peak events. 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. Annual average values do not allow for the characterization of variability on smaller time scales or capture the magnitude of shorter-term events. For short-term phenomena such as algal blooms, dips in dissolved oxygen or habitat capacity, averaging of data can remove the actual "signal" of a measured event contained within the original data. As a result, events and impacts limiting aquatic life or exceedance of a regulatory threshold could be obscured by the averaging.

We have provided a few examples of each of these issues in the discussion of our resource concerns below. Cumulatively, these concerns impact the baseline from which impacts are measured, as well as uncertainty with the predicted magnitude of project effects. To assist with managing this uncertainty, EPA includes recommended management actions at the end of each topic.

Lakes and Reservoirs - Water Quality Concerns

Impaired 303(d) List Waterbodies Potentially Impacted by Proposed Project

Many of the lakes and reservoirs that will be used to move Windy Gap Firming Project (WGFP) water to the Front Range (*i.e.* Granby Reservoir, Shadow Mountain Reservoir, Grand Lake, Horsetooth Reservoir and Carter Lake) are experiencing water quality problems related to excess nutrient loads. Excess nutrients can trigger algal blooms, decrease water clarity, and decrease dissolved oxygen levels. Depleted oxygen in deep water can mobilize metals such as manganese and mercury. The resulting fish tissue mercury concentrations are a human health and fishery management concern, while increased dissolved manganese can raise pretreatment costs in municipal water supplies.

The FEIS includes improved documentation of the impairment status for major lakes and reservoirs potentially impacted by the project (see Table 3-55, FEIS p. 3-128). Four of the lakes and reservoirs associated with WGFP (Granby Reservoir, Shadow Mountain Reservoir, Carter Lake and Horsetooth Reservoir) are already on

Colorado's Clean Water Act §303(d) List of Impaired Waters ("303(d) List") with impairments either caused by, or exacerbated by, nutrients. Granby Reservoir, Carter Lake and Horsetooth Reservoir are impaired for their aquatic life use due to high levels of methyl mercury found in fish tissue which poses human health concerns. Low dissolved oxygen increases the availability of mercury to the food chain, and WGFP nutrient loads could reduce oxygen concentrations. Granby Reservoir, Shadow Mountain Reservoir, Grand Lake and Horsetooth Reservoir all have exceeded the water quality standard for manganese due to depleted dissolved oxygen, and the project could exacerbate these levels causing increased costs to municipal water suppliers.

Any addition of nutrients to impaired lakes would be expected to worsen the existing conditions. It is therefore important that the assessment of baseline conditions and the projection of nutrient loads caused by the project be accurate, and that the nutrient reductions through mitigation be measurable and conservative. In the comments below, the EPA identifies a number of instances where significant uncertainty remains regarding analyses, results or interpretation. Given the uncertainty involved with projected results, we also offer recommendations to assure adequate resource protection.

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. Because the nutrient neutral concept is vital to avoiding objectionable impacts, we carefully reviewed the analyses in the FEIS on which the concept relies. To achieve nutrient neutral operation, monitoring and mitigation commitments are necessary in the Record of Decision (ROD) to assure that the project contributes no new nutrients (i.e. no added phosphorus and nitrogen) to the lakes involved. The FEIS does not commit to sufficient monitoring or mitigation to assure this result. EPA offers several recommendations below to address this concern.

The EPA's review of the FEIS identified areas of concern when documenting baseline water quality conditions, documenting baseline nutrient loads, modeling nutrient dynamics/effects, and in calculating the benefits of mitigation. We conclude from our review of these analyses - details of which are listed below - that the FEIS likely underestimates the amount of mitigation that will be necessary to assure nutrient neutral operation. The level of uncertainty left by the analyses argues for upgrading the commitment of mitigation beyond the proposed 1:1 ratio, and during project implementation: committing to confirm the baseline via monitoring; monitoring the actual project loads; monitoring lake water quality; and measuring the effectiveness of mitigation projects.

The following are the EPA's concerns with the ability of FEIS models and analysis to accurately represent current conditions, to reflect nutrient cycling in the system, and to predict project impacts with enough accuracy to assure nutrient neutral mitigation:

Baseline Nutrient Load Conditions: It is important that the baseline from which the mitigation commitments will be measured derive from verifiable data documenting existing conditions. It is our understanding that baseline nutrient loads were developed from a small data set of measured nutrient concentrations at various input locations (that may not be representative) and on modeled hydrology. Because of deficiencies (detailed below) in both the methods used to calculate existing and projected loading, and in modeling procedures for

nutrient fate and transport, nutrient neutral operation of the project cannot be ensured until the baseline nutrient loading rates can be confirmed through monitoring as the project moves forward.

Three Lakes and CB-T System Modeling and Assessment: The FEIS includes analysis of the Three Lakes System (Grand Lake, Granby Reservoir and Shadow Mountain Reservoir) using 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 provide less than the necessary level of certainty as to how these lakes process and respond to nutrient inputs.

The FEIS and supporting technical reports do not identify the data used to establish baseline nutrient conditions or for loading calculations. For the tables comparing existing conditions to water quality standards (e.g. Table 3-40) the FEIS does not explain how the analyses establish thermal stratification, and how the presented results are calculated. Data used to represent baseline conditions in some cases appear to exclude certain hypolimnion and metalimnion data that were representative of current impaired conditions. For example, the limited dataset used to characterize existing conditions for dissolved oxygen in Shadow Mountain Reservoir appears not to have used available datapoints indicative of impairment (Table 3-42 compared to Table 3-55 and Lake and Reservoir Water Quality Technical Report Appendix A-3.). Despite Shadow Mountain Reservoir being listed as impaired for aquatic life due to low dissolved oxygen, the table of existing conditions does not include any data exceeding the dissolved oxygen criteria, yet more recent data indicating impairment of the dissolved oxygen criteria are not discussed. Further, 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 used was from a timeframe immediately following drawing down and refilling the Reservoir for repairs. This is not considered to be representative of the typical long-term conditions. These omissions would appear to prevent the model and analyses from accurately reflecting current conditions.

The FEIS includes useful figures (3-66 and 3-67) showing the fate and transport of nutrients in the Three Lakes Model. These figures, which show changes in nutrient outflows, internal loading and settling, are not fully explained in the text of the FEIS. The increased nutrient storage in sediments associated with WGFP, is important and is not discussed as a project impact. Compared to existing conditions, the proposed action is predicted to "sink" additional nutrients to settling in lake sediments which could result in undisclosed adverse consequences because these sediments will become a long-term source of excess nutrients to the lakes (see Figure 3-66). The FEIS discussion focuses on changes in average annual nutrient concentrations, but does not discuss sequestration of nutrients in sediments, exports of higher nutrient concentrations through the C-BT system, and their fate over time. These issues likely result in understating lake and river nutrient concentrations, and therefore underestimating WGFP loads.

Further, determining and tracking thermal stratification in lakes is a dynamic process that requires detailed temperature profile data in order to properly and accurately calculate results. There is no documentation that this was done for the comparisons of ambient conditions to water quality standards. It appears that the FEIS calculations and modeling chose a thermocline depth for each lake and assumed that thermocline depth remained constant throughout the summer season in the analyses. This assumption is likely an

oversimplification of these dynamic systems that may have led to removing some data from consideration and analyses, increasing the uncertainty of reported existing conditions and predicted results.

The model results are in some cases inappropriately averaged over an entire year, in effect washing out 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. 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. For short-term phenomena such as algal blooms or dips in dissolved oxygen, 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). Further, the BATHTUB model is not capable of predicting dissolved oxygen concentrations throughout the water column. Instead dissolved oxygen levels were indirectly interpolated from other model results, without a clear translator, increasing uncertainty in the output for Carter and Horsetooth Reservoirs.

While even 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. The EPA strongly recommends a management framework involving monitoring and mitigation as a necessary component of the BOR's ROD to assist in assuring and documenting the project's nutrient neutral water quality goals.

Recommendations for inclusion in the ROD:

To assure the project will not cause water quality impacts or exacerbate existing water quality impairment through nutrient neutral operation, the EPA recommends the ROD include the following requirements:

- Verify that baseline loading estimates are accurate through monitoring of the nutrient sources identified in Table 3-68. The monitoring of nutrient concentrations and flows at these sites should be performed for at least two years and at a frequency necessary to verify the predicted loads. Existing data sets for these sources could be used to augment monitoring. All data used should be open to public review;
- Conduct weekly monitoring of nutrient loads from the Windy Gap pumpback and Adams Tunnel flows (i.e. total nitrogen and phosphorus concentrations and flows) during project operations. The loads must be monitored in a way that allows the specific contribution of WGFP loads to be calculated. At least two years of baseline data should be collected prior to WGFP operation, followed by at least ten years of WGFP operation monitoring or until nutrient loading issues are resolved;
- Conduct regular monitoring of Granby Reservoir, Shadow Mountain Reservoir, Grand Lake, Carter Lake and Horsetooth Reservoir for phosphorus, nitrogen, chlorophyll *a,* temperature, and dissolved oxygen through the full depth profile. Include a deep hypolimnion manganese sample with each profile. We recommend monthly profiles from March-May and from fall turnover through ice-up. During the period of lake stratification, approximately June through fall turnover, weekly profiles would be needed

to assess conditions and identify unforeseen impacts. At least two years of baseline data should be collected prior to WGFP operation, followed by at least ten years of WGFP effects monitoring;
- Conduct semi-annual monitoring of fish-tissue mercury concentrations for each of the five lakes and reservoirs listed above; and

To assure that mitigation commitments are providing the predicted load reductions necessary to meet nutrient neutral goals, the ROD should include the following requirements:

- Firm-up specific mitigation commitments and provide initial estimates of the load reduction from each. Because it is likely that the FEIS analysis underestimates WGFP-related loads (for reasons stated above) the projected load reductions should conservatively exceed the estimated loads;
- As mitigation is put in place, monitor and measure the actual nutrient load reductions from each mitigation commitment to assure that all meet or exceed predicted load reductions;
- For nonpoint source mitigation, increase the mitigation ratio to at least 2:1 over the base ratio as appropriate to account for the uncertainty involved in predicting or measuring nonpoint source nutrient reductions, and recognizing that its effectiveness is dependent on diligent long-term maintenance of best management practices.
- Publish an annual monitoring and mitigation evaluation and status report, available to the public, for at least ten years (or longer if the mitigation reductions are not confirmed to be at least equal to the measured project load). This report would document measurements of nutrient loads and lake/reservoir water quality to demonstrate whether "nutrient neutral" mitigation measures are sufficient to offset measured nutrient loading and whether any unforeseen impacts have arisen. It would also document monitoring results associated with each of the implemented mitigation measures and compare against projected nutrient reductions and against the measured nutrient loads; and
- Include *action triggers* in the event that:
    - Monitoring results indicate that WGFP nutrient loading is not fully mitigated, or
    - Monitored lake levels of ambient nutrients, chlorophyll *a* and dissolved oxygen concentrations turn out to be worse than those predicted in the FEIS.

  The triggered action(s) would require increased nutrient mitigation with enough of a buffer to assure Windy Gap operations remain nutrient neutral for the life of the project.

Colorado River Basin - Aquatic Life/Stream Morphology Concerns

The native annual discharge of the upper Colorado River has already been reduced by 67% through historic water diversions according to data in the FEIS (Table 3-1). The changes to natural hydrology, particularly the loss of peak flows, have adversely affected many of the river's functions. Despite these impacts, the river still supports a trout fishery and other recreational and aquatic life uses and values. Yet the river is showing signs of stress. Summer water temperatures are reaching and exceeding state water quality standards for protecting aquatic life. Sediment is accumulating in some reaches, and stream channel morphology is not fully supporting historic functions. As a result, fish and macroinvertebrate populations have significantly declined in some stream segments. All of these indicators raise concern that additional withdrawals from the system will exacerbate the current stressors and the incremental additional withdrawals from the proposed project could lead to disproportionate effects.

The FEIS includes useful additional information and analyses regarding these resources. In comments below we detail remaining concerns with the representation of current conditions in the FEIS with respect to stream morphology and aquatic life. We also express concerns with the FEIS's representation of the effects from WGFP to those resources. Combined, these comments argue for enhanced monitoring and mitigation commitments in the ROD to assure the project avoids and minimizes adverse effects to the river and aquatic life.

Stream Morphology – Peak Flow Events and River Function

EPA has several concerns with the methods used to represent current conditions and project effects related to stream morphology. Peak flow events are key to maintaining natural stream morphology, and they provide and sustain critical river functions including sediment transport and maintaining pore spaces in larger substrates (*e.g.* gravels, cobbles, and boulders) that are key to aquatic life functions. Cumulatively, the issues listed below increase our concern that the project as proposed will exacerbate already degraded river conditions.

The additional analyses of the peak flows needed for channel maintenance indicate that some important peak flow events will occur in 44-54% fewer years under the proposed action compared with existing conditions below Windy Gap Diversion (WGD). This represents a relatively significant change considering the naturally low frequency of these events (see Table 3-32). Similar declines in the frequency of these flows will occur under the cumulative effects scenario as well (Table 3-35). The FEIS flow duration curve analysis also projects that WGFP will exacerbate the loss of high flow events (e.g., flows of 3,160 cfs and higher) in the upper Colorado River system in Grand County. These high magnitude flow events provide numerous ecological functions including partial and full bedload transport, opening interstitial spaces, break-up of channel armoring, periphyton scour/disturbance and limitation of vegetation encroachment. Because WGFP will reduce peak flow events and overall stream discharge compared to existing conditions, this project will exacerbate the effects cited above unless mitigation is included.

The FEIS, in several sections, appears to state conclusions based on analyses or interpretation of results using methods that are inconsistent with scientific protocol. For example, the way the channel maintenance flows analysis is presented substantially understates the potential changes associated with the proposed action. Flow recurrence is projected to decrease from 13% to 6% of the years for flows between 4,600 cfs and 6,520 cfs, which means they will occur 54% less frequently. However, the FEIS states that "flows in the 10 – 25 year recurrence interval would occur about 7 percent less under the action alternatives compared to existing conditions (FEIS 3-97)." This same issue occurs in Section 3.7.3 on Cumulative Effects (p. 3-103). Reducing the frequency of these flow events by 54% is a substantial change, especially given the naturally low frequency of these high flow events, and the proposed mitigation is unlikely to prevent adverse impacts associated with loss of channel maintenance flows.

In an example from the stream morphology section, analyses were conducted using gauge data from Hot Sulphur Springs and Kremmling (more than 8 miles downstream of Windy Gap Diversion), but available U.S. Geological Survey (USGS) Windy Gap gauge data – a site much closer to the location of additional withdrawals – were not included in the analyses. Although flow data may be similar for these two gauges, observations of stream morphology and aquatic life indicate the FEIS study locations may not be representative

of the reach immediately below the diversion. Furthermore, the FEIS maintains that the 1981study by Ward and Eckhart is representative of the current geomorphic conditions in the Colorado River below WGD following construction and operation of the original Windy Gap project, but does not provide any current data from this reach to support this assertion. The effects of the WGD are most likely to be seen in the reach immediately below WGD and before the influence of tributary streams are added. Despite two recent reports from Colorado Division of Wildlife (DOW) (Nehring, *et. al.* 2010 and Nehring, *et. al.* 2011) that cite stream morphology degradation in the reach below the WGD structure that will likely be exacerbated by the proposed project, the FEIS concludes, "The upper Colorado River is a morphologically stable stream and the changes in flow predicted from the WGFP are not expected to substantially affect stream morphology or sediment transport and deposition in the Colorado River below Windy Gap Reservoir (p. ES-13)." In this case, the proposed mitigation for stream morphology is not designed to remedy the existing impacts or to avoid exacerbating those impacts.

In order to determine whether the proposed peak flows will be sufficient to support sediment transport functions, the FEIS includes additional data from the Breeze station to evaluate the streamflow needed to mobilize sediments (i.e., shear stress) ranging in size from fine sediments to coarse gravel. It would be advisable to also consider the relationship between streamflow and larger sediments, including cobbles and boulders, as previously recommended by the EPA. These larger sized sediments, when mobilized, do a considerable amount of work on the channel, including creation of riffle and pool complexes, abrasion of periphyton and full bedload transport. Without an analysis of the shear stress and streamflow magnitude needed to move larger substrates, it is difficult to conclude, as the FEIS has, that peak flows associated with the proposed project will be sufficient to assure similar channel maintenance functions normally carried out by large sediments classes in high flow. It is likely that the flow magnitudes necessary to mobilize these larger sediment classes fall within the range of channel maintenance flows that will be most impacted by the proposed project (i.e., the 5-50 year flow events).

Consistent with our comments on the DEIS, and for the reasons stated above, EPA also remains concerned that the proposed flushing flow mitigation is limited to the release of 600 cfs for 50 consecutive hours at least every three years, and only under certain conditions (p. E-14). The FEIS states that flows of 850 cfs or higher are necessary to mobilize large gravels, and that flow magnitudes associated with a 50 year flood event are necessary for full bedload transport. As we have explained throughout our technical discussions, we do not think that flushing flows of 600-850 cfs are sufficient to maintain the channel and preserve ecological characteristics of the river. According to Nehring et al. (2011), the loss of aquatic taxa in the reach immediately below WGD is likely due to reductions in magnitude and duration of scouring flushing flows. Nehring et al. (2011) states that "periodic flushing flows of sufficient magnitude and duration are critically important for maintaining the biotic integrity of stream ecosystems…[A] true flushing flow requires a discharge substantially greater than 1,000 ft3/s for several weeks, as occurred in 2010 and 2011. Flows of lower magnitude and shorter duration will not result in the deep cleaning of the cobble-boulder substrates in the riffles, chutes or pools" (p. 81).

In the FEIS mitigation plan, bypassing a 600 cfs flushing flow once every three years would only be required in years when natural flows are available and when the Subdistrict has over 60,000 acre-feet of water supply in Chimney Hollow and Granby Reservoirs on a specific day, April 1. By making these important flushing flows a conditional requirement, the likelihood that mitigation flows will be provided at the needed frequency is reduced, particularly in drier weather cycles when those flows are especially important. Additionally, as

indicated in the FEIS, WGFP water could be stored in reservoirs other than Granby and Chimney Hollow to allow for operational flexibility in the C-BT system. Because WGFP water can be stored in other C-BT reservoirs to meet customer needs, there is no assurance that mitigation commitments contingent upon levels in Chimney Hollow and Granby would occur at the frequency needed to provide the desired result.

An analysis of impacts for stream hydrology, morphology and other resource areas is absent for the reach of the Colorado River immediately below Granby Reservoir. In the FEIS, the reach of the Colorado River between Granby Reservoir and Windy Gap Diversion is divided into two reaches for analysis, one being located upstream of the Fraser River confluence and the other downstream of the Fraser River confluence and only the reach downstream of the Fraser River confluence is analyzed in detail in the FEIS. The reach immediately below Granby Reservoir was not analyzed in detail despite the fact that annual flow depletions of 15% are predicted for this reach in an average year. Because annual flow depletions in this reach are similar to those below the Windy Gap diversion, it is possible that similar stream morphology and aquatic life impacts may occur in this reach and appropriate mitigation needs to be provided.

Recommended Mitigation for Hydrology-Related Effects

EPA recommends the ROD include the following as mitigation requirements:

- We continue to recommend that additional flushing flows of bankfull (1240 cfs) and higher below WGD should be incorporated as mitigation for this proposed project. It is likely that flows in the 5-50 year recurrence interval range provide numerous ecological functions, including bedload transport, break-up of channel armoring, periphyton scour/disturbance and limitation of vegetation encroachment, and as such, flushing flows of this magnitude should be proposed at sufficient duration and frequency to maintain this reach of river.
- Any mitigation proposed to offset impacts to the upper Colorado River system should not be linked to storage levels or operations of reservoirs, but instead should be based solely on the magnitude of impact to Colorado River resources. EPA recommends that the reservoir storage condition be removed from the flow mitigation.
- EPA recommends an added mitigation measure to provide assurance that Windy Gap Reservoir maintenance (*e.g.* dredging) efforts will not contribute sediment loads to the Colorado River during periods of low flow, when the River has insufficient power to transport that sediment.
- EPA recommends that mitigation to offset impacts to stream morphology and aquatic life, including possible reduced habitat availability, be proposed for the reach of the Colorado River immediately below Granby Reservoir.

Surface Water Quality – Temperature

The FEIS includes significantly improved dynamic temperature modeling that more accurately predicts the effects of WGFP alternatives on river temperatures. This model has added certainty and reduced some of the EPA's concerns with the river temperature analyses. Windy Gap Reservoir is a shallow, in-channel impoundment that already contributes significantly to warming the river below. The FEIS acknowledges that additional water withdrawals and the resulting lower flows can exacerbate the high temperature events. Additionally, while the FEIS does not model the potential exacerbating effects of climate change, it does

recognize that climate change will likely increase river temperatures on average over time as the air becomes warmer. These factors heighten the importance that WGD be operated to avoid contributing to temperature effects on aquatic life. In this section we detail the EPA's remaining concerns with temperature analysis and the proposed mitigation, and recommend monitoring and mitigation enhancements to avoid contributing to exceedance of Colorado's acute, chronic or narrative temperature water quality standards (WQS) in the river downstream of WGD.

Narrative Temperature Standard: In addition to chronic and acute temperature standards, Colorado has published a narrative temperature standard that applies to effects that may occur with temperatures below the chronic threshold. The FEIS states "Water temperatures lower than the MWAT [mean weekly average temperature: chronic standard] would not adversely impact the species" (FEIS, pg. 3-226). The FEIS 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 below those acute and chronic thresholds as required under the narrative portion of the Colorado's water temperature standard. The analysis also neglects to evaluate the significance of the *magnitude* of modeled increases in water temperatures during cooler water temperature months, such as June. The temperature modeling assessment in the FEIS does not discuss or quantify temperature increases that would occur in June as a result of the project, a month when significant volumes of water are planned to be diverted as a result of the WGFP. In the Colorado River, significant increases in June water temperatures could disproportionately impact priority restoration species such as the rainbow trout, a fish which has these thermally-sensitive life stages present during this month (Ewert 2010; Nehring 1988). The FEIS does not evaluate whether the WGD could adversely affect trout due to project-related June temperature increases and therefore does not assure compliance with Colorado's narrative WQS.

Proposed Temperature Mitigation: There are several unsubstantiated differences between the proposed mitigation provisions in response to approaching the chronic temperature WQS versus the acute WQS. In the case of the chronic WQS, the FEIS states that when the weekly average temperature (WAT) exceeds the MWAT Chronic Threshold, the Subdistrict will reduce or curtail WGFP pumping at the WGD to the extent necessary to maintain temperatures within the MWAT Threshold. The mitigation provision for the chronic WQS is only triggered after the standard is exceeded whereas, a safety factor is added as a buffer, triggering mitigation related to the acute WQS. The chronic WQS, like the acute WQS warrants a trigger that is below the actual standard value such that mitigation provisions would contribute to preventing exceedances of the WQSs.

Additionally, the mitigation provision for the acute standard includes potential reduction or curtailment of pumping for both the original Windy Gap Project *and* the WGFP, whereas the mitigation provision for the chronic WQS considers only reduction or curtailment of WGFP pumping. The option to curtail or reduce pumping should include pumping from both the original Windy Gap Project and WGFP in either the acute or chronic scenario as both are equally important.

Temperature Mitigation and Monitoring Recommendations:

EPA recommends the ROD include the following requirements:

- Apply equivalent temperature mitigation for both the acute and chronic scenarios regarding curtailment or reduction of pumping with at least the proposed 1°C safety factor, including commitments from Windy Gap and WGFP withdrawals.
- Commit to at least two years of baseline monitoring of June temperatures and their effects on thermally-sensitive life stages of rainbow trout to evaluate compliance with the narrative WQS. Monitoring should then be continued for at least two years after WGFP is operational to compare against the baseline. If effects triggering the narrative temperature WQS are found, appropriate management actions should be committed to, including curtailment or reduction of pumping.
- Place an additional continuous temperature gauge in the reach upstream of the influence of WG Reservoir. Combined with the two proposed continuous temperature gauges downstream of WGD, this gauge would be useful in determining the relationship between Windy Gap Project or WGFP operations and any exceedance of temperature standards.

Aquatic Resources – Aquatic Life

The FEIS characterization of aquatic life impacts is substantially limited because it does not include data within the first 8 miles downstream of WGD, the reach most likely to experience adverse effects. The Colorado DOW and other entities have collected macroinvertebrate and fish data from the reach immediately downstream of the diversion, although these data were not included the FEIS. Specifically, the FEIS acknowledges that additional data regarding the condition of the invertebrate community exist (*e.g.* Nehring et al. 2010) although it does not explore this information in any depth as it pertains to conclusions regarding the condition of the river. The most recent DOW report (Nehring et al. 2011) provides a more comprehensive assessment of the current condition of the aquatic community in the Colorado River both upstream and downstream of the WGD, and directly fills the information gap for this reach. The DOW study includes aquatic resource sampling sites 1.5 and 3 miles downstream of WGD providing new and valuable information to inform the forthcoming BOR decision on WGFP and its associated mitigation requirements.

Based upon new data released in the DOW Report (Nehring et al. 2011), 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 DOW report documents significant declines in mayfly, stonefly and caddisfly taxa (reduced by 54%, 40% and 62%, respectively) between 1981 and 2010 at sites downstream of the diversion, and the local extirpation of a native fish (mottled sculpin), and attributes these declines to current water withdrawals in the system and the related effects on channel functions. DOW also documents development of sediment beds and associated mats of rooted aquatic vegetation below WGD. In explaining the biotic condition, DOW concludes 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." The DOW report also notes, "The severe reductions in the frequency, magnitude and duration of high flushing flows below WGD since its construction in the 1980s, has severely reduced the stream power in

the Colorado River downstream of Windy Gap." The DOW report cites six stream ecosystem issues associated with water storage and export, including 1) restoration of channel connectivity, 2) channel reconfiguration, stream power and flushing flows, 3) sediment deposition and transport, 4) water temperature, 5) encroachment of rooted aquatic vegetation, and 6) whirling disease. The EPA agrees with this list, and recommends that the information in this report be used to inform the characterization of current conditions and predicted impacts and that mitigation be proposed to offset the incremental effects of this project that relate to these issues.

EPA appreciates the inclusion of additional macroinvertebrate metrics, including % EPT taxa (Ephemeroptera, Plecoptera and Trichoptera) and the Colorado Multi Metric Index tool (MMI), however the EPA is concerned that they were incorrectly used to conclude that the current aquatic condition is "excellent," and that no additional impacts are likely to occur from the proposed project (p. 3-208). According to Nehring et al. (2011), the species assemblage consisted of 73% EPT taxa prior to the construction of the Windy Gap dam, compared with 56% EPT taxa in 2010. These declines in characteristic montane taxa in response to water withdrawals and their associated stressors can inform an assessment of current conditions and direct project impacts, because they indicate that the current community is already impacted by water withdrawals and similar future withdrawals, as proposed in this project, will add to these stressors. As such, a community consisting of 56% EPT taxa as cited in the FEIS likely reflects compromised biotic integrity and function, and not an excellent condition. Nehring et al. (2011) concluded that withdrawals anticipated from the future Windy Gap and Moffat diversions would exacerbate these declines and similar trends in taxa loss may be expected following the proposed project..

Further, to characterize health of the benthic macroinvertebrate community of the Colorado River below WGD, the FEIS summarizes macroinvertebrate data collected in two studies (FEIS pg. 3-208) (Rees 2009; Miller Ecological Consultants 2010). The FEIS correctly defines the MMI as a unitless index that assesses biological condition on a scale of 0-100, and correctly identifies attainment and impairment thresholds for high-elevation cold-water streams (50 and 42, respectively). The FEIS then presents scores from the Rees (MMI values of 92 and 89 for samples taken above and below Windy Gap) and Miller Ecological Consultants studies (MMI values of 100 at Lone Buck and Breeze sites below Windy Gap) as evidence of a "healthy macroinvertebrate community" (FEIS pg. 3-208). The FEIS concludes that "these MMI values indicate the existing macroinvertebrate community is unimpaired" (FEIS, pg. 3-229). These high MMI scores are very different than those presented as evidence during a December 2011 Colorado 303(d) rulemaking hearing for this portion of the Colorado River. Macroinvertebrate data from the Colorado River below Windy Gap was presented from several participants in the hearing, including the Northern Colorado Water Conservancy District (NCWCD), citing much lower MMI scores (37-60) than reported in the FEIS. For example, a memo by Timberline Aquatics (Rees 2009) presented data from an October 2008 assessment of the benthic macroinvertebrate community downstream from Windy Gap Reservoir, and the resultant MMI score of 44.6 differs significantly from the MMI value of 89 reported in the FEIS (also Rees 2009). It is not immediately apparent if these MMI scores were calculated from the same macroinvertebrate sample in different ways, however, there is a large discrepancy in MMI values.

Given the conflict with MMI scores presented in testimony surrounding the § 303(d) list hearing, the conclusion reached in the FEIS regarding the health of the existing macroinvertebrate community below WGD should be reevaluated. The scores presented in testimony are in much closer proximity to non-attainment and impairment thresholds, and as such, any incremental degradation of the macroinvertebrate community is problematic and

could lead to aquatic life impairment. Importantly, as a result of the same 303(d) hearing, a portion of segment COUCUC03 (Colorado River from below Windy Gap Reservoir to FR538) was placed on Colorado's Monitoring and Evaluation list, a list which "identifies water bodies where there is reason to suspect water quality problems, but there is also uncertainty regarding one or more factors, such as the representative nature of the data" (CDPHE Water Quality Control Commission, 5-CCR-1002-93).

EPA is concerned that daily habitat data were used for aquatic habitat modeling (p. 3-215), but were averaged together into two-week means for presentation in the FEIS. A daily time-step is appropriate to determine habitat availability. Presenting these data as a two-week average removes the daily variations which can be limiting for aquatic life, and the full magnitude of predicted effects would be potentially masked.

Although the FEIS acknowledges that WGFP will further reduce peak flows in the Colorado River in Grand County, and will have adverse impacts to aquatic life including reduction in trout habitat in the Colorado River, it does not include mitigation sufficient to offset these effects. Similarly, no mitigation is proposed for similar reductions in trout habitat in Willow Creek.

Aquatic Life Mitigation Recommendations

EPA recommends the BOR include the following mitigation measures that were identified in the DOW's 2011 report, as requirements in the ROD:

- Construct a bypass channel around Windy Gap Dam. The bypass channel would reduce or eliminate high temperature events exacerbated by WGFP that stress trout populations, reduce sediment deposition and transport impacts to the river exacerbated by WGFP, restore river connectivity for many aquatic species, and reduce whirling disease impacts to fish populations. The bypass channel would mitigate some of the likely impacts on aquatic life below the diversion associated with WGFP operation, potentially even improving some conditions over the current condition.
- Commit to in-stream channel reconfiguration for the Colorado River below WGD to mitigate for the aquatic life effects of lower discharge associated with WGFP. Channel reconfiguration would reduce the loss of habitat availability for fish and macroinvertebrate populations downstream and increase stream power to clear fine sediments.
- Commit to additional channel maintenance flow requirements of sufficient magnitude, duration and frequency to maintain the ecological functions in the river to address the loss of high flow events due to WGFP withdrawals.

Analysis Of The Relationship Between Minimum Flow Below Windy Gap And Water Temperature Above The Williams Fork

Blair Hanna, AMEC Earth and Environmental
2/5/2009

A modeling study was performed using the QUAL2K model for Existing Conditions to find the relationship between the minimum flow downstream of Windy Gap Reservoir and the predicted average daily water temperature in the Colorado River above the Williams Fork.

Method

The Existing Conditions model was used that describes conditions in the Colorado River on July 25th. The diversion from Windy Gap was calculated for each simulation to vary the flow below the Windy Gap reservoir from the minimum in-stream flow from 90 cfs to 250 cfs. The model was run and the daily minimum, daily maximum and daily average water temperatures in the Colorado River just above the Williams Fork predicted by the model were investigated. The results are shown in Table 1 and Figure 1.

Table 1. QUAL2K Tabular Results

			Colorado River Just Above the Williams Fork		
Run Name	Flow below Windy Gap (cfs)	Flow above Williams Fork (cfs)	Avg daily temperature (deg. C)	Min daily temperature (deg. C)	Max daily temperature (deg. C)
90 cfs	90.0	93.5	18.72	13.11	25.35
	100.0	103.5	18.37	13.07	24.71
	105.0	108.5	18.21	13.06	24.41
	110.0	113.5	18.06	13.04	24.11
	150.0	153.5	17.08	13.00	22.15
	200.0	203.5	16.28	13.00	20.46
	250.0	253.5	15.75	13.00	19.27
EC	413.3	689.0	14.60	12.49	17.07

EXHIBIT M

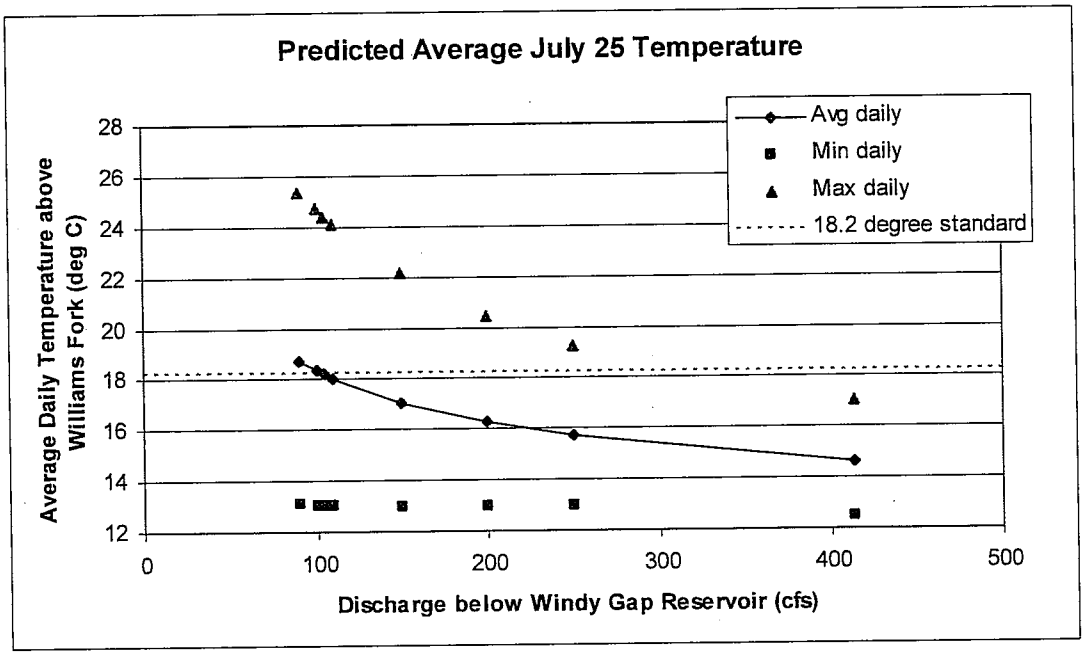


Figure 1. QUAL2K Graphical Results

Discussion

The maximum water temperature in the Colorado River between Lake Granby and Kremmling is predicted by the QUAL2K model to occur just above the Williams Fork inflow. For the Existing Conditions simulation, the average daily water temperature for the worst-case conditions on July 25th is 14.6 °C. When the minimum instream flow of 90 cfs below Windy Gap is imposed on the Existing Conditions simulation, the average daily water temperature is predicted to be 18.7 °C. Note that in the DEIS the Existing Conditions simulation with the minimum instream flow to 90cfs below Windy Gap is NOT shown. For the *Alternatives* when the minimum instream flow of 90 cfs below Windy Gap is imposed an average temperature of 18.9 °C is predicted above the Williams Fork (Figure 3-38 of the DEIS). The results using the Existing Conditions simulation are comparable to the DEIS results, but not exact.

Simulation results show a relationship of increased water temperature with decreased river flow (Figure 1). The results show that a flow below Windy Gap Reservoir of 105 cfs would result in an average temperature above the Williams Fork of 18.2 °C. This minimum flow rate would likely achieve compliance to the maximum weekly average temperature (MWAT) table value standard for this reach of 18.2 °C.

The MWAT is calculated from field sampling data and is defined as, "the largest mathematical mean of multiple, equally spaced, daily temperatures over a seven-day consecutive period, with a minimum of three data points spaced equally through the day." (CDPHE, 2008). Model prediction of July 25th daily average water temperature is not directly comparable to the MWAT as defined by CDPHE (2008). However, comparison of the model-predicted daily average temperature with the MWAT table standard can be

made using the assumption that the model results for July 25th are predicting the worst-case conditions for average temperature on any day during the year and these conditions remain consistent and do not worsen over any 7-day period. If water temperatures were higher for any day in any 7-day window during the year, the River water temperatures may exceed the MWAT standard.

These simulations show that for water management in the Colorado River for Existing Conditions, a flow of 105 cfs instead of 90 cfs might better achieve water temperature compliance in this reach of the Colorado River.

References

Colorado Department Of Public Health And Environment (CDPHE), Water Quality Control Commission, 2008, Regulation No. 31, The Basic Standards And Methodologies For Surface Water. Effective: May 31, 2008

Detailed Comments
Public Notice No. 200980523
Windy Gap Firming Project DEIS

Compliance with the CWA Section 404(b)(1) Guidelines

Compliance with the Guidelines requires that impacts to aquatic resources be first avoided and minimized, and compensatory mitigation should be used only for impacts that cannot be avoided or minimized. These requirements are essential to meeting the overall objective of the Clean Water Act to restore and maintain the chemical, physical and biological integrity of the nation's waters. EPA believes that alternative water supply options exist that would meet the basic project purpose while avoiding the impacts to the Colorado River associated with firming existing Windy Gap water rights. The applicant must demonstrate that all appropriate and practicable steps to avoid and minimize adverse impacts to the aquatic environment have been taken.

40 CFR §230.10(a) Alternatives Analysis:

The DEIS states that the purpose and need of the proposed project is, in part, "to deliver a firm annual yield of about 30,000 AF of water from the existing Windy Gap Project to meet a portion of the water deliveries anticipated from the original Windy Gap Project" (see DEIS p.1-1). Despite the applicant's intent to improve the yield from the existing Windy Gap project and to exercise existing Windy Gap water rights, the Corps of Engineer must make an independent evaluation of the basic project purpose (i.e., overall project purpose) to adequately evaluate alternatives to determine the least environmentally damaging practicable alternative (LEDPA).

EPA agrees with the Corps that the basic project purpose for the project is water supply (Public Notice of Permit Application). However, the Corps also states that the overall project purpose is to "deliver a firm annual yield of approximately 30,000 AF of water from the existing Windy Gap Project to provide a portion of the water deliveries anticipated from the original Windy Gap Project and to provide up to 3,000 AF of storage to firm water deliveries for the Middle Park Water Conservancy District." As detailed in the EPA's Final Determination of the CWA Section 404(c) veto of the Two Forks Water Supply Impoundments (November 23, 1990 at p. 2, footnote 2), EPA has determined that the terms "basic purpose" and "overall project purposes" are to be used interchangeably and are not intended to have distinct meanings. The DEIS and Corps Public Notice for this project have interpreted basic and overall project purpose(s) to have different meanings which artificially narrows the scope of the alternatives. EPA believes the project purpose is to meet a portion of the existing and future water supply demands of the project participants and thus additional less environmentally damaging practicable water supply-oriented alternatives that address this purpose should be analyzed and disclosed in future NEPA documentation for the edification of both the public and decision makers.

Both NEPA and the Section 404(b)(1) Guidelines require evaluation of reasonable alternatives, which must be rigorously explored and objectively evaluated. It is also essential to

EXHIBIT N

the decision making process to present a reasonable range of alternatives in a manner that provides a clear and consistent comparison (40 CRF 1502.1. 1502.14(b)). Alternatives that are reasonable or practicable may include alternatives that are outside the capability of the applicant and are feasible from a technical and economic standpoint, rather than simply desirable from the standpoint of the applicant. The preamble to the Guidelines states that practicable alternatives must be "reasonably available or obtainable" but the mere fact of ownership does not necessarily determine reasonable availability. The regulation states that *"(a)n alternative is practicable if it is available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes. If it is otherwise a practicable alternative, an area presently not owned by the applicant which could reasonably be obtained, utilized expanded, or managed in order to fulfill the basic project purpose of the proposed activity may be considered."* 40 CFR 230.10(a)(2). This regulation also states that if inadequate information is presented in the DEIS for the evaluation of alternatives under the Guidelines, the Corps of Engineers may need to supplement the DEIS with additional information (40 CFR 230.10(a)(4)).

According to the Guidelines, the Corps may not permit a project if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences (40 CFR 230.10(a)). The DEIS does not provide an appropriate alternatives analysis regarding the availability of less damaging practicable alternatives. The alternatives evaluated in the DEIS are limited to providing storage or firming for all or a portion of the existing junior water rights of the Windy Gap Firming Project for current and future municipal and industrial supply. Water rights are considered vested property rights and can be transferred or conveyed in the same manner as property rights. The intent of Section 404 of the CWA is that no discharge of dredged or fill material should be permitted, unless it can be demonstrated that such a discharge will not result in unacceptable adverse impacts to the aquatic ecosystem. In addition, where a discharge is proposed for a special aquatic site (such as the wetlands and riffle and pool complexes in the Upper Colorado) all practicable alternatives to the proposed discharge which do not involve a discharge into a special aquatic site are presumed to have less adverse impact on the aquatic ecosystem, unless clearly demonstrated otherwise. The proposed use of junior Windy Gap water rights present a more damaging alternative for water resource development when compared to more senior rights and other less damaging alternatives for water supply. The DEIS described the process of evaluating a broad range of alternatives including structural and nonstructural water supply alternatives and that the screening process resulted in the elimination of the majority of alternatives in order to comply with the Guidelines. However, the DEIS does not sufficiently explain how the Guidelines criteria were applied.

Despite the screening criteria used in the DEIS to eliminate alternatives, other reasonable and less damaging practicable alternatives may be available to meet current or future demand when used alone or in combination with other alternatives. Such alternatives include, but are not limited to: 1) water conservation including active municipal, industrial (M&I) and agricultural efficiency measures; 2) acquisition of more senior water rights including water rights that have been available to the project proponent since the original Windy Gap project; 3) agricultural transfers including permanent, interruptible and rotating/fallowing transfers; 4) use of short-term agricultural leases for immediate temporary water supplies; 5) conjunctive use of surface water

and groundwater; and 6) M&I reuse, including water rights exchanges, non-potable reuse, and indirect potable reuse. Although the DEIS discusses common reuse and conservation practices by both the Provider and municipalities involved in this project, it does not explore additional conservation opportunities and quantities of water (i.e., supply alternative) that could be conserved with state-of-the-art water conservation/re-use programs in combination with smart growth land use principles directed towards more sustainable water use. These water supply alternatives are detailed in the State of Colorado Statewide Water Supply Initiative, Phase II Report (SWSI) CDM 2004; http://cwcb.state.co.us/IWMD/AlternativeAgriculturalWaterTransfersGrantProgram/. EPA understands the State of Colorado considers these alternatives viable to address Colorado's water supply needs.

The DEIS states that each participant has developed a unique portfolio of water supply sources to meet existing and anticipated water needs and that a diversity of water supply sources is generally preferred to ensure reliable deliveries (see DEIS p. 1-11). The additional alternatives identified above may provide comparably diverse water supply opportunities or potentially more reliable and efficient options for water supply for the Participants than the proposed project and should be critically explored. An alternative that is aggressive on conservation (alone or in combination with other alternatives identified above) will not only disclose valuable information for the decision makers and the public to compare the magnitude of environmental effects of the alternatives, but will also reduce costs and dramatically reduce environmental impacts and energy use.

With population projections in Colorado increasing approximately 65% by 2030, sustainable water supply project alternatives, including urban and agricultural conservation measures, are critical strategies for meeting new water supplies because saving water can produce immediate new water supply with less adverse impacts to Colorado's rivers. Conservation measures in highly populated basins in Colorado, including modest reductions in indoor/outdoor residential use, are estimated to save enough water to satisfy as much as 25% of the state's anticipated growth in M&I water needs by the year 2030 (Trout Unlimited et al., 2005). Conservation measures already employed by the Participants were built into the water demand projections in the DEIS with the assumption that the recent lower demand levels will continue. The DEIS should have included information about how conservation demand figures were factored into decreasing the demand for Windy Gap water. Future conservation supply alternatives analysis should include both "existing" conservation demand reduction calculations and "conservation oriented" smart growth/agricultural/urban efficiency water supply programs (e.g., water rate structures, landscaping ordinances, appliance rebate programs, turf replacement rebate programs, retrofits programs for old construction) for current and future infrastructure served by the project. The cost associated with the active financial investment in conservation approaches relative to the cost of the proposed alternatives should also be evaluated and disclosed in future NEPA documentation. Urban and agricultural efficiency programs (inherent in a water conservation alternative) should not be discounted as a future water supply alternative for the short–term and long-term and should be the basis for any other alternatives (including a combination of alternatives) that meet water supply objectives and may be potentially less damaging than the proposed action.

Less environmentally damaging alternative water supplies potentially available to the applicant should focus on water supply methods that are both cost effective and prevent chronically low flows or dewatering from critical water resources supporting both ecological and recreational values in the Colorado River Basin. Agricultural transfers, both temporary and permanent, may be available to the applicant for water supply in both basins, and may be less damaging to the aquatic environments affected by this project. All action alternatives evaluated in the DEIS are limited to existing junior water rights – water rights that by definition are the last in time, last in line, and typically require larger storage projects due to low reliability and yield requirements for consecutive years. Acquisition of more senior water rights may provide more flexibility and less adverse impacts to aquatic resources with proper management.

The alternatives identified above may provide diverse water supply opportunities, or potentially more reliable and efficient options for water supply for the Participants than the proposed project and should be critically explored. Because other potentially less damaging practicable alternatives were not adequately considered or evaluated in the DEIS, the Corps of Engineers needs to supplement the NEPA document, or further evaluate alternatives under the CWA Section 404 permit review process, to adequately demonstrate compliance with the Guidelines.

40 CFR §230.10(b) Water Quality Impacts

High potential exists for the WGFP to exacerbate existing water quality impairments in East Slope and West Slope water bodies. The DEIS predicts increased nutrient loading and consequent dissolved oxygen (D.O.) reductions to both East and West Slope rivers and reservoirs, several of which are already impaired. Carter Lake and Horsetooth Reservoir are on the State of Colorado's 2008 Clean Water Act Section 303(d) List of Water-Quality-Limited Segments as impaired for their Aquatic Life Use due to mercury bioaccumulation in fish tissue (associated with nutrient enrichment and reduced oxygen environments). In addition, Horsetooth Reservoir is listed for D.O. impairment. Granby Reservoir, Shadow Mountain Reservoir, and Grand Lake are all acknowledged as exceeding applicable water quality standards (WQS). Projected instream temperature increases are also a significant stressor to aquatic life, and a significant impact of the project. High temperature and nutrient levels (and consequent low D.O. levels) may lead to additional, more severe, or further impairments throughout these watersheds, which will be difficult to remedy through point source controls alone. Further, any worsening of these conditions increases the future required efforts and costs associated with remediation and restoration. The proposed action appears to have the potential to directly impact the assimilative capacity for high temperatures and nutrients in all of the downstream reservoirs and streams, exacerbating the difficult cleanup plans and wasteload allocations required in any forthcoming "Total Maximum Daily Loads" (TMDLs).

Please see our enclosed detailed comments on the DEIS submitted to BOR on December 19, 2008 (pages 12-18) regarding water quality concerns for additional information.

40 CFR §230.10(c) Significant Degradation

The project, as currently proposed, will likely cause or contribute to significant degradation of waters of the U.S. The impacts of greatest concern to the EPA include the potential for adverse changes to water quality, stream morphology and aquatic life following the removal of additional flows from the Colorado River due to this proposed action, as well as other major water diversion projects currently proposed in the upper Colorado River Basin. Additional wetland impacts resulting from reasonably foreseeable projected changes in land use, construction and development under the proposed action could result and thus should be evaluated and disclosed as cumulative impacts. A thorough analysis of these potential effects is necessary to gauge the overall proposed project impacts, to evaluate the availability of less damaging practicable alternatives and to determine the feasibility and appropriateness of mitigation.

Determination of cumulative effects on the aquatic ecosystem

The DEIS states that the project's direct and secondary impacts to stream morphology, water quality and aquatic life as minor, and that cumulative effects are similar to, or slightly greater than the direct and secondary effects. EPA believes that the impacts of this project, in combination with past and reasonably foreseeable actions, are significant and unacceptable to an aquatic resource of national importance. It is likely that the proposed project will have serious adverse effects on aquatic ecosystem diversity, productivity and stability of the Colorado River which are not analyzed sufficiently in the DEIS.

According to the DEIS, the WGFP will result in flow reductions to the upper Colorado River, the majority of which are projected to occur between May and August. From this project alone, the Colorado River average annual flow below the Windy Gap diversion is estimated to decrease by 14% from existing conditions under the action alternatives. Other projects analyzed in the cumulative effects portion of the DEIS, in combination with Windy Gap, are estimated to reduce the Colorado River annual average flow below the Windy Gap diversion by 21% in a wet year (1% in a dry year). EPA has significant concerns with the reduction in flows to the Colorado River below Windy Gap (as well as at other points on the Colorado River, listed on Table 3-16, DEIS p. 3-45) associated with the action alternatives and cumulative impacts.

It is important to note that the DEIS states that average annual stream flow in the Colorado River at Hot Sulphur Springs (approximately 10 miles below WGP) declined from 486,209 AF in 1905-1949 to 175,264 AF in 1950-1994 (see DEIS p. 3-7), a decline in average annual stream flow of 64% due, in part, to historical diversions from the Moffat Collection System (Moffat), Colorado-Big Thompson Project (C-BT) and Windy Gap Project diversions. Thus, this project, in combination with other reasonably foreseeable future actions, including additional diversions proposed with the Moffat expansion, will remove an additional 21% of the remaining 36% of the average annual flow, leading to further incremental and adverse impacts to the river from manmade diversions.

Existing remnant peak flow conditions on the Colorado River are very different from historical conditions (Figure 1, Table 1), due in large part to the cumulative effect of numerous water diversion projects including the C-BT, Moffat, WGP and other water development in the basin. EPA is concerned that further proposed reductions to the existing hydrograph from additional water diversion (the proposed and future projects) will reduce the resiliency of the aquatic ecosystem and place it at a much higher risk of substantial and irreversible changes to the aquatic community.

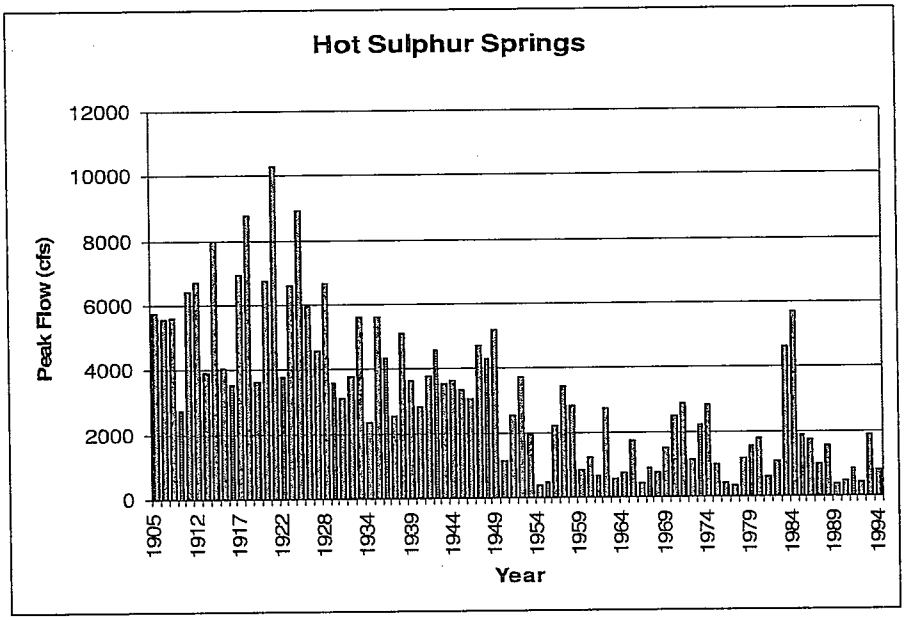


Figure 1: Instantaneous peak flows from the USGS gage at Hot Sulphur Springs from 1904-1994. The study period for WGFP hydrologic analyses began in 1950.

Table 1: Instantaneous peak flow return intervals from USGS gage at Hot Sulphur Springs for 1904-1949 and 1950-1994 calculated by EPA using a Log-Pearson Type III Distribution. Flow is displayed in cubic feet per second (cfs).

Return Interval (years)	1905-1949 Flow (cfs[1])	1950-1994 Flow (cfs)
2	4,629	1,232
5	6,302	2,297
10	7,440	3,176
25	8,909	4,483
50	10,026	5,598
100	11,166	6,831
200	12,334	8,199

This project's impacts to the Colorado River, coupled with other reasonably foreseeable actions, will have significant and unacceptable adverse effects on the aquatic ecosystem, and therefore critical attention must be given to the cumulative impacts of water diversions on the Upper Colorado River. Although the impact of a particular discharge may constitute a minor change in itself, the cumulative effect of numerous such piecemeal changes can result in a major impairment of the water resources and interfere with the productivity and water quality of existing aquatic ecosystems (40 CFR 230.11(g)).

Furthermore, EPA is concerned that the cumulative effects analysis did not consider the potential for threshold (non-linear) responses within the Colorado River. Nor did the cumulative effects analysis address the potential impacts of climate change in a meaningful way. The impacts of the project are exacerbating current hydrologic conditions associated with the operation of diversion within the Upper Colorado Basin. Additional incremental or piecemeal impacts of proposed diversions towards a reduced hydrograph with altered timing of flows increases the likelihood for the aquatic ecosystem to approach a threshold point, or tipping point, beyond which the ecosystem may exhibit dramatic and unacceptable changes, potentially including loss of native fish species. Also, it is reasonably foreseeable that with projected climate change, minimum stream flows supporting less aquatic habitat and productivity will occur much more often than occur now. Climate change, coupled with the reduced hydrograph due to water diversions, will likely cause and contribute to significant adverse impacts to the portions of the upper Colorado River impacted by this project.

The DEIS does not provide adequate information to assess the severity of cumulative impacts on a larger scale. A broader cumulative impact analysis is necessary to assess the long-term cumulative impacts and uncertainty associated with all major water diversions in the upper Colorado Basin, as well as the potential for threshold responses and uncertainty associated with projected climate change. EPA believes at a minimum, the applicant should provide a cumulative effect analysis that addresses the collective effects of major water diversions (past, present and reasonably foreseeable) in the upper Colorado Basin, including C-BT, Moffat and Windy Gap, and also models the impacts of a scenario where flows are reduced substantially due to climate change. EPA is willing to work with BOR, the Corps and the applicant to identify the appropriate scope and methodology for a cumulative impacts analysis to adequately determine and disclose the projects' cumulative adverse impacts for consideration of compliance with the Section 404(b)(1) Guidelines.

Stream Morphology/Aquatic Life Concerns

The DEIS states that flushing flows in the Colorado River, equal to or greater than 450 cfs, occur about 45 days in an average year and 103 days in a wet year per year under existing conditions (see DEIS p. ES-11). Under the proposed action, these flushing flows would occur only 36 days in an average year (35 days for the other action alternatives) and only 93 days in a wet year for all action alternatives (see DEIS Table 3-22) (20% and 9% reductions respectively). In addition, stream morphology impacts were assessed by comparing the frequency of bankfull discharge (equal to or greater than 1,240 cfs at Hot Sulphur Springs) under existing and proposed conditions and by comparing changes in the range of channel maintenance flows. The DEIS

states that the frequency of flushing flows and bankfull discharge would remain adequate to transport sediment and prevent deposition, and therefore no mitigation for stream morphology impacts is proposed. Furthermore, the DEIS states that the differences in channel maintenance flows would be small and unlikely to measurably alter channel morphology or sediment movement. EPA is concerned that these analyses do not adequately characterize potential significant adverse impacts to the stream morphology and associated ecological communities of the Colorado River.

The DEIS states that channel maintenance flows are the flows considered necessary to maintain the physical characteristics of a stream channel and provide benefits to the stream ecosystem by conveying water and eroded materials, preventing vegetation establishment in the channel, sustaining aquatic ecosystems, temporarily storing flood flows on the floodplain, and maintaining healthy streambank and floodplain vegetation (see DEIS 3-60). The DEIS presents an analysis of channel maintenance flows consistent with the Schmidt and Potyondy (2004) methodology. EPA is concerned that this methodology has been inappropriately applied to assess changes in channel maintenance flows from the proposed project. According to Schmidt and Potyondy (2004), "(t)he approach is appropriate for quantifying channel maintenance flows on perennial, ***unregulated***, snowmelt-dominated, gravel-bed streams with alluvial reaches" (emphasis added). As stated in the DEIS and illustrated in Figure 1 and Table 1 of this letter, the flow regime under existing conditions is already substantially altered through regulated water diversions in the basin. For example, the peak flow with a return period of 25-years in the period of record from 1904 to 1949 has, under existing conditions, increased to a return interval of 200 years so this peak flow is much less frequent(see Table 1 above). Both the magnitude and frequency of flow events are substantially altered compared with unregulated conditions on the Colorado River, and as such, applying this methodology likely significantly understates the potential impacts to stream morphology from this proposed project.

As stated in the Water Resources Technical Report to the DEIS, the frequency, magnitude and duration of flow events affects channel dynamics. In snowmelt dominated systems like the Colorado River, much of the work on the channel is done by the spring snowmelt peak flows, where channel geometry and complexity respond to these dominant, or bankfull discharges of water and sediment. The river stage associated with bankfull discharge is considered to be the point at which the river begins geomorphic "work" on the entire channel system, and higher flows extend the duration and magnitude of this work. The additional withdrawal of flows from the Colorado River due to the proposed project will likely cause bankfull stage and flow to be reached less frequently, resulting in less capacity within the river system to maintain adequate conditions for aquatic ecosystem integrity (e.g., temperature, D.O., channel habitat, back-water areas for juvenile amphibians, fish, endangered species, etc.).

The diversion of water from the Colorado River to meet water supply needs will further adversely impact the natural hydrology downstream of the diversion point, thus affecting the aquatic ecosystem downstream. Diversion of the snowmelt peak flows in wet and average years will reduce the frequency of medium and high flow events, which will likely, in turn, affect stream morphology, instream water quality, the physical habitat of downstream aquatic communities, food web structure, spawning, egg hatching, migration cues for fish, and the ability

for riparian species recruitment and inundation of backwater and floodplain habitats. To truly understand what the diversion will mean for the aquatic ecosystem and hydrology downstream of the diversion point, EPA suggests that the following analyses be performed:

- Establish/characterize the relationship between bankfull discharge and river stage at monitored points, e.g., at two gauged points downstream from the withdrawal point on the Colorado River;
- Model the stage of the river and projected effects of the project alternatives on stage at these gage locations;
- Document the current pattern of river stages and consequent (existing) habitat availability, temperature and D.O. levels. Then model, with the expected decreases in flow and resultant decreases in river stage, the change in frequency that stream temperature and D.O. meet (or conversely exceed) water quality criteria and that physical habitat parameters are maintained;
- Assess the potential for threshold responses of the aquatic community.

These analyses should be done both within the context of the direct and secondary impacts of this project as well as cumulative impacts of this and other reasonably foreseeable actions (e.g., Moffat Collection System Project and climate change).

Project-induced changes in flow characteristics will likely impact aquatic life in the upper Colorado River Basin ecosystems due to changes in aquatic habitat, including changes in stream morphology and water quality. In the DEIS, impacts to aquatic life were concluded to be minor, or in some cases beneficial. However, the analysis did not adequately consider potential impacts to aquatic communities due to changes in water quality or physical habitat. Increased nutrient loading, reductions in D.O. and instream temperature increases are all impacts disclosed in the DEIS, and may result in an inability to support aquatic life use standards due to expected changes in ambient environmental conditions. Changes in these conditions can influence the abundance and distribution of native and sport fish, macroinvertebrate and algal communities, and will likely lead to a community dominated by species tolerant of degraded water conditions.

The DEIS states that project-induced changes to channel morphology and sediment movement are minor. However, the DEIS analyses do not adequately characterize potential impacts to the stream morphology and associated ecological communities of the Colorado River. Spawning site availability for fish, habitat heterogeneity (e.g., riffle and pool complexes) and refugia for aquatic macroinvertebrates is largely influenced by changes in substrate characteristics and channel complexity associated with the timing, frequency and magnitude of flow events. Furthermore, peak flows that mobilize and transport medium sized sediments (sands and gravels) abrade periphyton assemblages from larger substrates, and loss of this abrasive ability with reduced flows will facilitate periphyton growth and survival and alter the algal and macroinvertebrate assemblages. It is important to note that project-induced reductions in habitat availability are based upon existing conditions, which represent a substantially altered and regulated flow regime. Further, piecemeal impacts due to this project and other reasonably foreseeable actions have the potential to significantly and permanently reduce the quality of habitat for aquatic communities. EPA recommends that a more complete analysis of impacts to

aquatic resources be conducted, including a meaningful integration of water quality and stream morphology impacts. Ecological modeling and analyses should be conducted using a daily time-step, instead of the DEIS's monthly time-step that may mask discharge values that occur for only a few days within any given month.

Reasonably-foreseeable development impacts

The DEIS fails to evaluate cumulative impacts to wetlands and other waters resulting from reasonably foreseeable growth inducing effects from the proposed action. Firming of Windy Gap water will likely provide more reliable water supply to both the Front Range communities and the West Slope Participants. This proposed water supply will affect future development growth rates, population density and changes in land use patterns. These potentially significant cumulative effects from land development and construction should be evaluated and disclosed to determine the potential adverse impacts to wetlands and other waters and not just related to development near the proposed reservoirs. An analysis similar to the one used in the Northern Integrated Supply Project DEIS should be used to calculate cumulative adverse impacts to wetland acreages resulting from construction and development in a broader study area. However, it should not be assumed that Clean Water Act Section 404 permits including mitigation will be required for all reasonably foreseeable development impacts because certain wetlands and other waterbodies in Colorado do not require permits or mitigation due to their locations on the landscape.

40 CFR § 230.10(d) Mitigation:

Compliance with the Guidelines requires a determination of no significant degradation to waters of the United States, including the biological, physical and chemical characteristics of the aquatic ecosystem and human use characteristics (e.g., recreational and commercial fisheries, water-related recreation and aesthetics). EPA recognizes that compensatory mitigation may allow an applicant to reduce the impacts below the threshold of significance; however, an adequate characterization of the impacts is required to apply an appropriate level of mitigation. Although the DEIS states that effects to the water quality, aquatic resources and stream morphology of the proposed action are minor, EPA believes that these effects, while stated to be minor, have the potential to be significant, and monitoring and mitigation measures should be disclosed and required for unavoidable impacts to waters of the United States.

The DEIS acknowledges the importance of bankfull and channel maintenance flows in the DEIS. EPA suggests that BOR address a minimum mitigation that is equivalent to that flow volume (e.g., 1,240 cfs for bankfull discharge) instead of the 450 cfs of the existing mitigation.

Pursuant to 33 CFR §332.4 and 40 CFR §230.94, *Compensatory Mitigation for Losses of Aquatic Resources*, a compensatory mitigation plan must be submitted and approved by the Corps before the District Engineer can issue an Individual CWA Section 404 permit. This plan must address a number of critical details regarding the mitigation project including: clearly articulated project goals and objectives; project site selection criteria; site protection instruments (e.g., conservation easements); detailed quantitative and qualitative baseline information

describing both the impact and compensation sites; a detailed discussion of the mitigation project's credit determination methodology and results; a maintenance plan; ecological performance standards used to evaluate the degree to which the compensation projects are replacing lost functions and area; detailed monitoring requirements; a long-term management plan describing necessary long-term stewardship of the compensation sites and who is responsible for performing this stewardship; an adaptive management plan; and financial assurances to ensure project construction, implementation, and long-term management.

Aquatic Resource of National Importance

The upper Colorado River is an aquatic resource of national importance (ARNI). The upper Colorado River provides a valuable habitat for many aquatic organisms and supports four federally listed fish species further downstream. In addition, the upper Colorado River is a valuable commercial and recreational resource, providing significant economic benefits to Colorado's western slope communities. Segments of the Colorado River downstream of the Windy Gap diversion are moderate to steep gradient and are characterized by riffle and pool complexes, special aquatic sites under the Guidelines (40 CFR 230.45). Wetlands comprise approximately 1-2% of the arid landscape in Colorado. Over the last two centuries, Colorado has lost an estimated 50% of its wetlands. The riparian wetland complexes associated with the upper Colorado River, which are also special aquatic sites under the Guidelines, (40CFR 230.41) therefore provide a rare and unique habitat.

The Colorado River has a drainage area of 642,000 km^2, covering nearly 8% of the United States, including parts of Colorado, Wyoming, Utah, New Mexico, Arizona, Nevada and California. Beginning in the high mountains of Colorado and Wyoming and flowing through the intermountain plateaus of the American Southwest to its confluence with the Gulf of California, the Colorado River is the seventh longest river corridor and has the seventh largest drainage area in North America. For purposes of water allocation, the Colorado River is divided into the upper and lower basins at the confluence with the Paria River near Lees Ferry, Arizona (Cushing and Benke 2005).

The Colorado River Basin is one of the most regulated rivers in the world, with over 40 flow regulation structures, 4 large mainstem reservoirs and numerous diversions. It is estimated that 64% of the runoff from the Colorado River system is used for irrigation and an additional 32% is lost through reservoir evaporation (Dynesius & Nilsson 1994). Because of water scarcity throughout the western U.S., 40% of the virgin annual discharge of the Colorado River is diverted out of the basin (Dynesius & Nilsson 1994). For example, the C-BT project diverts a substantial volume (over 370 million m^3/year) from the upper Colorado River across the Continental Divide to Colorado's eastern slope communities of the Mississippi River drainage (Cushing and Benke 2005). The Windy Gap Project and proposed Windy Gap Firming Project utilize C-BT infrastructure to divert additional flows from the upper Colorado River to the other side of the Continental Divide (i.e., transbasin diversion).

The upper Colorado River headwaters are located primarily in Grand County, Colorado, and the mainstem flows originate in the alpine meadows of Rocky Mountain National Park. The upper Colorado River and its tributaries experience widely variable seasonal fluctuations in flows, with the largest flows resulting from snowmelt. Approximately 75% of the total annual flow occurs during the spring and early summer runoff period of May through mid-July. Average daily flow and instantaneous peak flows (see Table 1 and Figure 1) in the upper Colorado River have decreased since about 1950 as the result of the C-BT project, the Moffat Collection System, the Windy Gap Project, and other water development in the basin.

The geology of the upper Colorado River from Granby Reservoir to Gore Canyon is variable and relatively complex (ERO and Boyle 2006). In general, the width of the floodplain and the thickness of the alluvium are controlled by the bedrock geology. In reaches of the river that flow through areas of erosionally resistant bedrock units, the floodplain tends to be narrow, relatively straight, and contains little if any alluvium. In areas of less resistant bedrock geology, the floodplain is relatively wide, meandering, and contains significant thickness of alluvium. The Colorado River floodplain varies between ¼ to ½ mile wide, depending on the resistant bedrock units. Above 6,561 feet above mean sea level (amsl), riparian communities at consist of alder, dogwood, birch, elderberry, Rocky Mountain maple and willows. Between 5,905 feet amsl and 6,561 feet amsl, cottonwoods and willow dominate and the invasive salt-cedar is present (Cushing and Benke 2005).

In the Windy Gap Project area, the Fraser River is the largest tributary of the Colorado River above the Windy Gap Reservoir. Approximately 50% of the Fraser River headwater flows are diverted to the East Slope for Denver's use. Despite these significant diversions, the fishery below the Windy Gap dam is a State of Colorado designated Gold Medal Water which produces at least 60 pounds of trout/acre and at least 12 trout, 14 inches or longer per acre. This Gold Metal Water is a 20-mile reach of the Colorado River with a self sustaining brown trout population. The aquatic ecosystem in the Colorado river below WGP supports an extremely diverse fish assemblage for a cold water river (Email from Colorado Division of Wildlife to EPA on December 19, 2008). These fish species include: brown trout, rainbow trout, Colorado River cutthroat trout, cutthroat x rainbow trout hybrid, longnose, white, bluehead and flannelmouth suckers, hybrids of white and other suckers, mountain whitefish, speckled dace, mottled sculpin, Iowa darter, creek chub, and northern pike.

The lower reaches of the upper Colorado River Basin have historically supported 14 indigenous fish species. Four of these species are federally listed as endangered, including the bonytail chub, Colorado pikeminnow, humpback chub and razorback sucker. In 1988, the U.S. Fish and Wildlife Service established the Upper Colorado Endangered Fish Recovery Program, a partnership of public and private stakeholders working to balance recovery of these fish species with current and future water needs (http://www.fws.gov/coloradoriverrecovery/). Flow regulation and diversion in the Colorado River Basin have restricted fish to about 25% of their former range and have blocked some of the spawning migration routes of the Colorado pikeminnow and other species. In the upper Colorado River Basin, the remaining habitat has been changed considerably, with reduced access to riparian wetland and backwater habitats. Riparian wetlands have filled or been disconnected from the river by dikes, and many of the

river's backwater and floodplain habitats have disappeared. Within these wetland areas, juvenile native fish have higher growth rates due to the beneficial habitat conditions and ample food source.

The bonytail chub, considered by some scientists to be functionally extinct, was once one of the most abundant fish species in the basin, but now occurs in only a few locations. Current recovery efforts include reintroducing populations through stocking of the Colorado, Green and Yampa Rivers. Management of non-native species is another necessary step towards recovery (http://www.fws.gov/coloradoriverrecovery/).

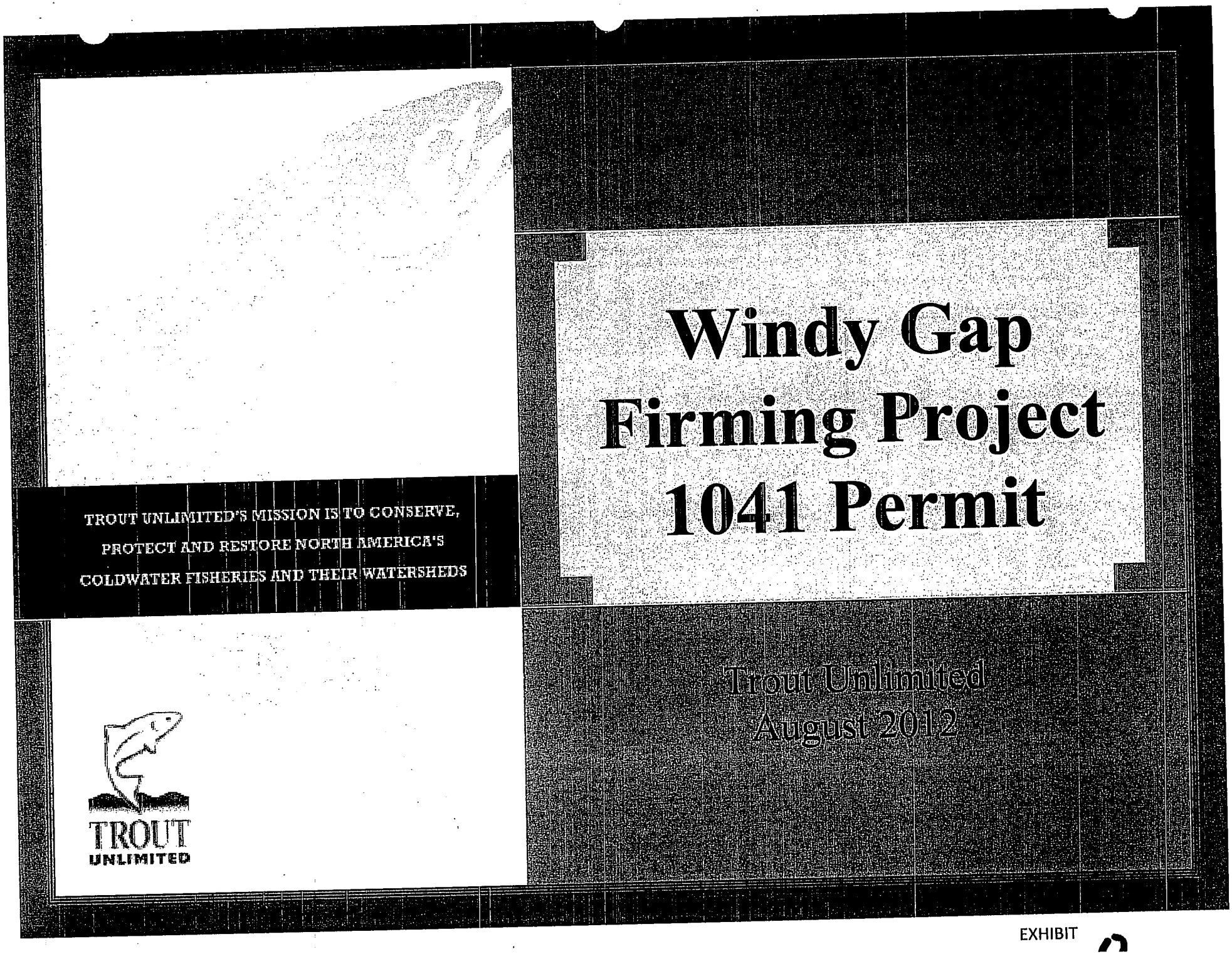
Dams and diversions restrict the distribution of Colorado pikeminnow, a large predatory and highly migratory fish species with a life span of 40 plus years. Currently, populations of the Colorado pikeminnow in the upper Colorado River Basin are relatively stable. In the Green River, evidence suggests that Colorado pikeminnow populations may be on the rise, largely because of operational changes of the Flaming Gorge Dam. Restoration efforts for the Colorado pikeminnow include establishing and maintaining more natural flow hydrographs by releasing more water to mimic spring snowmelt peak flows and stabilizing flows in late summer for juvenile fish. Also, efforts are being made to ensure that stocking of non-native fish does not conflict with endangered fish recovery and to build fish ladders around certain dams to allow endangered fish to migrate up and down the river (http://www.fws.gov/coloradoriverrecovery/).

The humpback chub, which lives primarily in canyons with swift currents, historically, inhabited canyons of the Colorado River and four of its tributaries, the Green, Yampa, White and Little Colorado Rivers. Currently, two small but stable populations remain at Westwater Canyon in Utah and Black Rocks, in Colorado. The largest known population is in the Little Colorado River in the Grand Canyon, where there may be up to 10,000 fish. No population estimates are available for the rest of the upper Colorado River Basin. Recovery efforts include establishing and protecting more natural spring snowmelt peak flows, monitoring fish population numbers and managing stocking of non-native fish to avoid conflict with endangered fish recovery (http://www.fws.gov/coloradoriverrecovery/).

The razorback sucker was once widespread throughout most of the Colorado River Basin, but in the upper Colorado River Basin, they are currently found in only the upper Green River, the lower Yampa River and occasionally in the Colorado River near Grand Junction. In the upper Colorado River Basin, it is estimated that approximately 500 adult suckers remain, most of which are thought to be greater than 25 years old. Current recovery efforts include releasing hatchery-raised razorbacks into the Colorado, Green, Gunnison and San Juan Rivers. Also, because these fish grow significantly faster in backwaters and wetlands than they do in the river channel, and these wetland habitats are necessary for the survival of young razorback suckers, efforts are currently underway to acquire access to riparian wetlands for these endangered fish. Management of non-native species is another necessary step towards recovery (http://www.fws.gov/coloradoriverrecovery/).

Current instream flow requirements include releases from Grandby Reservoir mandated by the 1961 Secretarial Decision Document that vary seasonally from 20 cubic feet per second (cfs) in September through April, 75 cfs in May through July and 40 cfs in August, and are flexible pending low flow predictions. In 1980, the Azure Settlement Agreement mandated instream flows on the Colorado River of 90 cfs from the Windy Gap diversion to the Williams Fork confluence, 135 cfs from the Williams Fork to Troublesome Creek confluence, 150 cfs from Troublesome Creek to the Blue River confluence. The agreement also mandates a flushing flow release from Windy Gap Reservoir of 450 cfs for 50 consecutive hours once every 3 years within the months of April, May or June. Those instream flows are needed to help maintain fish populations, the aquatic ecology, and geomorphology of the river. The proposed project will likely make it more difficult to maintain these flows with increased diversions.

The Colorado River (including segments downstream of the Windy Gap diversion) is intensively used by the public for recreational activities and represents a valuable commercial and recreational resource. Five segments of the Colorado River downstream of the Windy Gap diversion are currently being evaluated for designation under the Wild and Scenic Rivers Act as Recreational. The outstanding remarkable values of these five segments include: recreational (fishing, floatfishing, scenic driving and other recreation), wildlife, scenic, historic, geological, paleontological and cultural.



TROUT UNLIMITED'S MISSION IS TO CONSERVE, PROTECT AND RESTORE NORTH AMERICA'S COLDWATER FISHERIES AND THEIR WATERSHEDS

TROUT UNLIMITED

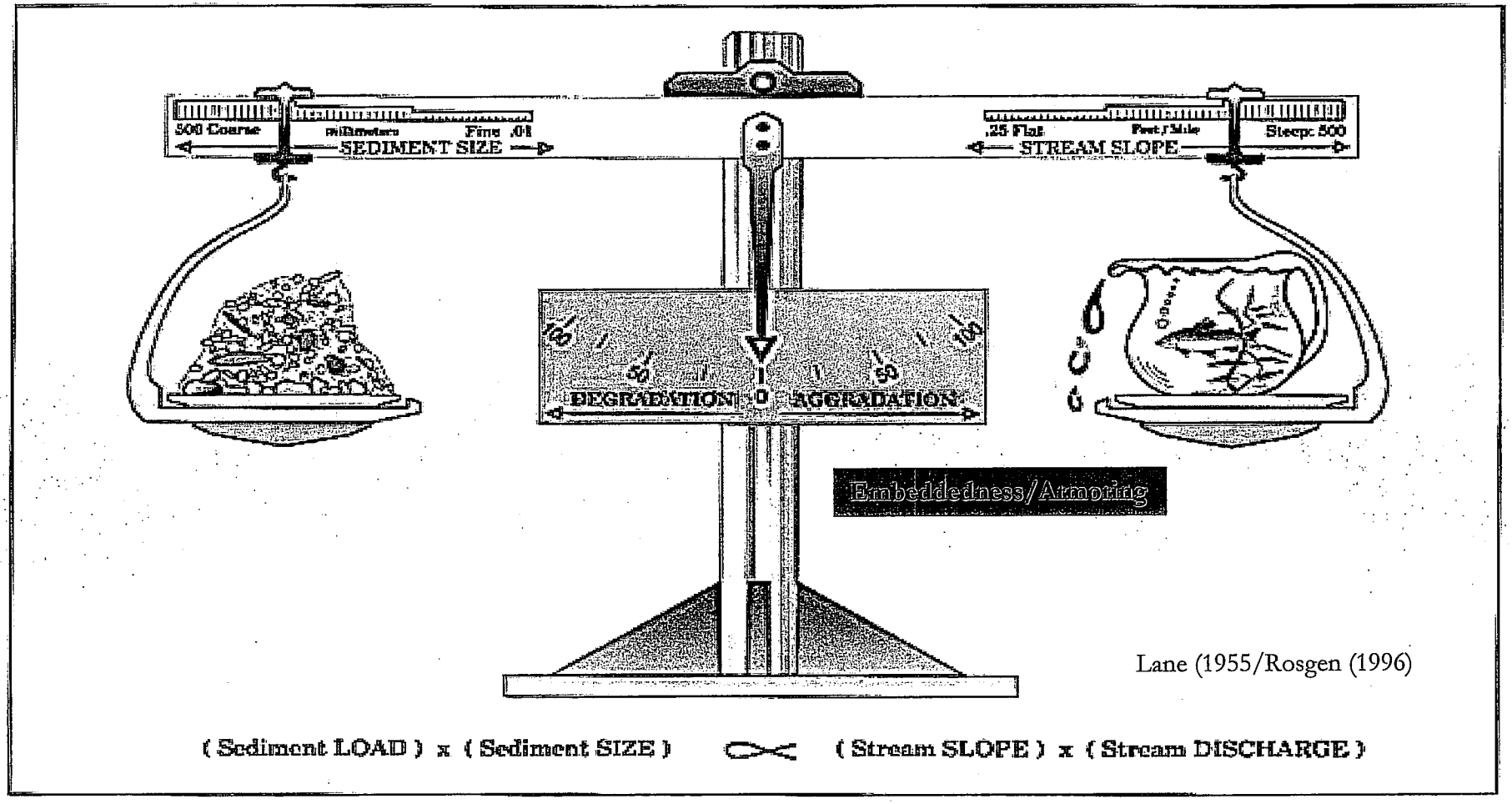
Windy Gap Firming Project 1041 Permit

Trout Unlimited

August 2012

EXHIBIT

The relationship between sediment and streamflow



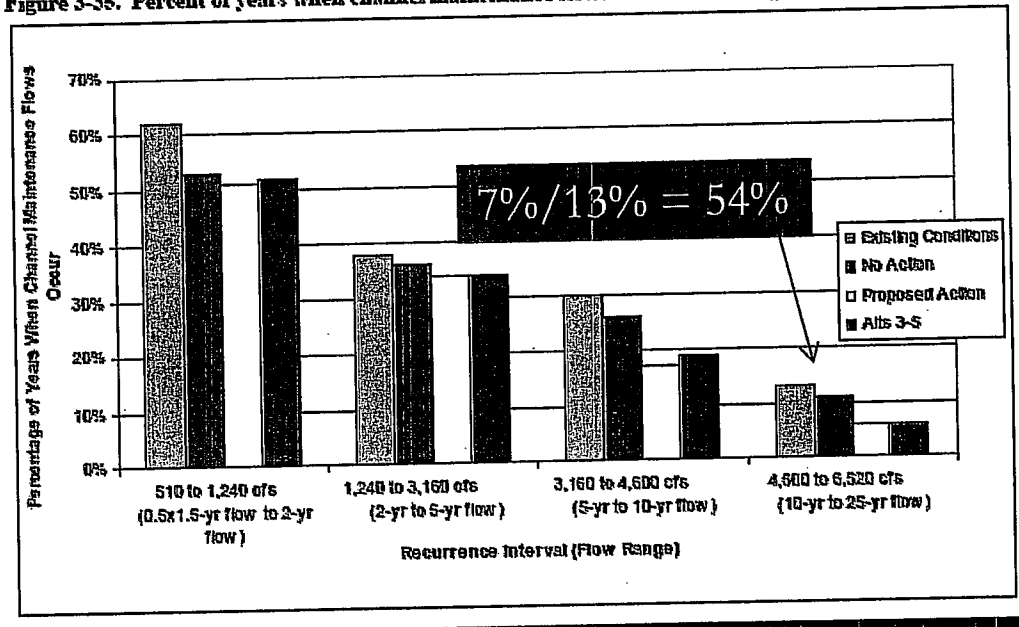
Lane (1955/Rosgen (1996)

Changes in Colorado River Channel Maintenance Flows at HSS (1950-1996

Recurrence Interval	Flow Range cfs	Percentage of Years Flow Range Occurs			
		Existing Conditions	No Action	Proposed Action	Alternatives 3-5
0.8x1.5-yr to 2-yr flow	510 to 1,240	62%	53%	51%	51-53%
2- to 5-yr flow	1,240 to 3,160	38%	36%	34%	34%
5- to 10-yr flow	3,160 to 4,600	30%	26%	17%	19%
10- to 25-yr flow	4,600 to 6,520	13%	11%	6%	6%

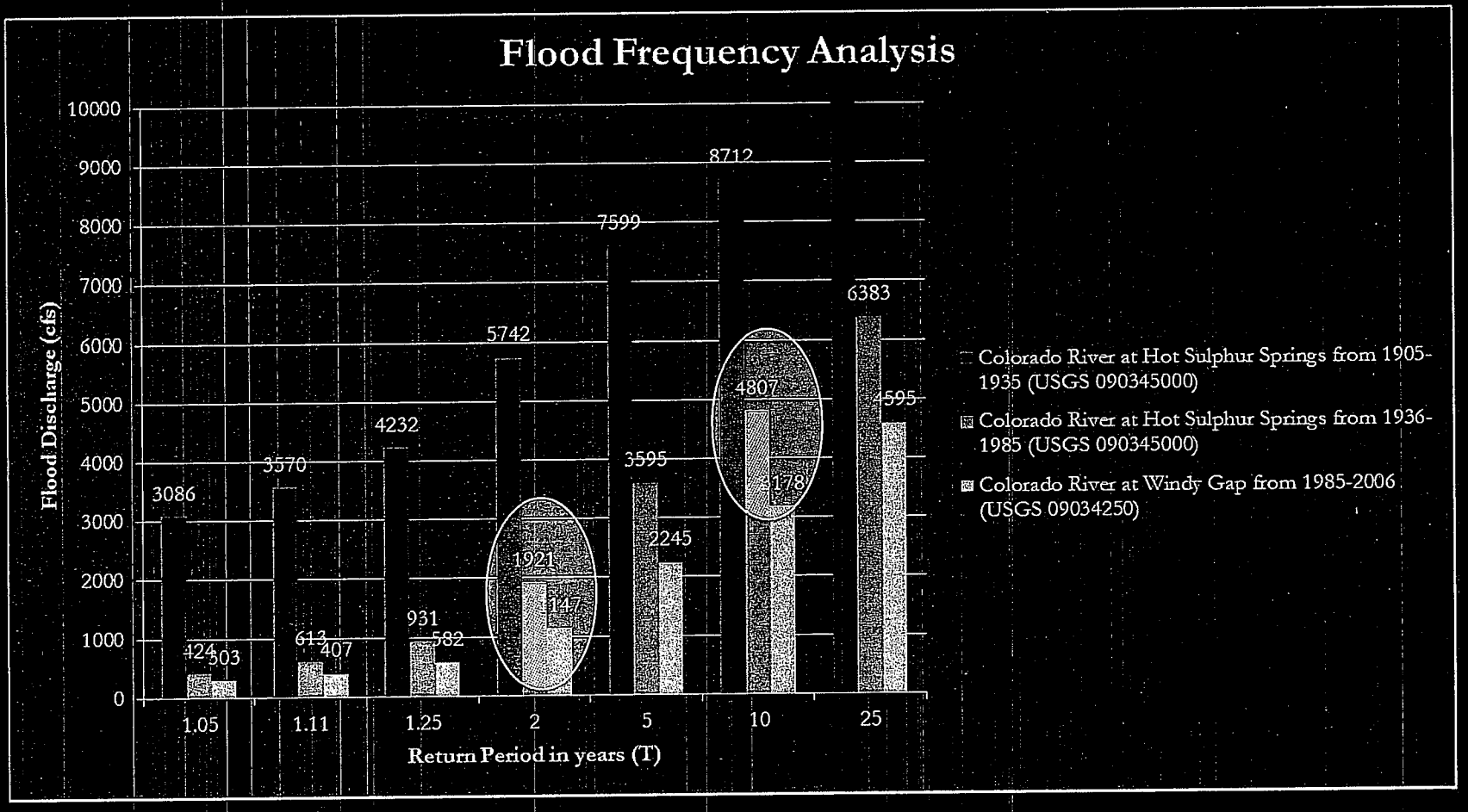
13%-6% = 7%

Figure 3-35. Percent of years when channel maintenance flows occur at Hot Sulphur Springs.



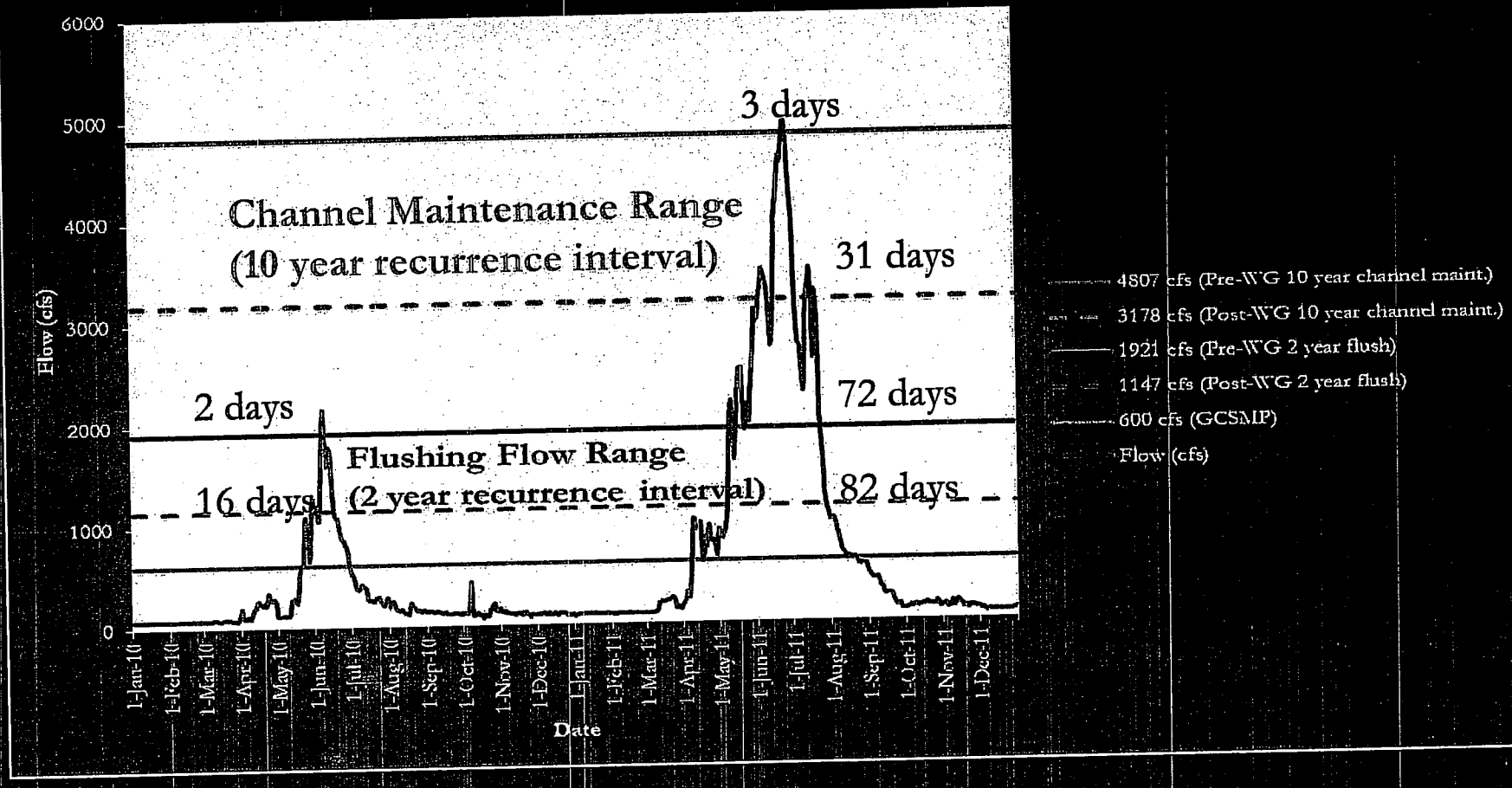
- The Final EIS attempts to downplay the reduction in frequency of channel maintenance flows like the 10-25 year recurrence interval stating that these flows would "occur about 7% less" under the action alternative.
- EPA countered this statement saying "Peak flows needed for channel maintenance…will occur 44-54% fewer years under the proposed action compared to existing conditions below Windy Gap Diversion. This represents a relatively significant change considering the naturally low frequency of these events."

Grand County Stream Management Plan



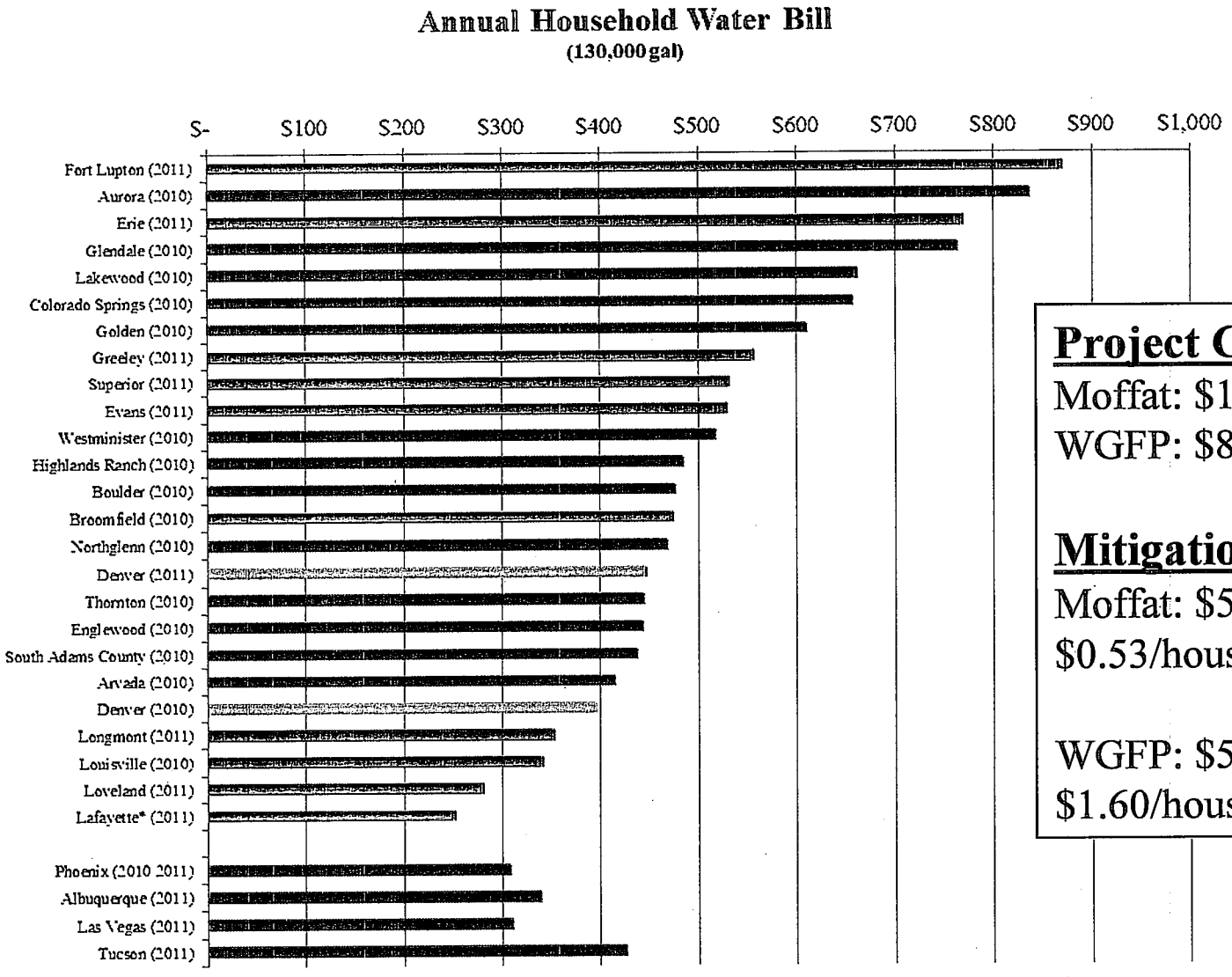
- Flushing Flows (fine sediment) generally recur every 2 years
  - Pre-Windy Gap = 1,921 cfs; Post-Windy Gap = 1,147 cfs
- Channel Maintenance Flows (larger cobble) generally recur every 10 years
  - Pre-Windy Gap = 4,807 cfs; Post Windy Gap =3,178 cfs

2010 and 2011 Flows at Colorado River at Windy Gap (USGS 09034250)



- Pre-WG Channel Maintenance Flow (4807 cfs) was available for 3 days in 2011
- Post-WG Channel Maintenance Flow (3178 cfs) was available for 31 days in 2011.
- Pre-WG Flushing Flow (1921 cfs) was available for 2 days in 2010 and 72 days in 2011.
- Post-WG Flushing Flow (1147 cfs) was available for 16 days in 2010 and 82 days in 2011.

Impact of Mitigation on Water Rates



Project Costs

Moffat: $15/household/yr

WGFP: $87/household/yr

Mitigation Costs

Moffat: $5,000,000 → $0.53/household/yr

WGFP: $5,000,000 → $1.60/household/yr

Impact of Mitigation on Tap Fees

	Project Costs	Mitigation Costs ($5,000,000 each project)
Denver Water	$3,595/tap	$129
WGFP Participants	$2,979/tap	$67

1041 Terms and Conditions
Trout Unlimited

- Construction of the bypass
  - Prefer UCRA's language
- Pumping reduced to allow adequate flush
  - Permit delayed pending study, or
  - Permit requires study w/stakeholder input, when completed incorporated into permit
  - TU proposed flow ranges adjusted after bypass / channel work benefits
  - Prefer SECOND option but if flow ## to be included, third option rather than 600 cfs known to be inadequate
- Pumping reduced if near temp stds – NWCOG but exempted only if Subdist shows doesn't cause **or contribute to violation**
- Biological monitoring