



April 21, 2014

Ms. Sharon McHale
Project Manager
U.S. Bureau of Reclamation
2800 Cottage Way
Sacramento, CA 95825-1893
Via Email: smchale@usbr.gov

**Re: Upper San Joaquin River Basin Storage Investigation
Draft Feasibility Report**

Dear Ms. McHale:

Thank you for soliciting public comments in response to the Upper San Joaquin River Basin Storage Investigation Draft Feasibility Report (the Report), published by the U.S. Bureau of Reclamation (Reclamation) and dated January 2014.

These Friends of the River comments are in addition to joint comments submitted separately in response to this Report by the Natural Resources Defense Council and Friends of the River. The joint comments are hereby incorporated by reference.

The focus of the Report is on the proposed Temperance Flat Dam (TFD), which would be constructed on the San Joaquin River Gorge upstream of the existing Friant Dam and Millerton Reservoir. As described in the report, the TFD would be 665 feet high, with a storage capacity of more than 1.3 million acre feet of water. Despite its size, the dam would produce a paltry 76,000 acre-feet of water annually for use by downstream farms and cities. Reclamation claims that the TFD would also provide significant ecosystem and emergency water supply benefits. Reclamation estimates that the dam would cost nearly \$2.6 billion to build and incur annual operating costs of up to \$121 million.

To place the TFD in perspective, other existing dams of similar heights in California, including Oroville, New Bullards Bar, New Melones, and Shasta, produce far more water. The TFD's average additional water supply contribution of 76,000 acre feet represents about 1% of what the Central Valley Project currently delivers annually on average and about 4% of the amount of water historically being over-drafted annually from San Joaquin Valley groundwater basins. A private investor would

never consider building this extremely marginal dam project. It is only feasible as a public project with highly inflated and entirely speculative non-water supply benefits.

The importance of providing the public and government decision makers accurate information concerning the economic feasibility and cost of constructing and operating the TFD cannot be understated. Federal and state agencies have adopted a beneficiary pays protocol in regard to large water infrastructure projects like the TFD and correctly identifying the real costs and benefits of such projects is crucial to a sound decision-making process. Congress is currently considering legislation to authorize the TFD, and the California Legislature is currently considering legislation to revise a state-funded water bond that could help cover the public costs of the TFD. An accurate and factual feasibility report is essential to ensuring that prospective legislation is truly in the public interest.

Friends of the River commissioned Dr. Jeffrey Michael, Associate Professor of the Eberhardt School of Business and Director of the Business Forecasting Center at the University of the Pacific (Stockton, CA) to conduct an economic analysis of the Report. His findings are attached (Review of Economic Benefits and Costs in the January 2014 Draft Upper San Joaquin River Storage Investigation Feasibility Report, April 15, 2014).

Dr. Michael found that the Report's conclusion that the TFD is economically justified and financially feasible is based on "extremely exaggerated" estimates of the TFD's hypothetical ecosystem and emergency water supply benefits. Dr. Michael concludes that the proposed TFD will provide little or no economic benefits in these categories and after making reasonable adjustments to the largest benefit categories, the TFD has a benefit-cost ratio below one and is not economically justified.

Below is a summary of Dr. Michael's key findings and conclusions.

Ecosystem Benefits –

The economic valuation of ecosystem benefits – particularly supposed benefits to salmon – is "deeply flawed" and reasonable adjustments to this one category of benefits would result in a benefit-cost ratio of less than one.

The maximum plausible value for ecosystem benefits is \$7 million annually (compared to the Bureau's postulated \$75.6 million in benefits under Alternative 4), and a strong case can be made for zero benefits.

The salmon benefits of the project should be valued as the costs of reasonable alternatives that would achieve comparable increases in salmon abundance and/or

reductions in water temperatures in the San Joaquin River in the absence of a the new dam.¹

The benefits transfer approach used for valuing ecological benefits overstates benefits by choosing a single study of a non-comparable scenario on the Klamath River and incorrectly scaling the benefits to cold water benefits from Temperance Flat.

The feasibility study ignores the ecosystem loss from permanently inundating habitat with the new dam.

Emergency Water Supply Benefits –

Emergency water supply benefits – the second largest category of benefits – are “grossly overstated” and a strong argument can be made that these benefits are zero due to other actions that are likely to be taken to reduce the risk of loss of water exports and supply.

The no-action scenario incorrectly ignores hundreds of millions of dollars in levee improvements (in the Delta) that have already been implemented, as well as likely future actions to improve levees or build tunnel conveyance under the Delta to reduce the risk.

Recent Bay-Delta Conservation Plan (BDCP) studies of the emergency water supply benefits of the proposed Delta tunnels show much smaller benefits. Simply scaling the estimated emergency water supply benefits to be proportional to similar assessments in the BDCP would reduce this benefit by 90%, from roughly \$25 billion to less than \$4 million annually. Thus, the maximum plausible value for this benefit is \$4 million.

Delta Risk Management Strategy (DRMS) data on levees from the California Department of Water Resources is outdated and inaccurate, and the flood probability predicted by DRMS have been repeatedly criticized as overstated.

Costs allocated to emergency water supply benefits should be allocated to water users, not the state or the general public.

The opportunity cost of using the water for emergency purposes does not appear to be accounted for in the study. TFD water will be unavailable for ecosystem and other uses if it is used as an emergency supply.

¹ Dr. Michael suggests comparing the costs of supposed TFD salmon benefits with the cost and benefits of building a temperature control device on Friant Dam. The joint NRDC/FOR comments note that isolating gravel pits, restoring riparian habitat, and fully funding and implementing other key San Joaquin River Restoration Project actions will improve conditions for salmon more than the TFD. Both options cost considerably less and provide more ecosystem benefits than the TFD.

Agricultural Water Supply Benefits –

The Report uses an unconventional approach to valuing agricultural water supply benefits that greatly inflates the value of agricultural water and is at odds with other studies that values agricultural water reliability with the same models.

The vast majority of National Economic Development benefits associated with the very modest amount of additional agricultural water provided by the TFD are not the result of increased crop production but are the result of an entirely hypothetical decrease in groundwater pumping, the regulation of which to date has eluded state policy makers.

Exaggerated Need For Water –

The feasibility study greatly exaggerates the purpose and need for Temperance Flat dam by relying on outdated and exaggerated predictions of water supply shortages, water demand, and projected population growth from the 2005 California Water Plan Update.

Discount Rate –

The combination of a 100-year life span for dam benefits and relatively low 3.75% discount rate are generous assumptions that support building the TFD. There is considerable uncertainty surrounding many of the TFD's alleged benefits, which would make a higher discount rate appropriate.

Conclusion –

After adjusting the highest three categories of benefits (ecosystem, emergency water supply, and agricultural water supply) to their maximum reasonable values, the benefits of the TFD drops from \$141-\$157 million annually to \$52.5 million annually and the benefit-cost ratio drops from 1.21-1.35 to .045. The results would be even worse if the considerable ecosystem costs to the flooded area were included.

In addition to Dr. Michael's findings and the issues raised in the joint comments submitted by NRDC and FOR, below are some additional comments on the Report.

The San Joaquin River Gorge – A Recommended Wild & Scenic River

The TFD reservoir would flood the San Joaquin River Gorge, an area made up largely of public land managed by the Bureau of Land Management (BLM) for public recreation and preservation of wildlife habitat, botanical resources, and cultural values.

According to the BLM, the San Joaquin River Gorge is an exemplary example of a low elevation (2,000 feet) major drainage originating from the southern Sierra Nevada. The BLM found 10.75 miles of the San Joaquin River Gorge between Kerkhoff Dam and Millerton Reservoir to be eligible for National Wild & Scenic River protection.

To protect the river's outstandingly remarkable scenic, wildlife, and cultural values, the BLM has made a preliminary recommendation to Congress that 5.4 miles of the upper segment of the river (from Kerkhoff Dam to the upper Kerkhoff powerhouse) be protected in the National Wild & Scenic Rivers System.² This makes the San Joaquin River Gorge a very special river. Only about 6% (by mileage) of California rivers are eligible for or protected in the National Wild & Scenic Rivers System and only about 1% of American rivers are protected in the System.

The Report at least acknowledges the special status of the San Joaquin River Gorge with this somewhat tortured statement:

BLM concluded a preliminary determination to suggest that the San Joaquin River segment from Kerckhoff Dam to Kerckhoff Powerhouse is suitable for inclusion in the NWSRS. (Report pg. 6-35)

According to the BLM Manual for Wild & Scenic Rivers Policy and Program Direction (Chapter 6400, July 13, 2012), the agency has made a preliminary recommendation for Wild & Scenic River protection that will move up through the BLM chain of command to the Interior Secretary, who then transmits the recommendation to Congress. In the meantime, the BLM is required to protect the free flowing condition and outstandingly remarkable values of the suitable river, "...which will not be altered by the construction or development of stream impoundments, diversions, or other water resources projects." (BLM Manual, Chap. 6400, pg. 3-8)

Reclamation considers the BLM's Wild & Scenic River protection recommendation for the San Joaquin River Gorge to be an unresolved issue "...that will need to be addressed and resolved...during upcoming phases of the Investigation."

In fact, there is an unambiguous national policy requirement that must be addressed in Reclamation's Investigation of the TFD and the BLM's study and recommendation for Wild & Scenic River protection for the San Joaquin River Gorge. In establishing the National Wild & Scenic Rivers System in 1968, Congress declared:

...that certain selected rivers of the Nation which, with their immediate environments, possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values, shall be preserved in free-flowing condition, and that they and their immediate environments shall be protected for the

² Bakersfield BLM Proposed Resource Management Plan & FEIS, Vol. 1, pg. 95, USDI BLM, August 2012.

benefit and enjoyment of present and future generations. (16 USC Sec. 1271)

Congress further declared:

...that the established national policy of dam and other construction at appropriate sections of the rivers of the United States needs to be complemented by a policy that would preserve other selected rivers or sections thereof in their free-flowing condition to protect the water quality of such rivers and to fulfill other vital national conservation purposes.

To help fulfill this declared intent, Congress established a study process:

In all planning for the use and development of water and related land resources, consideration shall be given by all Federal agencies involved to potential national wild, scenic and recreational river areas, and *all river basin and project plan reports submitted to the Congress shall consider and discuss any such potentials*. The Secretary of the Interior and the Secretary of Agriculture shall make specific studies and investigations to determine which additional wild, scenic and recreational river areas within the United States *shall be evaluated in planning reports by all Federal agencies as potential alternative uses of the water and related land resources involved*. (16 USC Sec. 1276(d)(1))

The Wild & Scenic suitability is not an “unresolved issue” as characterized by Reclamation. USC Sec. 1276(d)(1) makes it clear that Wild & Scenic protection for the San Joaquin River Gorge is an alternative to the proposed TFD that must be considered by Reclamation in the Investigation and as a formal alternative in the upcoming Environmental Impact Statement.

Loss Of Ecosystem Benefits

The Report acknowledges that the TFD reservoir footprint will flood and therefore create long term, adverse, and unavoidable effects on riverine habitat, aquatic ecosystems, fisheries, biological resources (including botanical and wetlands), wildlife and wildlife habitat. (Report pg. 5-16, Table 5-10) But the Report fails to adequately quantify the ecosystem benefits that would be lost beneath the TFD reservoir. Many of the ecosystem benefits that would drown beneath the reservoir are unique or rare, which makes their quantification even more important in terms of providing a realistic benefit-cost assessment of the TFD.

According to the BLM, wildlife and the habitat that supports wildlife in the Gorge is one of the outstandingly remarkable values that make the river eligible for Wild & Scenic protection. The Gorge supports diverse habitats, including oak woodlands,

chaparral, and karst cave ecosystems that support common as well as threatened and endangered wildlife species. One state-listed endangered species (bald eagle) and one federally listed threatened species (vernal pool fairy shrimp) are known to occur in the area. The federally listed endangered valley elderberry longhorn beetle is likely to occur in the area. Several other listed species could also occur in the area, including the federally threatened California tiger salamander and the state listed and federally endangered least Bell's vireo. Seven additional BLM and state-listed special status species are known to occur within the area, with potential habitat for several more.

The Gorge also supports at least one state threatened plant species, the tree anemone. There is potential habitat for ten additional special status plant species, including the state federally listed Hartweg's golden sunburst, the state listed endangered and federally listed threatened San Joaquin Valley orcutt grass, the federally listed threatened Mariposa pussypaws, and the state listed endangered and federally listed threatened succulent owl's clover.

Little is known about the possible unique ecosystem values of the Millerton Cave. Unlike most karst caves, the Millerton Cave was carved out of granite by a running stream. It's likely that the cave may be home to many endemic species but surveys are needed to inventory its biological values.

The permanent loss of these rare and unique aspects of the Gorge ecosystems must be fully considered as a cost in the Report's assessment of ecosystem benefits.

Loss of Recreation and Scenic Benefits

Oddly, the Report claims a beneficial effect on recreation, perhaps because it focuses largely on reservoir-based recreation and fails to adequately quantify the non-reservoir based recreation benefits that would be lost beneath the reservoir footprint.

The San Joaquin River Gorge serves as a "community backyard" that is accessible year-round to well over 1,000,000 people in the Fresno-Clovis-Madera area, as well as local rural communities and is readily available for spending time in nature with families and friends, getting outdoor exercise and enjoying increased levels of personal fitness and wellness, and escaping workplace or school stress. Active management of these public lands enhances the quality of life for the local and regional communities by protecting cultural and natural resources, including watersheds that supply a large portion of the state's drinking water and offering easy access to recreation, health, fitness and open space opportunities.

According to the BLM, the scenic quality of the recreational setting in the Gorge is one of the outstandingly remarkable values that make the river eligible for Wild & Scenic protection. The entire Gorge area is available for a wide variety of outdoor recreational pursuits, including fishing, hiking, backpacking, swimming, camping,

nature study, mountain biking, and horseback riding. The lower segment of the Gorge is accessible by vehicle on a maintained paved road, with developed facilities that provide group and individual camping, trailheads, an equestrian staging area, and a small museum used for interpretive and environmental education programs.

The Gorge hosts 22 miles of hiking, equestrian, and mountain biking trails, including a segment of the San Joaquin River National Recreation Trail. The construction of trail bridges over the San Joaquin River and Big Sandy Creek substantially expanded access to the trail system. Access to the upper reaches of the Gorge is by primitive trail or kayak only. American Whitewater, the nationwide organization of whitewater boating enthusiasts, considers the Gorge to be a class II-V kayak run with outstanding scenery and interesting geology, with rock types not seen on other sections of the San Joaquin.

The BLM has a highly successful, nationally recognized interpretive and educational program at the Gorge, which has been presenting programs to schools and groups within the central California region since 1996. These programs are part of the national network of public lands as outdoor classrooms and are operated under the umbrellas of “Hands on the Land” and “Project Archaeology.” The Gorge programs serve an average of 6,000 students per year, with a projected demand of up to 12,500 students within the next ten years.

Overall outdoor recreation use of the San Joaquin River Gorge area has increased dramatically in the last few years. Visitation increased from 6,450 people reported in 2002 to more than 86,577 visitors in 2008. The approximate ethnicity of visitors to the Gorge based on BLM observations is 50% Caucasian and 50% Hispanic/Latino, Native American, Asian, and African American. The diverse nature of recreational opportunities in the area supports use by families with young children, school children, church groups and other organizations, and senior citizens, as well as class V kayakers, rock climbers, gorge scramblers, and other hearty adventurers.

As previously noted, there is no attempt in the Report to quantify the real value of these existing recreational assets. But Reclamation does inventory the BLM’s educational and recreational facilities in the Gorge that will need to be demolished and relocated. (Eng. App. Table 4-7, pg. 4-24) These include 11,225 square feet of educational facilities (the museum, learning center, wildlife pond, and the replica Native American village), more than 6.6 miles of trails (including segments of the San Joaquin River National Recreation Trail, Wuk-ki’o Trail, and the Pa’san Ridge Trail, and the trailhead campgrounds.

Reclamation also estimates that demolishing and relocating these facilities will cost up to \$195.8 million. (Eng. App. Table 6-4, pg. 6-13) Required land acquisition costs of \$15.9 million are also listed, but this does not include the cost of replacing existing public lands that will be inundated, including the BLM lands in the Gorge. Not mentioned in the list of BLM educational and recreational facilities to be

demolished and relocated is the group campground and equestrian staging area, which are located near the other facilities slated [for](#) removal/relocation.

One of the facilities that would be demolished but not relocated is the iconic green footbridge that crosses the San Joaquin River Gorge. Because the TFD reservoir will be too wide to feasibly construct a replacement bridge, Reclamation proposes to replace the bridge, which is currently used year-round, with a seasonal water taxi. The cost of operating the seasonal water taxi and which agency would cover this cost is not specified.

Reclamation assumes recreational participation levels will be unchanged or possibly increased with the relocation or replacement of existing recreational facilities. (Econ. App. Pg. 9-5) Reclamation claims it would seek to maintain the quality of visitor experiences by replacing affected recreational facility capacity with facilities providing equivalent visual resource quality, amenities, and access. (Eng. App. Pg. 4-23) But this will be difficult if not impossible to do in regard to providing the equivalent visual resource quality of the San Joaquin River Gorge.

Elsewhere in the Report, Reclamation admits “Aesthetic features associated with the visual landscape are among the most prominent attributes potentially affected by the project” and that the TFD “will change the aesthetic nature of the Upper San Joaquin River area (the Gorge).” According to the Report:

Instead of a free-flowing river with adjacent upland, there will be a regulated reservoir that will change in elevation during year. The visual landscape associated with all of the alternative plans – on a nearly equal basis among them – is generally considered to be adversely affected compared to the No-Action Alternative of a free-flowing river. However, the area is somewhat inaccessible at present, and not widely visited. The four alternative plans will include an unimproved road that provides greater access for recreationists. In summary, the aesthetic attributes of the Upper San Joaquin River above Friant Dam are adversely affected by each of the alternative plans. (Econ. App. Pg. 13-3)

Even when it admits to adverse and unavoidable aesthetic impacts, Reclamation gets important facts wrong. Approximately 1/3 of the BLM’s San Joaquin River Gorge is easily accessible by paved road and well-maintained hiking, mountain biking, and equestrian trails. The Gorge is in fact heavily used for recreation even when compared with the adjacent Millerton State Recreation Area, which encompasses a larger area (including Millerton Reservoir) and offers more developed facilities. The Gorge hosted 86,577 visitors in 2008, an amount equal to a quarter of the 338,000 visitors to the Millerton State Recreation Area in the same year. Reclamation claims that the TFD will support up to 96,400 new visitor days, only slightly more than the recreation use of the Gorge that would be lost or degraded.

The San Joaquin River Gorge possesses the highest scenic quality rating provided BLM lands, because landforms, vegetation, water, and related factors within the Gorge offer notable and exemplary visual features that attract visitors from throughout the geographic region. BLM considers the scenery of the San Joaquin River Gorge to be an outstandingly remarkable value that makes the river eligible and suitable for Wild & Scenic protection. Although Reclamation admits that replacing a free flowing river with a reservoir that will change in elevation during the year will adversely affect the visual landscape, the significance of this change is understated.

Although the TFD will be capable of storing 1.3 million acre feet of water, even Reclamation admits that much of the time the reservoir will be partially empty. Under past climatic conditions, the average end of the month storage behind TFD ranges from 400,000 to 600,000 acre feet (depending on the month) – that’s 30-45% of the reservoir’s total capacity (Modeling Appendix, Attachment C, Figure 3, pg. 13). The result will be a substantial bathtub ring that replaces scenic canyon slopes currently clothed in oak woodlands, grasslands, chaparral, and spectacular granite rock formations. Even under Reclamation’s predicted climate change conditions, the TFD reservoir will be at 45-65% capacity at the end of each month, so the loss of scenic quality will still be substantial. Given the extensive degradation of the scenic setting, it’s doubtful that Reclamation’s plans to replace recreational facilities will provide the same high quality experience that is available today.

The permanent loss of the scenic quality of the Gorge and the degradation of recreational benefits associated with the loss, as well as the not-quite-equal replacement of recreational facilities offered by the Bureau must be adequately quantified and fully considered in the cost-benefit ratio of the project.

Loss of Cultural Benefits

According to the BLM, cultural resources in the Gorge are one of the outstandingly remarkable values that make the river eligible for Wild & Scenic protection. The Gorge is located within the ethnographic region of several Foothill Yokuts groups and the North Fork Mono. The Kechayi and Dumna Yokuts were known to have used this area. Archeological sites left behind by the Yokuts and the Mono in this region includes pictograph rock art, bedrock mortar and milling stone food processing stations, lithic scatters, and village sites. Several of the Native American and prehistoric archeological sites in the Gorge are eligible for listing in the National Register of Historic Places. These cultural resources contribute significantly to public visitation and the use of the Gorge as an environmental education and interpretive site.

There is little information in the Report on the TFD’s impact to cultural resources, perhaps because the simple fact is that all cultural resources below the reservoir take line will be lost or degraded. Interestingly, “Native American and Cultural

Resources” is listed as an unresolved issue, but Reclamation treats the issue as a simple matter of consistency with National Historic Preservation Act and providing Tribal groups the opportunity to participate in the EIS/EIR process. (Report pg. 6-34) Given the significant cultural resources of the Gorge, Reclamation should clarify the “unresolved” nature of this issue and attempt to fully quantify the loss of cultural values and associated interpretive and environmental education opportunities.

Cost

In the Report, Reclamation estimates that constructing the TFD will cost \$2.6 billion. Reclamation previously estimated the cost of the TFD at \$3.36 billion in its Plan Formulation Report (October 2008). This represents more than a 30% decrease in the estimated cost of the project. The organization of the Report makes it extremely difficult to identify what factor or factors have contributed to this astounding decrease in cost (astounding because the true costs of Reclamation projects tend to be significantly underestimated). A few years ago, Reclamation estimated the cost of the proposed Auburn Dam, a dam of similar size but not design as the TFD, at nearly \$9.6 billion. As with the TFD, the construction of the Auburn Dam would risk the loss of significant upstream ecosystem and recreation benefits beneath its reservoir. Even accounting for Auburn’s more costly design and construction costs, it seems likely that the TFD cost estimate is wildly underestimated.

Conclusion

As summarized above, the Report greatly exaggerates ecosystem and emergency water supply benefits from the TFD and overestimates the value of its agricultural water supply benefits. The Report also fails to consider cheaper but more effective alternatives for supplying ecosystem and emergency water supply benefits. And the Report overestimates the true costs of building the TFD, particularly in regard to applying reasonable values to the existing ecosystem, recreation, scenic, and cultural benefits of the San Joaquin River Gorge that would be entirely lost or degraded beneath the TFD reservoir.

The Report depends on over-inflated population and water supply projections that are out of date. The Report should use a higher discount rate given the uncertainty over TFD benefits. In addition, the Report fails to adequately assess the need to consider Wild & Scenic River protection of the San Joaquin River Gorge as a viable alternative in the environmental review, as required by the National Wild & Scenic Rivers Act. The estimated overall cost of the TFD seems vastly underestimated given the issues outlined above and in comparison to previous cost estimates of this and other similar sized projects.

Given these problems, Friends of the River recommends that Reclamation withdraw the draft Report, revise it to address these several critical issues, and re-issue the revised Report in draft form to solicit additional public comment.

Sincerely,



Steven L. Evans

Consultant, Friends of the River
1583 3rd Avenue, Sacramento, CA 95818
Phone: 916-708-3155
Email: sevans@friendsoftheriver.org

Attached:

Review of Economic Benefits and Costs in the January 2014 Draft Upper San Joaquin River Storage Investigation Feasibility Report, April 15, 2014, by Dr. Jeffrey Michaels, Associate Professor of the Eberhardt School of Business and Director of the Business Forecasting Center at the University of the Pacific (Stockton, CA),