

**UNITED STATES OF AMERICA  
FEDERAL ENERGY REGULATORY COMMISSION**

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Utah Board of Water Resources, )  
Lake Powell Pipeline Project ) P-12966-001  
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**LAKE POWELL PIPELINE COALITION’S COMMENTS ON PROPOSED STUDY  
PLAN AND SCOPING DOCUMENT 2**

The Lake Powell Pipeline Coalition (Coalition) hereby comments on the Commission’s “Scoping Document 2” (SD2) for the Lake Powell Pipeline Project, eLibrary no. 20080821-3005 (Aug. 21, 2008). Pursuant to 18 C.F.R. § 5.12, we also comment on Utah Board of Water Resources’ (UBWR) Proposed Study Plan (PSP), e-Library no. 20080822-5016 (Aug. 22, 2008), and related documents.

The Coalition consists of: Citizens for Dixie's Future, American Rivers, Glen Canyon Institute, Grand Canyon Wildlands Council, Living Rivers - Colorado Riverkeeper, Sierra Club, the Town of Springdale, Utah, and Western Resource Advocates. The descriptions and interests of member groups are stated in our SD1 Scoping Comments (July 7, 2008), e-Library no. 20080707-5206.

These comments are organized into five sections. Section I comments on UBWR’s Scoping Document 2. Section II replies to UBWR’s responses to preliminary study requests, as stated in PSP, Attachment B. Section III replies to UBWR’s “Responses to Questions and Comments Regarding Colorado River Water Supply and Operations,” as provided in PSP Attachment C. Section IV comments on the Phase I Water Needs Assessment (2008)(WNA), available at <http://www.water.utah.gov/lakepowellpipeline/projectupdates/default.asp>. Section V comments on the PSP, Attachment A.

**I.  
COMMENTS ON SCOPING DOCUMENT 2**

We appreciate the Commission’s consideration of issues raised during the scoping process, and are pleased that a number of our recommendations from SD1 were integrated into SD2. However, several of our most important concerns have not been integrated in a satisfactory way.

We comment on the issues and alternatives described in the SD2, the Study Plan and the Water Needs Assessment (WNA). For ease of reference, we show proposed changes to

the document text in ***bold italicized text***. Our comments track the title and outline number in these documents for each section where we have a comment.

## **2.2. Scoping Meetings and Written Comments**

SD2 states that scoping is intended to serve as a guide to issues and alternatives to be addressed in the Environmental Impact Statement (EIS). The public expressed concerns in the scoping process that should be addressed in the EIS, including:

- A. Increased water conservation can delay the need for the pipeline or other water supply projects and avoid substantial cost burdens on the region's current and future residents.
- B. The supply of water for the predicted population growth will diminish the quality of life in the region.
- C. Continued droughts and the impacts of climate change could put the supply of water for the Pipeline at risk.

These important questions must be analyzed in the study plans, yet the proposed plans fall short. These significant questions were not adequately addressed by the Federal Energy Regulatory Commission's (Commission) responses in SD2; our comments in the following sections re-emphasize the importance of these studies, and attempt to clarify our initial study plan requests.

### **2.2.1 Issues Raised During Scoping**

We realize that SD2 came out at the same time as the study plan, so that some of the conclusions in SD2 are not included in a study plan. Therefore, we are pointing out issues that need to be included in the study plans. The concerns with the Commission's responses in SD2 include the following.

#### **Population Growth**

SD2 states that the "EIS will include population growth-related effects of the proposed pipeline and alternatives where such effect can be reasonably foreseen." SD2, p. 9. However, this objective is not in a study plan and we request it be included.

#### **Water Conservation**

SD2 states that "some level of conservation effort appears to be part of water conservation districts ongoing plans. The EIS will include any conservation measures that we conclude could be achievable." SD2, p. 10.

In the Water Need Assessment, UBWR projects conservation measures will reduce per capita water use by only 25% by the year 2060. Substantially more conservation savings are available, however, and this projection does not adequately integrate achievable water conservation into future demand projections. Twenty-five percent is an unreasonably low target for water use efficiency. As the Coalition explained in detail in its comments on SD1, water conservation savings could be much higher. *See* Coalition SD1 Comments, p. 28. Current trends clearly show water demand could be reduced significantly by the year 2060. *See* Section IV, section ES-5.1.2, *infra*. The study plan should include a smart growth water conservation scenario as a part of the analysis.

### **Storage in Navajo Sandstone Aquifer**

SD2 states that “the Navajo Sandstone Aquifer is not a reasonable alternative to the LPP.” SD2, p. 11.

In order for the EIS to be complete and thorough, the project alternatives studied must assess the potential for other water supplies to meet participants’ demands. These supplies should include, among others, the Navajo Sandstone aquifer’s potential to provide more water. Indeed, water rights information shows there are existing developed private water rights that could be converted to culinary use over time. According to SD2, these rights are not being considered in this study. Although the Navajo Sandstone aquifer is over-appropriated and closed to any new appropriations there is still a significant amount of existing water rights held by private individuals and public agencies that could convert to culinary use by 2060. UBWR infers in the No Action alternative that without the Pipeline there are no other options for development of the aquifer. However, the Division of Water Rights stated “there are 332,760 acre feet of approved water rights in the Navajo/Kayenta and upper Ash creek aquifers.”<sup>1</sup> The community water supply systems coming from Navajo Sandstone wells and springs were 41,470<sup>2</sup> acre-feet (AF) which represent a small percentage of that. A thorough study of water supplies must include all water rights as part of the analysis. In addition, in its Dec. 28, 2007 letter, eLibrary 20071228-5027, the U.S. Department of Interior’s Office of Environmental Policy and Compliance stated that “the evaluation information should clearly state the water rights of the Virgin River Drainage.”

The amount of water available in Navajo Sandstone aquifer is still debated by the experts and more water resources may be found with more study. In its *10 Years of Water Conservation 1995-2005 Report*, the Washington County Water Conservancy District

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<sup>1</sup> Washington County Water Conservancy District (WCWCD), *Petition for classification of the Navajo/Kayenta and Upper Ash creek aquifers (July 2005)*.

<sup>2</sup> Division of Water Resources, “Municipal and Industrial Water Supply and Uses in the Kanab Creek/Virgin River Basin,”] (2008), Table 13; p.38]: wells are limited to 50% of their “maximum” capacity for reliable supply.

(WCWVD) claims “[t]he Virgin River Upper Basin total available groundwater supply has been estimated at 2.2 million acre feet. The Central Basin groundwater supply has been estimated at nearly 200 million acre feet.”<sup>3</sup>

Furthermore, The Navajo Sandstone Aquifer Storage Project (Project) has been very successful at storing water under Sand Hollow Reservoir. Since 2002, 70,000 AF of water has been recharged into the aquifer and UBWR claims only 8,000 acre feet of it as a culinary source by the 2060. The Washington County Water Conservancy District (WCWCD) stated in their Water Line newsletter that this aquifer could hold up to 200,000 AF of water. As annual recharge increases this Project could supply more future culinary water supply and drought storage by 2060.

### Conversion of Agricultural Wells

SD2 states: “Because the number of agricultural users that would give up their water rights and convert them to residential use is highly speculative, we cannot predict which agricultural wells might be available to convert to residential use in the future.” SD2, p.11.

Private agricultural well water could credibly yield substantial volumes of culinary water. The Commission’s analysis of water supplies for the No Action and Action alternatives would be deficient if it ignored agricultural land and water use conversions. Rather than disregard the potential for agricultural water use conversions based on their speculative nature, the Commission must develop reasonable assumptions. We recommend that the Commission rely on urban planning documents and patterns of growth to assess potential agricultural lands that will be converted to urban use, and quantify the water rights associated with these lands. The Coalition pointed out in SD1 that there are still other water resources available that are not being considered by UBWR as possible future culinary water supplies<sup>4</sup>. We disagree that UBWR provided an acceptable, thorough estimate of potential water supply; UBWR only considered agricultural conversion of 4,000 AF<sup>5</sup> to culinary use and 12,400 AF of agricultural water to secondary use by 2060 – an unacceptably low estimate. *See* Section IV, WNA 4.1.5.5, *infra*. Given the rapid rate of development of agricultural lands in Washington County, the Commission’s EIS must assess the potential for agricultural water conversions to meet future needs. We recommend that the Commission establish several scenarios, with varying conversion rates.

### Cumulative Impacts of Growth

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<sup>3</sup> Calvin G. Clyde, Utah Water Research Laboratory, *Groundwater Resources of the Virgin River Basin in Utah* (1987).

<sup>4</sup> SD1 Comments, pp. 25-27. A substantial amount of groundwater has been developed and is used mainly for agriculture. This water could be acquired as development takes place when irrigated acreage is retired.

<sup>5</sup> 4,000 AF is from Quail Lake exchange. *See* Section IV, WNA p. 4-18.

SD2 states that “FWS recommends the EIS evaluate the cumulative impacts of project induced land development, urbanization, and population growth on surface water quality, included nutrient loading, pollutant runoff, and sediment loads.” SD2, p. 16. The Commission responded: “we have modified section 4.2.2 of SD2 to include indirect effects of induced growth on water quality parameters, where such effects can be reasonably foreseen, and are due to building the pipeline or an alternative.”

We echo the comments of the FWS and emphasize the importance of analyzing the impacts of a new water supply on land use and regional growth. In their scoping comments, the Environmental Protection Agency (EPA) offered to do an analysis on the environmental impacts of population growth.<sup>6</sup> We strongly urge the Commission to accept EPA’s offer. In addition, a smart growth initiative was considered in the Utah Department of Transportation’s *Southern Corridor Highway EIS*, p. 6-1, available at <http://www.udot.utah.gov/sc/>, and the same data could be used for the Pipeline’s EIS since the growth would occur in the same area.

SD2 states that “We have revised section 4.2.9 to indicate more specifically that the EIS will address issues related to reasonably foreseeable population growth that would be associated with the proposed action and any other alternatives addressed in the EIS.” SD2, p. 21. We do not find this objective in 4.2.9 and request that it is be included in a study plan.

### **Net Demand for Electricity**

SD2 states: “The Lake Powell Pipeline Coalition comments that the EIS should address the effect of the project’s net demand for electricity on the local cost of electricity.” The Commission Responded: “Because of how interconnected power systems operate, we can trace the effects of a new pumping load from the proposed project to local rates; we have revised section 4.2.9 to include effects of the proposed pumping load on the regional power system.”

The Coalition wishes to clarify its request to the Commission. While we agree that the impact of a new pumping load on the regional power system should be integrated into the Socioeconomic Study Plan, our original intended request described a different analysis. In our comments on SD1, the Coalition states that the EIS should assess the impacts of rising electricity rates, greenhouse gas emissions, and climate change regulation on the Lake Powell Pipeline’s annual operational costs. This analysis should include a range of scenarios (i.e. various electricity costs that reflect the rising and volatile rates in recent years, and various

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<sup>6</sup> U.S. Environmental Protection Agency, “Comments on Pre-Application Document” (July 15, 2008), eLibrary 20080724-0151.

estimates of the costs of greenhouse gas emissions, starting with but not limited to EPA estimates associated with the Warner-Lieberman Bill on climate change (2007).

### **3.2 Our Alternatives to the Proposed Action**

SD2 states: “The Lake Powell Coalition recommends that the Commission consider a Water Conservation Alternative in the EIS. The Coalition recommends that the alternative include increased water conservation, improved efficiency in Kane, Washington and Iron counties: and the potential for augmenting local existing water sources.” SD2, p. 9. SD2 also states, however, that “we will consider and assess all reasonable alternatives to the proposed project.” The Coalition’s viable alternative, proposed in our SD1 Comments, pp. 12-13 was rejected without serious review and should be reconsidered for study.

In both the Purpose and Need Statement for the EIS and the Water Needs Assessment, conservation and water use efficiency measures must be included. We provided extensive information in our initial scoping comments on measures implemented in other Southwestern cities today, and conservation measures that could save extensive volumes of water in Washington, Kane, and Iron Counties. Perhaps most importantly, as noted in detail under Water Needs Assessment in Section VI, the need for the proposed action is flawed due to incomplete and inaccurate data on per capita use by communities. The study plan must address these shortcomings by more accurately reflecting the actual needs of the participants and updating water use data.

Furthermore, the study plan arbitrarily drops consideration of alternatives that could better comport with 40 C.F.R. § 1502.14 including, among other things, water conservation, water reuse, 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.<sup>7</sup>

In conclusion, the Coalition requests that, in its Action Alternative, the Commission include smart growth, water conservation, water reuse, and the potential for alternative water supplies to meet future needs. This alternative should include:

#### **Coalition’s Alternative to the Lake Powell Pipeline**

1. Reevaluation of the high growth rate projected by Governor Office Planning and Budget’s (GOBP) population projections. Washington County experienced exceptionally high rates of growth between 2000 and 2005, but given the national economic downturn since SD1, these high rates of growth are not likely to continue indefinitely. In developing its Purpose and Need, the

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<sup>7</sup> See Council on Environmental Quality (CEQ), “Forty Most Asked Questions Concerning CEQ’s NEPA Regulations,” 46 Fed. Reg. 18026 (1981).

Commission should model several population growth rates and water demands. *See* Section IV, WNA ES-3.1, ES-3.2, *infra*.

2. Updated water use data for participant cities using water retail sales. Estimates of water use for the participants are from various years, and include different valuation methodologies. Future demand projections should be based on updated levels of use. Using the correct per capita use would reduce demand by a significant amount. *See* Section IV, WNA 2.3, *infra*.
3. Consideration of reasonable water conservation measures. Reasonable water conservation measures could provide the 59,000 AF of water by the year 2030.<sup>8</sup> Other measures that could reduce demand include updating building codes with plumbing and appliance standards. Using pricing to reduce water demand is more cost-effective than implementing a non-price conservation program. Investing in water infrastructure efficiency is also a cost effective alternative.
4. Reevaluation of water demand in a scenario that would reduce demand by using a progressive, realistic conservation goal greater than 25%. *See* Section IV, WNA ES-5.1.2, *infra*.
5. Reevaluation of the potential yield of the Sand Hollow Reservoir. Sand Hollow is a 50,000 AF reservoir, which has a 20,000 AF of drought reserve and 30,000 AF of active pool. UBWR only counts 7,500 AF of yield for culinary water, but we suggest it could yield more water by 2060. *See* Section IV, WNA 4.1.5.7, *infra*.
6. Counting 50% (40,000 AF) of agricultural water converting to culinary use by 2060. UBWR is only counting 4,000 AF converting to culinary use by 2060. In addition, treat agricultural water for culinary use. *See* Section IV, WNA 4.1.5.5, *infra*.
7. Consideration of potential yield from the Sand Hollow Aquifer Storage Project. Sand Hollow Aquifer Storage Project is now holding 70,000 AF of recharged water, and gaining water every month, but UBWR only counts 8,000 AF by 2060. As the annual recharge increases the yield could increase in the future. In its Capital Facilities Plan (2006), p. 50, WCWCD stated a yield of 15,000 AF would be possible. *See* Section IV, WNA 4.1.6.3, *infra*.
8. A study of other reasonable future water supply projects, including:

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<sup>8</sup> *See* Coalition SD1 Comments, (July 7, 2008), e-Library no. 20080707-5206, p.29.

- a. Capture and storage of Santa Clara river spring runoff by recharging of the aquifer under Gunlock Reservoir.
  - b. Development of an aquifer storage project above Snow Canyon area wells.
  - c. Capture of more of the Virgin River high flows that now go downstream because of the limited size of the diversion pipe (which only captures flows up to 150 CFS) by diverting high flows and piping them to the proposed Sand Stone Reservoir near Leeds to recharge the aquifer.
9. Reduction of the WCWCD's Level of Service of .89 AF to .45 AF per residential unit for inside and outside use, which would cut water demand in half. *See* Section IV, WNA 4.1.2, *infra*.
  10. Conversion of private wells to culinary use. The Coalition identified 18,000 AF of private wells that may be converted to culinary use by 2060. *See* Coalition SD1 Comments, p. 27.
  11. Conversion of more existing private surface (900,000 AF) and underground water rights (330,000 AF) to culinary use for future supplies. The UBWR predicts none will convert to culinary use by 2060.
  12. Using smarter land use planning by including Vision Dixie principles on how to grow. The way that we use land (the types of use and the level of intensity) relates directly to water use, water supply, and water quality. By better understanding land use changes, we will use less water and could plan to accommodate future changes successfully. *See* [www.visiondixie.org](http://www.visiondixie.org). In addition, data from a smart growth initiative was considered in the *Southern Corridor Highway EIS*, p. 6-1, and should be considered in the Pipeline's EIS.
  13. Increases in participants' capacity to treat, distribute, and reuse wastewater by building new plants. WNA Table ES-8 predicts only 16,900 AF of waste water will be available by 2060. However, WNA Table 6-1 states 54,500 AF could be available by 2060.
  14. A yield given to Sand Hollow well expansion. *See* Section IV, WNA 4.1.5.3, *infra*.
  15. A study of Navajo Sandstone Aquifer for possible development.

16. Elimination of dependence on the proposed Pipeline that is vulnerable to drought and political conflict.

#### **4.0 Scope of Cumulative Analysis and Resource Issues**

SD2 states that “based on the information in the Pre-Application documents, we have identified land use, water, wildlife, threatened and endangered species, riparian vegetation and habitat, and socioeconomic resources as potentially cumulatively affected by construction and operation of the Lake Powell Pipeline Project and other basin activities.” SD2, p. 25.

The Coalition is concerned that the analysis is too narrow and only considers the direct impact of construction and operation of the Pipeline itself in the study plans. The analysis must also consider the indirect and cumulative impacts created by the water supply project.

One of the public’s major concerns from scoping was that the population growth would diminish their quality of life. Therefore, population growth and its consequences on the human and natural environment must be part of the analysis. Other federal agencies, including the EPA and U.S. Fish & Wildlife Service have also asked that impacts of growth be analyzed in the study plan. In addition, in its Dec. 28, 2007 letter, *supra*, the U.S. Department of Interior stated that “other environmental issues requiring analysis” include “growth inducing effects” and “long term effects such as human population growth.” However, population growth as a result of this is “major water supply project”<sup>9</sup> is not adequately addressed in the study plan.

While SD2 acknowledges the need to address “issues related to reasonable foreseeable population growth that would be associated with the proposed action and any other alternatives addressed in the EIS,” it continues, “However, we note that population growth, either with or without the proposed project in place, would have a myriad of impacts, both positive and negative, on the local area. Predicting effects not associated with the proposed project and alternatives are beyond the scope of the EIS.” See SD2, p.21.

The Coalition believes population growth and change of land use caused by the water supply project should be addressed in a study plan. In order to fully assess the impacts of the pipeline on population growth and land use, the EIS must present a “baseline” scenario that provides an analysis of population growth and land use in the region if the pipeline is *not* developed. Again, we recommend the EPA assist the Commission in the analysis.<sup>10</sup>

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<sup>9</sup> UBWR, PAD Vol. I, § 1.4 (General Information).

<sup>10</sup> EPA, Comments on PAD, *supra*.

“EPA stated in their scoping comments on SD1 that “while it may be true this area would grow without this project, the impacts of this growth should be addressed in the DEIS as either indirect or cumulative impacts. . . . The impacts of growth can be analyzed by estimating the additional people, homes and /or cars, and their impacts to: water quality; air quality (from additional driving); habitat, wildlife and plants; infrastructure costs; and energy use. EPA would be happy to work with FERC on this type of analysis.”<sup>11</sup>

The Coalition asserts the impact of population growth on the natural and human environment must be included in the analysis to fully analyze those impacts in advance. Based on our close review, the analysis planned for in the study plan thus far fails to satisfy the requirements of The National Environmental Policy Act (NEPA). These include:

- 42 U.S.C. § 4331(a). “The Congress, recognizes the profound impact of man’s activity on the interrelations of all components of the natural environment, particularly the profound influences of population growth [and] high-density urbanization.”
- 40 C.F.R. §1502.16(g). The EIS section on environmental consequences must include discussions of “[u]rban quality, historic and cultural resources, and the design of the built environment, including the reuse and conservation potential of various alternatives and mitigation measures.”
- 40 C.F.R. §1508.8. Three types of impacts should be studied in an EIS: direct, indirect, and cumulative.<sup>12</sup> Direct impacts are those that “are caused by the action and occur at the same time and place.”<sup>13</sup> 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.”<sup>14</sup> They may include “...growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems.”<sup>15</sup> A 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 future actions . . . . Cumulative impacts can result from

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<sup>11</sup> *Id.*

<sup>12</sup> *Id.* at § 1508.25(c); *see also id.* at §§ 1508.7, 1508.8.

<sup>13</sup> *Id.* at § 1508.8(a).

<sup>14</sup> *Id.* at § 1508.8(b).

<sup>15</sup> *Id.*

individually minor but collectively significant actions taking place over a period of time.:<sup>16</sup>

- 40 C.F.R. § 1508.14. "Human environment shall be interpreted comprehensively to include the natural and physical environment and the relationship of people with that environment. . . . This means that economic or social effects are not intended by themselves to require preparation of an environmental impact statement. When an environmental impact statement is prepared and economic or social and natural or physical environmental effects are interrelated, then the environmental impact statement will discuss all of these effects on the human environment."

In addition, we disagree with the Commission's decision not to analyze the cumulative effects of the proposed Pipeline on water supplies throughout the Colorado River basin. Specifically, the study plan must include a detailed analysis of potential cumulative impacts due to other water development projects currently planned including (but not limited to) projects in the Upper Basin such as the Navajo-Gallup pipeline, the Million pipeline, and the Yampa pumpback project; and projects in the Lower Basin such as the Drop 2 Storage Reservoir.

#### **4.1.1 Geographic Scope**

SD2 states that "[f]or land use and socioeconomics, we will consider cumulative effects to include areas that could potentially receive Colorado River water from the proposed project or alternative water supplies considered in the EIS." SD2, p. 26. However, this objective is not in a study plan and request that the study plan be updated to reflect this goal.

#### **4.2.2 Water Resources**

SD2 states that it will consider "[e]ffects of any reasonably foreseeable effects of building the project and alternatives, such as related changes in land use, population density, or population growth, on surface water quality, including nutrient loading, pollutant runoff, and sediment loading." SD2, p. 28. However, the complete objective is not in the study plan and we request that the study plan is updated to reflect this goal.

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<sup>16</sup> *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.").

#### **4.2.5 Threatened and Endangered Species**

SD2 states that it will consider “[e]ffects of project induced land development, urbanization, and population growth on surface water quality, including nutrient loading, pollutant runoff and sediment loading, wildlife populations and their habitat and threatened and endangered species.” SD2, p. 31. However, this entire objective is not in the study plan and we request that the study plan is updated to reflect this goal.

## **II.**

### **REPLIES TO UBWR’S RESPONSES TO STUDY REQUESTS**

In PSP Attachment B, UBWR provides its “Response to Study Requests.” Our replies track the title and outline number in the Response for each section for which we have a comment.

#### **1. Coalition’s Request for an Alternative Water Supply Sources Study**

UBWR responds:

“The Coalition requests a study to identify potential alternative sources of water supply for the portions of Kane, Washington, and Iron Counties proposed to be served by the [Project] over the license term. In brief, the Coalition proposes a consensus-based review of potential, alternative local water sources, development of multiple parameters to assess the possible viability of potential alternatives, field studies to collect data to better evaluate the preliminary viability determinations, and a consensus based report on the results. UBWR agrees that this issue needs to be addressed, but, as explained below, submits that the record in this regard is already nearly complete, so the requested study is not necessary.”

UBWR, PSP Attachment B, p. 1.

We disagree that the record with regard to alternative water supply sources is near complete. Based on our close review of the Water Needs Assessment, it does not include all the possible water sources that could be developed in the future. Rather, it focuses on a narrow scope of the WCWCD and municipal supplies and excludes private water rights and augmenting of local water supplies. For the Commission to make an informed decision on the validity of the participants’ need for water, it must have adequate information regarding water rights and storage. *See* Section IV, WNA 6, *infra*.

Further, UBWR’s assumptions regarding future demand for water supply do not appear to be reliable. UBWR assumes that Washington County has developed culinary water

supplies of 83,910<sup>17</sup> AF today, and only has future supplies of 11,000 AF of culinary and 14,100 AF of secondary water to develop by 2060. This does not seem creditable with 332,760 AF of private underground and 900,000 AF of surface water rights (which includes cities', agencies' and private water rights) in the County. The study plan must comprehensively assess the volume of water rights available in the County that could be developed in the future. An assumption could be made that a certain percentage could convert to culinary use for by 2060. See Section I, section 3.2, *supra*.

UBWR further responds: "The Coalition is free to identify any alleged deficiencies in the information existing and to be gathered, and to offer its own comparative evaluation of the Project and potential alternative water sources." *Id.*, pp. 2-3. We disagree with UBWR's attempt to place the burden of environmental studies on the Coalition. We previously provided details on water alternatives that should be studied as they potentially could be impacted by the Project. See Coalition Comments SD1, p. 13 and pp. 55-66. In the absence of definitive data that the project will not have potential impacts on water supply, the burden of study is on UBWR as the discretionary permit applicant to determine the extent of potential effects.

We reiterate our request for an Alternative Water Supply Sources Study as described in our SD1 Comments at pp. 52-57.

### **3. Coalition's Request for Climate Change Study**

In PSP Attachment B, UBWR states: "The Coalition . . . makes no effort to explain how a climate change-related reduction in water availability for the project would be related to implementation of Interim Guidelines."

In the *Interim Guidelines for Colorado River Interim Guidelines for Lower Basin Shortages and Coordinated Operations for Lakes Powell and Mead*, U.S. Bureau of Reclamation (2007) the U.S. Bureau of Reclamation (BOR) states: "acknowledging the potential for impacts due to climate change and increased hydrologic variability, the Secretary proposes that these guidelines be interim in duration and extend through 2026."<sup>18</sup> Thus the implementation of the *Interim Guidelines* are linked to the impact of climate change on the Colorado River, and are subject to re-consultation by the Secretary of Interior as new information becomes available.

UBWR suggests that the Commission should rely on modeling done for the Interim Guidelines for information on the hydrologic impacts of the Lake Powell Pipeline. However,

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<sup>17</sup> WNA, Chart ES-8, p.19.

<sup>18</sup> Bureau of Reclamation, *Interim Guidelines for Colorado River Interim Guidelines for Lower Basin Shortages and Coordinated Operations for Lakes Powell and Mead*, p. ES-24 ("Climate Change Considerations").

the modeling for the EIS did not include rules for an Upper Basin Compact call. Given that the Lake Powell Pipeline is a major new diversion of water in the Upper Basin, with a priority date of 1959 that places it junior to many other Upper and Lower Basin water rights, it could likely be subject to shortage in a compact call.

When new modeling that includes climate change is completed it will show more accurately the impacts of the Lake Powell Pipeline withdrawals on existing senior water rights holders. It is essential that project participants and decision makers have a complete analysis of the reliability of pipeline supplies.

UBWR incorrectly assumed the Coalition was not asking for something more than the current CRSS model.<sup>19</sup> See Coalition's Comments re Climate Change Study Plan Request in, Level of Effort and Cost, *infra*, see also SD1 Comments, pp. 45, 64. The model should develop paleo-hydrology, include climate change hydrology, and represent the Colorado River Compact. We explain these same concerns about CRSS model in our comments on UBWR's Study Plan 19: Climate Change, see Section V., Coalition Comments re PSP, *infra*.

### III.

#### **REPLIES TO UBWR'S RESPONSE TO QUESTIONS AND COMMENTS REGARDING COLORADO RIVER WATER SUPPLY AND OPERATION OF LAKE POWELL**

In PSP Attachment C, UBWR responds to comments regarding Colorado River water supply. We reply to certain responses.

##### **Longevity of Water Supply**

**Comment:** What is the longevity of the water supply from Lake Powell since the lake is silting up?

**UBWR's Response:** "In December 1986 the U.S. Department of Interior, Bureau of Reclamation completed a report titled, "1986 LAKE POWELL SURVEY," which presented the results of the 1986 Lake Powell sedimentation survey. This was the first survey of the lake since it began filling in March 1963. The purposes of the report were to document the present water storage capacity, loss of storage capacity by sedimentation and the rate of sediment deposition. The average rate of sediment deposition since closure of the dam and September 1986 (23.5 years) was 36,946 acre-feet per year. The annual rate of sediment deposition is approximately 43 percent of the original estimate of 85,400 acre-feet per year. Assuming the rate of sedimentation remains constant Lake Powell has a useful life of hundreds of years." PSP, Attachment C, p. 1.

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<sup>19</sup> See PSP Attachment B, p. 8.

**Coalition Response:** Given the variation in flow rate exhibited since the 1986 Lake Powell sedimentation survey the conclusions reached by it are no longer valid. While sediment deposition rate will decrease as flow decreases other factors come into play. A Duke University-led study published in the peer-reviewed journal *Geology* in November 2008 found that “diminished river flows crossing existing deltas became so choked with sediment that periodically they entered the lake essentially as submarine avalanches, carrying much of the sediment deep into the lake. While this re-deposition will increase the net total capacity of the reservoir it will also greatly accelerate the sedimentation rate at the bottom of the reservoir (~22 yr river input) drastically decreasing the time before sediment buildup will reach the level of the river outlet works 237 feet above river level, rendering it unsafe in the occurrence of an earthquake or flood.”<sup>20</sup> This will require expensive modifications to keep the dam operating. This study plan must address this issue, which could have a major impact on the viability of the proposed pipeline. The study plan needs to provide for a full analysis of his eventuality and its possible impacts on the proposed Pipeline project.

### **Impact on Lower River Flows**

**Comment:** What effects will the LPPP have on the Colorado River drainage all the way to Mexico?

**UBWR’s Response:** “The ‘Law of the River,’ including the Colorado River Compacts and the recently adopted Colorado River Interim Guidelines for Lower Basin Shortages and Coordinated Operations for Lake Powell and Mead, require and prescribe the release volume of water from Lake Powell. The release volumes from Lake Powell are set based upon the above documents regardless of the development of the LPPP or any other Upper Basin project. The effects of the LPPP depletions on the Lower Colorado River Basin will be immeasurable.” PSP, Attachment C, p. 2.

**Coalition’s Response:** “With the occurrence of drought, various ambiguities and uncertainties no doubt would surface to challenge the Law of the River. Not securely in place are the necessary legal and institutional mechanisms to interpret the priorities, define various options and devise strategies for dealing with drought.”<sup>21</sup>

While the hydrologic modeling for the Interim Guidelines did include a hypothetical Upper Basin development schedule, as submitted by the Upper Colorado River Basin Commission, it did not analyze the specific impact of the Lake Powell Pipeline with respect to the date planned for its development or the volume of water it would divert. The impact

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<sup>20</sup> Lincoln Pratson et al., “Drought And Sediment Shift Lead To Increase In Lake Powell’s Capacity To Hold Water,” *Geology* (2008), available at <http://www.gsjournals.org/perlserv/?request=get-document&doi=10.1130%2FG24733A.1>.

<sup>21</sup> Joe Gelt. “Sharing Colorado River Water: History, Public Policy and the Colorado River Compact.” *Arroyo*, Vol. 10 No. 1 (August 1997), available at <http://ag.arizona.edu/AZWATER/arroyo/101comm.html>

of a new 100,000 acre-foot diversion in the near term will be indisputably significant, and should be assessed independently. Of particular interest is the frequency of flows in the limitrophe reach of the Colorado River in Arizona. This reach of the Colorado River depends on flows in excess of Mexico's treaty deliveries. For the past several decades these flows have occurred with regular frequency due to floods on both the Colorado and Gila Rivers. The study plan should quantify the probability of flows to the limitrophe reach in Arizona both with and without the project. *See* Section V, Study Plan 19.

### **Federal Reserved Water Rights**

**Comment:** What effects will the LPP project have on federal reserved water rights, the 1944 Treaty with Mexico, Lower Colorado River Basin States and delivery of water to Native American Tribes and the Colorado River Delta?

**UBWR's Response:** "The obligations to the Republic of Mexico, the Lower Basin States and Native American tribes will not be affected by the LPPP. Utah and the other Upper Division States will continue to meet their obligations under the 'Law of the River:' Development of Utah's compact allocation is fully intended by the 'Law of the River,' and Utah can use its allocation for the LPPP or other projects and still fully comply with its legal obligations." PSP, Attachment C, p. 2.

**Coalition's Response:** "Recognizing the likelihood of a Colorado River treaty with Mexico the compact designed that water for that country would come from unallocated 'surpluses' then thought to be available. Upper and Lower Basin states would equally make up any resulting 'deficiency.' A 1944 U.S.-Mexico Treaty allocated 1.5 million AF of Colorado River water to Mexico. In the absence of surpluses, it would seem that Upper and Lower Basin states, according to the compact, must each provide 750,000 AF for Mexican use."<sup>22</sup> "The delivery obligation to Mexico is legally binding even during severe, sustained drought."<sup>23</sup> A settlement with Mexico will come during the lifetime of the Pipeline; therefore the Treaty with Mexico should be addressed in the study plan.

We disagree with UBWR that the Law of River and the Interim Guidelines will protect the water for Pipeline in a time of sustained drought conditions. Thus, the UBWR's responses do not answer the questions. The risks of drought to the water supply for the Pipeline are of great concern to stakeholders and need to be analyzed in a study plan. David H. Getches, in "Law of the Colorado River: Coping with Severe Sustained Drought," writes:

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<sup>22</sup> *Id.*

<sup>23</sup> Lawrence J. MacDonnell *et al.*, "The Law of the Colorado River: Coping with Severe Sustained Drought." *Water Resources Bulletin*, Vol. 31 No. 5 (Oct. 1995), available at <http://www.hydrosphere.com/publications/ssd/TheLawofTheColoradoRiver.pdf>

“The Law of the River creates certain priorities in drought... and there may be serious environmental consequences and related legal restraints on how the water is used in times of shortage. The Law of the River effectively shifts the burden of the consequences of sever, sustained drought, to Arizona and ultimately to the Upper Basin. The amount actually available for use depends on available supplies and quantities in storage. Utah’s allocation is 23 percent of storage. Shortages begin to arise in some states as annual flows decline below 14 million acre feet. In anticipation of possible shortages, the 1948 Compact established the Upper Colorado River Commission (“Commission”) and empowered the Commission to order curtailments of consumptive uses in the Upper Basin as required to meet downstream delivery obligations.”<sup>24</sup>

A discussion of reduced flows for the Pipeline and a possible compact call must be included in the study plan analysis.

Moreover, regardless of the impact of the Pipeline on the ability of the Upper Basin states to meet compact deliveries, the project will have impacts on Lower Basin shortages. The study plan should identify the impact of the Pipeline on Lower Basin water deliveries, notwithstanding legal obligations.

### **Long-term Depletion in Compact Hydrology**

**Comment:** Annual depletion of LPPP is significant and will affect the seven states dependent on the Colorado River. The project will affect the entire geographic region of the West and will cause broader regional impacts.

**UBWR’s Response:** “The Colorado River Compact, Upper Colorado River Basin Compact, the Colorado River Storage Project Act and other elements of the ‘Law of the River’ contemplate development and use of each of the seven Colorado River Basin States apportionments. The study plan does not specifically address annual depletion in Lake Powell, since the project develops Utah’s Colorado River apportionment as intended in the ‘Law of the River’ and the annual depletion is not significant, 1/240<sup>th</sup> of the capacity of Lake Powell.” PSP, Attachment C, pp. 2-3.

**Coalition’s Response:** In “most scenarios of Colorado River at Lees Ferry (which separates the upper from the lower basin) indicate that, within 20 years, discharge may be insufficient to meet current consumptive water resource demands. The recent experience illustrates that ‘critical’ conditions already exist in the basin. Climate variability and change, together with increasing development pressures, will result in drought impacts that are beyond the institutional experience in the region and will exacerbate conflicts among water

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<sup>24</sup> *Id.*

users.”<sup>25</sup> Therefore, due to reduction in flows of the Colorado River, the seven Basin States and broader impacts must be included in a study plan.

In March 2007, Don Ostler, Executive Director of the Upper Colorado River Commission, addressed the consequences of the Upper Basin’s plans to develop its full compact apportionment of water. He discussed the reality that the river was over apportioned in 1922 and that “no upper basin states are blindly developing water without looking at what is available.”<sup>26</sup> He raised the questions of “planning on an even smaller supply, addressing global warming and the issue of over-development in the Lower Basin.” He concluded his presentation with the question, “What happens when the Upper Basin develops their full share?” He believes it will be less likely that Lake Powell will equalize or spill high flows to Lower Basin, and more likely that legal conflict will break out between basin states.<sup>27</sup>

### **Impacts of Downstream Fish Communities**

**Comment:** An assessment is needed to describe potential impacts on the fish community in Lake Powell and native and endangered species downstream of Glen Canyon Dam that may result from construction and operation of LPPP.

**UBWR’s Response:** “The small impact of the withdrawals by the LPPP on the Lake elevation should have no measurable impact on the fish community in the Lake. Upper Basin precipitation will play a much larger role in the elevation and supply of water in Lake Powell.

“The releases required by the ‘Law of the River’ will still be made from Lake Powell after the LPPP is operational, so the LPPP should have no impact on native and endangered species below the dam. The Bureau of Reclamation’s Colorado River Interim Guidelines for Lower Basin Shortage and Coordinated Operations EIS includes the LPPP depletions, and the U.S. Fish and Wildlife Service’s December 12; 2007 Biological Opinion for that EIS concluded that it was not likely to jeopardize the continued existence of the endangered species downstream of Glen Canyon Dam.”

**Coalition’s Response:** “The requirements of the Endangered Species Act may impose the most noticeable constraints in allocating water during the shortages that would arise in the event of a severe sustained drought. Moreover, virtually the entire Colorado River has been

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<sup>25</sup> Intergovernmental Panel on Climate Change, *Climate Change and Water* ( June 2008), p.105, available at <http://www.scribd.com/doc/5065346/climatechangewateren>.

<sup>26</sup> Don Ostler, "Upper Basin Plans to Develop its Full Compact Apportionment of Water. What are the Consequences?" (University of Utah) (Mar 24, 2007), available at <http://www.law.utah.edu/media/show-media.asp?MediaID=180&TypeID=4>.

<sup>27</sup> *Id.*

designated as “critical habitat” for one or more of the endangered fish species. During a prolonged drought, it is probable that the Secretary of the Interior would have to take account of the flow-related needs of the fishes as well as consumptive use commitments under the Law of the River.”<sup>28</sup> Thus, a study plan must address how Endangered Species will be protected during drought.

**IV.**  
**COMMENTS ON PHASE 1 WATER NEEDS ASSESSMENT**

The Coalition hereby provides comments on the *Lake Powell Pipeline Study Water Needs Assessment Phase 1 Report* (Aug. 19, 2008) (WNA). The WNA is integral to evaluating the need for the project as water delivery and supply to water users in southwest Utah is one of the primary purposes of the proposed Project. Our comments track the title and outline number in these documents for each section where we have a comment.

**ES-1. Introduction**

One purpose of the WNA is to “Determine the validity of the participants’ (Water Districts) requests based on estimates of future supplies and demands.” WNA, p. 1. Based on our review of the WNA, we are concerned that it does not provide sufficient detail and may be based on inaccurate assumptions. We do not believe the WNA provides adequate factual basis for the PSP.

**ES-3.1. Population Projections**

The WNA provides: “A range of population projections was determined for each of the Districts based on population projections data from the GOPB.” WNA, p. 6. We disagree with the population projections.

Due to the economic downturn, population growth will not be as robust as projected by the GOPB’s model in Table ES-1 which projects an annual growth rate of 5.59% from 2005-2010 and 5.10% from 2010-2020. These growth rates need to be re-evaluated to be

<b>Chart A</b>	
<b>Washington County Building Permits Issued <sup>(1)</sup></b>	
Year	Single Family
2000	1241
2001	1561
2002	1887
2003	2262
2004	2901
2005	3479
2006	1845
2007	1422
2008	478 YTD
	October
<b>Washington County Existing Home Sales <sup>(1)</sup></b>	
2007	6095
2008	2238 YTD
	October
<sup>(1)</sup> Data from Southern Utah Title Company	

<sup>28</sup> MacDonnell *et al.* 2005, *supra*.

more reasonable before the study plans precede. The study plan must consider the number of building permits as a measure of actual growth because they accurately reflect the need for new water hookups.

Chart A provides actual building permit information taken from Southern Utah Title Company in St. George. These data differ from the projections in the WNA. The GOBP estimates that about 10,000 plus people are moving here every year. However, the majority of these people are buying an existing home, not a new home. See chart A on Home Sales. We request that different growth scenarios be used. More information on building permits can be found in the Strategic Planning Group Study Washington County 2035 Housing Study, p. III-5.<sup>29</sup>

### **ES-3.2. Per Capita Water Use**

The WNA estimates current and future per capita water use rates. See Section IV, WNA, p.6. We disagree with how these rates were determined.

Averaging all the rural agricultural communities' secondary water use to get the per capita water use rate distorts the need for water. Based on our review, it appears a significant amount of irrigation water is included in per capita use.

Based on our review of the WNA, Table ES-2, p.7, estimating the culinary water use of 276 gallons per person per day (gpcd) for Washington County and adding more secondary use of 53.3 gpcd for a total of 328.3 gpcd inflates the water demand. The current information lacks detail on how the numbers were derived. As stated below, actual current retail water sale data needs to be collected to reflect current use.

### **ES-5.1.2. Conservation Savings**

The WNA estimates the progress of the conservation program in Washington County. WNA, p. 15. We are concerned that the UBWR's 25% water conservation goal, as stated in the WNA, should be increased and different scenarios should be used to show how demand is reduced with conservation. While it is understood Southern Utah is hotter and dryer than the cities evaluated in the WNA – St. George, Washington, Santa Clara, Ivins, Hurricane and La Verkin – these cities are good examples of water conservation potential in Utah. Numerous water providers throughout the state have also adopted the states goal of 25% by 2050, and many have nearly attained those savings today. They include:

- The Jordan Valley Water Conservancy District provides water to the cities of West Jordan, South Jordan, Sandy, Midvale, Riverton and South Salt Lake as well as numerous irrigation districts, committed to reduce use by 25% from

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<sup>29</sup> Available at [www.visiondixie.org](http://www.visiondixie.org).

2000 levels by 2025.<sup>30</sup> 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.<sup>31</sup>

- ” Data compiled by the Division of water Resources indicate daily per capita water consumption in Salt Lake City dropped from 250 gallons to 208 gallons, a decrease of 17 percent. Similarly, daily per capita water consumptions in the Logan area dropped from 248 gallons in 1998 to 200 gallons in 2003, a decrease of 19 percent. The Ogden-Clearfield area is also experiencing a drop in water use, with daily per capita consumption dropping from 189 gallons to 153 gallons from 2001 to 2003.”<sup>32</sup>
- Salt Lake City’s LEED Program aims for Sustainable Urban Growth. As an exemplar western city poised on the edge of a desert, Salt Lake City can show the way for others to sustain urban growth by utilizing water resources wisely, both indoors and outdoors, to promote a healthy, sustainable ecosystem and economy. Salt Lake City has established ambitious water efficiency and pollution prevention goals including: Reduce per capita water use from 2000 yr levels (232 gpcd) by 25 percent by the year 2010 (188 gpcd) while reducing energy demands and pollution and, concurrently, promoting biodiversity. In this way, Salt Lake City hopes to reduce the need for additional water supplies to accommodate growth in the region.<sup>33</sup>

We believe that the WNA underestimates current water conservation savings in Washington County. For example, “St George City, which is the largest city in the county had an estimated population in December 2007 of 83,364. If the population counted second homes, the population served increases to 102,234. Per capita water use for all residential water use was approximately 243 gpcd. If second homes were included, water use drops to 198 gpcd. In 2002 the average monthly water use was 23,891 gpd. In 2007 the average water use was 18,685 gpd, a drop of approximately 27%.”<sup>34</sup> UBRW could use St George City’s Water Conservation Plan on conservation water savings to calculate water conservation for the next 50 years. The Utah State Intuitional Trust Lands (SITLA) is one of the largest

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<sup>30</sup> Jordan Valley Water Conservancy District, *2004-2005 Summary of Operations (date)*, p. 49.

<sup>31</sup> *Id.*

<sup>32</sup> University of Utah, “Water Use and Residential Rate Structures in the Intermountain West.” *Utah Economic and Business Review* (March/April 2005).

<sup>33</sup> “Salt Lake City LEED Program Aims for Sustainable Urban Growth.” *Water Wiser Newsletter* (Oct. 2004). Available at: <http://www.awwa.org/waterwiser/watch/index.cfm?ArticleID=365&navItemNumber=3348>.

<sup>34</sup> City of St. George, *Water Conservation Plan Update* (January 2008), p. 3.

developers of mixed use communities in the County. Coral Canyon and Sienna Hills residential communities both of which use much less water than the county average. These communities could be used to demonstrate achievable water conservation savings. Sienna Hills development has smaller lots, mandates open spaces, natural vegetation, limits the amount of lawns, requires drought tolerant plants, and limits the amount of land that can be landscaped. In addition, SITLA will develop 10,000 acres called the south block which is state land south of St. George. Data from a smart growth initiative for the south block was considered in the *Southern Corridor Highway EIS* (p. 6-1) and should be considered in the Pipeline's EIS.<sup>35</sup>

Further, in Washington County the median lot sizes have decreased from 10,000 square feet in 1990 to about 8,500 square feet in 2005.<sup>36</sup> In St George the average is seven homes per acre.<sup>37</sup> The smaller lots use less water; the trend toward smaller lot sizes should also be considered in the analysis for the WNA.

Lastly, the WNA uses Boyle report assumptions which do not account for price elasticity, i.e. water demand does not respond to changes in water prices. Changes in water prices result, in this case, from the development on new supply sources in Washington County.

Increased prices can affect demand: "Using pricing to manage water demand is more cost-effective than implementing non-price conservation program. The gains from using prices as an incentive for conservation come from allowing households to respond to increased water prices in the manner of their choice, rather than by installing a particular technology or reducing particular uses, as prescribed by non-price approached. Price-based approached also have important advantages in terms of monitoring and enforcement."<sup>38</sup>

Public opinion supports water conservation in Washington County. The polls include the following:

- WCWCD hired VanGuard Media in 2008 to do a survey to gage public opinion on the Pipeline and found high favorability for water conservation and a preference for tiered pricing.

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<sup>35</sup> Utah Dept. of Transportation, *Southern Corridor Highway Environmental Impact Statement* (Oct. 2005). Available at <http://www.udot.utah.gov/sc/>.

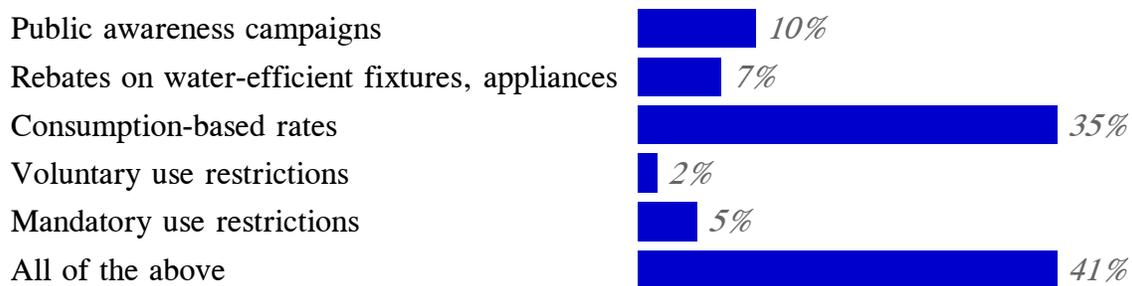
<sup>36</sup> Washington County, *2035 Housing Study* (2007), p. IV -2, available at [www.visiondixie.org](http://www.visiondixie.org)

<sup>37</sup> UDOT, *Southern Corridor EIS, supra*, Chapter 6.

<sup>38</sup> Olmstead, *Comparing Price and Non-price Approaches to Urban water Conservation* (Sept. 2008), p.18.

- Vision Dixie principles are being adopted by all the communities in the county. Principle 2 is water conservation, which was a high priority in Vision Dixie public polling survey results. The Vision Dixie principle states: “We all need to take actions to use less water.”<sup>39</sup> It continues: “Water conservation can have a positive impact on economic development. There are many businesses and individuals that will be attracted to this area because we are managing our resources wisely.”<sup>40</sup>
- “Conservation pricing is an important component of any effective demand management program and should be utilized in any community that is 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 (Table 6).”<sup>41</sup>

**Table 1**  
**Results of AWWA Quick Poll<sup>42</sup>**



Additionally, the municipalities that have 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, but increase rates noticeably from one block to the next.

#### **ES-6.4. No Action alternative**

The WNA states: “The supply and demand for the No Action Alternative is shown in Figure ES-14. Demand would be met up to 2020, but there would be a shortage of

<sup>39</sup> Vision Dixie, *2035 Land Use & Transportation Vision* (2007), p.14, 25 at [www.visiondixie.org](http://www.visiondixie.org).

<sup>40</sup> *Id.*

<sup>41</sup> American Water Works Association, “Results of Survey: What’s the best way to get customers to use less water?” Available at <http://www.awwa.org/QuickPollResults.cfm?itemnumber=1663>.

<sup>42</sup> *Id.*

approximately 145,200 ac-ft per year by end of the planning period (2060).” WNA, p. 25. We disagree with the WNA’s assessment of the consequences under the No Action Alternative.

The assumptions that there will be a water shortage of 145,200 acre feet in 2060 is skewed by assuming a very high population rate and distorted per capita use rates. The Coalition has provided options to augment other local water supplies not counted by UBWR and provide solutions to reducing water demand. *See* Section I, section 3.2, *supra*.

Stating that there will be water shortages that will limit economic development is unfounded in fact and should be deleted from this alternative.

### **2.3. Methodology**

The WNA states, “Various methods are used by cities throughout the United States to calculate per capita water use.” WNA, p. 2-11. As described below, we disagree with some of the assumptions and methods used to calculate water use.

The WNA states “agricultural water use was not to be used” in per capita use. WNA, p. 2-12. However, Table 17, Secondary water use chart in the DWR 2008 report shows that a significant amount of agricultural water from irrigation companies is included. This has to be redone using updated retail sales information to make sure agricultural irrigation water is not included in the rate.

Furthermore, a review of earlier DWR water use reports reveals that secondary use has not increased although population growth has doubled. The level of secondary water use of 7, 445.5<sup>43</sup> acre feet 2005 in the WNA has actually gone down over the years. The reports are summarized in the table below.

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<sup>43</sup> DWR 2008 report, p. 42, Table 17.

**Secondary Water Use Estimates DWR**

Acre feet	Year	Reference
11,170	1990	Utah State Water Plan Kanab/Creek/Virgin River Basin , August 1993, on p. 9-24, Table 9-8, also includes part of Kane County to Johnson Wash
10,587	1998	Boyle Engineering Corporation ,Water Supply Needs for Washington and Kane Counties & Lake Powell Pipeline Study, p.21-22. December 1998, Table 2.3. <sup>44</sup>
9,770.3	1998	1998 DWR M & I report, p. x, table II Washington County
7,818.6	2002	DWR 2002 report p. 42 Table 17
7,445.5	2005	DWR 2008 report p. 42 Table 17

This information indicates secondary water does not increase with population growth. Thus, it is not justified to add 52 gpcd of secondary use in per capita use for 50 years, because it distorts the need for water.<sup>45</sup> Secondary use is also seasonal, and not used 365 days a year.

Secondary systems that are not metered should be reevaluated because they are the irrigation water shares that have been turned over to the cities due to changing from flood irrigation to a pressurized system. Basing estimates solely on water rights and making assumptions based on unmetered water skews the per capita use rate.

Using Division of Water Resources (2008) estimate (*see* Table 16, p. 41) for gallons per capita per day isn't realistic because DWR is comparing the small agricultural communities that push up the figures for gallons per person per day. Another option could be to use the cities in the urban core that are served by the WCWCD and get updated information, making sure to separate out agricultural water, and use the average (gpcd) of those cities to more accurately assess the need for the Pipeline.

WNA states “per capita water use data were determined by dividing total water use by the permanent population (i.e. non-permanent resident population was not included in the calculation of per capita water use).” WNA, p. 3-12. If non-residents, which are 25% of

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<sup>44</sup> Boyle Engineering, *Corporation Water Supply Needs for Washington and Kane Counties & Lake Powell Pipeline Study* (1998), pp. 21-22, available at <http://wcwcd.state.ut.us/Plans,%20Studies%20&%20Reports.htm>. Table 2.3, p. 21, shows the secondary use is from the irrigation companies. The report includes this use in per capita use, although UBWR states agricultural water is deleted from per capita use.

<sup>45</sup> *See* Lake Powell Pipeline Study, Water Needs Assessment, Phase 1 Report, Final Draft (Aug. 2008) (WNA), p. 3-12, Table 3-10, available at <http://www.water.utah.gov/lakepowellpipeline/projectupdates/default.asp>

the population, are not counted that also inflates the per capita use. Non- residents should be counted in another scenario.

The assumptions of the Boyle report need to be reevaluated in the WNA used to predict water demand. “The Boyle report aggregated all classes of water; it assumed that these sectors will grow in direct proportion to population growth. This is not the case—commercial and industrial water use typically grows at a slower rate than population. Boyle Report’s assumption that secondary water use will increase with population is particularly suspect. Secondary water is an artifact of low-density residential development into agricultural area.” Defects of Boyle report study are identified in Hydrosphere Resource Consultants, *Review of Water Supply Needs in Washington County, Utah* (2000) p. 5.<sup>46</sup>

New methodologies need to be developed to more accurately reflect water need in the future in the WNA. UBWR should set a standard way of counting per capita use using water retail sales so it can accurately be measured and compared.

## 2.6. Existing Water Supplies

The WNA addresses the concept of demand hardening:

“As per capita water use is reduced, the ability to use demand management as a drought protection strategy is also reduced. The decrease in flexibility of per capita water use is referred to as ‘demand hardening.’ It is important that reliable yield estimates for the Districts are not overestimated because of demand hardening that will occur in the future as additional conservation measures are enacted.”

WNA, p. 2-14. The WNA uses demand hardening as a justification for not implementing long term drought measures. The concept of demand hardening is defined as follows: “By saving water, long-term conservation can also reduce the water savings potential for short-term demand management strategies during water shortages.”<sup>47</sup> While demand hardening can be a concern, much research has been done in recent years on the topic and according to the Colorado’s Statewide Water Supply Initiative (SWSI) phase II report demand hardening is only a concern “during a water shortage if conserved water is used to serve new customers.”<sup>48</sup>

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<sup>46</sup> Available at [http://www.citizensfordixie.org/images/pdf/hydrosphere\\_original\\_water\\_supply\\_report.pdf](http://www.citizensfordixie.org/images/pdf/hydrosphere_original_water_supply_report.pdf).

<sup>47</sup> J.E. Flory *et al.*, *Long-term Water Conservation and Shortage Management Practices: Planning that Includes Demand Hardening*, prepared for California Urban Water Agencies (1994).

<sup>48</sup> *Colorado SWSI Phase II Report* (Nov. 2007), § 2.3.2 at 2-11, available at <http://www.cdm.com/NR/rdonlyres/0ED27922-DFB9-431F-A9DF-4328B0CE3FC4/0/ColoradoStatewideWaterSupplyInitiative.pdf>.

- Customers who have reduced their demand through technological changes or who join a system as efficient users (such as new customers) can still achieve behavioral reductions during a shortage.<sup>49</sup>
- By modeling the demand impacts of long-term conservation programs on current customers, and the potential for drought curtailment in new and existing customers, it is possible for water providers to determine what portion of achieved conservation savings should be held to maintain (or improve) system reliability and what portion can be used to serve new customers.<sup>50</sup>

Additionally, encouraging wasteful use is not good policy and is in fact inconsistent with state and federal law.

#### **3.1.4. Tourism Population**

The WNA evaluates water use by the tourist population. *See* Section IV, WNA, pp. 3-11, Table 3-8. It estimates an annual average of 16,013,000 tourist visits to Washington County. *See id.* It does not describe the basis for this number, and thus the estimate cannot be verified. Alpha Engineering’s assumption that a motel visit uses 150 gallons per day (gpd) is not valid. In a chart of per capita use, the WNA estimated water use of 70 gpd for a person in a house.<sup>51</sup> Thus, an estimate of 150 gpd for a person who stays in a motel room only for the night is not valid.

#### **4.1.2. WCWCD Regional Water Supply Agreement**

The WNA states:

“WCWCD has executed a Regional Water Supply Agreement (RWSA) with five municipalities in Washington County, beginning with the City of St. George, effective April 23, 2006, and followed in 2006 by Washington, Ivins, Hurricane and LaVerkin. Toquerville has approved its execution and other municipalities are likely to follow. The RWSA is the vehicle by which WCWCD will provide water throughout the county in the future.... [¶] “The RWSA operate under a new approach in contrast to the typical take or pay contracts traditionally relied upon by the District. Capital costs for water development are paid for largely by new growth in the form of impact fees.”

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<sup>49</sup> *Id.*, p. 2-11.

<sup>50</sup> *Id.*, p. 2-12.

<sup>51</sup> WNA, p. 3-12, Table 3-10.

WNA, p. 4-2. The WNA further provides: “The impact fees are structured to provide for a baseline amount of water, set as 0.89 acre feet, as required by the Utah Division of Water Quality, for one equivalent residential unit.” WNA, p. 4-3.

We have been unable to locate documentation to support a determination that 0.89 acre feet of water is an appropriate baseline amount of water being provided to existing residents within the municipalities. Every residential unit is considered to have the same high water use without consideration for other types of residences that use less water such as condos, apartments, and smaller lots. Further, the Utah Division of Drinking Water (Division) has an 800 gpd requirement per residential unit for just indoor use. This high rate is allocated for peak use and drought. The shortcoming of this estimate is that it does not consider the long term benefits of water conservation in its forecast of reduced water demand. As a result, communities then have to build excess (redundant) water supply simply to facilitate cutbacks during drought. This is highly uneconomical and misleading to ratepayers. The Division indicates that the 800 gpd is an *estimate*, “in the absence of firm water use data.” R309-510-4; R309-510-7(2). Therefore, if available water data supports a reduced water use rate for indoor use, this actual “level of service” could be reduced and the amount of water required for future growth would be reduced by a significant amount.

The state rule on drinking water systems, R309-510-6 (Water Conservation), provides as follows:

“This rule is based upon typical current water consumption patterns in the State of Utah. They may be excessive in certain settings where legally enforceable water conservation measures exist. In these cases the requirements made in this section may be reduced on a case-by-case basis by the Executive Secretary.

Drinking water systems are encouraged to use the water resources of the state wisely. Conservation measures such as low flow toilets and low water demand landscaping (xeriscaping) may significantly reduce the demands on water systems.”<sup>52</sup>

Consistent with this rule, the WNA should verify that 0.89 AF of water is indeed “typical water consumption,” and provide detailed information on how this estimate was derived. An average home uses about 10,000 gallons per month for both inside and outside watering, or approximately 0.45 AFA. Actual retail water sales figures should be collected for this study.

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<sup>52</sup> R309-510-6, available at [http://www.drinkingwater.utah.gov/documents/rules\\_ddw\\_version/R309-510\\_3-8-06.htm](http://www.drinkingwater.utah.gov/documents/rules_ddw_version/R309-510_3-8-06.htm)

### 4.1.3. WCWCD Existing Supplies

The WNA states: “The yield estimates used for Washington County are considered reliable because ground water supplies and agricultural water curtailment for M&I use can be used to supplement surface water supplies to fully meet demands during extreme drought years.” WNA, p. 4-3. If this statement is correct, then the alleged consequences of the No Action Alternative should be lessened by the availability of ground water supplies and agricultural water curtailment. See Section IV, WNA section 4.1.3.3, *infra*.

#### 4.1.3.3. Summary of Existing WCWCD Culinary Supplies

The WNA summarizes the reliable yield for existing WCWCD projects that can be used for culinary and secondary purposes. See WNA, Table 4-1, p. 4-9. Table 4-1 assumes 29,500 ac-ft/yr of reliable culinary quality water yield from Quail Creek and San Hollow Reservoirs. This is consistent with the data in Table 6-1, “WCWCD Summary of Existing and Future Supplies,” see Section IV, WNA, p. 6.3. Table 6-1 also reports 29,500 AFA from Quail Creek and Sand Hollow Reservoir. Based on our review, 29,500 AFA of culinary water from these two reservoirs, plus the well field of 8000 ac-ft, does not appear on its face to be an efficient yield of two reservoirs that hold large amount of water in storage. The WNA should disclose current storage protocols, and explain why more storage is not being considered as yield of culinary water for 2060. Further, the WNA’s assertion in its analysis of the No Action Alternative that there is not adequate storage for drought, is inconsistent with the storage capacity indicated in Table 4-1. The chart below shows the large amount of water in storage and a much smaller amount of water being sold and is an example of the small amount of yield of those resources.

#### WCWCD reservoirs and aquifer storage only

	Acre feet yield	Acre feet storage capacity 2008	Retail sales acre feet 2007 <sup>53</sup>
Quail lake Reservoir	22,000	40,000	16,345
Sand Hollow Reservoir	7500	50,000	2,149
Sand Hollow wells	8000		
Sand Hollow aquifer storage		70,000	
Total	37,000	160,000	18,494

<sup>53</sup> See Melodie Sorensen, WCWCD, pers. comm. to Citizens for Dixie’s Future (Oct. 21, 2008).

#### **4.1.4.1. Potable Water Supplies**

The WNA states,

“The total reliable potable water supply for all public community systems in Washington County is about 72, 560 acre feet per year (DWRe2008a). Table 4-2 shows the reliable potable water supplies developed by each public community water system in Washington County. The annual potable water use in Washington County in 2005 was 39,291 ac-ft, representing about 54 percent of the reliable potable water supply.”

WNA, p. 4-10.

Table 2, “Reliable Potable Water Supplies – Washington County,” shows WCWCD’s surface water from the Virgin River to be 39,700 AF and 3,750 AF from wells which is not reflected in the current total supplies. However, Table 6-1, “WCWCD Summary of Existing and Future Supplies,” *see* Section IV, WNA, p. 6.3, states WCWCD provides less water of 29,500 AF of annual surface water supplies.

Over the years the amount of available water in county has gone down in various water reports. For instance, in the WCWCD’s Virgin River Management Plan potential M & I Water Supplies was 176,700 AF.<sup>54</sup> This study should reevaluate possible future water supplies of all reports.

#### **4.1.4.2. Secondary Water Supplies**

*See* Section IV, WNA section 2.2, *supra*.

#### **4.1.5.3. Sand Hollow Well Field Expansion**

This section discusses the potential for well expansion. However, a future yield is not noted in possible future supplies.

#### **4.1.5.4. Wastewater Reuse**

The WNA makes inconsistent statements about the availability of storage for reuse water, stating both that there is no storage for reuse water and that water can be stored in Warner Valley. WNA page 6-3 Table 6-1 shows 54,500 AF of reuse water that could be used in the future. However, WNA p.19 Table ES-8 only shows 16,900 AF of potential reuse by 2060.

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<sup>54</sup> *Virgin River Management Plan* (1999), Table 8 at p. 14, available at <http://wcwcd.state.ut.us/Plan,%20Studies/VRMP/VRMPFinal5.PDF>.

#### 4.1.5.5. Agricultural Conversion for M & I Supply

More irrigation water could be converted to culinary use than UBWR predicts. “Additional municipal water supplies become available from irrigation water rights appurtenant to land purchased for development. This water supply can constitute the majority or, in some cases, the totality of the water required by the developed uses. About 82,000 AF of water per year (page 3, Boyle report) were used on irrigated lands in Washington County. Assuming that agricultural efficiency is approximately 50% (as reported in the USGS 1995 National Water-Use data files<sup>55</sup>) then, roughly, this would be available for transfer to municipal uses.”<sup>56</sup> Thus more culinary water could be available by 2060. UBWR predicts only 4,000 acre feet will convert to culinary and that should be analyzed in WNA Phase II.

We request that, in developing its Action Alternative, the Commission consider all potential sources of water that could meet the project participants’ water needs. In Washington County, for example, 969,488 AF of surface water rights exist,<sup>57</sup> with only 40,198 AF of surface water supplies in public community systems.<sup>58</sup> UBWR shows 83,910 AF of developed water rights, with future supplies of 11,000 AF of culinary and 12,400 AF of secondary of undeveloped water rights.<sup>59</sup> Presumably most of the water rights in Washington County are currently used for agriculture. Although we do not endorse widespread dry up of agriculture, if fallowing or lease agreements are well-designed, they can be beneficial for agricultural communities. These supplies often are cost-competitive with structural alternatives, and should be considered in the Action Alternative.

#### 4.1.5.7. Lake Powell Pipeline

The WNA states, “WCWCD has requested the deliver of 70,000 ac-ft of water per year from the LPP project. In order to fully develop the 70,000 acre feet of Lake Powell water they will need to construct additional storage.” WNA, p. 4-20. However, in section 4.1.6.1, the WNA asserts the Fort Pearce Reservoir will not be used. This is a contradiction and needs to be discussed in Phase II WNA.

For decision makers to accurately assess the impact of Lake Powell water on Quail Lake and Sand Hollow Reservoirs, an accounting of how much water is actually diverted into the reservoirs needs to be included in the analysis. A 110-foot diversion dam was built on the

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<sup>55</sup> <http://water.usgs.gov/watuse/spread95.html>.

<sup>56</sup> Flaws in the Boyle study are identified in Hydrosphere Resource Consultants, *Review of Water Supply Needs in Washington County, Utah (2000)*, available at [http://www.citizensfordixie.org/images/pdf/hydrosphere\\_original\\_water\\_supply\\_report.pdf](http://www.citizensfordixie.org/images/pdf/hydrosphere_original_water_supply_report.pdf).

<sup>57</sup> *Virgin River Management Plan, supra*, Appendix B, p. B1-13.

<sup>58</sup> DWR (2008), Table 14 at 339.

<sup>59</sup> WNA, Table ES-8, p. 19.

Virgin River and a higher elevation reservoir was created behind it to create a big enough head to generate power. The WCWCD diverts 150 cfs (112,500 acre feet a year) constantly from the Virgin River at the Quail Lake Diversion to generate power and store water. They release 3 cfs over the diversion for the fish and then 3 miles downstream release an additional 30 cfs through the Pah Tempe Power Plant into the Virgin River for the endangered fish. According to water use input data from the Division of Water Rights, in 2007, the WCWCD provided water from the Virgin River; to Hurricane City 1230 acre feet; Hurricane Irrigation Company 12,856 acre feet; and to Hurricane Golf Course 643 acre feet among other small retail users. Then the balance is taken to Quail Lake 1 power plant and onto the reservoirs. As needed a small amount of water is returned to the river for the endangered fish before the Hurricane USGS gauge. The USGS hydrographs do not reflect the diversion of water because the diversion occurs between the Virgin and Hurricane USGS gauges.

The assumption that 4 AF of storage is needed for 1 AF of yield is inconsistent with how WCWCD manages the Quail lake Reservoir. It is managed with 1 AF of storage and 1 AF of yield, (20,000 acre feet of storage and 20,000 acre feet used for yield). Sand Hollow on the other hand is being managed as 8000 acre feet of yield with 4 times storage because of the Virgin River streamflow are variable. However, the current Quail Creek diversion is constant, so the variability of the Virgin River is not a limiting factor. There may be a more efficient way to operate the system to yield more water with just a change in WCWCD's management policy.

Sand Hollow Reservoir is essentially full. With only 2000 AF being sold today, there will be no room for Lake Powell water. This issue should be discussed in the analysis.

#### **4.1.6.1. Additional Virgin River Water Available for Development**

The WNA states: "After numerous studies by various State and Federal agencies, the DWRe and WCWCD have concluded there is no additional Virgin River water available to be developed for water supply in Washington County because of variable streamflow, poor water quality, lack of storage options, minimum streamflow requirements, and the potential for sedimentation of possible reservoir sites." WNA, p. 4-21. We disagree with this conclusion. See Section I, SD2 section 3.2, *supra*.

WNA Figure 4-4 (p. 4.22), "Daily Streamflow for Virgin River below Washington Fields (DWRe 2008b), shows that the size of the Virgin River diversion pipe (150 cfs) is insufficient during high flows to capture the water which is lost to overflow. In 2005, 273,281 acre feet out of an annual yield of 379,383 acre feet, was lost due to the size of pipe."<sup>60</sup> A study should be made on ways to capture this high water overflow so it can be

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<sup>60</sup> WCWCD, *Waterline* (winter 2008), available at [www.wcwcd.state.ut.us](http://www.wcwcd.state.ut.us).

pipled down to the proposed Sand Stone Reservoir site and stored in the Navajo Sandstone aquifer.

Another option for future water supplies is to expand the existing Sand Cove Reservoir system into a series of up to five significantly-sized aquifer recharge reservoirs with well fields to capture water stored underground. This system would augment the storage capacity of Baker and Gunlock reservoirs and increase the ability to capture more Santa Clara River spring runoff. It would also produce pristine culinary water for delivery to the Pipeline system from the Gunlock wells to the St. George regional water delivery system.

In the Virgin River Management Plan it states there are about 900,000 acre feet of surface water rights in the county.<sup>61</sup> We understand these are paper water rights. But, a percentage of these rights could convert to culinary water development by 2060. These water rights must be part of the study on available water for the future.

#### **4.1.6.3. Ground Water Development**

The WNA states, “The Virgin River ground water basin in Washington County ... is considered to be over-appropriate by the Utah Division of Water Rights (DWRe 2008aa).” WNA, p. 4-24.

Although the Navajo Sandstone is over-appropriated and closed to any new appropriations, there is still a significant amount of existing water rights held by private individuals and public agencies that could convert to culinary use by 2060. In the proceeding on WCWCD’s Petition for Classification of the Navajo/Kayenta and Upper Ash Creek Aquifers, the Division of Water Rights reports that “there are 332,760 acre feet approved water rights.” Ground water rights must be part of a thorough study on water supplies. Private land comes with water rights and as land is developed some of these rights will convert to culinary water in the future. If the state is not going to let existing water rights holders develop their water rights in the future, the EIS is a good place to start discussing the issue to create public awareness of the problem and alleviate the implications of groundwater overdraft.

More is known about available water in the Navajo Sandstone aquifer under Sand Hollow Reservoir than this section reveals and should be included in the WNA. For instance a USGS report states that “estimated recharge volumes have ranged from about 200 to about 3500 acre-feet per month. Total ground-water recharge from March 2002 through August 2006 is estimated to be about 51,000 acre-feet.”<sup>62</sup> There is 200,000 AF of storage in the

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<sup>61</sup> See Virgin River Management Plan, *supra*, Appendix B, p. B1-13.

<sup>62</sup> USGS, *Assessment of Artificial Recharge at Sand Hollow Reservoir, Washington County, Utah, Updated to Conditions through 2006* (2007), p. 1.

aquifer. This is a significant amount of water and should be discussed in the water needs analysis. Current artificial recharge to the aquifer is estimated to be 70,000 AF.

More water from the Navajo Sandstone aquifer would be available if the pending Washington County Growth and Conservation Act passes. This legislation would change the status of the Red Cliffs Desert Reserve (Reserve) which is currently closed to water development to a National Conservation Area and the text in the bill would allow development of the Navajo Sandstone aquifer. The WCWCD also has wording the bill to be able to change the Red Mountain proposed wilderness area to a National Conservation Area to be able to drill new wells there in the Navajo Sandstone.

### **6.2.1.2. Water Supply and Demand**

The WNA states, “Existing and future water supplies under the No Action Alternative would meet project M&I water demand within the WCWCD service area through approximately 2020 (Figure 6-9). WNA, p. 6-15.

The assumption that more water will be needed by the year 2020 is not accurate as the list of available options in the Coalition’s Alternative to the Pipeline reveals. *See* SD2 comments 3.2 *supra*. The WRA states: that the No Action Alternative will not provide for a reserve supply for drought, emergencies, and other losses. However the chart below shows there is available water storage.

#### **Existing Drought Options**

Quail Lake Reservoir	20,000 acre feet
Sand Hollow Reservoir	20,000 acre feet
Sand Hollow Aquifer	60,000 acre feet
Agricultural water	40,000 acre feet, half of existing water rights

### **6.1.2 WCWCD Integrated Water Resources Plan**

The Coalition’s Alternative to the Pipeline should be integrated into water resources plan. *See* Section I, SD2 section 3.2, *supra*.

V.  
COMMENTS ON PROPOSED STUDY PLAN

We comment on the PSP as filed on August 22, 2008. We understand UBWR has revised some of the individual study plans as of November 13, 2008. We have not yet completed our review of the November 13 study plans. While not required under 18 C.F.R. § 5.12, where possible we have tried to address the November 13, 2008 study plan modifications. However, we reserve the right to amend our comments following completion of our review.

In addition to providing an environmental report with its license application, as required by 18 C.F.R. § 5.18, the license applicant must provide the following information for purposes of the Commission's compliance with NEPA:

- “ (1) Provide all necessary or relevant information to the Commission;
- (2) Conduct any studies that the Commission staff considers necessary or relevant to determine the impact of the proposal on the human environment and natural resources;
- (3) Consult with appropriate Federal, regional, State, and local agencies during the planning stages of the proposed action to ensure that all potential environmental impacts are identified. (The specific requirements for consultation on hydropower projects are contained in § 4.38 and § 16.8 of this chapter and in section 4(a) of the Electric Consumers Protection Act, Pub.L. No. 99-495, 100 Stat. 1243, 1246 (1986));
- (4) Submit applications for all Federal and State approvals as early as possible in the planning process; and
- (5) Notify the Commission staff of all other Federal actions required for completion of the proposed action so that the staff may coordinate with other interested Federal agencies.”

18 C.F.R. § 380.3(b)

Under 40 C.F.R. § 1502.16,<sup>63</sup> the Commission's EIS must analyze the environmental consequences of the proposed action, including direct, indirect, and cumulative effects:

“... The discussion will include the environmental impacts of the alternatives including the proposed action, any adverse environmental effects which cannot be avoided should the proposal be implemented, the relationship between short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and any irreversible or irretrievable commitments of resources which would be

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<sup>63</sup> Under 18 C.F.R. § 380.1, the Commission must comply with the Council on Environmental Quality's NEPA regulations.

involved in the proposal should it be implemented. ... It shall include discussions of:

- (a) Direct effects and their significance (§ 1508.8).
- (b) Indirect effects and their significance (§ 1508.8).
- (c) Possible conflicts between the proposed action and the objectives of Federal, regional, State, and local (and in the case of a reservation, Indian tribe) land use plans, policies and controls for the area concerned. (See § 1506.2(d).)
- (d) The environmental effects of alternatives including the proposed action. The comparisons under § 1502.14 will be based on this discussion.
- (e) Energy requirements and conservation potential of various alternatives and mitigation measures.
- (f) Natural or depletable resource requirements and conservation potential of various alternatives and mitigation measures.
- (g) Urban quality, historic and cultural resources, and the design of the built environment, including the reuse and conservation potential of various alternatives and mitigation measures.
- (h) Means to mitigate adverse environmental impacts (if not fully covered under § 1502.14(f)).”

40 C.F.R. § 1502.16.

We are concerned the PSP will not yield adequate data for purposes of the Commission’s preparation of the EIS under NEPA, and its ultimate licensing decision under the FPA. Plainly the Commission has an obligation under NEPA to consider the Project’s effects in light of climate change, which will change the hydrology of the entire basin over the term of the license. The Commission is further obligated to consider the indirect biological and social impacts of changes to the region’s water supply. However, the PSP does not address these issues. It focuses on the direct effects on project construction and operations, and does not include studies of the potential indirect or cumulative effects of the Project in the context of changes to the Colorado River’s hydrograph as a result of climate change. We request that the Revised Study Plan required under 18 C.F.R. § 5.13 include studies which will yield information regarding the indirect and cumulative effects of the Project. We also request that the Revised Study Plan better articulate the nexus between project operations and effects on the resource to be studied, as required by 18 CFR § 5.9 (b)(5).

We further are concerned that the PSP provides inadequate time to complete field studies. We agree with the previous comments of the Department of the Interior, Office of Environmental Policy and Compliance (DOI):

[The] proposed time line is inconsistent with FERC's Integrated Licensing Process (ILP) regulations. The proposed time line compresses the ILP's structured 3 to 3.5 year filing process into an abbreviated 20-month program. Such a condensed approach will compromise the evaluation of environmental issues for this new and significant construction. The regulation contemplates that at least two field seasons of studies man be necessary to gather sufficient information. If a second year of study is required, it certainly cannot be completed with 13 months. To meet the proposed schedule, the Applicant may intend to conduct studies before a study plan is approved. This approach presents a risk that studies conducted will not conform to the approved study plan.

*See* DOI letter (Dec. 28, 2007), *supra*. The PSP does not address this concern, and so we request the Revised Study Plan provide more time for field studies.

We provide our specific comments on the individual study plans below. Our comments track the title and outline number in the PSP for each section where we have a comment.

#### **Study Plan 1: Air Quality**

Overall, the scope of the existing air quality study plan—which plans to analyze only the direct impacts of construction, operations, and maintenance of the pipeline—is too narrow. The study plan must include the cumulative and indirect impacts of population growth on air quality. *See, e.g.*, 40 C.F.R. § 1508.8. According to comments in the record, there is substantial public concern that the water supply project will facilitate additional population growth, which may diminish the quality of life in the region. Air pollution resulting from this additional population growth must be assessed in the air quality study plan analysis. In their comments on SD1, EPA offered to help with that analysis; we encourage the Commission to utilize EPA's expertise.<sup>64</sup>

In its Draft Air Quality Study Plan, the UBWR notes that its analysis will include, among other elements, the “determination of power sources for pumping and potential impacts of developing additional generating capacity (to the extent feasible)” (§1.4.3). This analysis is essential to a complete and thorough EIS. The power demands of the pipeline could have substantial impacts on air quality by increasing electricity generation at existing or new power plants. This air quality analysis should provide information on emissions of gases

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<sup>64</sup> EPA, PAD Comments, *supra*.

regulated under the Clean Air Act *and* greenhouse gas emissions. The Coalition is concerned about the phrase “to the extent feasible” and encourages the State to make every effort to assess increased air emissions resulting from power demands. If, for example, the UBWR decides it cannot determine the specific power plants responsible for providing electricity to the pipeline’s pumps, it should use typical emissions statistics for the state or region. *See* Coalition SD1 Comments, pp. 19, 39.

### 1.2.1. Goals and Objectives

We recommend the following *revisions* to the goals for this study:

“The goals of the air quality study plan are to determine potential impacts on air quality and identify measures to protect air quality to the extent that it may be affected by Project construction, operation, and maintenance. Specific impacts on air resources could include construction equipment emissions and fugitive dust emissions during Project construction and operation,” *as well as indirect and cumulative impacts of increased emissions as a result of population growth.*

### 1.6.2.3. Task 3 -- Data Analyses

We recommend the following *revisions* to this text:

“Data collected from the literature review and field investigations will be compiled and analyzed by experienced, licensed engineers. Data evaluations will focus on satisfying the identified goals and objectives; specifically, establishing *baseline air quality, and* determining how the Project construction will affect air quality, how the Project operations would affect air quality, and identifying potential mitigation measures. The analysis will involve air quality modeling utilizing the SCREEN3 model to simulate potential pollutant dispersion. Air quality simulation results will be compared to the National Ambient Air Quality Standards (NAAQS) and applicable state or local standards. The results of the data analyses will be used to determine the need for mitigation measures. The SCREEN3 model will be run as necessary to help determine the effectiveness of mitigation measures in controlling Project air emissions that would meet air quality standards.”

## **Study Plan 2: Aquatic Resources**

### 2.1. Introduction

We recommend the following *revisions* to the Introduction:

“The purpose of this study plan is to define the procedures and methodologies for analyzing potential impacts on aquatic resources, *including instream and riparian habitat*, for the Project. This study plan describes goals and objectives, provides a description of the study area, describes the Project nexus, presents the proposed methodology, presents staffing and equipment requirements, provides a budget for activities associated with the aquatic resources portion of the study, and provides a generalized project schedule. The study will identify potential impacts of the Project on aquatic resources during construction, operation, and maintenance, and identify measures to mitigate impacts on aquatic resources that could be affected by Project construction, operation and maintenance activities. The study plan addresses those aquatic resources issues that might reasonably be affected by Project construction, operations, and maintenance.”

### 2.2.1. Study Goals and Objectives

We recommend the *following revisions* to Section 2.2.1.

“Following are the primary objectives of the aquatic resources study:

...

- Identify the effect of invasive species transfer as a result of Project implementation, as well *as methods to control invasive species transfer*
- Determine long- and short-term *direct, indirect and cumulative* impacts that could occur on aquatic habitat from Project construction and operation
- Identify how the Project operation could affect the objectives of the Virgin River Management Plan and other management programs, *including linkages to other Colorado River Basin aquatic plans including the studies in Grand Canyon and the Multi-species conservation Plan in the lower Colorado River*”

### 2.2.2. Data Needed to Perform the Analysis

We recommend the following *revisions* to Section 2.2.2.

“The following data are required and will be collected in order to perform the analysis.

- Identification of open water, stream and riparian habitat available within the impact area
- Information on fish and aquatic species distributions, *densities*, life history (spawning areas and migration patterns, seasonal habitat use, etc.) and

*anticipated* responses to project-related activities (turbidity, increased human presence, etc.) *on both a short and a long-term basis.*

- Areas of important habitat and/or the distribution of aquatic species within the impact area need careful delineation, *(including scientifically qualified assessments of location, size and linkages), mapping, and documentation*
- Sport fish information for the lake, reservoirs and streams that support a game fish population *including potential impacts on forage fish and their distribution*
- *Evaluation of potential project operation based on future Lake Powell operations as related to reduced elevations associated with climate change and projections of impacts to water in reservoir (why important – reduced reservoir levels will change the limnology and fish dynamics of the reservoir)...*”

### 2.3. Agency Resource Management Goals (§5.11(d)(2))

We recommend the following *revisions* to Section 2.3.

“The existing information base for aquatic resources is considered adequate *by [name of agency, party]* to document baseline conditions but the study will confirm that assumption and will be prepared to augment the current database as necessary.”

### 2.4.2. Existing Information

We recommend the following *revisions* to Section 2.4.2.

*“The Colorado Plateau and Arizona Strip are notoriously affected by seasonal precipitation. Average or normal flow dynamics are inadequate to describe the situation. Specifically summer monsoon impacts and needs of species, and winter storm dynamics in respect to floods and sediment movement need to be included in the analysis.*

...Upstream users of the Kanab Creek in Utah divert flows for municipal and irrigation purposes, leaving it mostly dry in the summer season where the preferred alignment would cross the creek (BLM 2007a). *Studies have shown that humpback chub have been documented at the mouth of Kanab Creek in the Grand Canyon along with an assemblage of other native fish species. Impacts of construction and long-term management of the pipeline may affect the sediment and water quality conditions in lower Kanab Creek and should be included in the analysis.*

The Virgin River Resource Management and Recovery Program also aim to provide habitat to other native fish while allowing for continued use of the water resources.

***[Mention other lower basin fish management plans. The Colorado River system will be impacted by this transfer of water and it should be noted in the study plan]...***

“Zebra mussels (*Dreissena polymorpha*), quagga mussels (*Dreissena rostriformis bugensis*) and Asian clams (*Corbicula fluminea*) are exotic mollusk species whose occurrence is slowly moving west. Recent findings indicate ‘the presence of an extremely small number of individual, larval quagga or zebra mussels in Lake Powell’ (USFWS et al. 2007). The extent to which Lake Powell has been influenced to date by these mussels remains minimal. ***Based on evidence of impacts of exotic mussels on downstream environments, it appears these species will soon impact Lake Powell. The study plan will look beyond today and anticipate what the impacts will be under an expanded mussel population and changing water quality conditions due to drought.*** Measures to prevent the spread and infestation of mussels in Lake Powell include boat decontamination stations available in Glen Canyon National Recreation Area marinas. Quagga and zebra mussels and Asian clams are present in Lake Mead and have been documented to foul water intake structures. The Utah Division of Wildlife Resources has hired aquatic resource biologists and technicians, and has purchase mobile sprayers for use in decontaminating boats. ***[Identify proposed measures to treat mussels at pipeline intake.]*** . . . Biologists believe that the Spiny water flea may displace native zooplanktons in Lake Powell (Trophy 2007). ***The study plan will evaluate this eventuality...***

The invasive New Zealand mudsnail (*Potamopyrgus antipodarum*) has recently been found in several trout streams in Utah and throughout the West, however this species has not been reported (*or surveyed*) within the Paria River, Kanab Creek, or the Virgin River drainage and has not been reported within the Project area....”

#### 2.4.3. Identified Data Sources

We recommend the following ***revisions*** to Section 2.4.3.

“The following data sources have been identified to date.

- Colorado River Interim Guidelines for Lower Basin Shortages and Coordinated Operation for Lake Powell and Lake Mead, 2007. ***See projections on reservoir elevations in future hydrologic conditions included in the EIS.***
- ***Spring data from Grand Canyon Wildlands Council....”***

#### 2.4.4. Additional Data Needed

We recommend adding the following items to Section 2.4.4.

- *Evaluation of mussel management at pipelines (see Lake Mead, Lake Havasu, etc. plans)*
- *Evaluation of potential impacts of reservoir limnologic dynamics at the pipeline intake – what changes will occur under present day and anticipated future reservoir conditions in relation to reduced elevations.*
- *Impacts of season water transfer on reservoir (Lake Powell) and receiving reservoirs (Sand Hollow and Quail Creek).*
- *Impacts of water withdrawal from Powell on regional groundwater system as related to springs on the Arizona Strip*
- *Impact of annual maintenance-related water releases to the Paria River and impacts on native fish assemblage and downstream Grand Canyon ecosystem.*
- *Scientific assessment of intake impacts on fish species in Lake Powell, including how to screen and how to avoid loss of juvenile fish to pipeline.*

## 2.5. Nexus to Project (§5.11(d)(4))

We recommend the following *revisions* to Section 2.5.

“The diversion of water from Lake Powell to Sand Hollow Reservoir in the Virgin River drainage and potential for annual maintenance-related water releases to the Paria River may result in a biota transfer of potentially harmful species. In addition, it will be important to develop a Lake Powell intake structure that will not entrain or trap fish or other valuable resources. *This is a critical issue, since the Corp of Engineers spends millions of dollars on this issue in the NW Columbia and Snake River system.*

The design of the water intake and intake structure will need to meet all appropriate regulatory standards [*cite standards*] for escapement (screen size, intake velocity, etc.) to protect fish. Typically the selection of the proper criteria (well defined) has been demonstrated to reduce entrainment of fish to an acceptable level. [*Explain “proper criteria” and how it will be selected.*]....”

### 2.6.1. Define Baseline Conditions

We recommend the following *revisions* to Section 2.6.1.

“Aquatic resources baseline conditions, *including density and distribution*, will be defined for the existing fish and other critical aquatic species and populations and habitat conditions in the immediate impact area and surrounding area....

All available local and state records, creel census, Utah Division of Wildlife Resources information, Arizona Game and Fish Department information, ***[relevant Tribes]***, and academic research papers will be collected, catalogued and used to analyze the aquatic resource within the potential impact areas.”

### 2.6.2. Analyze Impacts

We recommend adding the following ***revisions*** to Section 2.6.2.

“Disturbances caused by pipeline crossing of streams and channels will be identified in detail and the surrounding areas of direct and indirect, short- and long-term potential impact mapped to determine if any critical species may be affected.

***[Add assessment of indirect and cumulative impacts from this and other water management projects.]***

The Project alternatives will be evaluated with regard to significance criteria to define measurable potential impacts and determine the need for mitigation.

There are ~~no~~ specific regulatory guidelines for supporting aquatic species populations or aquatic habitat loss or impacts ***in the Endangered Species Act and other applicable laws....***

The following criteria will be used initially to determine significant impacts on aquatic species and the various aquatic habitats:

- Activities that could have a measurable effect or disturbing influence (***short and long-term***) on any aquatic species or their habitat, ***including wetlands and springs***, in the project impact area will need to be carefully analyzed....
- ***Limnological impacts in Lake Powell Reservoir and its impacts on forage and sport fish populations.***
- Biota transfer of native and invasive species ... would require monitoring and periodic assessment....It may not be possible to absolutely manage this potential problem to any practical extent for all species; however, the ability to monitor the problem is a critical factor, ***as is mitigation within the control of the project.*** Control and mitigation measures, where possible, will be investigated, ***and*** their ***potential*** impacts analyzed, ***and management actions identified.*** The impact of the application of management methods and maintenance (i.e. chemicals, pipeline cleaning, etc.) will be identified ***and assessed in respect to their biological potential and economic cost.***

- Any project activity that reduces or limits the quality of the aquatic resource or habitat (*including wetlands*) either through disturbance or reduction will need to be identified and considered a significance criterion to be monitored and mitigated. Improvements to aquatic environments such as the use of pressurized water for the Hurricane irrigation system resulting in enhanced flow management in the Virgin River must be determined.
- Project activities that could restrict or prevent the natural movement, migration or use of aquatic habitat will need to be considered *on a seasonal and multi-year basis...*

The analysis of impacts on aquatic resources will be based on standard operating procedures and measures to avoid or reduce impacts that have been used in similar water intakes, pipeline and power generation and transmission projects. The significance criteria for aquatic resources will then be applied to determine if any impact would require modification of the project or mitigation. Mitigation measures would then be developed to offset significant impacts. The mitigation measures will be based on applicable state and Federal statutes and regulations, past experience and best professional judgment to either satisfy a legal requirement or to satisfy the public interest. In some cases significant impacts may not be able to be mitigated. All reasonably foreseeable mitigation options will be evaluated by the Federal Energy Regulatory Commission, Bureau of Land Management, and other responsible federal agencies and factored into the respective decision documents. *A multi-agency monitoring group, including the tribes, needs to be established and vested with power to force changes in operations if negative impacts occur to ecosystem.*”

### 2.6.3. Cumulative Impacts Analysis

We recommend the following *revisions* to Section 2.6.3.

“The aquatic resources cumulative impacts analysis will address the combined impacts of the alternatives and any past or future proposed or planned actions that have or are likely to affect the aquatic species and resources in the impact areas. The inter-related projects and project elements will be identified for analysis of cumulative impacts. *[Provide more detail.]*“

### 2.6.4. Invasive Aquatic Species Analysis

We recommend Section 2.6.4 be revised to specify who will conduct the workshop discussion sessions.

**Study Plan 6:**  
**Land Use Plans and Conflicts**

We recommend that Study Plan 6 be revised to include the change of land use to include more development, and its indirect and cumulative impact on the human and natural environment. The study plan should analyze the effects of increased all-terrain vehicle (ATV) use along the pipeline and new transmission line corridors as well as new roads needed to access the blow off values.

This was the only study plan that listed what the issues were from scoping and how each issue would be addressed. All study plans should follow this example.

**Study Plan 10:**  
**Socioeconomics/Water Resources Economics**

**10.2. Study Description**

The scope of the study plan is too narrow and will only study the direct impacts of construction, operations and maintenance of the Pipeline. The study needs to include indirect and cumulative impacts as well, consistent with 40 C.F.R. § 1508.8.

**10.2.1. Goals and Objectives**

We recommend *adding* the following to the primary objectives of the socioeconomic and water resources economics study listed in Section 10.2.1.

- ***Identify potential cumulative impacts to land uses.*** (SD2 states at p. 26: “For land use and socioeconomics, we will consider cumulative effects to include areas that could potentially receive Colorado River water from the proposed project or alternative water supplies considered in the EIS.)
  
- ***Quantify the project impact on population growth.*** (SD 2 states at p. 21: “We have revised section 4.2.9 to indicate more specifically that the EIS will address issues to reasonable foreseeable population growth that would be associated with the proposed action and any other alternatives addresses in the EIS.” EPA stated in their scoping comments on SD1 that, “while it may be true this area would grow without this project, the impacts of this growth should be addresses in the DEIS as either indirect or cumulative impacts.” “The impacts of growth can be analyzed by estimating the additional people, homes and /or cars, and their impacts to: water quality; air quality (from additional driving); habitat, wildlife and plants; infrastructure costs; and energy use. EPA would be happy to work with FERC on this type of analysis.”<sup>65</sup>)

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<sup>65</sup> *Id.*

- ***Identify and evaluate potential impacts to quality of life.*** (SD2 states at p. 2: “A major public concern from scoping was the possibility that “supplying water to allow the predicted population growth will diminish the quality of life in the region.” There is nothing in the study plan that addresses this issues. Quality of life issues include air pollution; loss of critical environmental areas; fiscal impact of infrastructure.<sup>66</sup>)

### 10.4.3 . Issues and Data

We recommend that Section 10.4.3 be expanded to state ***alternatives*** which will be included in the analysis, such as:

- ***Water conservation program.*** (see Section I, Comments re SD2 section 3.2 *supra*; and Section IV, WNA section ES 5.1.2, *supra*.)
- ***Water rate pricing to reduce water demand.*** (see Section IV, Comments re WNA section 3.4, *supra*.)

We recommend that Section 10.4.3 be expanded to include the following ***issues*** for analysis.

- ***Consider the costs of water treatment plant upgrades for Lake Powell water and greenhouse gases emitted from water treatment.*** (See Coalition SD1 Comments, p. 48.)
- ***Study the electrical cost of pumping the water from Sand Hollow reservoir to cities through the WCWCD’s regional pipeline.***
- ***Study the cost-effectiveness of the project if non-rate funds are unavailable for construction, operation, and maintenance.*** (The economic benefit of the Pipeline for current residents will be marginal if outside money is not used to fund the Pipeline.<sup>67</sup> The analysis should also estimate the impact on residents and taxpayers if the recent economic downturn continues and population growth slows. This analysis should also estimate the full socioeconomic

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<sup>66</sup> EPA formulated a smart growth initiative that was considered in the *Southern Corridor Highway EIS* page 6-1 available at <http://www.udot.utah.gov/sc/> The same data could be used for the Pipeline’s EIS since the growth would be in the same area.

<sup>67</sup> David Tufte, *The Proposed Lake Powell Pipeline: A report on its Effect on Socioeconomic Resources* (June 20, 2008, available at <http://www.powellpipelinefacts.org/images/pdf/Pipeline/pipeline%20report%20d.%20tufte%207-08.pdf>).

impacts on residents and taxpayers if the project is built, the population grows, but water becomes unavailable due to climatic, biological or political reasons. The study should consider whether state or federal funding would be available to mitigate the burden of impact fees on Project beneficiaries, and how the net benefits of the Project may vary depending on funding source.)

- ***Determine the cost to the poor and fixed income residents from higher water fees.*** (There are thousands of households in the three counties that live on less than median annual income. The expected price tag of the Pipeline will be a tremendous burden to the poor as water assessments go up. The study must consider “the natural and physical environment and the relationship of people with that environment. “ 40 C.F.R. §1508.14.)
- ***Determine how the increase in impact fees will impact the cost of building and deter home building in the service area in the future.***
- ***Analyze the effects on operation and maintenance costs resulting from the incremental expense of pumping water as the elevation of Lake Powell rises and falls.*** (For example, what would the added cost be if Lake Powell is less than 50% full more than 50% of the Pipeline’s projected lifetime? What added costs would occur when the price of electricity for the pumps increases in price by 1%, 2%, 3%, 4%, and 5% by the time of construction in 2015? The WCWCD stated that water will be purchased in small blocks as needed therefore the economic benefit will be gradual.)

### **10.6.2.3. Task 3 – Data Analyses**

We recommend the study plan be revised to include existing data compiled by the Environmental Protection Agency regarding the costs of growth in the region.<sup>68</sup>

## **Study Plan 11: Special Status Aquatic Resource Species and Habitat**

### **11.3. Agency Resource Management Goals (§5.11(d)(2))**

We recommend that Section 11.3 be expanded to include water- and species-management plans in the lower Colorado River Basin.

#### **11.4.1. Background Description**

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<sup>68</sup> Environmental Protection Agency, Comments on PAD, *supra*.

We recommend that Section 11.4.1 be expanded to include *site-specific assessment along the Project alternative alignments*.

#### **11.4.2. Study Area Definition**

We recommend that Section 11.4.2 be expanded to include *connected and linked habitats*.

#### **11.4.3. Issues and Data Needs**

We recommend that Section 11.4.3 be expanded to add *density* to habitat, distribution of listed species background information,

#### **11.5. Nexus to Project (§5.11(d)(4))**

We recommend that Section 11.5 be expanded to *include indirect impacts to endangered or sensitive fish species resulting from the introduction of Colorado River water into the Project area and/or the construction of the Project pipeline*.

This section states in part, “While the risk of a direct impact as a result of the water diversion or construction is slight, the potential impact as a result of the inadvertent introduction of an invasive species is higher.” PSP, p. 88. We disagree. The study plan assumes there is no change in future hydrograph, consequently effects could be minimal. But, given the climate change, the study needs to consider possible changes in flows and channel stability to Lake Powell and the Colorado River. The flow regimes need to be sufficient for stream channel integrity, riparian plant communities and habitat. This study plan must consider reduced flow scenarios.

#### **11.6.2.2. Task 2 - Field Investigations**

This section proposes no field investigations. The study plan should include the option for field investigations if need is determined.

#### **11.6.2.3. Task 3 - Data Analyses**

This section states: “The Project is not likely to negatively impact these species as a result of construction or the actual transfer of water.” PSP, p. 90. This statement is pre-decisional and otherwise inappropriate because it assumes there is no change to flows from drought and is pre-decisional.

### **Study Plan 13: Wildlife Resources**

The temporal and geographic scope of the existing Wildlife Resources study plan is too narrow. It should include the impact to Colorado River riparian habitat in the Southern Arizona reach known as the limitrophe, due to the reduced frequency and magnitude of excess flows released from Hoover Dam. The limitrophe is habitat for two endangered species, the Southwest Willow Flycatcher and the Yuma Clapper Rail, as well as a number of other species of concern. Analysis of impacts to these species must be included in the applicant's study plan.

The scope of the study should also be broadened to include indirect and cumulative impacts of the Pipeline, rather than just the direct impacts of construction, operations and maintenance of the Pipeline.

### **Study Plan 17: Surface Water Quality**

#### **17.4.1. Background Description**

We recommend that the background description be *expanded* to describe how the Quail Lake Diversion system works.

*The WCWCD diverts 150 cfs (112,500 AFA) constantly from the Virgin River at the Quail Lake Diversion to generate power and store water. They release 3 cfs over the diversion for the fish and then 3 miles downstream release 30 cfs through the Pah Tempe Power Plant into the Virgin River for the endangered fish. According to water use input data from the Division of Water Rights in 2007, the WCWCD delivered from the Virgin River; 1230 AF to Hurricane City; 12,856 AF to Hurricane Irrigation Company; and 643 AF to Hurricane Golf Course among other small retail users. Then the balance is taken to Quail Lake 1 power plant and onto the reservoirs. As needed a small amount of water is returned to the river for the endangered fish before the Hurricane USGS gauge. The USGS gauge hydrographs cannot be used for average flows because the diversion occurs in between the Virgin and Hurricane USGS gauges.*

#### **17.4.4. Sand Hollow Reservoir**

The description of Sand Hollow Reservoir should be corrected: it is a 50,000 AF reservoir. The reservoir has an active pool of about 30,000 AF and drought pool of 20,000 AF. The 30,000 AF active pool is not considered in the culinary water reliable yield information used in the WNA. The existing annual reliable yield of surface water from Sand Hollow Reservoir was only estimated to be 7,500 AF. It is not clear why the active 30,000

AF pool is not reflected in the available water estimate, as it would add 22,500 AF to current supplies. This should be explained in the study plan.

The study plan should describe the Navajo Sandstone Aquifer Storage Project (Project), which has been very successful at storing water under Sand Hollow Reservoir. Since 2002, 70,000 AF of water has been recharged into the aquifer and UBWR claims only 8,000 AF of it as a current yield for the Sand Hollow well field. WCWCD stated in their Water Line newsletter that this aquifer could hold up to 200,000 AF. As recharge increases this Project should also be included as possible future culinary water supply and drought storage.

#### **17.6.2.2. Task 2 -- Field Investigations**

This task should be expanded to include the following topics:

- Water quality analysis of recharge of Sandy Hollow aquifer storage project.
- Evaluation of the impact of the raising water table from Lake Powell and its possible impacts to housing subdivisions.
- Survey of new springs should be done around the Sand Hollow Reservoir.
- Impacts of the use of higher concentrations of chlorine to treat exotic mollusk species, specifically the impacts to human health as a result of the creation of carcinogenics when chlorine reacts with organic matter trihalomethanes (THM).

#### **Study Plan 18: Surface Water Resources**

This study will only identify potential impacts of the Project on surface water resources during construction, operation, and maintenance. As discussed in the Coalition SD1 Comments at length, the proposed study plan is not sufficient because it does not do an analysis of the indirect and cumulative impacts of the water supply project.

It is questionable whether the proposed study plan can assess a thorough range of conditions in one field season (for the areas where they don't already have data). For instance, if the water year is "wet", water quality parameters may be "better" than if the data is collected during a "dry" year. The study plan should at a minimum acknowledge the potential inaccuracy of their data.

#### **18.2.1. Study Description**

We recommend that Section 18.2.1 be expanded to include *indirect and cumulative impacts on surface water resources*, consistent with SD2:

**“Comment:** FWS recommends the EIS evaluate the cumulative impacts of project induced land development, urbanization, and population growth on surface water quality, including nutrient loading, pollutant runoff, and sediment loads.

**Response:** We have modified section 4.2.2 of SD2 to include the indirect effects of induced growth on water quality parameters, where such effects can be reasonably foreseen, and are due to building the pipeline or an alternative.”

SD2, p. 16.

#### **18.4.2. Study Area Definition**

We recommend that Section 18.4.2 be expanded to include *the Colorado River downstream of Lake Powell below Lake Mead*. Assuming no change in future hydrograph, effects could be minimal. But given climate change scenarios and drought, the study needs to consider effects to both Lake Powell and Colorado River downstream due to reduced flows.

#### **18.3. Issues and Data Needs**

We recommend that Section 18.3 address the following questions.

*What Standard Construction Procedures (SCPs) would be adopted to protect crossings of streams and washes?*

*Furthermore, how would they be maintained over the long term?*

*Is there funding set aside for this work?*

We further recommend that the study add *fill permits* (i.e. roads, pipelines, culverts) to the list of federal and state permits needed for discharging water.

We recommend that the study include *channel erosion* as a potential project impact.

We recommend that the study include an estimate for *funding for mitigation and long term monitoring/maintenance of mitigation sites*.

#### **18.6.2. Task 1 – Define Baseline Conditions**

We recommend that this section should include *baseline conditions for stability of stream channels*. For example, what are the current sediment loads? What are levels of

erosion and deposition that occur in stream channels? What channel conditions are necessary to support current function?

### **18.6.3. Task 2 – Alternatives Analysis**

Task 2 states: “The State of Utah has concluded that the Project will not affect water levels in Flaming Gorge Reservoir or Lake Powell, and will not affect streamflows in the Colorado River. Documentation will be provided by the Division of Water Resources to verify this conclusion.” PSP, p. 166. This is a conclusion, not a method of analysis. As a conclusion, it is premature, preceding the relevant study. Among other things, UBWR is not considering reduced flows from climate change and sustained drought. *See Coalition Comments on Study Plan 19, infra.*

## **Study Plan 19:** **Water Supply and Climate Change** **Comments on Climate Change**

### **19.1. Introduction**

Overall, water managers in the seven states of the Colorado River Basin cannot adequately plan for a future of increased climate variability unless they can anticipate how future climate will affect streamflows in the Colorado River.<sup>69</sup> This process is absolutely necessary to ensure sustainable future water supplies and to evaluate the impacts climate change on the affected the human and natural environment and the over-allocation of Colorado River water rights. The PSP will not answer the public’s question from SD1 of whether the continued drought and climate effects will put the water supply for the Pipeline at risk from physical shortage. We acknowledge that this is a basinwide issue which extends beyond the Pipeline project. We request that UBWR engage in a collaborative effort to develop and implement a comprehensive climate change study for the basin. To this end we propose changes to Study Plan 19to provide for a more comprehensive study of climate change.

UBWR stated in its response to public comments on the Colorado River Supply, *see* PSP, Attachment C, that the impact of Lake Powell Pipeline on the Colorado River system was already included in the Bureau of Reclamation’s EIS hydrologic modeling for the Interim Guidelines and that the “Law of River” provides protection to their water right for the Pipeline. However, climate change changes were not included in the Bureau of Reclamation’s Colorado River Simulation System (CRSS) model.<sup>70</sup> Revisions to this model are necessary for this study, as discussed in Section 19.6.3 below.

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<sup>69</sup> Brad Udall, “Recent Research on the Effects of Climate change on the Colorado River.” *Intermountain West Climate Summary* (May 2007), p. 1.

<sup>70</sup> Bureau of Reclamation, *Final EIS: Colorado River Interim Guidelines for Lower Basin Shortages and Coordinated Operations for Lake Powell and Lake Mead*, Appendix U (Oct. 2007), page U-11.

### 19.2.1. Study Description

The Coalition contends that both the temporal and geographical scope of the proposed study plan is too narrow. In order to be sufficient, the study plan must include the *entire Colorado River Basin* and all areas that receive deliveries of Colorado River water.

The PSP does not include studies of the potential indirect or cumulative effects of the project in the context of changes to the Colorado River's hydrograph as a result of climate change. The PSP should be revised to include such studies. The PSP also should be revised to better articulate the nexus between project operations and effects (indirect, direct and cumulative) on the resource to be studied, as required by 18 CFR § 5.9 (b)(5).

### 19.2.2. Goals and Objectives

The first bullet point in this section is unclear and should be revised. Any climate change, regardless of its genesis, must be considered in this analysis. The reason to include climate change in the hydrologic analysis is to develop the best possible projections of future hydrologic conditions in the basin, and to assess the impact of the project in that context.

### 19.4.1. Study Area Definition

The study area should include *Mexico* because of the 1944 U.S.-Mexico Treaty, which allocated 1.5 MAF of Colorado River water to Mexico. The study plan should discuss to what degree the basin states will need to contribute to Mexico's Treaty delivery, to the extent that such deliveries cannot be comprised of unallocated surpluses (as specified in the 1922 Compact). In addition, the study should consider the real impact on the frequency and volume of flows below Morelos Dam (the last delivery point on the river) and how the changed flows will impact the viability of habitat on the Colorado River in Southern Arizona and in Mexico.

### 19.4.3. Issues and Data Needs

The study should address the over-allocation of the Colorado River and the current reduced Colorado river mean flows.

This section, it is critical to note, separates the analysis of project impacts from review of climate change studies; these two elements must be integrated.

The study should consider the State of Colorado's Colorado River ("Big River") analysis that will be included in the Interbasin Compact Committee's Water Supply Availability Study.<sup>71</sup>

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<sup>71</sup> Available at <http://ibcc.state.co.us/Process/Needs/WaterSupplyAvailability/>.

The fifth and sixth bullet points do not clearly explain why the study plan has to determine the potential causes of climate variability and estimate the extent to which human activity had affected climate change.

The ninth and tenth bullet points state:

“Colorado River streamflow and proposed LPP diversions will be simulated using the Bureau of Reclamation’s existing Colorado River Simulation (CRSS) model to determine the long-term sustainability of the proposed diversion and potential obligations under the Colorado River Compact....The Bureau of Reclamation CRSS model will be used to determine potential effects on downstream water rights such as those associated with the Navajo, Ute, Paiute, and Hopi tribes.”

It is important to note that these evaluations use an enhanced CRSS modeling and are not limited to the index sequential method applied to historic data of 15 Million Acre Feet Annually (AFA). Instead these evaluations should include reduced flow scenarios of 14 million AFA and 13 million AFA, paleo sequences, as in the Interim Guidelines EIS (Appendix N), and incorporate climate change information, such as those developed by Christensen *et al.*, *infra*.

The analysis of downstream impacts should go beyond the sustainability of the proposed project (which would project how often and by what quantity the pipeline would not be full, presumably due either to a compact call or physical limitations) and compact requirements (which would be limited to how often upper basin states are called to curtail use based on their compact delivery requirements). The water supply analysis also needs to include assessment of lake levels at Lake Mead and shortage projections for downstream water users.

The study should include more than the surface area and water availability at Lake Mead. It should also evaluate:

- ***the impact the probability of shortage conditions in the Lower Basin***
- ***the impact on the probability of surplus conditions in the Lower Basin.***

The eleventh bullet point reads: “Potential impacts to water supply associated with reasonably foreseeable activities such as other proposed diversions from Lake Powell will be estimated.” This should be expanded to include ***other diversions from the Upper Colorado River basin.***

The twelfth bullet point reads, “The potential effects of reasonably foreseeable water development projects on the yield of the LPP Project will be determined by simulating

streamflow using the Bureau of Reclamation CRSS model (reasonably foreseeable projects will be limited to those incorporated in the CRSS model).” However, the Upper Basin Commission projections for future development of the Colorado River in the CRSS did not include specific projects. Therefore, the model needs to be enhanced. *Yampa pumpback and Million pipeline as well as depletions for energy development* should be considered in the study plan.

### **19.6.1. Overall Approach**

The study plan claims, “Climate change methodology will include review of existing literature and use of existing models to determine potential effects of climate change on the availability of water supply for the proposed LPP diversion.” However, the Coalition is concerned that current modeling will not model the impacts of the Pipeline’s diversion unless they are enhanced.

There is some doubt about UBWR’s intent to even use a model. The study plan states, “Colorado River streamflow and water supply availability may be simulated using existing models developed by Federal or State agencies.” PSP, p. 171. We reemphasize the important of modeling projecting future river flows, and request that “may be” be deleted from the study plan.

The Western Governors' Association has called for greater use of climate change information in water supply planning, believing that “[c]limate change scenarios need to be integrated with projections of long-term demands planning for climate changes should be undertaken at all levels, from the federal government to private and public water utilities.”<sup>72</sup>

### **19.6.3. Task 2—Climate Change Evaluation**

The first bullet point in the Nov. 13<sup>th</sup> version of the study plan should be amended. The study should not address the causes of climate change.

The third bullet point should be amended to include the No Action Alternative.

The seventh bullet point should be amended to provide that the study should determine impacts of water availability for existing projects as well as for proposed projects, particularly other Upper Basin projects such as those under discussion in the State of Colorado.

The eighth bullet point should be amended to provide that the climate change information must be integrated into the main body of analysis and not relegated to an appendix.

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<sup>72</sup> Western Governors’ Association, *Water Needs and Strategies for a Sustainable Future* (2006), available at <http://www.westgov.org/wga/publicat/Water06.pdf>.

The Study Plan should also consider the following existing information:

- Richard Seagar *et al*, *Model projections of an Imminent transition to a more Arid Climate in Southwestern North America, Vol May 25, 2007* available at <http://www.onthecolorado.org/Resources/ClimateDocs/2007Seager.pdf>.
- P.C. D. Milly, *Stationarity is Dead: Whither Water Management*, Climate change undermines a basic assumption that historically has facilitated management of water supplies, demands, and risks. available at <http://www.onthecolorado.org/Resources/ClimateDocs/MillyBetancourt2008.pdf>.

### Enhancements of CRSS

We now turn to the use of CRSS in this study plan. We support such use, provided that the model is enhanced as described immediately below. Public comments to BOR on the Interim Guidelines have identified the following enhancements, which we support.

- “The model makes assumptions based on a very short historic data set (1906-2006) and assumes that 15 million AF (MAF) will be available. Scientifically peer reviewed analysis performed and reported by the National Academy of Sciences indicate that at Best Case, no more than 14.5 MAF should be used, and more likely the actual volume should be closer to 13.5 MAF. If everything else remains the same the BOR’s assumptions that the flow will be 500,000 AF higher than the long-term mean amounts to 5 MAF in ten years and 12.5 MAF in 25 years. The Upper Basin depletions uses a figure of 5.4 MAF when in fact the Upper Basin is proclaiming to want to deplete 6.0 MAF. This difference amounts to 3 MAF by the year 2030.”<sup>73</sup>
- “The potential for shortage on the Colorado River have been mounting long before the emergence of the current drought. The over-allocation of water due to improper assumptions as to the Colorado River’s mean inflow has reached the point where shortages, which never occurred in the past, will shortly be inevitable. Reclamation is repeating the same mistake in its modeling by using 15.0 million acre-feet (MAF) mean flow projection well above the paleo-climate reconstruction estimates of 13.0-14.7 MAF. If the observed flows of 14.2 MAF of the past 50 years were used as a guide....the Upper Basin water

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<sup>73</sup> David L. Wegner, *Comments on the Bureau of Reclamation Draft EIS Colorado River Interim Guidelines for Lower Basin Shortages and Coordinated Operations for Lake Powell and Lake Mead* (April 27, 2007), available at <http://www.usbr.gov/lc/region/programs/strategies/FEIS/comments/SpecialInterestNGO.pdf>.

users would be destined to restrict their consumption to meet their delivery requirements to the Lower Basin.”<sup>74</sup>

- In addition, the CRSS model only uses gage data from 1906-2006 and “with the growing recognition of the inadequacy of the gaged record as a baseline for planning, the use of paleoclimate data has received increased interest in the water resources profession. In the Upper Colorado River basin, tree-ring data have been used to reconstruct streamflow over the past five centuries and longer using dendrochronological techniques.”<sup>75</sup> Thus the BOR and UBWR should consider Paleo-reconstruction in water planning.

As described in the Coalition’s SD1 Comments, we further recommend additional enhancements to CRSS.

- Paleo hydrology and long-term mean flows
- Revised, accurate hydrology, based on long term historic flows and the projected impacts of climate change (based on current models)
- Legal constraints such as the Colorado River Compact (present perfected rights are not in the model)<sup>76</sup>

The study should include a range of future hydrologic conditions derived from at least the following two methodologies:

- Resampling of both direct and indirect historic data (both the gage records and the tree ring records)
- Development of future inflow projections that preserve key statistical elements of the historic record (such as variability) but use physically-based models to simulate runoff using precipitation, temperature, and other climate data from projections developed in models of climate change, specifically the data released in 2008 by the Intergovernmental Panel on Climate Change.<sup>77</sup> See references in Coalition SD1 Comments, pp. 39-40.

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<sup>74</sup> John Weishet, *Comments on the Bureau of Reclamation Draft EIS Colorado River Interim Guidelines for Lower Basin Shortages and Coordinated Operations for Lake Powell and Lake Mead* (April 30, 2007), available at <http://www.usbr.gov/lc/region/programs/strategies/FEIS/comments/SpecialInterestNGO.pdf>

<sup>75</sup> Bureau of Reclamation, *Final EIS: Colorado River*, *supra.*, p. U-71.

<sup>76</sup> *Id.*, p. U-50.

<sup>77</sup> IPCC, *Climate Change and Water*, June 2008 available at <http://www.onthecolorado.org/Resources/ClimateDocs/IPCCvolFour2008.pdf>

The analysis used for the Interim Guidelines relied primarily on gage records. Several factors require that the impact assessment for the proposed Pipeline includes an analysis based on inflow scenarios developed under the second methodology above.

- While the Interim Guidelines introduced new management rules for existing reservoirs, the Pipeline proposed a new, supplemental use of water from the Colorado River, with considerable implications for the reliability of water supply for the proposed project as well as existing water use in downstream areas.
- Since this is a permanent project to supply water to homes and communities that are yet to be built the residents will expect a permanent water supply. For that reason, the approach used the USBR Interim Guidelines is not appropriate. If you consider Appendix N, N-4 in the Interim Guidelines EIS the 10<sup>th</sup> percentile of Lake Powell's elevation (figure N-11 is related) USBR estimates that there is a 10% probability that Lake Powell will at this elevation or lower and this figure may be useful in assessing physical shortage.

Furthermore, this study plan should consider single-trace and index sequential modeling (ISM) procedures for the following scenarios concerning Colorado River hydrology. They include:

- The tree-ring record should be modeled using the full spectrum of regression approaches as discussed (see chart on page 104) by the National Research Council.<sup>78</sup>
- Specifically, the four approaches of regression include: stepwise (Woodhouse et al., 2006)<sup>79</sup>; best subsets (Michaelsen et al., 1990); principle components analysis (Stockton and Jacoby, 1976);<sup>80</sup> and, alternative principle components analysis (Hidalgo et al., 2000).<sup>81</sup>

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<sup>78</sup> National Research Council, *Colorado River Basin Water Management: Evaluating and Adjusting to Hydroclimatic Variability* (2007), available at: [http://dels.nas.edu/dels/rpt\\_briefs/colorado\\_river\\_management\\_final.pdf](http://dels.nas.edu/dels/rpt_briefs/colorado_river_management_final.pdf).

<sup>79</sup> Connie Woodhouse et al, *Updated Streamflow Reconstructions for the Upper Colorado River Basin* (2006), available at: <http://www.onthecolorado.com/Resources/ClimateDocs/WoodhouseGrayMeko2006.pdf>

<sup>80</sup> Charles Stockton and Gordon Jacoby, *Long-term Surface Water Supply and Stream Trends in the Upper Colorado River Basin* (1976), available at: <http://www.onthecolorado.com/Resources/ClimateDocs/StocktonJacoby1976.pdf>

<sup>81</sup> Hugo Hidalgo et al., *Alternative principal components regression procedures for dendrohydrolic reconstructions* (2000), available at: <http://www.onthecolorado.com/Resources/ClimateDocs/Hildago2000.pdf>.

The study plan should model the Medieval Warming Period using the full spectrum of regression approaches as mentioned above. Especially the twelfth century and thirteenth century, since the tree-ring record reveals periods of severe and sustained drought during this specific time-period.

Future trends in streamflow reduction for the Colorado River basin should also be modeled and using the full spectrum of modeling procedures. For example, in a 2005 article in *Nature*, C.D. Milly *et al.* concluded: "Global pattern of trends in streamflow and water availability in a changing climate." The authors analyzed 21 simulations of climate change using prescribed external forcing of the late nineteenth century and the whole twentieth century to predict future global trends in streamflow. For the Colorado River basin, the trend indicates a decrease in flows from 10% to 30% by year 2050. It would be appropriate for the study plan to model the full spectrum, namely both 10% and 30%.<sup>82</sup>

In a 2007 paper, Martin Hoerling *et al.* analyze future streamflows for the Colorado River basin according to the parameters of the Palmer Drought Severity Index (PDSI). This method of predicting future trends in streamflow indicate a 45% decline in Colorado River streamflow between years 2035-2060. It would therefore be appropriate for this study plan to model streamflow according to the PDSI and as the worst case scenario.<sup>83</sup>

In addition, this study plan should consider the findings in NOAA-funded Reconciling Projections of Future Colorado River Stream Flow study that will be completed in 2009. The study is about understanding the difference among climate change modeling projections in order to provide water managers with more useful information. Moreover, this study plan should consider reduced model inflows to Lake Powell to assess the possible impacts on the natural environment and Colorado River water rights for the entire period of analysis to anticipate the new information on climate change that will result from NOAA study that comes out in 2009.<sup>84</sup>

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<sup>82</sup> C.D. Milly *et al.*, "Global Patterns of Trends in Streamflow and Water Availability in a Changing Climate, *Nature* (November 2005), available at <http://www.onthecolorado.com/Resources/ClimateDocs/MillyDunneVecchia2005.pdf> .

<sup>83</sup> Martin Hoerling *et al.*, "Past Peak Water in the Southwest, *Southwest Hydrology* (2007), available at: <http://www.onthecolorado.com/Resources/ClimateDocs/Hoerling2007.pdf>. See also Niklas S. Christensen *et al.*, "The Effects of Climate Change on the Hydrology and Water Resources of the Colorado River Basin" (2004), available at [http://wwa.colorado.edu/resources/colorado\\_river/Christensen\\_2004.pdf](http://wwa.colorado.edu/resources/colorado_river/Christensen_2004.pdf), and P.W. Mote, *Variability and Trends in Mountain Snowpack in Western North America* (2005), available at <http://www.cses.washington.edu/db/pdf/moteetalvarandtrends436.pdf>.

<sup>84</sup> Information about the study is available at: [http://wwa.colorado.edu/colorado\\_river/docs/reconciling\\_projections\\_future\\_coloriver\\_flow\\_overview.pdf](http://wwa.colorado.edu/colorado_river/docs/reconciling_projections_future_coloriver_flow_overview.pdf)

## Public Participation in Climate Change Study

We request that the next version of the PSP propose specific procedures for meaningful participation by stakeholders, since this study is fundamental to the analysis of the proposed pipeline's impacts on water resources.

### 19.6.4. Task 3- Effects on Other Water Users

We recommend addition of a bullet point: *Determine potential effects on existing and proposed upstream water rights in the event of a compact call.*

## Study Plan 19: Water Supply and Climate Change (Comments on Water Supply)

### 19.2.2 . Goals and Objectives

We recommend that Section 19.2.2 be expanded to include the following goals:

- *Provide a comprehensive analysis of both population growth and water demands in the proposed service area.*

In its current form, the Water Needs Assessment does not accurately address population growth or water demands. The analysis must use various sources of population growth estimates, and should model a range of growth scenarios (ranging from low to high growth rates). The recent national economic downturn has influenced housing and population growth rates throughout the nation. These shifts can have dramatic and expensive consequences for large water supply projects. Scenarios modeling different rates of growth and water use rates will provide the necessary foundation for project participants, the State, and others to make an informed decision on the Pipeline. See Section IV, WNA section ES-3.2, 2.3, 4.1.4.2, *supra*.

The study plan must consider the complete picture of water supplies in the county within existing approved private water rights for surface and underground water because some of these rights will be sold for development by the year 2060. UBWR states there are no other water resources beyond the 83,000 AF currently identified, plus future supplies of 11,000 AF of culinary and 14,100 AF of secondary water. This is not reasonable because a large percentage of existing private water rights could convert to culinary use in the future. All water supplies must be evaluated and discussed in the study plan, not only the WCWCD's water supply.

- *Evaluate water demand in water conservation scenarios that would reduce demand by using a progressive, realistic conservation goal greater than 25%.*
- *Study the effects of a raising water table in the Navajo Sandstone aquifer under Sand Hollow Reservoir and its possible impact on the homes in the Dixie Springs subdivision that sits below the elevation of the dike and Sand Hollow.*

#### 19.4.1. Background Description

See comments about the deficiencies of the WNA methodology in Section IV, WNA section 2.2.

#### 19.6.2.1. Task 1a -- Water Efficiency

We offer preliminary comments on the November 13, 2008 version of this study plan. We reserve the right to amend these comments pending further review of the November 13 plan.

The first bullet point in the Nov. 13<sup>th</sup> version should be expanded to *disaggregate secondary water*. From our review of the water use data the issue of how unmetered secondary water was accounted for needs to be addressed because it inflates the per capita use rate. See comments in Section IV, WNA section 2.2.

The approach proposed, creates hurdles to improving conservation than implementing it. We recommend that the “Evaluation of Potential Conservation” should focus on the first two bullets to determine potential savings and not use an arbitrary “screening process.

Western Resource Advocates (WRA) report on the cost-effectiveness of conservation, called Smart Savings –Available at <http://www.westernresourceadvocates.org/media/pandp.php#waterreports> as well as WRA reports on water rate structures (most recent would be the “Water Meter” which looked at 12 cities may be helpful in the study plan analysis).

The analysis should make sure to include the entire served population. The standard measure for indoor use is winter-time consumption (if landscapes require no outdoor use in Dec, Jan, and Feb). Estimates of outdoor use should include any “secondary” (i.e., non-potable) water, even if not delivered by the water utility, because reductions in outdoor use can be affected by local government through time-of-day watering, landscape type, water rates, as well as other programs, and the savings can lead to greater local water availability.

We recommend the second bullet, DSS Model, include calculations for future (not yet built) communities and businesses, including the water savings (indoor and outdoor) that

should be expected based on more efficient indoor water appliances and the trend toward more Xeri outdoor landscapes.

We recommend the third bullet, screening criteria, include objective screening criteria. Studies should determine not what is “typical” in the service area, but those technologies. The State of Colorado recently completed a study that determined the potential savings from different conservation programs and measures (and total state-wide savings potential) and the range of cost per AF saved for each element.

A process recently undertaken by the State of Colorado, with help from a stakeholder group that **included** water utilities, engineers, and conservation groups, generated a table of potential water savings through several different sources and, from that table, generated a potential state-wide conservation savings (basically took the savings possible per 1 million residents and multiplied by the State’s population. Available at, [http://cwcb.state.co.us/NR/rdonlyres/C65D6406-3EE0-4E44-9C5E-E1655D814CB8/0/S2\\_ConservationEfficiency.pdf](http://cwcb.state.co.us/NR/rdonlyres/C65D6406-3EE0-4E44-9C5E-E1655D814CB8/0/S2_ConservationEfficiency.pdf)

We also recommend the following **revisions**.

Create three conservation **programs** by compiling the best conservation measures. Each **program** will contain increasing levels of conservation effectiveness and will be characterized as either low, moderate, or high.

We suggest using the word “**scenarios**” instead of programs which is clearer since the latter is often synonymous with “measures” **Scenarios** are often described as “low”, “med” or “high” efficiency.

#### **Study Plan 20: Wetlands and Riparian Resources**

The scope of the existing Wetlands and Riparian Resources study plan is too narrow and will only study impacts resulting from construction, operations and maintenance of the Pipeline. The study plan must consider indirect and cumulative impacts as well.

The study plan is inadequate due to the limitation of the study area. It should be expanded to include the Colorado River riparian habitat in the Southern Arizona reach known as the limitrophe, due to the reduced frequency and magnitude of flows to Mexico. The applicant must include this analysis in their review.

## **VI. CONCLUSION**

We thank the Commission for considering these comments. We look forward to working with UBWR and the Commission to develop and implement the Revised Study Plan.

Dated November 19, 2008

Respectfully submitted,



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**DECLARATION OF SERVICE**

**Utah Board of Natural Resources,  
Lake Powell Pipeline Project (P-12966-001)**

I, Alison Koppe, declare that I today served the attached Lake Powell Pipeline Coalition's Comments on Proposed Study Plan and Scoping Document 2 by electronic or first-class mail to each person on the official service list compiled by the Secretary in this proceeding.

Dated: November 19, 2008

By:

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