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**OFFICE OF THE STATE ENGINEER
DIVISION OF WATER RIGHTS
STATE OF UTAH**

In the Matter of :
Change Applications a35402 (Water Rights : **WRITTEN**
89-74, 89-128, and 89-1513) and a35874 : **TESTIMONEY**
(Water Right 09-462). :
: March 1, 2010

Red Rock Forests (RRF), hereby provides this written testimony to supplement it's objections to and PROTEST filed on November 4, 2008, and Protestor's oral testimony provided during hearing on January 12, 2010, pursuant to Utah Code Ann. §73-3-7, for the above noted Kane County and San Juan County Water Conservancy District (SJCWCD or Applicant) water right transfer applications 09-462 (A35874) and 89-74, 89-128, and 89-1513 (A35402) (Transfer Applications). Protestor is a "person interested" for the purposes of Title 73 Chapter 3 of the Utah Code which deals with appropriation of water.

I. The Transfer Applications Will Impair Existing Water Rights

a. Utah Code Ann. §73-3-8(1) dictates that applications must be rejected if approval would result in the impairment of existing water rights, or interfere with more beneficial uses of water -- such as stockwatering, municipal and agricultural uses, and providing habitat for state-sensitive fish and wildlife species and other fish and wildlife.

The State Engineer must balance the impacts of the transfer on the instream environment taking into consideration historical water uses. “[T]he State engineer must investigate and reject the application either for appropriation or permanent change of use or place of use if approval would interfere with more beneficial use, public recreation, the natural stream environment, or the public welfare.” *Bonham v. Morgan*, 788 P.2d 497, 502 (Utah 1989).

b. The State Engineer must prevent impacts to senior water rights from the Transfer Applications. Based on the fact that the original point of diversion for the transfer request is near lake Powell and the new point of diversion will be near Green River, the Transfer would result in water being moved up stream hundreds of miles. Thus, prior to issuing the Application the State Engineer must determine whether water being diverted under the Transfer will impact multiple existing water rights on the Colorado and Green Rivers. This includes a determination of the impact to the flow through a written accounting to determine whether the appropriation can be made without injuring senior water rights or instream flows. Such determination must include information on the number of senior and junior water users that have either physical or on paper water rights in the area between the original and proposed points of diversion, the nature of such rights and the amounts of each water right.

That water is not available for the transfer is illustrated by the fact that the Colorado and Green Rivers are already over-appropriated and water is simply not available for additional appropriations, particularly one of this magnitude, from these Rivers. Finally, regardless of allegations made by the applicant that the power plant in question (Plant) could go “off-line” if there is an indication that senior water rights would be affected, it is extremely unlikely that Blue Castle, Inc. – the Company Operating the

Plant will simply shut down a nuclear reactor or other aspects of the power plant and, equally unlikely to shut off the water needed to operate the Plant, including that needed to avoid a reactor core meltdown. As a result, during times of water shortage, for which there will be increasing occurrences as the years get dryer, existing water right holders and instream flows needed for aquatic species will be cut off on multiple occasions as the power plant operations will, in most cases, take priority.

c. According to Utah Courts, “If the evidence produced by a protestant is compelling enough to undermine the reasonableness of the assertion that the proposed change will not impair vested rights, the state engineer should reject the application seeking to effect that change.” *Searle v. Milburn Irr. Co.*, 133 P.3d 382, 396 (Utah 2006). Prior to approving the Transfer Applications, therefore, the state must provide and consider information regarding the amount of unappropriated water available, the impracticality of the Plant to go “off-line” and the long-term availability of water in the Green River to satisfy all water appropriations.

II. The Transfer Applications Will Affect the Public Welfare

a. Utah Code Ann. §73-3-8(1) requires that applications must be rejected if the State Engineer has information or has reason to believe that the appropriation of water will affect public recreation, the natural spring environment, or prove detrimental to the public welfare.

b. An example of the impacts of uranium development to ESA listed fish species, at least in Utah, is the potential disruption of the Upper Colorado River Endangered Fish Recovery Program (Recovery Program) which is a collaborative effort between states, federal agencies, water users and environmentalists to recover four

species of endangered warm-water fish (Colorado pikeminnow, humpback chub, bonytail, and razorback sucker). To this end, the Recovery Program implements year-round base flows and annual spring peak flows based on each year's snowpack in all reaches of the Green River from Flaming Gorge Dam to the confluence of the Green and Colorado Rivers in Canyonlands National Park. These reaches include critical habitat for the endangered fish—river reaches found to be necessary for the fishes' recovery. In fact, in its protest of the Transfer Applications, The US Fish and Wildlife Service provides that:

These additional depletions could contribute to further decline of the Three Fish Species in Utah; roundtail chub, bluehead sucker and flannelmouth sucker and lead to potential listing under the Endangered Species Act (ESA). If these species were listed, water development throughout their habitat would become more regulated. These species range nearly statewide, thus, this would be a significant impact. Therefore, due to the potential reduced ecological function of the Green River, impacts to wildlife species, and impediment to water development across the state, the proposed water right transfer does not meet the public interest criteria.¹

c. Because, therefore, the Utah Department of Water Rights acknowledged that the surface waters in the Green River are fully allocated and (with some limited exceptions) generally not subject to new applications to appropriate, and existing water rights in Utah include large “approved” but not yet “perfected” applications to appropriate water in the basin, even without factoring in the Transfer Applications and water rights for Oil Shale development, the Recovery Program (which State Engineer should be concerned about) will already have much difficulty meeting Recovery Flows.

d. That listed fish species will be negatively impacted by the Transfer

¹ Testimony of Megan A. Estep, Chief, Division of Water Resources, U.S. Fish and Wildlife Service (January 12, 2010). (Attachment 1).

Applications is illustrated by the statements of Dr. Paul B. Holden, a fisheries biologist with 40 years of experience related to the Green River who responded to Applicants' witness Dr. Thom Hardy's conclusions presented at the January 12, 2010 hearing that the Transfer will not impact ESA listed species. Specifically, Dr. Holden provides that the:

impact of water withdrawal today is typically not the direct effect of any single withdrawal, but the cumulative effect of that withdrawal.... Hence the 70 cfs would add to the cumulative depletions in the river at the point of withdrawal and below.... Cumulative impacts of water withdrawal have impacted, and will continue to impact, the endangered fish.²

In addition, Dr. Holden provides:

[r]ecently the USFWS and Upper Basin Recovery Implementation Program developed instream flow considered necessary for recovery of the endangered fish in the Green River. Base flow recommendations for the lower Green River are already not being met in some years, and a constant 70 cfs withdrawal would increase the time that recommended flows were not met. This fact points out the effect with cumulative flow depletion."³

e. Any proposed use of water that has a clear potential to be detrimental to the public welfare should not be approved without supporting evidence to the contrary. The State Engineer, therefore, is required to reject the Transfer Applications under § 73-3-8(1).

III. Water is not available for the Transfer

a. Utah Code Ann. § 73-3-8(1)(a)(i) requires sufficient unappropriated water for the proposed appropriation. That such water is not available for the Application is illustrated by the fact that water needs in Utah are increasingly clashing with reality. The State has already doled out 180,000 rights to tap rivers and dig wells, but there is not enough water to honor them all. Although, publicly, the state's water managers tend to

² Dr. Paul B. Holden, PhD, Senior Fisheries Biologist, Letter to Kent Jones State Engineer p. 1 (February 19, 2010). (Attachment 2).

³ *Id.*

adhere to a policy that under the terms of the interstate treaties that govern the river, Utah still has plenty of left to develop, the water supply we thought we had is simply not there. Before authorizing additional water withdrawals, therefore, the State Engineer must conduct an adequate analysis of just how much water is left for Utah. Until recently, the thought has been that states like Utah would have enough water supply from the River so that it could continue to grow another hundred years.

b. It is predicted that Utah's population will "continue to grow at an unusually fast rate for a western, industrial nation. The Governor's Office of Planning and Budget projects that the population will grow from 2,833,337 in 2010 to 5,368,567 in 2050, mostly on the Wasatch Front."⁴ Related to current planning for the future the State Engineer must, therefore, consider population growth and the consequences of a hotter and drier climate and the threat of a diminished and/or early melting snowpack. This means that reliable water supplies for each additional bit of growth are becoming increasingly uncertain and they call into question the viability of the Transfer Applications. The State Engineer must, therefore, consider the impact of the Transfer Application together with growth including the predicted explosion of oil shale development in eastern Utah, which could require up to 400,000 acre-feet of water per year. It's anybody's guess when, or whether, oil shale will go forward, but large energy companies have already filed claims for hundreds of thousands of acre-feet of water.

c. The Colorado River Compact (Compact) is essentially a contract between the seven states, and its terms were consciously crafted to enable a kind of mutual

⁴ League of Women Voters of Utah Water Study, p. 3 (September 2009), *citing* (GOPB, 2009) (Utah Water Study). (Attachment 3)

coexistence. As part of the Compact bargain, the Upper Basin states including Utah, reserved 7.5 million acre-feet which provided certainty that California would not take this share of the river before they needed it. In return the Lower Basin have a significant advantage when water gets scarce through a proviso that says that the Upper Basin states will do nothing to prevent the flow of 7.5 million acre-feet downstream to the Lower Basin each year. The Lower Basin, therefore, gets 7.5 million acre-feet of water from the river's mainstem; the Upper Basin gets its 7.5 million acre-feet; and Mexico gets 1.5 million acre-feet, for a total of 16.5 million acre-feet. But over the long run, the river's mainstem can probably only reliably deliver about 13.5 million acre-feet.

d. The mathematics of the law of the river, however, simply have not worked because the sum of the parts is greater than the whole. In 1924, just two years after the Colorado River Compact was signed, a government hydrologist calculated that the actual flow of the river was 10 percent less than the Compact negotiators had assumed. In 1965, a water engineer named Royce Tipton estimated that the river's reliable flow was really about 14 percent less which was discouraging news at the time. Although subsequent reports found that long-term flows were fully 22 percent less, water managers in Utah put those reports on the table and went back to saying there's a lot of water. This was because, about the time the Tipton report was done, things turned wet and stayed that way through the late '90s. That wet period was the beginning of the Rocky Mountain boom days, when growth exploded in the West. The wet cycle meant there was more than enough water to accommodate the growth spurt, at least for the next 35 years. It also caused a weird psychological drift for water managers. Although severe droughts had left their mark hundreds of years back in the paleologic record, the 20th century was

abnormally wet. Consequently, what water managers think of as normal is, in fact, unnaturally wet, compared to the much longer lifetime of the Colorado River.

e. To date, Lake Mead and Lake Powell have provided the backup capacity that ensures enough water for every state as the result of, increasingly rare, El Nino events that have filled Lake Powell, in the past. If a drought in the continues, levels will continue dropping again and state water managers wait for another wet year. After nearly a decade of drought in the Southwest, however, the reservoirs are half empty. If they continue to drop, that will touch off a fight over what little water is in the river, like creditors battling over the carcass of a bankrupted company. And, owing to the 75-over-10 provision, California and the other Lower Basin states get first dibs on their 7.5 million acre-feet.

f. If drought conditions get bad enough and water levels continue to drop, under the Compact the Lower Basin states could make a legal "call" on the river and demand that the Upper Basin not take any of its Compact water until the 10-year average once more rose above 75 million acre-feet. This would affect anyone whose rights post-date the 1922 signing of the Compact, who would be "called out" and cut off to meet the Lower Basin's demands. This would be disastrous for the state since in order to comply with a call, Utah and the other Upper Basin states would have to shut down their own water users to satisfy their share of the delivery obligation. This would be done according to the rules of prior appropriation: More recent, or "junior," users would be shut down first; then the state government would work its way backwards, shutting down increasingly senior rights until the delivery obligation was met.

g. Adding climate change to the equation will almost certainly result in a

decrease in average flows for the Colorado River and things really start looking grim.

The desert Southwest is facing the slow decay of the water supply upon which the region has been built. According to a report on the current availability of water in Utah by the Utah League of Woman Voters:

Most of Utah's usable water comes from snowpack. The state's system of reservoirs fills in late spring and early summer from the slow snowmelt. The water level in the reservoirs starts to be drawn down beginning in late summer, through the rest of the year and into the next spring. The system depends upon a substantial snowfall and the timing of the spring snow melt. Little snow or more precipitation falling as rain does not allow for timely storage in Utah's high mountain reservoirs or for efficient seasonal allocation. If Utah has a hotter and drier climate, there will be less water in any form, a smaller snowpack, and probably higher human usage to counter the hotter, drier weather. Even if Utah were to be warmer but wetter, there are problems. More precipitation will fall as rain rather than snow, filtering through the ground to our aquifers not to our reservoirs, where it is more accessible to the water delivery system now in place. The smaller snowpack will melt early, and since Utah receives little summer moisture, it is likely that summer water use will still be high and long.⁵

h. Rising temperatures associated with global climate change "are expected to change the mix of precipitation toward more rain and less snow. Such precipitation shifts would affect the origin and timing of runoff, leading to less runoff from spring snowmelt and more runoff from winter rainfall, particularly in high-latitude or mountainous areas."⁶ These changes could significantly lower summer streamflows. The state's water supply, therefore, is so close between supply and demand that a long period of 80- or 85-percent years will bankrupt the system....

i. A recent joint publication of the US Geological Survey (USGS) states that:

⁵ Utah Water Study, p. 2-3, *citing* (Spr. Runoff Conf, 2009, Drought in Utah 2007).

⁶ CHANGES IN SNOWMELT RUNOFF TIMING IN WESTERN NORTH AMERICA UNDER A 'BUSINESS AS USUAL' CLIMATE CHANGE SCENARIO, IRIS T. STEWART¹, DANIEL R. CAYAN^{1, 2} and MICHAEL D. DETTINGER^{2, 1} (Attachment 4).

Potential climate change impacts affecting water availability include changes in precipitation amount, intensity, timing and form (rain or snow); changes in snowmelt timing and changes to evapo-transpiration...The prudent use of reservoir storage, as well as conjunctive surface water and ground water management are strategies that water managers employ to optimize water availability.” Therefore: Because climate change is traditionally detected over a period that spans multiple decades (Intergovernmental Panel on Climate Change, 2007), decisions with application horizon greater than 20 years might reasonably be informed by climate change information. Examples of such decisions include general planning studies exploring feasibility, economic benefits and costs, and estimation of risks to decide alternative actions, infrastructure or long-term operations criterion; expected benefits and impacts of proposed actions; environmental conditions and aquatic species likely to be affected by proposed actions; etc.⁷

Nuclear power plants are generally licensed for 40 years; thus, according to the above statement by the USGS, planning for nuclear power plant water consumption can reasonably be informed by looking at climate change information.

j. “Scientists and most water managers agree that global warming will bring higher temperatures to all of Utah...there is a concensus that Utah is destined to be hotter [and] A warmer climate will have serious consequences for a state that depends upon snowpack to create a reliable and easily stored water supply.”⁸

Several recent statistical and empirical studies, as well as climate model studies, show a reduction in runoff to the Colorado River, primarily due to increasing evapotranspiration and decreasing precipitation. The magnitude of the reduction from these studies is within a 10% to 30% range over the next 30 to 50 years. For example, a 2005 paper by authors from the USGS demonstrates that an “ensemble of 12 climate models” that accurately

⁷ K.D. Sharma & A.K. Gosain, Intergovernmental Panel on Climate Change, Application of Climate Information and Predictions in Water Sectors; Capabilities, p. 5-6 (2009). (Draft White Paper). (Attachment 5).

⁸ Utah Water Supply p. 2.

simulated changes in streamflow over the twentieth-century, predicted “10-30% reductions in runoff in ... mid-latitude western North America by the year 2050.”⁹ Such a change in streamflow could portend drastic changes in the ability to manage the Colorado River system, especially in terms of the state’s ability to store water in Lake Powell and Lake Mead. For instance, assuming a 10% to 30% reduction in runoff by 2057, two authors from Scripps Institution of Oceanography found in a 2008 paper that “live storage [in Lake Powell and Lake Mead] will be depleted completely 23-40 years from now, or sometime in the span 2030 to 2047.”¹⁰ Allowing for historical variability in river flow, in addition to a 20% reduction in runoff by 2057, the “probability of depleting both reservoirs’ live storage is 50% by 2028.” Alarming, the only “shortage option” that appeared to significantly lengthen the viability of Lake Powell and Lake Mead storage was a 25% reduction in water deliveries.¹¹

j. The applicant should be required to demonstrate, with high confidence, that such climatic changes will not significantly impair the nuclear power plants’ ability to operate over its 40-year operational license, as compared to current capacity factors across the US (91.8% capacity factor as of 2007); otherwise, the State Engineer should conclude that sufficient water is not available for the Plant and the Transfer application should be rejected by the State Engineer.

WHEREFORE, Protestor requests that the State Engineer reject application – the

⁹ USGS, Climate Models, Understanding global shifts in water availability: <http://water.usgs.gov/nrp/highlights/streamflow.climate.html> (Attachment 6).

¹⁰ When will Lake Mead go dry?, Tim P. Barnett and David W. Pierce, Scripps Institution of Oceanography, University of California San Diego, La Jolla, CA, 92037, USA, p. 11-13, January 23, 2008. (Attachment 7).

¹¹ Id.

Transfer Application for Water Right No. 09-462 and 89-74, 89-128, and 89-1513 (A35402) , as the water diversion would interfere with more beneficial uses of the water, the public welfare and with existing water uses.

Protestor reserves the right to submit additional information and evidence in support of this Protest to the extent such presentation of information and evidence is authorized. Protestors respectfully request to supplement this Protest with additional information in support of the Protest.

Dated March 1, 2010.

s/Harold Shepherd
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CERTIFICATE OF FAX AND MAILING

I hereby certify that I e-mailed and mailed, First Class, Return Receipt Requested, a copy of this Written Testimony to:

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Dated March 1, 2010.

s/Harold Shepherd
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