



**The Wilderness Society  
San Juan Citizens Alliance**

Mr. Terry Stroh  
Area Manager  
Bureau of Reclamation  
2764 Compass Drive, Suite 106  
Grand Junction, Colorado, 81506

Delivered via email to: TStroh@usbr.gov

Re: Paradox Valley Salinity Control and Evaporation Pond Pilot Study – Scoping Comments

January 30, 2012

Dear Mr. Stroh:

We appreciate the opportunity to comment on the Bureau of Reclamation's proposed Paradox Valley Evaporation Pond Pilot Study. These scoping comments are submitted on behalf of The Wilderness Society and the San Juan Citizens Alliance. Our organizations are heavily invested in conservation programs in the Dolores River Basin, and share goals to preserve the irreplaceable natural and cultural heritage of the Dolores River and nearby public lands.

The Wilderness Society (TWS) is a national organization with more than a half a million members and supporters nation-wide, and an active membership in Colorado. Our members, volunteers and staff live, work and recreate in the Dolores basin and in the vicinity of the proposed project. The mission of The Wilderness Society is to protect wilderness and inspire Americans to care for our wild places. We have worked for more than 70 years to maintain the integrity of America's wilderness and public lands and ensure that land management practices are sustainable and based on sound science to ensure that the ecological integrity of the land is maintained. The Dolores Basin comprises an area of program focus for us, where we are particularly interested in preserving wilderness and backcountry areas, opportunities for primitive recreational experience, and unique ecological values.

San Juan Citizens Alliance (SJCA) has been the lead conservation organization working to support sustainable stewardship in Southwest Colorado for 25 years. SJCA is a grassroots organization dedicated to social, economic and environmental justice in the San Juan Basin. We organize residents to protect our water and air, our public lands, our rural character, and our unique quality of life while embracing the diversity of our region's people, economy and ecology. Our members live, work, play and are deeply engaged with our public lands.

Through the ensuing NEPA process, we expect and encourage a full and thorough review of the environmental and socioeconomic impacts of federal salinity control actions, both in the Paradox valley and more broadly. We believe that for salinity treatment to truly be successful and sustainable in the long term, a comprehensive approach that considers the full Dolores River Basin, and perhaps Colorado River Basin, is warranted.

### **Purpose and Need:**

The Paradox Valley Salinity Control Project provides beneficial improvements to the water quality of the Dolores River, preventing on an annual basis approximately 110,000 tons of salt from entering the river as it travels north through Paradox Valley and toward its confluence with the Colorado. Groundwater brine from Paradox Valley is intercepted by shallow wells before loading into the Dolores, treated and then injected into a deep well, contributing to an overall reduction of salinity in the Lower Colorado River Basin. Although the benefits of the Paradox project include desirable improvements in habitat for Dolores and Colorado River fish species and improved water quality downstream, the Bureau of Reclamation's stated intent of replacing the current deep well brine injection system causes considerable concern regarding potential substantial impacts associated with many of the possible action alternatives, especially the potential development of the Evaporation Pond Pilot Study into a large-scale evaporative complex. Concurrently, the deep-well injection system poses concerns for its existing seismic impacts which will require a carefully considered approach to identify appropriate alternatives for its extension or replacement.

The Bureau of Reclamation contemplates implementing the Evaporation Pond Pilot Study under the recommendation of the Colorado River Salinity Control Forum and conducting an Environmental Assessment to site the pilot pond in close proximity to the Dolores River with a minimum of three potential sites to be examined. The pilot pond may create significant environmental impacts requiring substantial mitigation that will affect Paradox Valley, nearby residents and wildlife. The scope of the action contemplated, particularly when considered within the true context of potential build-out of surface evaporation ponds, cannot be adequately analyzed through an Environmental Assessment (EA), but rather requires the detailed and thorough NEPA analysis of an Environmental Impact Statement (EIS). The need for more extensive analysis is underscored by the severity of impacts already anticipated in the Bureau of Reclamation Scoping Notice to include injuries and deaths to sensitive migratory bird species protected by international treaty, and creation of a permanent, above-grade waste landfill in Paradox Valley, altering the scenic and agricultural nature of the surrounding area. The pilot pond will cause impacts to the Dolores River corridor, riparian zones and wetlands, habitat for sensitive species, potential BLM Areas of Critical Environmental Concern, and the proposed suitability of the middle Dolores River for Wild & Scenic River status. These potential impacts are the result of major actions by the Bureau of Reclamation that trigger the full analysis of an Environmental Impact Statement under NEPA's threshold. The potential benefits and adverse impact on imperiled native fish species, including those already protected by the Endangered Species Act, poses difficult questions that need to be addressed in consultation with the U.S. Fish and Wildlife Service. In sum, there is no question that the study will necessarily evolve into an on-the-ground project that will be the source of a wide array of impacts, therefore an EA with its pre-determined Finding of No Significant Impact is inadequate, with an EIS being the required NEPA process.

Because the Evaporation Pond Pilot Study is formally recommended by the Colorado River Salinity Control Forum under the authority of congressional mandate, it is better understood as the first federally directed phase of implementing a large-scale evaporation project in the Colorado River Basin than as a site-specific project on the Dolores River. Increasingly, the basin-wide salinity-control efforts are recognized as insufficient to meet water quality standards in the lower basin and across the international boundary with Mexico over the long term, particularly in light of over-allocation of water resources, storage evaporation and capacity reduction, and standing agricultural practices. It is well recognized that it will be more difficult in the future for the Bureau of Reclamation to fulfill the directives of the Salinity Control Act as demands on the basin continue to increase. The Paradox deep-well injection project currently accounts for approximately one-tenth of total salt removed from the Upper and Lower Colorado River Basins, despite its location on an upper basin tributary. The Evaporation Pond Pilot Study contemplates the construction of a 20- to 40-acre evaporation compound that, if demonstrated to be feasible, will be expanded to a major complex of evaporation ponds at an estimated size of 800 acres that will create the future need for permanent hazardous waste management. Not only is the pilot project significant in terms of footprint and specific impacts to Paradox Valley, but the general value of the Paradox Valley Salinity Control Project is of measurable and significant importance to federal agency actions to control salinity in the entire Colorado River Basin. A full Environmental Impact Statement is appropriate, warranted and desired in order to identify alternatives and fully analyze the impacts triggered by these major actions by federal agencies. Since the passage of the Salinity Control Act in 1974, such a comprehensive analysis has been lacking, but the time and need for it now are pressing.

### **Cumulative Impacts and Connected Issues:**

Salinity-control projects have been implemented over the past several decades by multiple federal agencies, including the Bureau of Reclamation, the Bureau of Land Management and the U.S. Department of Agriculture. Despite these efforts, increases in salinity can be expected from future extractive energy development throughout the basin, higher reservoir evaporation rates and lower high-flow periods due to global climate change and drought patterns, and decreased quantity due to over-allocation and increased consumption. Around the turn of this century, water managers recognized that the Colorado River Basin was out of balance and demand had exceeded supply. This recognition resulted in formal policy as the SECURE Water Act of 2009, which defined safe and adequate water supplies as fundamental to the security of the nation and identified global climate change as a factor in protecting those supplies.

Analysis of the Paradox Evaporation Pond Pilot Study must consider the likelihood that salinity control methods will require more action in the future due to these trends and complications. While approximately 47 percent of the salt in the Colorado River is from naturally occurring sources -- such as the brine aquifer that feeds the Dolores River in Paradox Valley -- that proportion is likely to change in the future, requiring a greater focus and attention to the underlying anthropogenic causes of salinity. In a sense, addressing the foundational issues of conservation, storage, diversions, flow management, agricultural and irrigation techniques, energy development, and supply and demand as they relate to salinity content and the overall health and vitality of the Colorado River Basin cannot be isolated from proper analysis and the search for the best solutions both within Paradox Valley and throughout the watershed.

Conducting an Environmental Impact Statement for the Salinity Control Program will facilitate analysis of these issues, but it should be inseparable from the broadest possible embrace of understanding regional development and multiple federal actions that impact shared goals of managing the Dolores and Colorado Rivers sustainably for the future.

Among these is the recent boom in mineral and energy exploration and extraction throughout the Upper Colorado River Basin. Oil and gas drilling activities and associated hydraulic fracturing have increased substantially, creating significant activity and development across the Colorado Plateau. Extensive areas of western Colorado and eastern Utah are recently leased or soon to be leased for natural gas development. The Dolores River watershed and its sensitive ecosystems and habitat are experiencing increased pressures from mineral extraction such as potash, uranium, carbon and base metals. Due to overlapping impacts, the Bureau of Reclamation analysis needs to be coordinated with the ongoing Department of Energy preparation of the Programmatic Environmental Impact Statement of its Uranium Leasing Program in the Dolores and San Miguel River Basins. The increased level of interest and activity in expanding mineral extraction within the Upper Colorado River Basin generates individual actions that each contribute to incremental increases in salinity; the concomitant downstream impacts must be analyzed for their cumulative effects.

Any federal action in Paradox Valley must be understood to be of intense interest and concern on the local, regional, and even national level. For generations, the diverse communities and stakeholders of the Dolores River Basin have valued the river for its contributions to local life, local economies and the character of the region. Local efforts to protect the Dolores River have flourished in recent years through the collaborative-based efforts of the Lower Dolores Working Group, Dolores River Coalition, and other cooperative groups. Collaborative efforts among conservation organizations have focused on the abundant and diverse conservation values of the Paradox Valley that are deserving of protection. An important focus of conservation initiatives has been the revitalization of native fisheries and populations in the San Miguel and Dolores basins. Salinity is a negative factor in the recovery of native species. A variety of locally-based efforts seek to promote sustainable recreation and tourism opportunities, including mountain biking and heritage tourism. All of these efforts have fostered increased stewardship over areas with sensitive habitat, wild lands characteristics or special recreational, cultural or scenic values.

The existing collaboration among diverse stakeholders throughout the Dolores River Basin should be considered as a weighty and important framework underlying any analysis of the Paradox Valley Evaporation Pond Pilot Study. These related actions and others -- from grassroots outreach to federal agency projects to national policy directives -- are interwoven with changing regional development patterns. The Colorado River Basin Salinity Control Program, too, is interwoven into the collective impact of multiple and competing uses imposed on the Dolores River.

### **Range of Alternatives:**

The Bureau of Reclamation should be creative and ambitious in its development of alternatives, as the possibilities for addressing salinity in the Colorado River Basin are numerous and the challenges associated with a large-scale evaporation pond complex are great.

Given associated problems of the three evaporation pond sites identified in the scoping notice and map, additional sites for the Paradox Valley Evaporation Pond Pilot Study must be

analyzed. Site 3 on the scoping map is problematic because of its proximity and possible encroachment into a segment of the Dolores River recommended for Suitability for Wild & Scenic River status through an extensive public process that included the Bureau of Land Management Southwest Resource Advisory Council (RAC) and Uncompahgre Field Office SubRAC. Site 2 on the scoping map is problematic for its proximity to a section of the Dolores River with degraded riparian habitat and disturbed natural flows that is already impaired and in need of restoration.

The permanent storage and creation of landfills to store toxic waste from evaporation ponds in Paradox Valley should be excluded from consideration in all alternatives. All evaporate waste created by the Paradox Valley Salinity Control Project should be removed and permanently stored in a licensed hazardous waste landfill in a suitable location. In addition, all alternatives should include specific provisions for monitoring for groundwater contamination, surface run-off, and impacts to wildlife and vegetation. Further, all alternatives should specify the best available technology for preventing leakage of evaporative ponds, and detail the expected materials and construction methods.

A No Action alternative should investigate the feasibility of continuing the existing brine injection system or expanding it to increase disposal capacity as a best possible scenario for avoidance of higher impact methods. The existing project is known to have caused a 4.3 magnitude earthquake in Paradox Valley in June 2000, but seismic events have registered lower magnitudes over time with the implementation of two annual shutdown periods. A full explanation of this event and measures to avoid its recurrence should be presented in the Draft EIS. A No Action alternative should thoroughly investigate all ramifications of increased seismic events caused by pressure injections in light of existing and future development within Paradox Valley, including the proposed Piñon Ridge Uranium Mill to the east. Mitigation of seismic events should include investigating the feasibility of replacing the current deep injection well with another in a new site, or operating multiple wells together in order to increase rest periods.

Salinity in the Colorado River Basin is greatly affected by agricultural practices and irrigation techniques, and an alternative should be developed to mitigate these impacts in the Dolores River Basin. The feasibility of implementing irrigation improvements should be investigated as a positive and supplemental measure to reduce salinity above and beyond existing measures while also reducing consumption. Water percolation from unlined irrigation ditches and stock ponds contributes to salt-loading in soils and increased saline runoff. Potential mitigation measures include creating cooperative programs with ranchers and farmers to improve water delivery controls, line ditches or build delivery pipes, and intercepting runoff.

An alternative emphasizing the salinity-reduction benefits of natural habitat restoration should also be developed. The Dolores River has been invaded by tamarisk in many sections, an indication of the poor health of the riparian corridor as well as the imbalance in salinity levels in the river. Federal tamarisk eradication efforts are beneficial to the health of habitat but also reduce salinity and improve the natural filtration of riparian zones. These efforts can be expanded and should be investigated as another tool for reducing salinity. Restoration of native cottonwood habitat zones can be expected to bring multiple environmental improvements.

The feasibility of using renewable energy sources should be incorporated into alternatives. The Bureau of Reclamation is planning to deploy a solar-powered desalinization pilot project this year at the Brackish Groundwater Research Facility in Alamogordo, N.M. In other instances, the Bureau is researching technology that combines desalinization with wind or

solar power, or co-location of desalinization facilities with power generators. The use of solar stills are another possibility in Paradox Valley, which has the benefit of returning a freshwater supply to the river.

The Bureau of Reclamation is currently conducting an exhaustive Supply and Demand Study for the Colorado River that addresses the imbalance between the Upper and Lower Basins, and the reliance of lower-basin users to have water problems such as salinity solved by upper basin suppliers. The Supply and Demand Study will analyze the impact and benefits of increasing natural flows in the river through the possible removal of dams, which are a major contributor to the siltation of rivers. An alternative for the Paradox Valley Salinity Control Project should be developed that takes into consideration the changing approach of the Bureau of Reclamation toward water management and any recommendations forthcoming from the Supply and Demand Study. An alternative that evaluates the impacts of managing natural Dolores River flows and increasing releases from McPhee Reservoir as a means of reducing salinity should be developed and considered.

### **Environmental Impacts Analysis:**

The Bureau of Reclamation's analysis of the Paradox Valley Salinity Control Project should comprehensively examine impacts to the environment and ecosystem of Paradox Valley and the riparian system and associated wetlands of the Dolores River. The analysis of impacts should also consider potential impacts to local communities and economies, western heritage and culture, and recreation and tourism. These impacts include:

1. **Water Quantity and Quality:** The impacts of increasing flows in the Dolores in order to mitigate the impacts of salinity on native fish species and stimulate their recovery;
2. **Riparian Zone and Wetlands:** The impacts of salinity control on the riparian areas and associated wetlands of the Dolores River, East Paradox Creek and West Paradox Creek, including the condition of vegetation and habitat;
3. **Groundwater Depletion:** The impacts to Paradox Valley hydrogeology from depleting the brine aquifer and intercepting underground flows into the Dolores River;
4. **Brine Character:** Analysis of the amount of natural salt-loading into the Dolores River and its natural character and flow variations as a means of developing more effective salinity control techniques;
5. **Air Quality and Odors:** Disclosure and analysis of air emissions associated with an evaporation pond, including the release of hydrogen sulfide, and potential dust releases from exposure of evaporative residues;
6. **Soil Quality and Impacts to Soil Crusts:** Analysis of soil conditions at proposed evaporation sites to determine suitability of locating ponds; and assessment of impairment of soil crusts from surface disturbance. Analysis of impacts to soil crusts is especially important in this vicinity, as impaired soil crusts can lead to increased ambient dust, in turn leading to increased dust storms and dust-on-snow. Increasing dust-on-snow conditions have been associated with

altered spring run-off regimes in the San Juan Mountains. Further, the BLM has identified soil crusts in the East Paradox vicinity as having exceptional ecological value, and warranting consideration for inclusion in an Area of Critical Environmental Concern (ACEC).

7. Birds: The impacts of evaporation ponds on birds protected by the Migratory Bird Treaty Act, by the Bald and Golden Eagle Protection Act, on bird species of special concern or with critical habitat in the region, and state and federal candidate and listed species. Of particular concern are the potential impacts to birds that have a particular need or affinity for the habitat characteristics of the project area, including cliff-nesting raptors, shorebirds, wading birds, waterfowl, swifts and swallows, and other riparian-associated birds. Such birds of significant concern include, but are not limited to:

- Peregrine falcons, a bird of state special concern, known to nest in several locations in or near the project area.
- Common merganser and Pied-billed grebe, known to breed in the project vicinity
- Great blue heron, known to breed in the project vicinity
- Black phoebe, a riparian-associated passerine with very limited range in Colorado, known to breed in the project vicinity
- Spotted sandpiper, known to breed in the project vicinity
- White-throated swift, Northern rough-winged swallow, and bank swallow, known to breed in the project vicinity

(See “Birds of Western Colorado Plateau and Mesa Country,” Righter, Levad, Dexter and Potter, 2004).

8. Bats: Impacts to bat habitat and foraging. This is especially relevant as the vicinity of the project area provides both roosting and foraging habitat attractive to bats, including caves and mines for roosting; and water sources, including the river and potential evaporation ponds, producing drinking water and insects for foraging. The combined effect of evaporation ponds and associated insects attracting bats, with the proposed noise emitters for the ponds, could have significant impact on bats and their acoustic-based navigation and feeding methods. At least eight different species of bats have been documented in Paradox Valley, including one or two BLM sensitive species (see “Bats in the Paradox Valley Area...” by Mark A. Hayes, University of Northern Colorado, 2008).

9. Rare plants and plant communities: Direct, indirect and cumulative impacts to rare plants and plant communities. This consideration is especially important because a number of rare and unique plants and plants communities have been documented in and near the project area. In particular, the globally rare New Mexico privet riparian vegetation community is found near the project area along the Dolores and San Miguel Rivers; occurrences of the globally rare Naturita milkvetch appear to lie within or very near the project area; the Paradox breadroot and Payson lupine occur nearby in the Paradox Valley; and rare and uncommon grassland communities occur nearby in the Paradox Valley. The potential dissemination of invasive species, effects on pollinators, and other indirect impacts on rare plants and vegetation communities should be included in the analysis.

10. Wildlife Habitat: Impacts of evaporation ponds on wildlife species, including migratory patterns and habitats, the use of winter and severe winter range, calving areas and breeding grounds;

Of particular note is the mapped occurrence of a Gunnison prairie dog colony in or very near the project area. Not only is this species of conservation concern in its own right, the presence of a prairie dog colony indicates the potential for impacts on many associated species, including reptiles, burrowing owls, and raptors and mammals that are drawn to feed on the prairie dog colony.

The proposed project appears to be located within or very near the following mapped (CDOW 2010) habitats for economically important game species, and impacts to these species and associated hunting activities should be assessed:

- Elk severe winter range
- Elk winter concentration area
- Mule deer severe winter range
- Mule deer winter concentration

Impacts should be especially carefully assessed for mammals that utilize the river or riparian corridor for movement corridors, drinking water or breeding. Among the mammals of special conservation interest that utilize the vicinity of the Dolores and San Miguel rivers and river corridors are river otter, a state species of special concern, and big-horned sheep.

11. Fish: The potential impacts to native fish must be thoroughly assessed. Native fish are of great conservation concern in the Dolores River, and any adverse impacts must be avoided to species of concern including but not limited to: Bluehead sucker, Flannelmouth sucker, Roundtail chub, and Colorado pikeminnow.

12. Livestock: Impacts to livestock on adjacent lands and the potential loss of grazing areas;

13. Nuisances: Impacts of wildlife mitigation measures such as netting, flashing lights, noise cannons, bioacoustics, water sprays and the visual impacts of brine coloring on nearby residents, visitors to the valley and wildlife;

14. Scenic Viewshed: Impacts to the scenic views and attractiveness of the region to visitors as well as to the rustic and agrarian character of Paradox Valley;

15. Cultural Resources: Analysis and surveys of the project area to identify and protect paleontologic, archeological, cultural and historic resources;

16. Recreation: Impacts to boaters, paddlers, anglers and other river-based recreational users;

Impacts to hikers, equestrians, birdwatchers and other recreational users who utilize the river corridor and adjoining lands, and whose experience may be affected by surface facilities, scenic views, sounds, ability to view wildlife, and access to preferred routes of travel;

Hunting, fishing, and other wildlife-based recreational use that depends on access to the river and nearby wildlife habitat, and depends on maintenance of hunting and fishing stock and movement corridors of wildlife;



Research and Natural History Activities: Impacts to scientific researchers and natural and human history aficionados, including botanists, avian monitors, geologists and rock hounds, historians, and anthropologists;

17. Land Management Designations and Public Lands Planning Processes: Analysis and avoidance of existing and proposed special land management designation areas, including but not limited to: river segments recommended for Wild & Scenic River Suitability; Areas of Critical Environmental Concern (ACECs); Special Recreation Management Areas; proposed National Conservation Areas; Wilderness Study Areas; Lands with Wilderness Characteristics; citizen-proposed Wilderness Areas; and designated critical habitats for sensitive species.

These considerations are especially important because the proposed project is located within a region currently undergoing Resource Management Plan Revision for the BLM Tres Rios and Uncompahgre Field Offices. It is important that these key regional land management planning processes be able to maintain their decision space and a reasonable range of alternatives, particularly as these alternatives currently include a number of potential special management areas that could be affected by the proposed project.

The broad range of sensitive resources potentially meriting protection through special designations is reflected in the range of ACECs included in the BLM Uncompahgre Field Office Draft ACEC study. The proposed project may impact the following potential ACECs: Dolores River Canyon, West Paradox and East Paradox.

18. Emergency Preparedness: Analysis of likelihood of natural catastrophe, extreme weather events, flooding, wildfire and other disasters that could cause the failure or malfunction of evaporative compounds and potential damages and impacts to the Dolores River and Paradox Valley;

19. Economic Development: Analysis of feasibility of harvesting commercial byproducts from evaporate material; analysis of potential contributions to local economies from a desalinization plant utilizing renewable energy;

20. Area Development: Analysis of the cumulative impacts of water depletion, seismic activity, drilling and other salinity-control activities, including consideration of any potential interaction with the pending development of a uranium milling facility and tailings compound nearby;

21. Waste: Analysis of impacts from storage, disposal and permanent management of evaporate waste material and costs of removal from Paradox Valley;

22. Energy: Analysis of feasibility of powering the Paradox Valley Salinity Control Project with non-polluting renewable energy sources.

23. Alternative Technologies: Analysis of feasibility of using alternative desalinization technologies, such as devaporation, zero liquid discharge crystallization and reverse oxidation.

## **Conclusion:**

The salinity and concentration of salts in the Dolores and Colorado Rivers are influenced by multiple factors, including reservoir storage, diversions, climatic conditions, seasonal variation and drought patterns, natural runoff flows, groundwater pumping, agricultural and irrigation practices, and salinity-control projects. The connection and complexity of these factors must be considered together for any analysis to be successful in developing appropriate action alternatives that are protective and beneficial to both communities and the environment.

The Paradox Valley is a special landscape deserving of protection and a large-scale evaporation pond complex and long-term toxic waste storage pose severe challenges to the area's conservation values. Real solutions to the salinity problems of the Colorado River Basin can be found in developing alternatives that embrace multiple approaches and root their success in sound science and management techniques that improve the health of land and water. Both the Dolores and the Colorado face increasing demands for water and the cumulative impacts of depleting supplies, degrading quality, energy development and over-allocation. Salinity-control policies must take these factors into consideration and identify solutions that help achieve shared community goals of revitalizing and protecting watersheds to benefit future generations.

Thank you for your consideration of these comments.

Sincerely,

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