

**IN THE SUPREME COURT OF THE STATE OF NEVADA**

ADAM SULLIVAN, P.E., NEVADA  
STATE ENGINEER, DIVISION OF  
WATER RESOURCES,  
DEPARTMENT OF  
CONSERVATION AND NATURAL  
RESOURCES; LAS VEGAS  
VALLEY WATER DISTRICT;  
SOUTHERN NEVADA WATER  
AUTHORITY; and CENTER FOR  
BIOLOGICAL DIVERSITY,

Appellants,

vs.

LINCOLN VALLEY WATER  
DISTRICT et al.,

Respondents.

**Supreme Court No. 84739**

**Consolidated with Nos. 84742,  
84741, and 84809** Electronically Filed  
Jun 13 2022 05:40 p.m.  
Elizabeth A. Brown  
Clerk of Supreme Court

**THE CENTER FOR BIOLOGICAL DIVERSITY’S RESPONSE IN  
OPPOSITION TO LINCOLN COUNTY WATER DISTRICT AND VIDLER  
WATER COMPANY’S MOTION TO DISMISS**

The Center for Biological Diversity (the “Center”) hereby opposes Lincoln County Water District and Vidler Water Company’s (together, “Vidler”) motion to dismiss. The Center submits the following arguments in support of its Opposition, and also in support of its Emergency Motion for Stay.

Vidler challenges the standing of three Appellants—the Center, the Southern Nevada Water Authority (“SNWA”), and the Muddy Valley Irrigation Company (“MVIC”)—on two general grounds. First, Vidler argues that Appellants lack

standing because, according to Vidler, Appellants “prevailed” below. Vidler also argues that Appellants are not “aggrieved” parties as required under NRAP 3A(a).

Both arguments lack merit. Appellants did not “prevail” below. They challenged specific aspects of Order 1309 that did not adequately protect their interests, but otherwise defended Order 1309 as a lawful and necessary exercise of the State Engineer’s statutory authority. Order 1309 protects Appellants’ interests—and specifically the Center’s interests in the endangered Moapa dace—by establishing a sustainable yield and groundwater pumping cap across an interconnected aquifer system known as the Lower White River Flow System (“LWRFS”). Order 1309 thus prevents new development that could interfere with senior water rights and harm the Moapa dace.

The harm against which Order 1309 protects is both real and imminent—as the Center explained in its Emergency Motion for Stay and Joinder, permitted groundwater rights in the LWRFS exceed the State Engineer’s sustainable yield by at least 30,000 acre-feet annually, and possibly more. Without the protection afforded by Order 1309, these permitted rights could be developed and pumped without restriction, impairing senior water rights held under the 1920 Muddy River Decree and threatening the dace—which is found only in certain warm-water springs in the Muddy River’s headwaters. Regardless of the various procedural developments below, Appellants are thus aggrieved by the District Court’s vacatur of Order 1309, and have standing to appeal.

Vidler is also incorrect that the Center lacks a particularized interest in protection of the Moapa dace. As explained in more detail below and in the

Declaration of Patrick Donnelly, the Center and its members have longstanding interests in the conservation and recovery of the Moapa dace which are distinct from those of the general public. Accordingly, this Court should deny Vidler’s Motion to Dismiss.

### LEGAL STANDARDS

Under NRAP 3A(a), a party has standing to appeal if they are “aggrieved by an appealable judgment or order.” A party is aggrieved “when either a personal right or right of property is adversely and substantially affected.” *Valley Bank of Nev. v. Ginsburg*, 110 Nev. 440, 446, 874 P.2d 729, 734 (1994) (quoting *Estate of Hughes v. First Nat’l Bank*, 96 Nev. 178, 180, 605 P.2d 1149, 1150 (1980)). “A substantial grievance also includes ‘[t]he imposition of some justice, or illegal obligation or burden, by a court, upon a party, or the denial to him of some equitable or legal right.’” *Las Vegas Police Protective Ass’n Metro, Inc. v. Eighth Judicial Dist. Court ex rel. County of Clark*, 122 Nev 230, 240, 130 P.3d 182, 189 (2006) (quoting *State v. State Bank & Tr. Co.*, 36 Nev. 526, 137 P. 400, 402 (1913)).

This case appears to present an issue of first impression: Whether an environmental conservation group has standing to appeal an adverse District Court decision on behalf of its members. The Center agrees with Vidler that in order to show standing as an “aggrieved” party the Center must demonstrate an affected interest distinct from that of the general public—in other words, a “particularized” interest. *See, e.g., Blanding v. City of Las Vegas*, 52 Nev. 52, 74, 280 P. 644, 650 (1929).

This is consistent with the practice of Utah courts, which have held that where a statute provides a right of appeal for “aggrieved” persons it is necessary to show a “particularized” injury—that is, a “distinct and palpable injury that gives rise to a personal stake in the outcome” of the case. *Wash. Cty. Water Conservancy Dist. v. Morgan*, 2003 UT 58, ¶ 17, 82 P.3d 1125, 1131 (Sup.Ct.); *see also Haik v. Jones*, 2018 UT 39, ¶ 18, 427 P.3d 1155, 1159 (Sup.Ct.).

The requirement of a “particularized” injury is also consistent with federal standing requirements under Article III of the U.S. Constitution. To obtain standing under Article III, a plaintiff must demonstrate “an injury in fact—an invasion of a legally protected interest which is (a) concrete and particularized and (b) actual or imminent, not conjectural or hypothetical.” *Lujan v. Defs. of Wildlife*, 504 U.S. 555, 560, 112 S. Ct. 2130, 2136 (1992) (cleaned up); *see also Pyramid Lake Paiute Tribe of Indians v. Nevada*, 724 F.3d 1181, 1187-88 (9th Cir. 2013) (applying the federal “injury in fact” test to an Indian Tribe’s challenge to a decision of the Nevada State Engineer). As the U.S. Supreme Court has explained, the purpose of the “injury in fact” test is the same as NRAP 3A(a)—to ensure that the plaintiff represents its own particular interest, and not those of the general public or a third party. *Defs. of Wildlife*, 504 U.S. at 562, 112 S. Ct. at 2137.

Once it is acknowledged that NRAP 3A(a)’s standing requirement is roughly equivalent to the federal “injury in fact” requirement, it is possible to address the question at hand—the standing of an environmental organization to challenge an agency decision on behalf of its members. In fact, the Supreme Court in *Defenders of Wildlife* addressed this very issue. There, the Court held that an environmental-

organization plaintiff meets Article III’s standing requirements where it alleges “specific facts” showing that a species of interest to the organization’s members is threatened by the complained-of conduct, and that the organization’s members are “directly” affected. 504 U.S. at 563, 112 S. Ct. at 2138. The Court also noted that “the desire to use or observe an animal species, even for purely esthetic purposes, is undeniably a cognizable interest for purpose of standing.” 504 U.S. at 562-63, 112 S. Ct. at 2137.

As explained below, the Center easily qualifies as an “aggrieved” part under this standard.

## **ARGUMENT**

### **I. The Center Did Not Prevail at the District Court or Settle With the State Engineer**

Vidler and others argue that the Center lacks standing because it allegedly settled with the State Engineer, or alternatively, that it “prevailed” below. Both of these arguments are legally flawed and factually inaccurate. Several Respondents, including Vidler, attempt to confuse the issue by suggesting that the Center somehow changed positions, or engaged in “gamesmanship” in collaboration with the State Engineer. Neither is true, and the Center will endeavor to clarify the record here.

The Center participated in the administrative proceedings that culminated in Order 1309, submitting both technical reports and expert hydrological testimony. Throughout the administrative process, the Center presented evidence that the impacts from groundwater pumping in the LWRFS are both geographically

widespread and effectively permanent. *See, e.g.*, Center’s Emergency Motion for Stay and Joinder, Exhs. 7-8. Other parties, such as Vidler and Coyote Springs Investment, LLC, disagreed about the geographic scope of the LWRFS and the impacts of groundwater pumping. *See, e.g.*, Center’s Emergency Motion for Stay and Joinder, Exh 12.

After the State Engineer issued Order 1309 in July 2020, the Center filed a Petition for Judicial Review challenging one particular aspect of the Order—namely the State Engineer’s factual finding that the LWRFS aquifer was at or approaching a “steady state.” *See* State Engineer & Center’s Joint Motion to Consolidate, Exh. 7 (Center’s Petition for Judicial Review). The Center’s Petition was based on data showing that springflows continued to decline—albeit slightly—and its purpose was to secure additional protection for the Moapa dace and senior decreed water rights. *Id.*

Other parties, such as Vidler and Coyote Springs Investment, LLC (“Coyote Springs”), filed Petitions for Judicial Review challenging Order 1309 in its entirety. *See, e.g.*, State Engineer & Center’s Joint Motion to Consolidate, Exhs. 4, 6 (Vidler and Coyote Springs’ Petitions). These parties wish to increase groundwater pumping in the LWRFS by developing junior water rights that are not currently in use, and they sought to vacate Order 1309 in order to facilitate an increase in pumping. Consequently, even though the Center and Vidler both filed Petitions for Judicial Review, their actual interests in this litigation are directly adverse.

The Center also participated in the District Court proceedings as Respondent-Intervenor, pursuant to a stipulation and Court Order allowing each Petitioner to

intervene in the others' cases. *See* State Engineer & Center's Joint Motion to Consolidate, Exh. 12 (Order Approving Joint Stipulation for Joint Intervention). As Respondent-Intervenor, the Center presented arguments defending Order 1309 against allegations that the Order was issued without statutory authority and violated the due process rights of Vidler and others.

On February 17, 2022—the last day of oral arguments before the District Court—the Center entered into settlement negotiations with the State Engineer. Counsel for the Center and the State Engineer began discussing a potential settlement of the Center's claim against the State Engineer's "steady state" conclusion, but no agreement was ever reached. Before the Center and the State Engineer could agree on settlement terms or finalize an agreement, the District Court issued an Order vacating Order 1309. The District Court's Order effectively mooted the settlement discussions.

The District Court ruled in favor of Vidler and the other Respondents, and against the Center, SNWA, and MVIC. Center's Motion for Emergency Stay and Joinder, Exh 1. The District Court concluded: (1) the State Engineer exceeded his statutory authority in delineating the LWRFS; and (2) the State Engineer's delineation of the LWRFS violated the due process rights of the prevailing petitioners. *Id.* The District Court later issued an Addendum and Clarification dismissing the Center's petition. State Engineer & Center's Joint Motion to Consolidate, Exh. 19.

Consequently, the Center is an "aggrieved" party under NRAP 3A(a). The Center never settled with the State Engineer; no settlement agreement was ever

executed, and nothing in the District Court’s docket reflects a settlement. Additionally, the District Court did not grant the Center any “relief” whatsoever. In fact, with Order 1309 vacated, the Center’s interests are at greater risk than they were when the Center filed its Petition for Judicial Review in July of 2020. As explained in the Center’s Emergency Motion for Stay, without Order 1309’s 8,000 acre-foot pumping cap, an additional 30,000 acre-feet of groundwater rights may now be pumped, threatening the very existence of the Moapa dace. *See* Exh. 1 (Declaration of Patrick Donnelly) and exhibits thereto. Finally, as discussed below, the Center’s interests in the protection of the dace are genuine, concrete, and particularized.

## **II. The Center and Its Members Are Aggrieved by the District Court’s Decision**

As noted, the Center agrees with Vidler that an appellant must show a “particularized” injury, separate and apart from the interests of the general public, in order to satisfy the standing requirement of NRAP 3A(a). And as explained above, this standard is roughly equivalent to the “injury in fact” requirement under Article III of the U.S. Constitution. Further, both this Court and federal Courts have recognized an organization’s standing to sue on basis of its members’ particularized interests. *Defenders of Wildlife*, 504 U.S. at 563, 112 S. Ct. at 2138; *Las Vegas Police Protective Ass’n*, 122 Nev. at 240, 130 P.3d at 190.

Here, the Center appeals on behalf of its members, including its Great Basin Director, Patrick Donnelly. Mr. Donnelly has “strong personal and professional interests” in the conservation of endemic species, including the Moapa dace



specifically. Exh. 1 ¶ 8. Mr. Donnelly’s personal interests in the dace are aesthetic, recreational, scientific and spiritual. *See generally id.* He has visited the Warm Springs Natural area on several occasions to observe and photograph the dace, and to enjoy the unique natural setting created by the area’s warm-water springs. *Id.* ¶ 16. He also has concrete plans to return to the Warm Springs Natural Area, and to partake in the same activities, in autumn of 2022. *Id.* ¶ 17. In addition, Mr. Donnelly participated in the administrative hearing that culminated in Order 1309, and endeavors to raise public awareness of the dace, including by authoring and publishing articles on the species. *Id.* ¶¶ 19-20.

Mr. Donnelly therefore easily meets the requirement to show a “particularized” injury. *See Defs. of Wildlife*, 504 U.S. at 562-63, 112 S. Ct. at 2137 (1992) (explaining that “the desire to use or observe an animal species, even for purely esthetic purposes, is undeniably a cognizable interest for purpose of standing”). In fact, the U.S. Court of Appeals for the Ninth Circuit cited these very interests—and the threat from groundwater pumping—when it held in 2015 that the Center had Article III standing to challenge a U.S. Fish and Wildlife Service Biological Opinion related to the Order 1169 aquifer test. Specifically, the court explained:

[The Center] alleges that its members have scientific, aesthetic, personal, spiritual and work-related interests in the continued survival of the Moapa dace and other species with habitats in the [Muddy Valley National Wildlife Refuge]. They are concerned that if the Moapa dace population is imperiled or permitted to decline, these interests will be harmed.

\* \* \*

[S]tate-ordered groundwater pumping is an ultimate cause of [the Center]'s injury

*Ctr. for Biological Diversity v. United States Fish & Wildlife Serv.*, 807 F.3d 1031, 1043 (9th Cir. 2015).

Mr. Donnelly and similarly-situated Center members are aggrieved by the District Court's decision because it subjects the Moapa dace and its unique habitat to severe and imminent danger. Specifically, the District Court's order removes any protection against increases in groundwater pumping. As Mr. Donnelly explains:

[T]here are far more permitted groundwater rights in the LWRFS than there is water available. The number of permitted rights exceeds the area's approximate sustainable yield by at least 30,000 acre-feet annually, perhaps more. . . . Without a stay of the district court's decision, there would be nothing to stop an increase in unsustainable groundwater pumping. Any such increase in groundwater pumping would, in turn, directly and indirectly impact the Moapa dace including by reducing the amount of aquatic habitat available for the dace, reducing water temperatures (which must stay above a certain level in order for the dace to reproduce), and ultimately reducing the dace population or potentially extirpating the dace entirely.

The results of the Order 1169 pumping test showed that significant withdrawals from the aquifers of the LWRFS are essentially irreversible—groundwater levels will not simply recover after pumping ceases, but rather such withdrawals represent a permanent drawdown in aquifer storage. As such, if the District Court's order remains effective during appeal, and groundwater pumping increases, it could cause irreparable harm to the Muddy River Springs Area and the Moapa dace, by permanently reducing aquifer storage and the spring discharge that the Moapa dace depends on to survive.

Exh. 1 ¶¶ 22-23.

Accordingly, the Center's members have particularized interests in the Moapa dace, which will be irreparably harmed if the District Court's order is not stayed,

and the Center is therefore an “aggrieved” party with standing to appeal under NRAP 3A(a)

### CONCLUSION

For all of the reasons discussed herein, the Center has standing to appeal and this Court should deny Vidler’s Motion to Dismiss.

**Affirmation:** The undersigned do hereby affirm that the preceding document and/or attachments do not contain the social security number of any person.

Dated this 13th day of June, 2022.

/s/ Scott Lake  
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*Attorneys for the Center for Biological  
Diversity*

## **CERTIFICATE OF SERVICE**

I certify that I am an employee of the Center for Biological Diversity, and that on this 13th day of June, 2022 I served a true and correct copy of the foregoing by electronic service to the participants in this case who are registered with the Nevada Supreme Court's efilings system to this matter.

/s/ Scott Lake  
Scott Lake

## INDEX OF EXHIBITS

<b>Exhibit No.</b>	<b>Exhibit Description</b>	<b>Number of Pages</b>
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# Exhibit 1

**IN THE SUPREME COURT OF THE STATE OF NEVADA**

ADAM SULLIVAN, P.E., NEVADA  
STATE ENGINEER, DIVISION OF  
WATER RESOURCES,  
DEPARTMENT OF  
CONSERVATION AND NATURAL  
RESOURCES; LAS VEGAS  
VALLEY WATER DISTRICT;  
SOUTHERN NEVADA WATER  
AUTHORITY; and CENTER FOR  
BIOLOGICAL DIVERSITY,

Appellants,

vs.

LINCOLN VALLEY WATER  
DISTRICT et al.,

Respondents.

**Supreme Court No. 84739**

**Consolidated with Nos. 84742,  
84741, and 84809**

**DECLARATION OF PATRICK DONNELLY IN SUPPORT OF THE  
CENTER FOR BIOLOGICAL DIVERSITY'S EMERGENCY MOTION  
FOR STAY AND JOINDER**

I, PATRICK DONNELLY, pursuant to NRS § 53.045, declare under penalty of perjury under the law of the State of Nevada that the foregoing is true and correct. As to matters that reflect an opinion, they reflect my personal opinion and judgment on the matter.

1. I live in Shoshone, California. I have a Bachelor of Science in Conservation and Resource Studies from the University of California, Berkeley. Desert ecosystems were my particular area of interest. I was a field restoration ecologist primarily in the California desert on and off for 13 years, including 5 years

full time in the field. This work primarily involved using restoration techniques to restore and enhance plant communities to support native ecosystem function. Desert ecology was and is a passion of mine.

2. I first became a member of the Center for Biological Diversity (“the Center”) in 2006. Since 2017 I have been employed at the Center, first as Nevada Wildlife Advocate, then the Center’s Nevada State Director, and finally my current role as Great Basin Director. My role is to advocate for the protection of wildlife, public lands, and groundwater of the Great Basin. As part of that role, I monitor state and federal government action involving endangered species in the state. I use the Freedom of Information Act and other tools to understand how resources are being managed by land management, wildlife management, and resource management agencies, and provide comments on documents prepared under the National Environmental Policy Act (“NEPA”), on administrative proceedings before state agencies, and in preparation for litigation.

3. The Center is a tax-exempt, non-profit, membership organization with thousands of members and supporters, including 715 members in Nevada. The Center’s main office is in Tucson, Arizona. The Center works through science, law, and creative media to secure a future for all species, great or small, hovering on the brink of extinction. The Center has an extensive history of working to protect ecosystems, species, water, and climate from groundwater overappropriation.

4. The Center has several programs in place to address the many components of its advocacy, including ones for Endangered Species, Oceans, Climate Law, Environmental Health, and Public Lands. At the Center, we believe



that the health and vigor of human societies and the integrity and wildness of the natural environment are closely linked. Beyond their extraordinary intrinsic value, animals and plants, in their distinctness and variety, offer irreplaceable emotional, spiritual, and physical benefits to our lives and play an integral part in culture. Their loss, which parallels the loss of diversity within and among human civilizations, impoverishes us beyond repair.

5. As part of its mission, the Center provides oversight of governmental activities that impact all species and their habitats, as well as on human health and wellbeing more generally. The Center has been at the forefront of efforts to hold the government accountable for its obligations under the Endangered Species Act, and engages in protection efforts and campaigns to ensure that our nation's environmental laws—including NEPA and the Endangered Species Act—are enforced with respect to imperiled wildlife and habitat, air and water quality, and human health, especially on our public lands.

6. The Center also actively develops and disseminates—to its members, policymakers, governmental officials, non-profit organizations, and interested members of the general public—a wide array of educational and informational materials concerning the status of and threats to biodiversity, air and water quality, and federal public lands. For example, we have numerous webpages related to endangered species and have implemented numerous letter submission “action alerts” to our membership on various endangered species issues, so they can easily provide public comments to policymakers on issues that are open for comment.

7. The Center's members' diverse interests span natural history, ecology, conservation, wildlife and native plant observation, nature photography, hiking, camping, backpacking, quiet and solitude in nature, dark skies, spiritual renewal, and a love of the Great Basin's natural landscapes. Center members, including myself, derive benefit from engaging with landscapes and the endangered species that reside there. The Center's members expect and rely upon state regulatory agencies, such as the Division of Water Resources, to protect the species, habitats, viewsheds, and air and water quality of these lands.

8. In addition to the Center's interests in Nevada's endangered species, I have strong personal and professional interest in such species and their habitats.

9. I regularly recreate and seek spiritual renewal in the habitats of endangered species in Nevada. I also have a strong professional interest in the integrity of these lands. These interests have been, and continue to be, significantly impacted by groundwater overappropriation and over-pumping in the Lower White River Flow System ("LWRFS"), and the potential for such activities to drive the Moapa dace (*Moapa coriacea*) to extinction.

10. I love the desert. I've spent my life chasing the questions the desert poses, and the few elusive answers it provides. Exploring the desert, including desert springs like the Muddy River Springs Area, is continually rewarding. The learning is constant, and each day exploring brings about novel observations and insights into the ecosystem, biogeography, and climate.

11. Rare and endemic species like the Moapa dace are one of my chief interests while enjoying Nevada's public lands. Endemic species are part of what

makes Nevada so unique—over 200 species occur here and nowhere else on earth. They are very frequently associated with water, and thus their health and vitality frequently reflects the health and vitality of the groundwater-dependent ecosystems they live in, which in turn support hundreds of species of flora and fauna that need groundwater to survive.

12. I also enjoy photographing rare groundwater-dependent species. Wildlife photography is a joyous exercise, capturing the beauty of an animal inhabiting its native lands, getting down in the dirt and mud to better understand how the animal lives and convey that in an aesthetically pleasing manner to the world through photography. Rare aquatic groundwater-dependent endemic species that I enjoy visiting and photographing include the Moapa dace, the Railroad Valley springfish (*Crenichthys nevadae*), the Ash Meadows Amargosa pupfish (*Cyprinodon nevadensis mionectes*), the Amargosa vole (*Microtus californicus scirpensis*), the sterile basin pyrg (*Pyrgulopsis sterilis*), the Tecopa bird's beak (*Chloropyron tecopense*), and the Amargosa niterwort (*Nitrophila mohavensis*).

13. Endemism is perhaps my favorite facet of biology—endemic species are those that live in one place and nowhere else on earth. Endemic species are a big reason that I love desert springs so much, since they tend to be hotbeds of endemism as aquatic species (like toads, fishes, or phreatophytic vegetation) found there are frequently separated from their nearest relatives by dozens of miles of open, dry desert. It has been many millenia since our deserts were places that had long interconnected waterways. Over that time period, these isolated populations of species have developed unique adaptations to their specific environments and

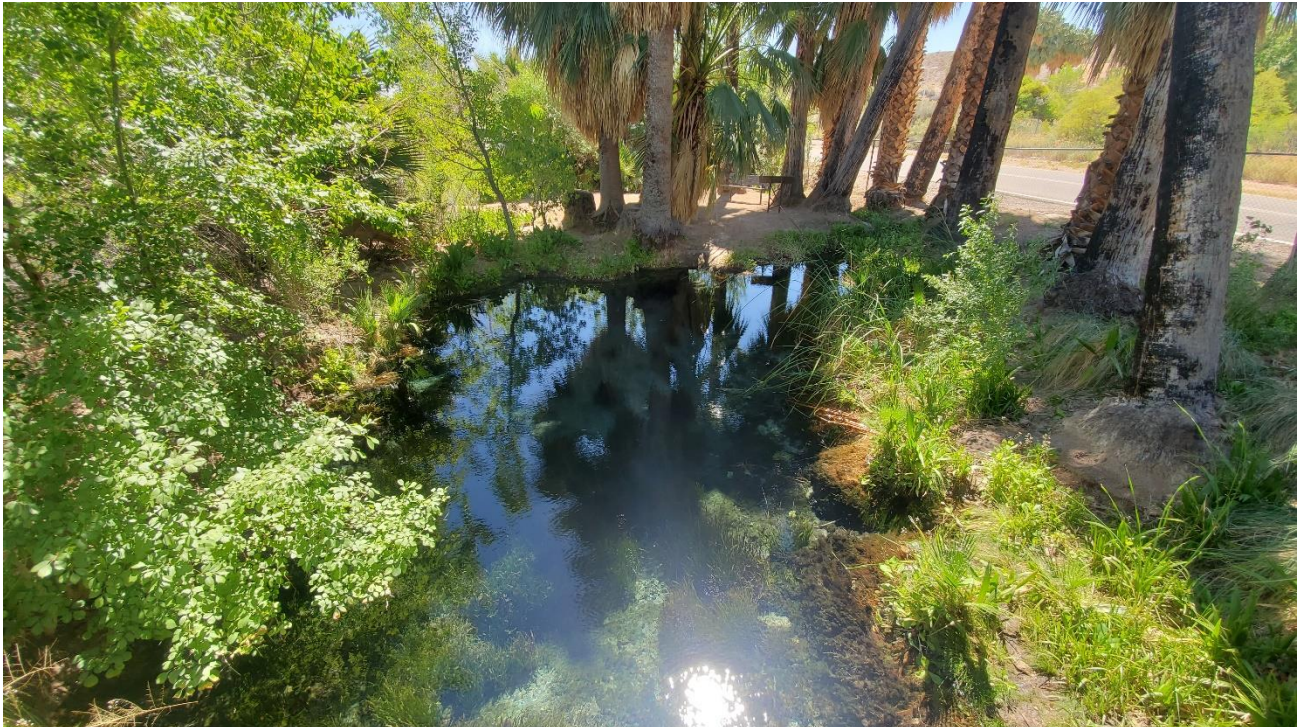
characteristics that only they possess, to the point that they become so differentiated that biologists regard them as discrete species. I believe in endemic species we truly understand the nature of the desert—their adaptations to their specific environment provide a lesson for all of us on how we can thrive in the harshest of conditions if we simply learn how to adapt our ways of being to what resources we have. Endemic species are the thing in the desert that brings me the most joy and draw me in for exploration, contemplation, and photography.

14. The Muddy River Springs Area is a large area of spring discharge at the headwaters of the Muddy River in Clark County, Nevada. These springs, managed primarily by the US Fish and Wildlife Service at Moapa Valley National Wildlife Refuge and the Southern Nevada Water Authority at the Warm Springs Natural Area, provide a vital refuge for endemic aquatic species such as the Moapa dace, the Moapa White River springfish (*Crenichthys baileyi moapae*), and the Moapa speckled dace (*Rhinichthys osculus moapae*). They form an enormous riparian area and alkali wetland which supports numerous bird species and other aquatic organisms and is an oasis of biodiversity in North America's hottest, driest desert.

15. The Moapa dace is a small fish species endemic to the Muddy River Springs Area, which was first listed as endangered in 1967. It has morphological and genetic differences which indicate to scientists species-level differentiation with other dace. It has been the focus of intensive conservation efforts for many decades to prevent its extinction.

16. I have visited the Muddy River Springs Area on several occasions to view the riparian habitat, view the Moapa dace, look for interesting birds, and enjoy

spiritual renewal in the pastoral setting. I visited Warm Springs Natural Area on August 13, 2020; May 13, 2021; and May 23, 2021. While there, I toured the various spring pools and brooks in the area, viewed the Moapa dace and other native fishes, and took photographs of the stunning setting. *See* photograph in Figure 1.



*Figure 1: Photograph of Warm Springs Natural Area and Moapa dace habitat, taken May 23, 2021*

17. I have a specific, concrete plan to revisit the Muddy River Springs Area in autumn of 2022, once the refuge and natural area reopen to public for the cooler months, to check on the Moapa dace and enjoy some time at one of the desert's best riparian areas.

18. The Muddy River Springs Area is a part of the LWRFS. The LWRFS is a seven-basin area in Clark and Lincoln Counties which form a common source of supply of groundwater which discharges at the Muddy River Springs Area. Thus



the groundwater of the LWRFS is what sustains the Moapa dace. The LWRFS also has numerous other ecologically important properties—most notably it forms some of the most intact and expansive habitat remaining habitat for the desert tortoise, which is listed as threatened under the Endangered Species Act. Given my interests, I have visited other parts of the LWRFS at other times. On January 1, 2018, I hiked up Arrow Canyon and saw the petroglyphs there. On July 23, 2020, I visited Kane Springs Valley and enjoyed the riparian area at Willow Spring. See Figure 2. On October 14, 2020, I visited Coyote Springs Valley and derived spiritual and aesthetic benefit from walking among the creosote bush in the high quality desert tortoise habitat.



*Figure 2: Photograph of Kane Springs Valley, taken July 23, 2020*

19. I have significant professional interest and involvement in the Moapa dace. I have been participating in the Nevada State Engineer's administrative proceedings regarding the Lower White River Flow System since 2018. This includes attending numerous public meetings and hearings in Overton and in Carson City; submitting numerous written letters, comments, and testimony; coordinating expert testimony; and participating in a two week evidentiary hearing in Carson City in 2019. I have also been intimately involved in the current litigation.

20. I have also made extensive efforts to raise public awareness about the Moapa dace and the LWRFS. I have spoken with a half dozen or more reporters about this issue over the past 4 years, resulting in more than 20 news articles about the issue, publicizing the plight of the dace to try to raise awareness about the issue. I have also authored a lengthy exposition about the LWRFS entitled "High Noon on the Muddy River," which was published in the *Desert Report* magazine.

21. The Center has also engaged in federal litigation on behalf of the Moapa dace. See Exhibit 1 (*Ctr. for Biological Diversity v. United States Fish & Wildlife Serv.*, 807 F.3d 1031 (9th Cir. 2015)). During the course of this litigation, the Federal Court of Appeals for the Ninth Circuit concluded that the Center had established in "injury in fact" sufficient to support standing under Article III of the U.S. Constitution based on its members' "scientific, aesthetic, personal, spiritual and work-related interests in the continued survival of the Moapa dace and other species with habitats in the [Muddy River Springs Area]." *Id.* at 1043-44.

22. Through my own research and my engagement with the State Engineer's administrative processes, I am aware that there are far more permitted

groundwater rights in the LWRFS that there is water available. The number of permitted rights exceeds the area's approximate sustainable yield by at least 30,000 acre-feet annually, perhaps more. *See* Exhibit 2 (Nevada State Engineer's Ruling 6254); Exhibit 3 (Nevada State Engineer's Order 1309). I therefore understand that without a stay of the district court's decision, there would be nothing to stop an increase in unsustainable groundwater pumping. Any such increase in groundwater pumping would, in turn, directly and indirectly impact the Moapa dace including by reducing the amount of aquatic habitat available for the dace, reducing water temperatures (which must stay above a certain level in order for the dace to reproduce), and ultimately reducing the dace population or potentially extirpating the dace entirely. *See* Exhibit 3 at 45-46.

23. This is not simply a short-term concern. The results of the Order 1169 pumping test showed that significant withdrawals from the aquifers of the LWRFS are essentially irreversible—groundwater levels will not simply recover after pumping ceases, but rather such withdrawals represent a permanent drawdown in aquifer storage. Exhibit 3 at 56-58. As such, if the District Court's order remains effective during appeal, and groundwater pumping increases, it could cause irreparable harm to the Muddy River Springs Area and the Moapa dace, by permanently reducing aquifer storage and the spring discharge that the Moapa dace depends on to survive. The harms to my interests in the dace and the Muddy River Springs Area that I will incur if the District Court's order remains in place are thus irreversible and irreparable.



24. Allowing the district court's decision to stay in place during this appeal will therefore permit activities that irreparably harm my recreational, aesthetic, scientific, and spiritual interests in the Moapa dace, the Muddy River Springs Area and the LWRFS.

25. The relief sought by Appellants, including the Center, in this action will remedy my injury, as well as the Center's and its members' injuries by staying the District Court's decision until the Supreme Court can rule on the merits of this case. This will prevent irreparable harm to the Moapa dace, the Muddy River Springs, other phreatophytic and groundwater-dependent species in the LWRFS, and my interests therein, as described throughout this declaration.

Pursuant to NRS § 53.045, I declare under penalty of perjury under the law of the State of Nevada that the foregoing is true and correct.

Executed on: June 8, 2022

A handwritten signature in cursive script, appearing to read "Patrick Donnelly".

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PATRICK DONNELLY

## INDEX OF EXHIBITS

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# Exhibit 1



Positive

As of: June 8, 2022 5:11 PM Z

## [Ctr. for Biological Diversity v. United States Fish & Wildlife Serv.](#)

United States Court of Appeals for the Ninth Circuit

April 11, 2014, Argued and Submitted, San Francisco, California; September 9, 2015, Resubmitted for Decision; September 17, 2015, Filed

No. 12-17530

### Reporter

807 F.3d 1031 \*; 2015 U.S. App. LEXIS 16558 \*\*; 81 ERC (BNA) 1502

CENTER FOR BIOLOGICAL DIVERSITY, Plaintiff-Appellant, v. U.S. FISH & WILDLIFE SERVICE; SALLY JEWELL, Secretary of the Interior, Defendants-Appellees, SOUTHERN NEVADA WATER AUTHORITY; COYOTE SPRINGS INVESTMENT, LLC, Intervenor-Defendants—Appellees.

**Prior History:** [**\*\*1**] Appeal from the United States District Court for the District of Nevada. D.C. No. 3:10-cv-00521-ECR-WGC. Edward C. Reed, Jr., Senior District Judge, Presiding. Submission Vacated June 24, 2014.

[Ctr. for Biological Diversity v. United States Fish & Wildlife Serv., 900 F. Supp. 2d 1151, 2012 U.S. Dist. LEXIS 139056 \(D. Nev., 2012\)](#)

### Core Terms

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dace, species, groundwater, habitat, pumping, consultation, Springs, conservation measure, effects, jeopardy, measures, water rights, biological, jeopardize, agency's action, conservation, afy, endangered species, cumulative effect, proposed action, continued existence, programmatic, incidental, scientific, withdrawal, federal agency, anticipated, fish, reduction, impacts

### Case Summary

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#### Overview

**HOLDINGS:** [1]-A conservation group demonstrated constitutional standing to bring an Endangered Species Act (ESA), [16 U.S.C.S. § 1531 et seq.](#), lawsuit by alleging that a legally deficient biological opinion under ESA § 7(a)(2) ([16 U.S.C.S. § 1536\(a\)\(2\)](#)) caused the U.S. Fish and Wildlife Service to take inadequate measures to ensure the continued existence of a fish species that might be at risk from groundwater pumping and that the injury could be redressed by further consultation; [2]-The biological opinion was not deficient because conservation measures on which it relied were enforceable under the ESA, the agency did not ignore scientists' concerns or otherwise fail to rely on the best scientific data available, and a no jeopardy conclusion was proper because groundwater pumping was not part of the federal agency action and thus could cause no taking under ESA § 9 ([16 U.S.C.S. § 1538](#)).

### Outcome

Judgment affirmed.

### LexisNexis® Headnotes

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Environmental Law > Natural Resources & Public Lands > Endangered Species Act > Federal Agencies

Environmental Law > Natural Resources &  
Public Lands > Endangered Species  
Act > Takings

### [HN1](#) **Endangered Species Act, Federal Agencies**

Endangered Species Act § 9 ([16 U.S.C.S. § 1538](#)) imposes a blanket prohibition on the take of any endangered species. [§ 1538\(a\)\(1\)\(B\)](#). Endangered Species Act § 7 ([16 U.S.C.S. § 1536](#)) imposes an affirmative duty to prevent violations of § 9 upon federal agencies.

Environmental Law > Natural Resources &  
Public Lands > Endangered Species  
Act > Federal Agencies

### [HN2](#) **Endangered Species Act, Federal Agencies**

Endangered Species Act § 7(a)(2) ([16 U.S.C.S. § 1536\(a\)\(2\)](#)) requires every federal agency to ensure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of critical habitat of such species. To achieve this substantive requirement, § 7 and its implementing regulations impose specific procedural duties on federal agencies. Each federal agency shall review its actions at the earliest possible time to determine whether any action may affect listed species or critical habitats. [50 C.F.R. § 402.14\(a\)](#). If the agency determines that its action may affect a listed species or habitat, it must engage in informal or formal consultation with the Secretary of the Interior or his designee. If informal consultation results in a written agreement between the action agency and the consultation agency that the proposed action is not likely to adversely affect any endangered or threatened

species, no further action is necessary. [§ 402.14\(b\)\(1\)](#). However, if at any point the consultation agency concludes that the proposed action is likely to adversely affect a listed species or critical habitat, formal consultation is required. [50 C.F.R. §§ 402.13, 402.14](#).

Environmental Law > Natural Resources &  
Public Lands > Endangered Species  
Act > Federal Agencies

Environmental Law > Natural Resources &  
Public Lands > Endangered Species  
Act > Takings

### [HN3](#) **Endangered Species Act, Federal Agencies**

During formal consultation, the U.S. Fish and Wildlife Service (FWS) is obligated to use the best scientific and commercial data available, as stated in [16 U.S.C.S. § 1536\(a\)\(2\)](#), to evaluate the effects of the proposed action on the survival of the species and any potential destruction or adverse modification of critical habitat. At the conclusion of the formal consultation process, FWS must provide a biological opinion setting forth a summary of the information on which the opinion is based, a detailed discussion of the effects of the agency action on the listed species, and an opinion as to whether the proposed agency action, taken together with cumulative effects, is likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of critical habitat. [§ 1536\(b\)\(3\)\(A\)](#); [50 C.F.R. §§ 402.14\(g\)\(4\), \(h\)\(1\)-\(3\)](#). If jeopardy is found, FWS shall suggest those reasonable and prudent alternatives which it believes would not violate [§ 1536\(a\)\(2\)](#) and can be taken by the applicant in implementing the agency action. [§ 1536\(b\)\(1\)\(B\)\(3\)\(A\)](#). If it is determined that neither jeopardy nor adverse modification is

likely, FWS can issue an incidental take statement which, if followed, exempts the action agency from the prohibition on takings found in Endangered Species Act § 9 ([16 U.S.C.S. § 1538](#)).

Civil Procedure > ... > Summary Judgment > Summary Judgment Review > Standards of Review

#### [HN4](#) [↓] **Summary Judgment Review, Standards of Review**

A district court's grant of summary judgment is reviewed de novo.

Administrative Law > Judicial Review > Standards of Review > General Overview

Environmental Law > Natural Resources & Public Lands > Endangered Species Act > Federal Agencies

Environmental Law > Administrative Proceedings & Litigation > Judicial Review

#### [HN5](#) [↓] **Judicial Review, Standards of Review**

A biological opinion is a final agency action within the meaning of the Administrative Procedure Act (APA) and is reviewed under APA [§ 706](#) ([5 U.S.C.S. § 706](#)).

Administrative Law > Judicial Review > Standards of Review > Arbitrary & Capricious Standard of Review

#### [HN6](#) [↓] **Standards of Review, Arbitrary & Capricious Standard of Review**

Administrative Procedure Act [§ 706\(2\)\(A\)](#) ([5 U.S.C.S. § 706\(2\)\(A\)](#)) requires a reviewing

court to uphold agency action unless it is arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law. An agency action is arbitrary and capricious if the agency has relied on factors which Congress has not intended it to consider, entirely failed to consider an important aspect of the problem, offered an explanation for its decision that runs counter to the evidence before the agency, or is so implausible that it could not be ascribed to a difference in view or the product of agency expertise. Under this standard, factual determinations must be supported by substantial evidence. An agency action will be sustained if the agency has articulated a rational connection between the facts found and the conclusions made. The arbitrary or capricious standard is a highly deferential standard of review, though the court's inquiry must nonetheless be searching and careful. The agency's decision, however, is entitled to a presumption of regularity, and the court may not substitute its judgment for that of the agency. This traditional deference to the agency is at its highest where a court is reviewing an agency action that required a high level of technical expertise.

Constitutional Law > ... > Case or Controversy > Standing > Elements

Evidence > Burdens of Proof > Allocation

#### [HN7](#) [↓] **Standing, Elements**

A plaintiff has the burden of proving the existence of U.S. Const. art. III standing at all stages of the litigation. To fulfill this obligation, the plaintiff must demonstrate: (1) the existence of an injury-in-fact that is concrete and particularized, and actual or imminent; (2) the injury is fairly traceable to the challenged conduct; and (3) the injury is likely to be redressed by a favorable court decision. To satisfy the injury-in-fact requirement of Article

III, a plaintiff asserting a procedural injury must show that the procedures in question are designed to protect some threatened concrete interest of his that is the ultimate basis of his standing.

Constitutional Law > ... > Case or Controversy > Standing > Particular Parties

Environmental Law > Natural Resources & Public Lands > Endangered Species Act > Federal Agencies

### [HN8](#) [↓] **Standing, Particular Parties**

The consultation procedures of Endangered Species Act (ESA) § 7 ([16 U.S.C.S. § 1536](#)) are designed to protect concrete interests advancing the ESA's overall goal of species preservation, and thus conservation groups' specific goals as to species preservation, by ensuring agency compliance with the ESA's substantive provisions. A desire to use or observe an animal species, even for purely esthetic purposes, is a cognizable interest for purposes of standing.

Constitutional Law > ... > Case or Controversy > Standing > Elements

### [HN9](#) [↓] **Standing, Elements**

A showing of procedural injury lessens a plaintiff's burden on the last two prongs of the U.S. Const. art. III standing inquiry, causation and redressibility. Thus, a plaintiff asserting a procedural injury must show only that it has a procedural right that, if exercised, could protect its concrete interests. Plaintiffs alleging procedural injury can often establish redressibility with little difficulty, because they need to show only that the relief requested—that the agency follow the correct procedures—may influence the agency's

ultimate decision of whether to take or refrain from taking a certain action. This is not a high bar to meet. Nonetheless, the redressibility requirement is not toothless in procedural injury cases.

Environmental Law > Natural Resources & Public Lands > Endangered Species Act > Federal Agencies

### [HN10](#) [↓] **Endangered Species Act, Federal Agencies**

During formal consultation, the U.S. Fish and Wildlife Service is required, among other things, to evaluate the effects of the action and cumulative effects on the listed species, and formulate its biological opinion as to whether the action, taken together with cumulative effects, is likely to jeopardize the continued existence of listed species. [50 C.F.R. § 402.14\(g\)](#). An action refers to all activities and programs carried out, in whole or in part, by federal agencies in the United States, whereas the effects of the action refers to the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action. [50 C.F.R. § 402.02](#). Interrelated actions are those that are part of a larger action and depend on the larger action for their justification. Interrelated actions include conservation measures, which the Endangered Species Act Handbook defines as actions to benefit or promote the recovery of listed species. Cumulative effects are those effects of future state or private activities, not involving federal activities, that are reasonably certain to occur within the action area of the federal action subject to consultation. [§ 402.02](#).

Environmental Law > Natural Resources & Public Lands > Endangered Species



Act > Federal Agencies

### [HN11](#) [↓] **Endangered Species Act, Federal Agencies**

A conservation agreement entered into by the action agency to mitigate the impact of a contemplated action on listed species must be enforceable under the Endangered Species Act, [16 U.S.C.S. § 1531 et seq.](#), to factor into a biological opinion's jeopardy determination.

Environmental Law > Natural Resources & Public Lands > Endangered Species  
Act > Federal Agencies

### [HN12](#) [↓] **Endangered Species Act, Federal Agencies**

The Endangered Species Act (ESA), [16 U.S.C.S. § 1531 et seq.](#), requires an agency to use the best scientific and commercial data available when formulating a biological opinion. [16 U.S.C.S. § 1536\(a\)\(2\)](#); [50 C.F.R. § 402.14\(g\)\(8\)](#). This standard does not require the agency to conduct new tests or make decisions on data that does not yet exist. Rather, the best available data requirement merely prohibits an agency from disregarding available scientific evidence that is in some way better than the evidence it relies on. The ESA does not require that a federal agency design or plan its projects using the best science possible. Rather, the ESA requires that, once a federal action is submitted for formal consultation, the consulting agency must use the best scientific and commercial evidence available in analyzing the potential effects of that action on endangered species in its biological opinion. [§ 1536\(a\)\(2\)](#). Thus, an objection that the terms of an agreement were negotiated simply cannot support a conclusion that the biological opinion's analysis of those terms failed to satisfy the requirements of the ESA.

Environmental Law > Natural Resources & Public Lands > Endangered Species  
Act > Federal Agencies

### [HN13](#) [↓] **Endangered Species Act, Federal Agencies**

To jeopardize—the action ESA prohibits—means to expose to loss or injury or to imperil. Either of these implies causation, and thus some new risk of harm. Likewise, the suffix "-ize" in "jeopardize" indicates some active change of status: an agency may not cause a species to be or to become in a state of jeopardy or subject a species to jeopardy. Agency action can only jeopardize a species' existence if that agency action causes some deterioration in the species' pre-action condition. An agency only jeopardizes a species if it causes some new jeopardy. An agency may still take action that removes a species from jeopardy entirely, or that lessens the degree of jeopardy. However, an agency may not take action that will tip a species from a state of precarious survival into a state of likely extinction. Likewise, even where baseline conditions already jeopardize a species, an agency may not take action that deepens the jeopardy by causing additional harm.

Environmental Law > Natural Resources & Public Lands > Endangered Species  
Act > Federal Agencies

### [HN14](#) [↓] **Endangered Species Act, Federal Agencies**

The Endangered Species Act, [16 U.S.C.S. § 1531 et seq.](#), requires simply that in preparing a biological opinion, the U.S. Fish and Wildlife Service consider whether the action, taken together with the cumulative effects, is likely to



jeopardize the continued existence of listed species. [16 U.S.C.S. § 1536\(a\)\(2\)](#); [50 C.F.R. § 402.14\(g\)\(4\)](#). It is not consistent with the statutory scheme that jeopardy caused by cumulative effects could obviate the requirement that the federal action itself must cause some incremental deterioration in the species' pre-action condition.

Environmental Law > Natural Resources & Public Lands > Endangered Species Act > Federal Agencies

Environmental Law > Natural Resources & Public Lands > Endangered Species Act > Takings

### [HN15](#) **Endangered Species Act, Federal Agencies**

See [16 U.S.C.S. § 1536\(b\)\(4\)](#).

#### **Summary:**

#### **SUMMARY\*\***

#### **Environmental Law**

The panel affirmed the district court's summary judgment in favor of the U.S. Fish and Wildlife Service and intervenors Southern Nevada Water Authority and Coyote Springs Investment, LLC in an action brought by the Center for Biological Diversity challenging the Fish and Wildlife Service's Biological Opinion which determined that the execution of a Memorandum of Agreement, concerning a groundwater pump test in Nevada, would not jeopardize the Moapa dace, an endangered species.

The panel held that the Center for Biological

Diversity had standing.

The panel rejected the Center for Biological Diversity's challenges to the Biological Opinion. Specifically, the panel found no evidence in the record that the Fish and Wildlife Service relied on improper factors, failed to consider important aspects of the problem, offered explanations for its decision **[\*\*2]** that were counter to the evidence before it, or offered implausible explanations for its decision. The panel held that the Fish and Wildlife Service's determination that its participation in the Memorandum of Agreement would not cause jeopardy to the Moapa dace was not arbitrary, capricious, or in violation of the Endangered Species Act.

**Counsel:** John Buse (argued) and Lisa Belenky, Center for Biological Diversity, San Francisco, California; William J. Snape, III, Center for Biological Diversity, Washington, D.C., for Plaintiff-Appellant.

Ignacia S. Moreno, Assistant Attorney General, James J. Dubois, Coby Howell, Ellen J. Durkee, and Nina C. Robertson (argued), United States Department of Justice, Environment & Natural Resources Division, Washington, D.C., for Defendants-Appellees United States Fish & Wildlife Service and Sally Jewell.

Murray D. Feldman (argued), Holland & Hart, Boise, Idaho; Craig D. Galli, Holland & Hart, Salt Lake City, Utah; Dana R. Walsh, Southern Nevada Water Authority, Las Vegas, Nevada, for Intervenor-Defendant-Appellee Southern Nevada Water Authority.

Kirk B. Lenhard, Scott M. Schoenwald, and Bradley J. Herrema, Brownstein Hyatt Farber Schreck, LLP, Las Vegas, Nevada, **[\*\*3]** for Intervenor-Defendant-Appellee Coyote Springs Investment, LLC.

**Judges:** Before: Mary M. Schroeder and

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\*\* This summary constitutes no part of the opinion of the court. It has been prepared by court staff for the convenience of the reader.

Consuelo M. Callahan, Circuit Judges, and Robert W. Pratt, Senior District Judge.\*  
Opinion by Judge Pratt.

**Opinion by:** Robert W. Pratt

## Opinion

[\*1035] PRATT, District Judge:

This case concerns Defendant-Appellee U.S. Fish and Wildlife Service's ("FWS") decision to enter into a Memorandum of Agreement ("MOA") with several non-federal entities who were subject to a Nevada State Order mandating a groundwater pump test. FWS anticipated that the pump test may affect an endangered species, the Moapa dace, and worked with the parties to obtain an agreement to implement a variety of conservation measures in advance of the groundwater pump test. FWS conducted a formal consultation under the Endangered Species Act ("ESA"), [16 U.S.C. § 1531 et seq.](#), and determined in a Biological Opinion ("Biop") that FWS's execution of the MOA would not jeopardize the Moapa dace. Plaintiff-Appellant Center for Biological Diversity ("CBD") challenged the Biop and the district court granted summary judgment in favor of FWS and Intervenor-Defendants-Appellees [\*\*4] Southern Nevada Water Authority ("SNWA") and Coyote Springs Investment, LLC ("CSI").

In this opinion, we resolve a challenge by FWS and Intervenor to CBD's standing. Because we conclude that CBD does have standing, we also resolve CBD's claims that the Biop was arbitrary and capricious because: (1) it unlawfully relies on conservation measures that are inadequate and unenforceable; (2) it was not based on the best available scientific

information; and (3) it failed to evaluate all [\*1036] foreseeable consequences of the proposed action. We reject CBD's challenges to the Biop and affirm the district court's grant of summary judgment.

## I. BACKGROUND

### A. The Statutory Scheme

The ESA "is a comprehensive scheme with the broad purpose of protecting endangered and threatened species." [Ctr. for Biological Diversity v. United States BLM, 698 F.3d 1101, 1106 \(9th Cir. 2012\)](#) (hereinafter "*BLM*") (citation and internal quotation marks omitted). This case centers on two provisions central to the ESA's protections: [HN1](#)<sup>[↑]</sup> section 9, which imposes a blanket prohibition on the "take" of any endangered species,<sup>1</sup> [16 U.S.C. § 1538\(a\)\(1\)\(B\)](#), and section 7, which "imposes an affirmative duty to prevent violations of Section 9 upon federal agencies." [Ariz. Cattle Growers' Ass'n v. FWS, 273 F.3d 1229, 1238 \(9th Cir. 2001\)](#) (citing [16 U.S.C. § 1536\(a\)\(2\)](#)).

[HN2](#)<sup>[↑]</sup> Section 7(a)(2) of the ESA requires every federal agency to "insure that any action authorized, funded, or carried out by such agency . . . is not likely to jeopardize the continued existence<sup>2</sup> of any endangered

<sup>1</sup>"The term 'take' means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, [\*\*5] or to attempt to engage in any such conduct." [16 U.S.C. § 1532\(19\)](#). The ESA's implementing regulations define "harm" as "an act which actually kills or injures wildlife. Such act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering." [50 C.F.R. § 17.3](#).

<sup>2</sup>"Jeopardize the continued existence of means to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that

\*The Honorable Robert W. Pratt, Senior District Judge for the U.S. District Court for the Southern District of Iowa, sitting by designation.

species or threatened species or result in the destruction or adverse modification of [critical] habitat of such species." [16 U.S.C. § 1536\(a\)\(2\)](#); [50 C.F.R. § 402.14\(a\)](#). To achieve this substantive requirement, section 7 and its implementing regulations impose specific procedural duties on federal agencies. "Each Federal agency shall review its actions at the earliest possible time to determine whether any action may affect listed species or critical habitats." [50 C.F.R. § 402.14\(a\)](#). If the agency determines that its action "may affect" a listed species or habitat, it must engage in informal or formal consultation with the Secretary of the Interior or his designee—in this case, [FWS](#).<sup>3</sup> [San Luis & Delta-Mendota Water Auth. v. Jewell](#), 747 F.3d 581, 596 (9th Cir. 2014); see also [16 U.S.C. § 1536\(a\)\(4\)](#); [50 C.F.R. § 402.14](#). If informal consultation [<sup>\*\*6</sup>] results in a written agreement between the action agency and the consultation agency that the proposed action "is not likely to adversely affect" any endangered or threatened species, no further action is necessary. [50 C.F.R. § 402.14\(b\)\(1\)](#). However, if at any point FWS concludes that the proposed action is "likely to adversely affect" a listed species or critical habitat, formal consultation is required. [Jewell](#), 747 F.3d at 596; [50 C.F.R. §§ 402.13, 402.14](#).

[HN3](#)<sup>↑</sup> During formal consultation, the FWS is obligated to use the "best scientific and commercial data available," [16 U.S.C. § 1536\(a\)\(2\)](#), to "evaluate[] the effects of the proposed action on the survival of [the] species and any potential destruction or adverse modification of critical habitat." [Nat'l Wildlife Fed'n v. Nat'l Marine Fisheries Serv.](#), 524 F.3d 917, 924 (9th Cir. 2008) (citing [16 U.S.C. § 1536\(b\)](#)). At the [<sup>\*1037</sup>] conclusion of the formal consultation process, FWS must provide a biological opinion setting forth a

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species." [50 C.F.R. § 402.02](#).

<sup>3</sup>FWS is both the action agency and the consultation agency in this case.

summary of the information on which the opinion [<sup>\*\*7</sup>] is based, a detailed discussion of the effects of the agency action on the listed species, and an opinion as to whether the proposed agency action, "taken together with cumulative effects, is likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of critical habitat." [16 U.S.C. § 1536\(b\)\(3\)\(A\)](#); [50 C.F.R. §§ 402.14\(g\)\(4\), \(h\)\(1\)-\(3\)](#). "If jeopardy . . . is found, [FWS] shall suggest those reasonable and prudent alternatives which [it] believes would not violate [§ 7(a)(2)] and can be taken by the . . . applicant in implementing the agency action." [16 U.S.C. § 1536\(b\)\(1\)\(B\)\(3\)\(A\)](#). If it is determined that neither jeopardy nor adverse modification is likely, FWS "can issue an 'Incidental Take Statement' which, if followed, exempts the action agency from the prohibition on takings found in Section 9 of the ESA." [Nat'l Wildlife Fed'n](#), 524 F.3d at 924-25 (footnote omitted); [16 U.S.C. § 1536\(b\)\(4\)](#).

## B. The Moapa dace

The Moapa dace is a small, thermophilic fish found only in the Muddy River, and particularly in the warmer waters of the upper springs and tributaries of the Warm Springs area in Southeastern Nevada. Biop at 14-15. Reproduction occurs year-round and is confined to the upper, spring-fed tributaries where water temperatures vary from 84.2 to 89.9 degrees Fahrenheit. *Id.* at 15. Juveniles are found almost exclusively in the spring-fed tributaries, [<sup>\*\*8</sup>] whereas adults, who have the greatest tolerance to cooler water temperatures, are also found in the mainstream of the Muddy River. *Id.*

The Moapa dace, a member of the North American minnow family, *Cyprinidae*, was listed as endangered under the Endangered Species Preservation Act of 1966 on March

11, 1967, and has been protected by the ESA since its inception in 1973. *Native Fish & Wildlife*, 32 *Fed. Reg.* 4001. Though critical habitat has not been designated for the species, FWS has assigned the Moapa dace the highest recovery priority because it is the only species in the genus *Moapa*, there is high degree of threat to its continued existence, and there is a high potential for its recovery. Biop at 14. Primary threats to the dace include non-native fishes, parasites, habitat loss from water diversions and impoundments, fire due to encroaching non-native plant species, and reductions to surface spring-flows resulting from groundwater development, which reduces spawning, nursery habitats, and the food base for the dace. *Id.* at 15.

In 1979, 106 acres of springs and wetlands located in the Warm Springs Area of the Upper Moapa Valley were designated as the Moapa Valley National Wildlife Refuge ("MVNWR") for the protection of the endangered Moapa dace. [\*\*9] *Id.* at 17-18. The thermal headwaters of the springs on the MVNWR are some of the most productive Moapa dace spawning habitat in the area. *Id.* at 18. The MVNWR consists of three units encompassing the major spring groups: the Pedersen Unit, the Plummer Unit, and the Apcar Unit (also known as Jones Spring). *Id.* In 2005, it was estimated that throughout the approximately 5.6 miles of habitat in the upper Muddy River system, the population of dace was about 1,300. *Id.* at 24. Approximately 95% of this total population occurs within one major tributary that includes 1.78 miles of spring complexes that emanate from the three major spring groups and their tributaries. *Id.* About 28 percent of the Moapa dace population was located on the MVNWR, while approximately 55 percent occupied the Refuge Stream, which is supplied [\*1038] by the spring complexes emanating from the MVNWR. *Id.* The Refuge Stream reach accounted for the highest density of Moapa dace, with the Plummer,

Pedersen, and Apcar Units containing the second, third, and fourth highest densities, respectively.<sup>4</sup> *Id.* at 24, 26.

### C. The parties, their water rights, and the State pump-test order

CBD is a non-profit corporation actively involved in species and habitat protection issues throughout North America and the Pacific. Its members and staff live, work, visit, and recreate in areas of Nevada that serve as Moapa dace habitat.

FWS is a federal agency that is part of the Department of the Interior. Its responsibilities include implementing the ESA and administering the National Wildlife Refuge System. Pursuant to Permit No. 56668, FWS owns a Nevada State water right certificate (the "FWS Water Right") for a flow rate of not less than 3.5 cubic feet per second ("cfs") as measured at the Warm Springs West flume for maintenance of the habitat of the Moapa dace and other wildlife purposes. The priority date for the FWS water right is August 15, 1991.

Several entities own permitted water rights with appropriation priorities senior to the FWS Water Right. SNWA is a political subdivision of the State of Nevada, which owns 9,000 acre feet per year ("afy")<sup>5</sup> of water rights (the [\*\*11] "SNWA Water Rights") with points of diversion within the Coyote Spring Valley hydrographic basin under Permit Nos. 49414, 49660-49662, and 49978-49987. CSI is a private landowner that owns 4,600 afy of water rights (the "CSI

<sup>4</sup> According to the 2005 survey, a total of 1,296 Moapa dace were identified. Biop at 26. Of these, 714 were in the Refuge Stream (1 fish per 4 feet of habitat), 177 were in the [\*\*10] Plummer Unit (1 fish per 5 feet), 174 were in the Pedersen Unit (1 fish per 11 feet), and 157 were in the Apcar Unit (1 fish per 20 feet). *Id.*

<sup>5</sup> An acre foot of water is the amount of water it would take to cover one acre to a depth of one foot. One acre foot of water comprises approximately 326,000 gallons.



Water Rights") with points of diversion within the Coyote Spring Valley hydrographic basin under Permit Nos. 70429 and 70430. The Moapa Band of Paiute Indians (the "Tribe") owns 2,500 afy of water rights (the "Tribe Water Rights") with a diversion rate of 5.0 cfs within the California Wash hydrographic basin<sup>6</sup> pursuant to Permit No. 54075.

On March 8, 2002, the Nevada state engineer issued Order 1169, which held in abeyance all applications for additional groundwater appropriation from Coyote Spring Valley pending a study of the impacts of pumping groundwater pursuant to already-existing water rights. In particular, the state engineer ordered that several entities owning water rights in the area, including SNWA, [\*\*12] CSI, and the Moapa Valley Water District ("MVWD"),<sup>7</sup> engage in a minimum five-year study "during which at least 50% of the water rights currently [\*1039] permitted in the Coyote Springs Valley groundwater basin are pumped for at least 2 consecutive years." Pump test participants were required to provide data on a quarterly basis regarding the rate of water diversion, as well as a report on impacts to groundwater and surface water resources upon conclusion of the study.<sup>8</sup>

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<sup>6</sup>The California Wash hydrographic basin neighbors the Coyote Spring Valley hydrographic basin.

<sup>7</sup>The MVWD supplies the municipal water needs of the Upper and Lower Moapa Valley in Clark County, Nevada. It owns several water rights in the Upper Moapa Valley including surface rights to spring flows in the Muddy Springs area and groundwater rights with points of diversion at the Arrow Canyon well under Permit Nos. 52520, 55450, and 58269. It also owns a right to 1.0 cfs of spring flow from the Jones Spring (the "Jones Water Right"). MVWD is not a party to this case.

<sup>8</sup>The pump test actually began on November 15, 2010, and was declared completed as of December 31, 2012. See Nevada State Engineer Order No. 1169A (Dec. 21, 2012), available at <http://images.water.nv.gov/images/Orders/1169Ao.pdf>. Study participants were granted to June 28, 2013, to file a report with the Office of the [\*\*13] State Engineer addressing "information

## D. The Memorandum of Agreement

Prior to and after the issuance of Order 1169, FWS was concerned that groundwater pumping in Arrow Canyon (by MVWD), in the Coyote Springs Valley hydrographic basin (by SNWA and CSI), and in the California Wash hydrographic basin (by the Tribe), was causing or would cause spring flows to decline in the Warm Springs area, creating potentially negative effects for the Moapa dace. In 2004, FWS began meeting with the various water-rights holders to identify conservation measures to aid Moapa dace survival in light of the anticipated pump test. On April 20, 2006, FWS, SNWA, CSI, MVWD, and the Tribe executed the MOA at issue in this case, based on their "share[d] common interest in the conservation and recovery of the Moapa dace and its habitat," as well as in each signatory's right to the "use and enjoyment of its water rights and entitlements." In furtherance [\*\*14] of this common interest, the MOA contains a variety of "monitoring, management and conservation measures," which can loosely be grouped into two categories—measures designed to reduce pumping and dedicate water rights for Moapa dace conservation and measures designed to restore and improve Moapa dace habitat.

In the first category of conservation measures, the MOA signatories agreed that: (1) MVWD's Jones Water Right will be dedicated to maintaining in-stream flows in the Apcar Stream; (2) 460 afy of the CSI Water Rights, plus 5% of any future water rights obtained by CSI, will be dedicated to the survival and recovery of the Moapa dace and its habitat;

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obtained from the study/pumping test, impacts of pumping under the pumping test and the availability of water pursuant to the pending applications." *Id.* We take judicial notice of this document because it is "a record of a state agency not subject to reasonable dispute." *City of Sausalito v. O'Neill*, 386 F.3d 1186, 1223 n.2 (9th Cir. 2004).

and (3) pumping would be slowed or ceased at various sites if water flow, as measured at the Warm Springs West flume, fell below certain "Trigger Ranges." In the second category of conservation measures, the MOA signatories agreed to provide funding for Moapa dace habitat restoration and recovery measures, including \$750,000 from SNWA to restore Moapa dace habitat on the Apcar Unit; \$125,000 from both FWS and SNWA to investigate effects of habitat change on the ecology of the Moapa dace; \$50,000 from SNWA to construct fish barriers to [\*15] help eliminate predatory fish from Moapa dace habitat; \$25,000 from SNWA to implement programs to eradicate non-native fish in the Warm Springs area; and \$50,000 per year for four years from CSI to FWS for restoration of Moapa dace habitat outside the boundaries of the MVNWR. The parties additionally agreed: (1) to establish a Recovery Implementation Program ("RIP") to identify, prioritize, and fund measures designed to protect the Moapa dace and facilitate its recovery; (2) to establish a Hydrologic Review Team to coordinate [\*1040] and ensure accuracy in monitoring and data collection; (3) that a portion of the Tribe's greenhouse facility would be dedicated to cultivating native vegetation for use in RIP-approved habitat restoration; (4) that the Tribe would permit access to its reservation for the construction of at least one fish barrier; (5) to identify and obtain additional land and water rights to aid in Moapa dace recovery; and (6) to cooperate in carrying out additional activities targeted at recovery of the Moapa dace as further data becomes available. The MOA also provided that, so long as all parties were in compliance with the MOA's terms, FWS would not assert injury to the FWS [\*16] Water Rights unless flow rates at the Warm Springs West flume fell below 2.7 cfs. Outside of FWS's agreement in this regard, the MOA explicitly "does not waive any of the authorities or duties" of any of the parties "from complying

with any Federal laws, including . . . [the ESA]," nor does it waive any obligation by FWS to "consult or re-consult under the [ESA]."

The MOA provides that the "Parties desire that FWS engage in consultation and prepare a formal biological opinion" under ESA § 7 prior to execution of the MOA. Although the MOA neither authorizes nor approves any groundwater pumping, it nonetheless states that FWS's consultation "shall consider the effects on the Moapa dace from the pumping of 9,000 afy under the SNWA Water Rights, 4,600 afy under the CSI Water Rights, and 2,500 afy by the Tribe . . . together with the implementation of the monitoring, management and conservation measures" identified in the MOA.

### **E. The FWS Programmatic Biop**

On January 30, 2006, FWS issued a document entitled "Intra-Service Programmatic Biop for the Proposed Muddy River Memorandum of Agreement Regarding the Groundwater Withdrawal of 16,100 Acre-Feet per Year from the Regional Carbonate Aquifer in Coyote [\*17] Spring Valley and California Wash Basins, and Establish Conservation Measures for the Moapa Dace, Clark County, Nevada" (the "Biop"). The Biop provides:

This biological opinion evaluates, as the proposed action, the execution of the MOA by [FWS]. None of the activities included in the MOA will be implemented absent project or activity specific consultations. Since the MOA contemplates future groundwater development of up to 16,100 [afy], this total withdrawal and the potential effects to the Moapa dace are evaluated in this biological opinion. As part of the proposed action, the following biological opinion will evaluate the effects of the cumulative groundwater withdrawal of

16,100 afy from two basins within the regional carbonate aquifer to the federally listed as endangered Moapa dace at a programmatic level in light of the conservation measures proposed in the MOA.

Biop at 1.

Due to "the number of impending actions by different entities included in the proposed action," FWS employed a tiered-programmatic approach in preparing its Biop. *Id.* at 2. Thus, the required consultation was intended to take place in two stages: the first stage (the January 30, 2006 Biop) would "evaluate landscape-level effects," [\*\*18] while a series of later second-stage Biops would "result[] in the completion of project-specific documentation that addresses the specific effects of each individual project." *Id.* at 2-3. Under this approach, second-stage consultations performed for specific action items in the MOA would "tier" to the first-stage document by incorporating portions of it by reference. *Id.* at 3 ("Thus each action has [\*1041] its own individual consultation document that is supported by the programmatic document."). Noting that signatories to the MOA "have proposed various minimization/conservation actions to offset effects [of groundwater pumping] to the Moapa dace" the Biop provides that it "will only evaluate the effects of the MOA (cumulative groundwater withdrawal of 16,100 afy and their minimization measures) to the endangered Moapa dace." Biop at 44.

Consistent with its stated approach, the Biop analyzes anticipated effects on the Moapa dace from the cumulative withdrawal of 16,100 afy from the Coyote Spring Valley and the California Wash, finding that the "Moapa dace will be directly affected by the proposed groundwater withdrawals since those actions are likely to affect the spring flows upon which the dace depends." *Id.* at 44-55. Among

other [\*\*19] things, the Biop opines that, if inflow at the Warm Springs gauge drops to 2.7 cfs due to groundwater pumping, the result could be 31% loss of spawning habitat at the important Pedersen Unit, though "much of the available spawning habitat on the Plummer and Apcar Units, and the Refuge Stream would not be as affected by groundwater pumping since they are lower in elevation and would continue to provide adequate spawning habitat." *Id.* at 54-55. Additionally, reductions in temperature from loss of flow in the Pedersen Unit could also extend downstream and "further impact Moapa dace by restricting its reproductive potential and make it more vulnerable to catastrophic events such as wildfire." *Id.*

The Biop next analyzes the anticipated effectiveness of the conservation measures in the MOA, noting that such measures "include the removal of non-native fishes, enhancing, and restoring habitat and restoring instream flows (Apcar Unit) to increase the amount of habitat available for use by all life stages of the species." *Id.* at 55. The Biop predicts that the MOA's conservation measures will, among other things, "increase thermal habitat and the reproductive potential of the species in the Apcar and Refuge streams," [\*\*20] "reduce potential for fire and restore the overall spawning and rearing habitat sufficient to sustain several hundred Moapa dace on the Apcar Unit of the MVNWR," "provide more secure habitat should water flows decline from groundwater development activities in the future," "improve habitat throughout the range of the species," "reduce the species vulnerability to catastrophic events," and "expan[d] the species within its range and increase its current population size." *Id.* at 59-60; see also *id.* at 56 ("The overall expected outcome of these measures is an increase in the species distribution and abundance throughout the range of the species."). The Biop explains that since the MOA provides that

most of the conservation measures would be implemented *before* significant groundwater pumping was to occur, the Moapa dace population would likely "respond positively, increasing in its distribution and abundance above current conditions. Therefore, the conservation benefits to the species would be realized prior to and would off-set the effect of groundwater development." *Id.* at 126, 130.

In conclusion, the Biop states as follows: "It is [FWS's] biological opinion that [FWS] becoming signatory to the MOA, as proposed and analyzed, is [\*\*21] not likely to jeopardize the continued existence of the endangered Moapa dace." *Id.* at 61. Regarding an Incidental Take Statement ("ITS"), the Biop provides:

No exemption from Section 9 of the Act is issued through this biological opinion. The cumulative withdrawal of 16,100 afy from Coyote Spring Valley and California Wash is likely to adversely affect [\*1042] listed species. However, the proposed action of signing the MOA, in and of itself, does not result in the pumping of any groundwater, and is one of many steps in the planning process for proposed groundwater withdrawal projects identified in the MOA and in the action area. Therefore, the Service has taken a tiered-programmatic approach in an attempt to analyz[e] the effects of the action. This programmatic biological opinion does not authorize any incidental take for programmatic impacts associated with the activities included in the MOA. The likelihood of incidental take, and the identification of reasonable and prudent measures and terms and conditions to minimize such take, is anticipated to be addressed in future project-specific consultations (second stage). These tiered-consultations would incorporate conservation measures outlined in the MOA at the specific [\*\*22]

project level. Any incidental take and measures to reduce such cannot be effectively identified at the programmatic level of the proposed action because of the number of impending actions by different entities and its regional scope. Incidental take and reasonable and prudent measures may be identified adequately through subsequent actions subject to section 7 consultation, and tiered to this programmatic biological opinion. Future site-specific projects that are in the Description of the Proposed Action section and identified in the MOA would require additional section 7 consultation (second stage) that would be tiered to this programmatic biological opinion."

*Id.* at 62.

## F. Proceedings in District Court

On August 23, 2010, CBD filed a Complaint for Declaratory and Injunctive relief against FWS and Sally Jewell,<sup>9</sup> asserting claims under § 7 of the ESA, the National Environment Policy Act, the National Wildlife Refuge System Improvement Act, and the [Constitution's Property Clause](#). SNWA and CSI intervened in the action. On September 27, 2012, the district court granted summary judgment in favor of Defendants on all of CBD's claims, concluding that "[w]hether the action fails for lack of standing or for lack of merit, the actions simply may not stand because [CBD] challenges an agreement designed to aid, not harm, the Moapa dace."

CBD appeals *only* the district court's grant of summary judgment on its ESA claim. In particular, CBD maintains that FWS's Biop violated § 7 of the ESA by: (1) failing to ensure

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<sup>9</sup> Pursuant to *Federal Rule of Appellate Procedure 43(c)(2)*, Sally Jewell has been [\*\*23] substituted for Ken Salazar as his successor.



against jeopardizing the continued existence of the Moapa dace; (2) failing to consider the best available scientific information; and (3) failing to evaluate all consequences of the action it purports to review.

## II. STANDARD OF REVIEW

[HN4](#)<sup>[↑]</sup> The district court's grant of summary judgment is reviewed de novo. [Pac. Coast Fed'n of Fishermen's Ass'ns. v. U.S. Bureau of Reclamation](#), 426 F.3d 1082, 1090 (9th Cir. 2005). [HN5](#)<sup>[↑]</sup> A Biop is a final agency action within the meaning of the Administrative Procedure Act ("APA") and is reviewed under [§ 706](#) of the APA. [Bennett v. Spear](#), 520 U.S. 154, 178-79, 117 S. Ct. 1154, 137 L. Ed. 2d 281 (1997). [HN6](#)<sup>[↑]</sup> [Section 706\(2\)\(A\)](#) of the APA requires a reviewing court to uphold agency action unless it is "arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law." [5 U.S.C. § 706\(2\)\(A\)](#). An agency action is arbitrary and capricious if the agency has:

[\*1043] relied on factors which Congress has not intended it to consider, entirely failed to consider an important aspect of the problem, offered an explanation for its decision that runs counter to the evidence before the agency, or is so implausible that it could not be ascribed to a difference in view or the product of agency expertise.

[Pac. Coast Fed'n of Fishermen's Ass'ns, Inc. v. Nat'l Marine Fisheries Serv.](#), 265 F.3d 1028, 1034 (9th Cir. 2001) (quoting [\*24] [Motor Vehicle Mfrs. Ass'n v. State Farm](#), 463 U.S. 29, 43, 103 S. Ct. 2856, 77 L. Ed. 2d 443 (1983)). Under this standard, factual determinations must be supported by substantial evidence. [Dickinson v. Zurko](#), 527 U.S. 150, 162, 119 S. Ct. 1816, 144 L. Ed. 2d 143 (1999). An agency action will be sustained if "the agency has articulated a rational

connection between the facts found and the conclusions made." [Pac. Coast Fed'n of Fishermen's Ass'ns](#), 426 F.3d at 1090.

The arbitrary or capricious standard is a "highly deferential" standard of review, though our inquiry must nonetheless "be searching and careful." [Marsh v. Or. Natural Res. Council](#), 490 U.S. 360, 378, 109 S. Ct. 1851, 104 L. Ed. 2d 377 (1989); [Jewell](#), 747 F.3d at 601. The agency's decision, however, is "'entitled to a presumption of regularity,' and we may not substitute our judgment for that of the agency." *Id.* (quoting [Citizens to Preserve Overton Park, Inc. v. Volpe](#), 401 U.S. 402, 415-16, 91 S. Ct. 814, 28 L. Ed. 2d 136 (1971)). This traditional deference to the agency is at its highest where a court is reviewing an agency action that required a high level of technical expertise. [Marsh](#), 490 U.S. at 377.

## III. DISCUSSION

### A. Standing

FWS, SNWA, and CSI challenge our jurisdiction to hear the present appeal, arguing that CBD lacks standing. [HN7](#)<sup>[↑]</sup> As the plaintiff in the underlying action, CBD has the burden of proving the existence of Article III standing at all stages of the litigation. See [Nat'l Org. for Women, Inc. v. Scheidler](#), 510 U.S. 249, 255, 114 S. Ct. 798, 127 L. Ed. 2d 99 (1994). To fulfill this obligation, CBD must demonstrate: (1) the existence of an injury-in-fact that is concrete and particularized, and actual or imminent; (2) the injury is fairly traceable to the challenged conduct; and (3) the [\*25] injury is likely to be redressed by a favorable court decision. [Salmon Spawning & Recovery Alliance v. Gutierrez](#), 545 F.3d 1220, 1224-25 (9th Cir. 2008) (citing [Lujan v. Defenders of Wildlife](#), 504 U.S. 555, 560-61,

[112 S. Ct. 2130, 119 L. Ed. 2d 351 \(1992\)\)](#).

To satisfy the injury-in-fact requirement of Article III, "a plaintiff asserting a procedural injury must show that the procedures in question are designed to protect some threatened concrete interest of his that is the ultimate basis of his standing." [Salmon Spawning, 545 F.3d at 1225](#) (quoting [Citizens for Better Forestry v. U.S. Dep't of Agric., 341 F.3d 961, 969 \(9th Cir. 2003\)](#)). Here, CBD alleges that its members have scientific, aesthetic, personal, spiritual and work-related interests in the continued survival of the Moapa dace and other species with habitats in the MVNWR. They are concerned that if the Moapa dace population is imperiled or permitted to decline, these interests will be harmed. We have previously held that [HN8](#) the consultation procedures of ESA § 7 are designed to protect "concrete interests" such as those asserted by CBD by "advanc[ing] the ESA's overall goal of species preservation, and thus the groups' specific goals as to [species] preservation, by ensuring agency compliance with the ESA's substantive provisions." [Salmon Spawning, \[\\*1044\] 545 F.3d at 1225-26](#); see also [Lujan, 504 U.S. at 556-63](#) ("Of course, the desire to use or observe an animal species, even for purely esthetic purposes, is undeniably a cognizable interest for purpose[s] of standing.").

While appellees do not dispute that CBD has alleged [**\*\*26**] an injury-in-fact, they argue that causation and redressability are lacking. Specifically, appellees assert that any threat to the Moapa dace's survival is caused exclusively by non-federal entities pumping groundwater pursuant to a non-federal pump test order, not by the conservation measures in the MOA, which were designed to protect the species. As to redressability, appellees claim that CBD's injury is not redressable because the pump test, and its correspondent negative effects on the Moapa dace, could

continue unabated even if the Biop and MOA were vacated.

[HN9](#) "A showing of procedural injury lessens a plaintiff's burden on the last two prongs of the Article III standing inquiry, causation and redressability." [Salmon Spawning, 545 F.3d at 1226](#) (citing [Lujan, 504 U.S. at 572 n.7](#)). Thus, because CBD is asserting a procedural injury, it "must show only that [it has] a procedural right that, if exercised, *could* protect [its] concrete interests." *Id.* (emphasis in original) (quoting [Defenders of Wildlife v. U.S. EPA, 420 F.3d 946, 957 \(9th Cir. 2005\)](#)). "Plaintiffs alleging procedural injury can often establish redressability with little difficulty, because they need to show only that the relief requested—that the agency follow the correct procedures—may influence the agency's ultimate decision of whether to take [**\*\*27**] or refrain from taking a certain action. This is not a high bar to meet." [Id. at 1226-27](#) (internal citation omitted). Nonetheless, "the redressability requirement is not toothless in procedural injury cases." [Id. at 1227](#).

While we agree that state-ordered groundwater pumping is *an* ultimate cause of CBD's injury, CBD more broadly claims that a legally deficient Biop caused FWS to execute an MOA that contained inadequate conservation, monitoring, and mitigation measures to ensure the continued existence of the Moapa dace in the face of such groundwater pumping. CBD contends its injury is redressable because if the Biop and MOA are vacated, FWS would be obligated to reinitiate consultation. According to CBD, this consultation, if conducted in compliance with the ESA § 7 procedures here challenged, "may influence [FWS's] ultimate decision as to whether to participate in the MOA," and on what terms. Moreover, CBD contends that the MOA federalizes groundwater withdrawals by non-federal parties and that those withdrawals

harm the Moapa dace and its members' interests in the species. We agree with CBD that it has sufficiently demonstrated standing under these circumstances. See [NRDC v. Jewell](#), 749 F.3d 776, 783 (9th Cir. 2014) (en banc) ("Because Plaintiffs allege [\*\*28] a procedural violation under Section 7 of the ESA, they need only show that, if the Bureau engages in adequate consultation, the DMC Contracts *could* better protect Plaintiffs' concrete interest in the delta smelt than the contracts do currently."); [Alliance for the Wild Rockies v. U.S. Dep't of Agric.](#), 772 F.3d 592, 598-99 (9th Cir. 2014) (concluding that an environmental group had standing to challenge federal agencies' approval of non-federal helicopter flights that might harass Yellowstone grizzly bears).

## B. Challenges to the Biop

### 1. Enforceability of conservation measures

CBD contends that the MOA fails to ensure against jeopardy to the Moapa dace [\*1045] because the conservation measures outlined in the agreement are not enforceable under the ESA. [HN10](#)<sup>[↑]</sup> During formal consultation, FWS is required, among other things, to "[e]valuate the effects of the action and cumulative effects on the listed species," and "[f]ormulate its biological opinion as to whether the action, taken together with cumulative effects, is likely to jeopardize the continued existence of listed species." [50 C.F.R. § 402.14\(g\)](#). An "action" refers to all activities and programs "carried out, in whole or in part, by Federal agencies in the United States," whereas the "[e]ffects of the action refers to the direct and indirect effects of an action on the species or critical habitat, together [\*\*29] with the effects of other activities that are interrelated or interdependent with that action." *Id.* § [402.02](#). "Interrelated actions are those

that are part of a larger action and depend on the larger action for their justification." *Id.* "Interrelated actions' include 'conservation measures,' which the *ESA Handbook* defines as 'actions to benefit or promote the recovery of listed species.'" [BLM](#), 698 F.3d at 1113. "Cumulative effects" are "those effects of future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation." [50 C.F.R. § 402.02](#).

In *BLM*, we held that the ESA's statutory scheme requires that [HN11](#)<sup>[↑]</sup> "a conservation agreement entered into by the action agency to mitigate the impact of a contemplated action on listed species must be enforceable *under the ESA*" to factor into a biological opinion's jeopardy determination. [BLM](#), 698 F.3d at 1117. In that case, Ruby Pipeline L.L.C. ("Ruby") sought a right-of-way to build a gas pipeline that would cross several thousand acres of federal land supporting numerous endangered and threatened fish species. *Id.* at 1106. FWS's analysis of the pipeline project determined it would adversely affect multiple endangered [\*\*30] species and critical habitats. *Id.* FWS then evaluated "several 'voluntary' conservation actions Ruby had indicated it would facilitate implementing," which were contained in a Conservation Action Plan (the "CAP measures"). *Id.* at 1109. Although the CAP measures contained no binding time line for implementation and were expressly *not* incorporated into the pipeline project plan,<sup>10</sup> FWS deemed them "cumulative effects" that were "reasonably certain to occur" and found that they would "eventually contribute to the conservation and recovery of

<sup>10</sup> Ruby's final Letter of Commitment to the CAP measures specifically provided that they were "entirely independent of the requirements of section 7 of the ESA" and that the pipeline project itself was "not dependent on the[] conservation actions." [BLM](#), 698 F.3d at 1110.

these fishes." *Id.* In reliance on the CAP measures, FWS concluded that the pipeline project was "not likely to jeopardize the continued existence" or "adversely modify or destroy designated critical habitat" of listed species and it issued an ITS exempting the take of certain species from liability under ESA § 9. [Id. at 1109-12, 1119.](#)

We concluded that the CAP measures were not cumulative effects; instead, they were "unequivocally interrelated" to the pipeline project [\*\*31] "in that the promises regarding the conservation measures were dependant on approval of the project." [Id. at 1118.](#) In fact, the CAP measures "fit squarely within the definition of 'conservation measures' in the *ESA Handbook*." [Id. at 1118.](#) Since interrelated actions are, by definition, part of the "effects of the action," we set aside the biological opinion as arbitrary and capricious:

[\*1046] [M]iscategorizing mitigation measures as 'cumulative effects' rather than conservation measures incorporated in the proposed project profoundly affects the ESA scheme. Any such miscategorization sidetracks the FWS, the primary ESA enforcement agency; precludes reopening the consultation process when promised conservation measures do not occur; and eliminates the possibility of criminal penalties and exposure to citizen suit enforcement incorporated in the ESA to assure that listed species are protected. . . .

Severing the Conservation Action Plan measures from the proposed action and instead treating their anticipated benefits as 'cumulative effects' of independent origin insulated the action agencies from consultation requirements under section 7, and Ruby from the ESA's penalties for unlawful take under section 9 in the event that the measures never

materialized. [\*\*32]

The Biological Opinion therefore unreasonably relied on the [CAP] measures as "cumulative effects" and took them into account in the jeopardy determination, when reliance on them would have been proper only if they were included as part of the project and so subject to the ESA's consultation and enforcement provisions.

[Id. at 1116, 1119.](#)<sup>11</sup>

The present case is plainly distinguishable from *BLM*. Here, the conservation measures in the MOA are not only "included as part of the project" consulted upon; they actually *are* the project consulted upon. Indeed, pursuant to the ESA regulations, the only activity reviewed in the Biop that even arguably qualifies as an "action" is FWS becoming signatory to the MOA. See [50 C.F.R. § 402.02](#) ("Action means all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by Federal agencies in the United States . . . . Examples include, but are not limited to: (a) actions intended to conserve listed species or their habitat."). Moreover, the Biop expressly provides that "reinitiation [\*\*33] of formal consultation is required where . . . there is a failure to meet any of the measures or stipulations in the MOA." Biop at 63. Thus, this is simply not a case where there is no ESA recourse whatsoever if a non-federal party fails to implement its promised conservation actions. See [BLM, 698 F.3d at 1114.](#) Under these circumstances, it is apparent that the MOA is enforceable "*under the ESA*," as required by [BLM](#).<sup>12</sup> [Id. at 1117.](#)

<sup>11</sup> Since cumulative effects encompass only "future non-federal actions" that are neither interrelated nor interdependent with the federal action, they are not enforceable under the ESA. See [BLM, 698 F.3d at 1117-18; 50 C.F.R. § 402.02.](#)

<sup>12</sup> While CBD admits in its Reply brief that the MOA's conservation measures "are part of [FWS's] action," it



[\*1047] In applying [BLM](#) to the present case, we also reject CBD's unsupported assertions that FWS "federalized" the groundwater extraction and made it a "part of the action" consulted upon merely by entering into an MOA in an attempt to proactively offset potential negative effects to the Moapa dace from groundwater pumping. The pump test does not fit within the definition of "action" because it is not "authorized, funded, or carried out, in whole or in part, by Federal agencies in the United States." [50 C.F.R. § 402.02](#). Because the groundwater pumping is not an "action," as defined by the ESA, its negative effects on the Moapa dace are not considered "effects of the action" because they are not "direct [or] indirect effects of an action on the species." *Id.* (emphasis added).

The negative effects of groundwater pumping also do not qualify as "effects of the action" by virtue of being "interrelated or interdependent with [the action]." [\*\*35] Indeed, the record does not support a conclusion that would satisfy the "but for" test of interrelatedness, i.e., "but for the federal project [(execution of the MOA)] these activities [(groundwater pumping)] would not occur." [BLM, 698 F.3d at 1113](#) (quoting [Sierra Club v. Marsh, 816 F.2d 1376, 1387 \(9th Cir. 1987\)](#)); [50 C.F.R. § 402.02](#) ("Interrelated actions are those that are

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[nonetheless staunchly maintains that an ITS is required to make the measures enforceable under the ESA pursuant to BLM. This position is not consistent with BLM's statement that noncompliance with "mitigation measures incorporated as part of the action project" is subject to enforcement via citizen action suits under the ESA. 698 F.3d at 1115. It is also incompatible with language in BLM indicating that, had the conservation measures in that case simply been included as part of the proposed action and biological opinion, they likely would have been enforceable. \*Id.\* \("FWS requested that Ruby file the final Conservation Action Plan with FERC so it could 'be included as part of the final biological assessment.' This approach, \[\\*\\*34\] it appears, would have rendered the Conservation Action Plan part of the proposed action, and so enforceable under the ESA."\). Moreover, as discussed \*supra\*, the conservation measures in this action are not just "incorporated as part of the action project"; they are the action project.](#)

part of a larger action and depend on the larger action for their justification."). Neither is there any evidence that the groundwater pumping has "no independent utility apart from the action under consideration," as required to be interdependent. [50 C.F.R. § 402.02](#). It appears then, perhaps somewhat ironically in light of CBD's reliance on [BLM](#), that the effects of groundwater pumping are best characterized as "cumulative effects," i.e., they are "effects of future State or private activities, not involving federal action, that are reasonably certain to occur within the action area of the Federal action subject to consultation."<sup>13</sup> *Id.*

## 2. Best available science

[HN12](#)<sup>[↑]</sup> The ESA requires an agency to use "the best scientific and commercial data available" when formulating a Biop. [16 U.S.C. § 1536\(a\)\(2\)](#); [50 C.F.R. § 402.14\(g\)\(8\)](#). This standard does not require the agency to "conduct new tests or make decisions on data that does not yet exist." [San Luis & Delta-Mendota Water Authority v. Locke, 776 F.3d 971, 996 \(9th Cir. 2014\)](#) (citing [Am. Wildlands](#)

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<sup>13</sup>We acknowledge that the Biop considers groundwater pumping as "part of the proposed action" rather than as "cumulative effects." See Biop at 1 ("As part of the proposed action, the following biological opinion will evaluate the effects of the cumulative groundwater withdrawal of 16,100 afy from two basis [\*\*36] within the regional carbonate aquifer to the federally listed as endangered Moapa dace at a programmatic level in light of the conservation measures proposed in the MOA."). Inartful use of language in a Biop, however, does not have the effect of transforming a non-federal action into a federal action. In any event, we do not believe this discrepancy, standing alone, is a reversible error, given that FWS is required in its biological opinion to determine "whether the action, taken together with cumulative effects, is likely to jeopardize the continued existence of listed species." [50 C.F.R. § 402.14\(g\)\(3\)](#); see also [BLM, 698 F.3d at 1113-14](#) (stating that cumulative effects "are essentially background considerations, relevant to the jeopardy determination but not constituting federal actions and so beyond the action agency's power to effectuate").

*v. Kempthorne*, 530 F.3d 991, 998-99, 382 U.S. App. D.C. 78 (D.C. Cir. 2008)). Rather, "[t]he best available data requirement 'merely prohibits [an agency] from disregarding available scientific evidence that [\*\*37] is in some way better than the evidence [it] relies on.'" *Kern Cnty. Farm Bureau v. Allen*, 450 F.3d 1072, 1080 (9th Cir. 2006) (quoting *Sw. Ctr. for Biological [\*1048] Diversity v. Babbitt*, 215 F.3d 58, 60, 342 U.S. App. D.C. 58 (D.C. Cir. 2000)); see also *Locke*, 776 F.3d at 995 ("Moreover, if the only available data is weak, and thus not dispositive, an agency's reliance on such data does not render the agency's determination arbitrary and capricious" (quotations and citations omitted)). "An agency complies with the best available science standard so long as it does not ignore available studies, even if it disagrees with or discredits them." *Locke*, 776 F.3d at 995; *Kern Cnty.*, 450 F.3d at 1080-81 ("Essentially, FWS 'cannot ignore available biological information.'") (quoting *Conner v. Burford*, 848 F.2d 1441, 1454 (9th Cir. 1988)).

CBD argues that the Biop fails to satisfy the best science requirement because FWS has "conceded that the Conservation Measures' flow reduction trigger scheme—the foundation for the [Biop's] no jeopardy finding—is based not on science but on expediency." In support of this claim, CBD cites a statement by FWS Office Field Supervisor Bob Williams that the flow reduction triggers in the MOA "were negotiated, not biologically based, and believed to be reasonable for the purpose of off-setting the affects to the species."<sup>14</sup> We

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<sup>14</sup>When read in full context, Williams's comment does not actually appear to support CBD's claim that the "flow reduction trigger scheme—the foundation for the Biological Opinion's no jeopardy finding—is based not on science but on expediency." His observation that the "reduction in pumping corresponding to flow decreases (triggers) were negotiated, not biologically based" refers to the flow triggers as defined in the [\*\*39] MOA. In fact, Williams's very next sentence states that the triggers used in the MOA (3.5 to 2.7 cfs) "are the *minimums*

reject this argument because it fails to differentiate between FWS's role as the action agency and FWS's role as the consulting agency. The [\*\*38] ESA does not require that a federal agency design or plan its projects using the best science possible. Rather, the ESA requires that, once a federal action is submitted for formal consultation, the consulting agency must use the best scientific and commercial evidence available in *analyzing* the potential effects of that action on endangered species in its biological opinion. See 16 U.S.C. § 1536(a)(2). Thus, CBD's objection that the *terms* of the MOA were negotiated simply cannot support a conclusion that the Biop's analysis of those terms failed to satisfy the requirements of the ESA. See, e.g., *Selkirk Conservation Alliance v. Forsgren*, 336 F.3d 944, 955-56 (9th Cir. 2002) (holding that FWS did not violate its duty to rely on the best scientific data available when it concluded that negotiated conservation terms would sufficiently mitigate expected harm to a species).

### 3. Effectiveness of conservation measures

CBD argues that the Biop is arbitrary and capricious because the record does not support a conclusion that the MOA's conservation measures are effective or adequate to insure against jeopardy to the Moapa dace. CBD also asserts that we owe no deference to the Biop's conclusions because FWS failed to address its own "scientists' unanswered and uncontroverted concerns" regarding the effectiveness of the MOA's conservation measures in avoiding jeopardy to

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that flows can be reduced, based on available data, without jeopardizing the species when considering the status of the species and the direct and indirect effects of this action." Williams further states that it "should be recognized that the 3.5 cfs is a State permitted water right *not a biological minimum flow established for the survival or recovery of the species.*" (emphasis added).

the Moapa dace.<sup>15</sup> Before [\*1049] conducting our analysis, we briefly recount CBD's criticisms of the Biop's no jeopardy conclusion.

First, CBD criticizes the MOA's flow triggers, and particularly the lowest 2.7 cfs flow trigger, which if reached, requires the MOA signatories to reduce pumping in the Coyote Spring Valley and the California Wash to 724 afy and 1,250 afy, respectively. CBD points out that in a separate § 7 consultation relating to construction of a pipeline (the "pipeline project") in the MVNWR, FWS hydrologist Tim Mayer expressed "strong doubt" about whether even a higher 3.1 cfs minimum flow threshold would adequately protect the Moapa dace or support a non-jeopardy determination, stating: "Biologically, do the flows proposed by SNWA protect the dace (does it support a non-jeopardy opinion)? We have no evidence that they do, since they have not been that low previously. Our proposed flows (of 3.3 cfs) seek to protect existing conditions so we assume that it won't jeopardize the species." CBD also points out that the FWS Water Right was already being impacted by pre-MOA groundwater pumping, and that even the intermediate flow triggers [\*\*41] of the MOA, ranging from 2.8 to 3.2 cfs, permit more groundwater to be pumped than was pumped prior to the MOA.

CBD's second critique of the Biop is that it assumes, without any support, that reducing or halting groundwater pumping will address any observed decline in spring flows. According to CBD, this conclusion is the "linchpin" of the Biop's no jeopardy conclusion because if Moapa dace habitat will continue to be lost after the cessation of groundwater pumping, the conservation measures of the MOA are

ineffective. CBD points to three draft comments by FWS's scientists in this regard that it claims were not addressed in the final Biop. First, hydrologist Tim Mayer stated: "I don't want to be put in a position of saying that the flows are going to stop declining at 2.7 cfs—this seems to be the conclusion of our BO and our basis for the non-jeopardy although the hydrological analysis doesn't say anything like that." Second, Mayer stated in a comment on the pipeline project that "stopping pumping at 2.7 cfs doesn't mean the flow reductions cease—springs may continue to decline even without pumping." Third, Rick Wadell, whose position with FWS is unclear, stated in comments to the [\*\*42] Biop that "[i]mpacts to the dace population may occur more rapidly than the water supply can be re-established."

Finally, CBD urges that the other conservation measures of the MOA, i.e., those unrelated to flow triggers, "are of limited effectiveness in avoiding loss of high quality Moapa dace habitat in the higher elevation Pedersen Unit spring complex." For instance, one FWS scientist expressed concern that MVWD's dedication of 1.0 cfs to the Apcar Unit was "being oversold." Another FWS scientist noted that it was unclear how CSI dedicating 460 afy would benefit the dace unless it could be "transferred to in-stream rights for dace. . . the small reduction in pumping from carbonates that this dedication might represent would only delay the impact a short time."<sup>16</sup>

#### **a. The Biop did not ignore the concerns of FWS scientists**

We disagree with CBD's assertion that the Biop fails to address or assuage Mayer's concerns that even a 3.0 cfs flow rate would

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<sup>15</sup> While fashioned as a "best science" claim, we consider CBD's assertion [\*\*40] that FWS ignored its own scientists' concerns in this section because the issue is closely related to CBD's argument regarding the effectiveness of the conservation measures.

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<sup>16</sup> CBD also refers generally to four pages of comments by Mayer, but does not specify how any of these comments: (1) rely on better science than that ultimately used in the Biop; or (2) undermine the ultimate conclusions of the Biop.

be insufficient to protect [\[\\*\\*43\]](#) the [\[\\*1050\]](#) Moapa dace. The comment itself makes clear that FWS did not possess definitive data supporting a conclusion on the matter either way, given that flow levels have never actually fallen so low. See [Locke, 776 F.3d at 995](#) (stating that the best science requirement does not "require an agency to conduct new tests or make decisions on data that does not yet exist"). In light of this lack of data, FWS projected the likely effects of a 2.7 cfs flow rate on Moapa dace habitat by: providing an extensive review of known characteristics of the regional carbonate aquifer system and its recharge sources; explaining the location and characteristics of Moapa dace habitat in and around the MVNWR and the varying sensitivities of the Pedersen, Plummer, and Apcar Units to changes in spring flow; and extrapolating from known groundwater/spring discharge relationships and currently observed groundwater impacts and trends "to project the impacts of future groundwater development on the springs" in the MVNWR. Biop at 18-55. It then employed numerical groundwater, hydraulic geometry, and thermal load modeling to project the "worst-case scenario or lower bound of impacts" believed likely to result if the flow rate at the Warm Springs West flume [\[\\*\\*44\]](#) is reduced to 2.7 cfs. [Id. at 44-55](#). In this worst-case scenario, the Biop anticipates that adverse effects of anticipated groundwater pumping would most significantly affect the Pedersen Unit—with a 22% reduction in riffle habitat, a 16% reduction in pool habitat, and a loss of thermal load extending downstream—and have a substantially lesser effect on the lower-elevation Plummer and Apcar Units. [Id.](#) at 54-55. We defer to FWS's chosen methodology and find that its conclusions were rationally based on available evidence. See [Locke, 776 F.3d at 995](#) ("[W]hat constitutes the best scientific and commercial data available is itself a scientific determination deserving of

deference.").

The Biop also does not, as CBD contends, assume with no support that reducing or ceasing groundwater pumping will slow the decline in spring flow at the Warm Springs West flume. While the Biop explicitly recognizes that "the response of the aquifer to a reduction or cessation of pumping is not known and has not been tested," Biop at 46, FWS still possessed sufficient data to make an informed prediction. As noted, the Biop provided an extensive evaluation of the regional carbonate aquifer system. Biop at 15-17. In so doing, it explains that "[g]roundwater inflow or recharge" to the system is [\[\\*\\*45\]](#) "primarily through precipitation." Biop at 16. Consistent with this understanding of the system's most likely recharge source, the Biop also recognizes that "groundwater levels have generally increased recently, likely in response to the extremely wet winter experienced by the region in 2005." [Id. at 48](#). After exploring the currently observed groundwater impacts and trends and a variety of flow models, the Biop then assumes a correlation between groundwater withdrawals and a decline in water levels in the system. Given this data, there was clearly a rational connection between the data available to FWS and its "assum[ption] that reducing and ceasing the pumping will slow the decline in water levels." [Id. at 46-47](#).


Because the record does not support a conclusion that FWS ignored its own scientists' concerns, we reject CBD's best science claim in this regard. The claim additionally fails because CBD has not pointed to any evidence supporting a conclusion that: (1) the "concerns" of FWS scientists were supported by better science that used in the Biop; or (2) FWS disregarded scientific information that was better than the evidence upon which it relied. [\[\\*1051\]](#) See, e.g., [Lands Council v. McNair, 537 F.3d 981, 993 \(9th Cir. 2008\)](#) (en



banc) (stating that courts may not "impose on the agency [\*\*46] [their] own notion of which procedures are best or most likely to further some vague, undefined public good") (internal quotation marks omitted); [Kern, 450 F.3d at 1080-81](#) (stating that "[a]bsent superior data . . . occasional imperfections do not violate [the best scientific data standard]" and finding that a best science claim fails where the plaintiff "point[s] to no data that was omitted from consideration") (quoting [Bldg. Indus. Ass'n of Superior Cal. v. Norton, 247 F.3d 1241, 1246, 345 U.S. App. D.C. 426 \(D.C. Cir. 2001\)](#)); [Greenpeace Action v. Franklin, 14 F.3d 1324, 1337 \(9th Cir. 1992\)](#) (rejecting a conclusion that "weak" evidence or uncertainty is fatal to an agency's decision); [Friends of Endangered Species, Inc. v. Jantzen, 760 F.2d 976, 985 \(9th Cir. 1985\)](#) (rejecting a best science claim where "appellant and its two experts did not direct [FWS] to any better available data").

#### **b. The Biop's no jeopardy conclusion was proper**

In *National Wildlife Federation v. National Marine Fisheries Service*, we stated:

[HN13](#)  To "jeopardize"—the action ESA prohibits—means to "expose to loss or injury" or to "imperil." Either of these implies causation, and thus some new risk of harm. Likewise, the suffix "-ize" in "jeopardize" indicates some active change of status: an agency may not "cause [a species] to be or to become" in a state of jeopardy or "subject [a species] to" jeopardy. American Heritage Dictionary of the English Language (4th ed.). Agency action can only "jeopardize" a [\*\*47] species' existence if that agency action causes some deterioration in the species' pre-action condition. . . . [A]n agency only "jeopardize[s]" a species if it causes some new jeopardy. An agency

may still take action that removes a species from jeopardy entirely, or that lessens the degree of jeopardy. However, an agency may not take action that will tip a species from a state of precarious survival into a state of likely extinction. Likewise, even where baseline conditions already jeopardize a species, an agency may not take action that deepens the jeopardy by causing additional harm.

[524 F.3d at 930.](#)

As we explained *supra*, the only "action" in this case, as that term is defined by the ESA and its implementing regulations, is FWS's participation in the MOA. CBD does not, however, point to a single provision in the MOA that causes even a *de minimis* deterioration in the Moapa dace's pre-action condition. Indeed, the Biop makes clear that the negative effects to the Moapa dace discussed therein are the result of State-mandated groundwater pumping—which under the facts of this case fit squarely within the ESA's definition of "cumulative effects." [50 C.F.R. § 402.02](#). The conservation measures in the MOA, on the other hand, are expected [\*\*48] to result in an "increase in the species distribution and abundance throughout the range of the species." Biop at 56. While CBD points to concerns by FWS scientists that some of the measures were being oversold, the Biop's observation that the conservation measures will improve conditions for the Moapa dace would hold true even assuming that some provisions of the MOA do not ultimately result in as high a level of benefit as anticipated in the Biop.

CBD's objections to the Biop and MOA in this case can appropriately be characterized as claiming that the MOA *does not do enough* to ensure the survival of the [\*1052] Moapa

dace in the face of groundwater pumping.<sup>17</sup> Adopting this position, however, would impermissibly broaden FWS's obligations, both as the action agency and as the consulting agency. [HN14](#)<sup>[↑]</sup> The ESA requires simply that in preparing a biological opinion, the FWS consider "whether the action, taken together with the cumulative effects, is likely to jeopardize the continued existence of listed species." [50 C.F.R. § 402.14\(g\)\(4\)](#); [16 U.S.C. § 1536\(a\)\(2\)](#). We do not believe it is consistent with the statutory scheme that jeopardy caused by cumulative effects could obviate the requirement that the federal action itself must cause some incremental deterioration [\*\*49] in the species' pre-action condition. See [Nat'l Wildlife Fed'n, 524 F.3d at 930](#) ("Agency action can only 'jeopardize' a species' existence if that agency action causes some deterioration in the species' pre-action condition."); see also [Oceana, Inc. v. Pritzker, 75 F. Supp. 3d 469, 491 \(D.D.C. 2014\)](#) ("But a Section 7 consultation must determine whether the specific agency action under review actually causes some additional harm to the species, beyond that which the species may suffer due to other factors."). Stated another way, it makes little sense that a federal action with entirely positive effects on an endangered species would be barred as causing jeopardy merely because cumulative effects, which are outside the federal agency's control but required to be considered in the ESA analysis, are anticipated to adversely affect that species. Accordingly, because the federal action provides only benefits to the Moapa dace, we find that the Biop's no jeopardy conclusion regarding FWS's participation in the MOA is not arbitrary and capricious.

We additionally [\*\*50] conclude that CBD has

failed to demonstrate that the Biop's no jeopardy conclusion is arbitrary and capricious because CBD has not shown that the action, even together with the cumulative effects, causes jeopardy to the "continued existence" of the Moapa dace. [16 U.S.C. § 1536\(a\)\(2\)](#). CBD has not challenged the Biop's conclusions as they relate to the survival of *all* Moapa dace; rather, CBD narrowly and improperly focuses on the claimed ineffectiveness of the conservation measures in only the Pedersen Unit. See FWS Consultant Handbook at 4-36 ("The determination of jeopardy or adverse modification is based on the effects of the action on the continued existence of the entire population of the listed species[.]"). In so doing, CBD fails to even acknowledge the Biop's conclusions that various non-flow related conservation measures are anticipated to "increase [Moapa dace] distribution and abundance over and above current conditions" before any groundwater pumping even occurs. Biop at 56. Such measures, among other things, "would reduce the potential for fire and restore the overall spawning and rearing habitat [at Jones Spring] sufficient to sustain several hundred Moapa dace," as well as increase the security of habitat throughout the species range [\*\*51] by removing non-native fishes and reducing species vulnerability to catastrophic events. [Id. at 57-60](#). It is proper for FWS to rely on mitigation and offsets in its jeopardy analysis, and it may view the effect of all such efforts on the species as a whole, rather than requiring a tit-for-tat offset in every subsection of species habitat. See [Rock Creek Alliance v. FWS, 663 F.3d 439, 443 \(9th Cir. 2011\)](#) (approving no jeopardy finding where mitigation plans were expected to offset adverse effects to endangered species, [\*\*1053] and holding that "[t]he [ESA] does not require that [FWS] replace impacted habitat on an acre for acre basis"); [Selkirk, 336 F.3d at 955](#) (finding adverse effects to species

<sup>17</sup> CBD seems to concede that this is its true claim in its Reply brief, stating that, if required to reconsult, FWS "undoubtedly has the power to persuade, if not compel, the non-federal signatories to adopt more stringent Conservation Measures."

outweighed by benefits of mitigation plan sufficient to support no jeopardy finding).

#### 4. Consideration of scope of federal action at issue

CBD argues that, by failing to issue an ITS, FWS acted arbitrarily and capriciously by failing to evaluate all foreseeable consequences of the proposed action. In particular, CBD objects to the Biop's deferral of analysis of potential take until second stage consultations, contending that "if a jeopardy analysis is possible in a programmatic consultation, analysis and quantification of potential take through an incidental take statement . . . must also be possible." [\*\*52]

[Section 1536\(b\)\(4\)](#) provides: [HN15](#) [↑] "If after consultation . . . [FWS] concludes that—the taking of an endangered species . . . incidental to the agency action will not violate [\[§ 1536\(a\)\(2\)\]](#)'s requirement that federal agencies avoid jeopardizing the continued existence of any endangered species] . . . [FWS] shall provide the Federal agency . . . with [an ITS]." (emphasis added). As we have stated, the "agency action" that is evaluated in the Biop is "the execution of the MOA by [FWS]." Biop at 62. While execution of the MOA presumes that groundwater withdrawals, and resultant take of Moapa dace, will occur consistent with Order 1169, the Biop correctly states that the execution of the MOA "in and of itself, does not result in the pumping of any groundwater." *Id.* CBD points to no evidence that incidental take was likely to occur merely because FWS executed the MOA, and we do not believe the record supports such a conclusion. Thus, there was no necessity that FWS issue an ITS.<sup>18</sup>

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<sup>18</sup> The notion that executing the MOA would not, itself, result in take is supported by the first page of the Biop, where it is noted that "[n]one of the activities included in the MOA will be implemented absent project or activity specific consultations." Biop at 1.

See [Ariz. Cattle Growers' Ass'n, 273 F.3d at 1233](#) ("We hold, based on the legislative history, case law, prior agency representations, and the plain language of the Endangered Species Act, that an Incidental Take Statement must be predicated on a finding of an incidental take."). We also conclude that deferral [\*\*53] of ITSs to second level analysis was appropriate based on the Biop's conclusion that "[a]ny incidental take and measures to reduce such take cannot be effectively identified at the programmatic level of the proposed action because of the number of impending actions by different entities and its regional scope." See [Gifford Pinchot Task Force v. FWS, 378 F.3d 1059, 1063-68 \(9th Cir. 2004\)](#) ("We have previously approved programmatic environmental analysis supplemented by later project-specific environmental analysis."); see also [W. Watersheds Project v. Bureau of Land Mgmt., 552 F. Supp. 2d 1113, 1139 \(D. Nev. 2008\)](#) (finding deferral of an ITS to a tiered biological opinion "reasonable" where "[s]imilar to *Gifford* . . . the biological opinion in this case does not contemplate actual action. Because no action is taking place at this time, no 'take' is occurring. . . . Thus, FSA will issue an ITS, if necessary, at the time a specific project is authorized.").

#### IV. CONCLUSION

We find no evidence in the record that FWS relied on improper factors, failed to consider important aspects of the problem, offered explanations [\*\*54] for its decision that were counter to the evidence before it, or offered implausible explanations for its decision. Accordingly, for the reasons explained [\*1054] herein, FWS's determination that its participation in the MOA would not cause jeopardy to the Moapa dace was not arbitrary, capricious, or in violation of the Endangered Species Act. The district court's grant of

summary judgment to FWS, SNWA, and CSI,  
is **AFFIRMED**.

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End of Document

# Exhibit 2

**IN THE OFFICE OF THE STATE ENGINEER  
OF THE STATE OF NEVADA**

IN THE MATTER OF APPLICATIONS 54055, )  
54056, 54057, 54058, 54059, 63272, 63273, )  
63274, 63275, 63276, 63867, 63868, 63869, )  
63870, 63871, 63872, 63873, 63874, 63875 AND )  
63876 FILED TO APPROPRIATE THE )  
UNDERGROUND WATERS OF THE COYOTE )  
SPRING VALLEY HYDROGRAPHIC BASIN )  
(210), CLARK COUNTY AND LINCOLN )  
COUNTY, NEVADA. )

**RULING**

**#6254**

**GENERAL**

**I.**

Applications 54055, 54056, 54057, 54058 and 54059 were filed on October 17, 1989, by the Las Vegas Valley Water District (LVVWD) to appropriate 6.0 cubic feet per second (cfs) under Applications 54055, 54056 and 54057 and 10 cfs under Applications 54058 and 54059 for a total of 27,510 acre-feet annually (afa) of groundwater from the Coyote Spring Valley Hydrographic Basin for municipal and domestic purposes. The proposed points of diversion are described as being located as follows:

Application 54055 within the SE $\frac{1}{4}$  SW $\frac{1}{4}$  of Section 5, T.13S., R.63E., M.D.B.&M.

Application 54056 within the SE $\frac{1}{4}$  SE $\frac{1}{4}$  of Section 32, T.13S., R.63E., M.D.B.&M.

Application 54057 within the SE $\frac{1}{4}$  NW $\frac{1}{4}$  of Section 16, T.14S., R.63E., M.D.B.&M.

Application 54058 within the NE $\frac{1}{4}$  NE $\frac{1}{4}$  of Section 1, T.13S., R.63E., M.D.B.&M.

Application 54059 within the NW $\frac{1}{4}$  NW $\frac{1}{4}$  of Section 19, T.13S., R.64E., M.D.B.&M.

The proposed place of use is described as being located within Clark, Lincoln, Nye and White Pine counties as more specifically described and defined in Nevada Revised Statutes (NRS) §§ 243.035-243.040 (Clark County), NRS §§ 243.210-243.225 (Lincoln County), NRS §§ 243.275-243.315 (Nye County), and NRS §§ 243.365-243.385 (White Pine County). Item 12 of the applications indicates that the water would be used within the LVVWD service

area and may also be served to users within Lincoln County, Nye County and White Pine County.<sup>1</sup>

## II.

Applications 54055, 54056, 54057, 54058 and 54059 were timely protested by many people or entities.<sup>2</sup>

Application 54055 was timely protested by the Muddy Valley Irrigation Company, U.S. Department of Interior Bureau of Land Management, Las Vegas Fly Fishing Club, City of Caliente, Moapa Band of Paiute Indians, County of White Pine and City of Ely, U.S. Department of Interior Fish and Wildlife Service, County of Nye, U.S. Department of Interior National Park Service, Unincorporated Town of Pahrump, Lincoln County Board of Commissioners, and Christopher Brown.<sup>3</sup>

Application 54056 was timely protested by the Muddy Valley Irrigation Company, U.S. Department of Interior Bureau of Land Management, Las Vegas Fly Fishing Club, City of Caliente, Moapa Band of Paiute Indians, County of White Pine and City of Ely, U.S. Department of Interior Fish and Wildlife Service, County of Nye, U.S. Department of Interior National Park Service, Unincorporated Town of Pahrump, Lincoln County Board of Commissioners, Aerojet Nevada, and Charles F. Hilfenhaus, Jr.<sup>4</sup>

Application 54057 was timely protested by the Muddy Valley Irrigation Company, U.S. Department of Interior Bureau of Land Management, Las Vegas Fly Fishing Club, City of Caliente, Moapa Band of Paiute Indians, County of White Pine and City of Ely, U.S. Department of Interior Fish and Wildlife Service, County of Nye, U.S. Department of Interior National Park Service, Unincorporated Town of Pahrump, Lincoln County Board of Commissioners, and Paula Engel.<sup>5</sup>

Application 54058 was timely protested by the Muddy Valley Irrigation Company, Las Vegas Fly Fishing Club, City of Caliente, Moapa Band of Paiute Indians, County of White Pine and City of Ely, U.S. Department of Interior Fish and Wildlife Service, County of Nye, U.S.

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<sup>1</sup> File Nos. 54055 through 54059, official records in the Office of the State Engineer. Exhibit Nos. 2, 3, 4, 5 and 6, Public Administrative Hearing before the State Engineer, July 16-20, 23-24, August 31, 2001, official records in the Office of the State Engineer (LVVWD Hearing).

<sup>2</sup> File Nos. 54055 through 54059, official records in the office of the State Engineer and Exhibit Nos. 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21 and 22 LVVWD Hearing.

<sup>3</sup> The Las Vegas Fly Fishing Club and Christopher Brown did not appear or participate in the hearing.

<sup>4</sup> The Las Vegas Fly Fishing Club, Aerojet Nevada, and Charles F. Hilfenhaus, Jr. did not appear or participate in the hearing.

<sup>5</sup> The Las Vegas Fly Fishing Club and Paula Engel did not appear or participate in the hearing.

Department of Interior National Park Service, Unincorporated Town of Pahrump, Lincoln County Board of Commissioners, James H. Fincher, and Debra Richardson.<sup>6</sup>

Application 54059 was timely protested by the Muddy Valley Irrigation Company, Las Vegas Fly Fishing Club, City of Caliente, Moapa Band of Paiute Indians, County of White Pine and City of Ely, U.S. Department of Interior Fish and Wildlife Service, County of Nye, U.S. Department of Interior National Park Service, Unincorporated Town of Pahrump, Lincoln County Board of Commissioners, James H. Fincher, Ely Shoshone Tribe, and Carolyn Morrison.<sup>7</sup>

The protests filed by the Federal agencies U.S. Department of Interior Bureau of Land Management, Fish and Wildlife Service and National Park Service were withdrawn by stipulation with the Applicant LVVWD.<sup>8</sup> The protests by the Muddy Valley Irrigation Company were withdrawn,<sup>9</sup> as were the protests by the Lincoln County Board of Commissioners, and White Pine County and the City of Ely, Nye County and Unincorporated Town of Pahrump.<sup>10</sup>

### III.

The protests to Applications 54055, 54056, 54057, 54058 and 54059 by the Moapa Band of Paiute Indians are summarized as follows:<sup>11</sup>

1. The applications seek to extract and export water from federal lands to which the LVVWD holds no interest; therefore, the State Engineer has no authority to issue a permit.
2. There are insufficient descriptions in the applications of the proposed works of diversion, costs of such works, time required to construct said works, and number of persons to be served.
3. It would be detrimental to the public interest to approve the applications before careful consideration of the environmental and socio-economic issues they raise. The State Engineer should require an independent assessment of these issues and obtain additional information on a water resource plan for the Las Vegas Valley.

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<sup>6</sup> The Las Vegas Fly Fishing Club, James H. Fincher, and Debra Richardson did not appear or participate in the hearing.

<sup>7</sup> The Las Vegas Fly Fishing Club, James H. Fincher, Ely Shoshone Tribe and Carolyn Morrison did not appear or participate in the hearing.

<sup>8</sup> Exhibit No. 24 LVVWD Hearing.

<sup>9</sup> Exhibit No. 25 LVVWD Hearing.

<sup>10</sup> File Nos. 54055 through 54059, official records in the Office of the State Engineer.

<sup>11</sup> Exhibit No. 10 LVVWD Hearing.



4. The proposed use, in combination with the other LVVWD applications, will conflict with existing rights, including the rights of the Moapa Band of Paiute Indians to the waters of the Muddy River and to groundwater under the Moapa Indian Reservation.
5. The proposed use is unlawful and threatens to prove detrimental to the public interest because the LVVWD lacks the financial resources and rights of entry to construct the necessary works and transport the water to the intended place of use.
6. Granting applications for massive amounts of water would conflict with federal law and policy regarding use or disposition of federal lands.
7. The quantities applied for exceed the annual recharge and safe yield and will result in groundwater mining resulting in adverse impacts on the location and quantity of water resources.
8. The use of the water will affect water quality and thus impair existing uses.
9. The use of the water will degrade wetlands and riparian habitats, including those on public lands in Death Valley National Monument, Great Basin National Park, Lake Mead National Recreation Area and national wildlife refuge units.
10. The use of the water will damage wetlands, springs, seeps and phreatophytes, which provide water and habitat for migratory species, other wildlife, grazing livestock and other existing uses.
11. The use of the water will jeopardize the existence of endangered and threatened species including, but not limited to, the desert tortoise, prevent or interfere with the conservation of such species, and take or harm such species.
12. The use of the water will impair environmental, scenic and recreational values that the State holds in trust for all of its citizens.
13. The use of the water will encourage waste and discourage reasonable conservation measures within the LVVWD's service area.
14. The use of the water will lead to regional air pollution (particularly carbon monoxide and particulates) in violation of law.

#### IV.

The protests to Applications 54055, 54056, 54057, 54058 and 54059 by the City of Caliente are summarized as follows:<sup>12</sup>

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<sup>12</sup> Exhibit No. 9 LVVWD Hearing.

1. These applications, combined with the others filed at the same time, seek a combined appropriation of 804,195 acre-feet of groundwater and the diversion and the exportation of such a quantity of water will lower the static water level in Coyote Spring Valley, adversely affect the quality of the remaining groundwater and threaten springs, seeps and phreatophytes, which provide water and habitat critical to the survival of wildlife and grazing livestock.
2. There is insufficient water to support the applications.
3. The diversion and export of the water in the applied for quantity will deprive the area of origin of water needed to protect and enhance its environment and economic well being, and destroy environmental, ecological, scenic and recreational values the State holds in trust for all its citizens.
4. It would threaten to prove detrimental to the public interest to grant the applications in absence of comprehensive planning including, but not limited to, environmental impacts, costs and socio-economic considerations, and a water resource plan.
5. The use of the water will conflict with existing rights because it will exceed the safe yield of the basin and unreasonably lower the static water level and sanction water mining. The use of water under the applications will cause a drop in the water table and degrade water quality.
6. The use of the water will threaten to prove detrimental to the public interest in that it will likely jeopardize the continued existence of endangered and threatened species, will prevent and interfere with the conservation of those species, take or harm those species, and interfere with the purposes for which federal lands are managed under federal statutes including, but not limited to, the Federal Land Use Policy Act of 1976 [sic].
7. The approval of the applications will sanction and encourage the willful waste of water that has been allowed by the LVVWD.
8. The applications should be denied because the LVVWD has not obtained the necessary legal interest in the federal lands to extract, develop and transport the water from the proposed points of diversion to the place of use.
9. The use of the water will perpetuate and increase inefficient use of water in the LVVWD service area.
10. The LVVWD lacks the financial ability to develop the resource and transport it to the intended place of use.

11. The applications are deficient in that they fail to include a description of the place of use, works of diversion, estimated cost of the works and estimated time to place the water to beneficial use.
12. The use of the water will exceed the safe yield of the basin thereby adversely affecting phreatophytes and creating air pollution in violation of State and Federal laws.
13. The applications should not be granted as the LVVWD has failed to provide information for the State Engineer to sufficiently guard the public interest. The adverse effects cannot be properly evaluated without an independent, formal and publically-reviewable assessment of the cumulative impacts of the proposed extraction, mitigation measures, alternatives to the project and implementation of water management strategies.
14. The applications should be denied because the population projections are unrealistic and ignore constraints to growth.
15. The applications should be denied because the conservation programs instituted by the LVVWD are ineffective.
16. The applications should be denied because the cost of the project will result in rate increases that will reduce demand thereby rendering the project unnecessary.
17. The applications should be denied because it will allow the LVVWD to lock-up water resources for use beyond current planning horizons.
18. The applications should be denied because current trends in housing, plumbing fixtures standards and demographic patterns all suggest that simplistic water demand forecasts overstate future need.
19. The applications should be denied because the current per capita water consumption rate for LVVWD is too high and there are most cost-effective alternatives.

V.

Applications 63272, 63273, 63274, 63275, 63276, 63867, 63868, 63869, 63870, 63871, 63872, 63873, 63874, 63875 and 63876 were filed on July 24, 1997, and February 24, 1998, by Aerojet General Corporation and assigned to Coyote Springs Investment, LLC (CSI) to appropriate 10.0 cfs, not to exceed 7,239 afa under each application of groundwater from the Coyote Spring Valley Hydrographic Basin for quasi-municipal purposes. The proposed points of diversion are described as being located as follows:

Application 63272 within the SW $\frac{1}{4}$  SW $\frac{1}{4}$  of Section 12, T.12S., R.63E., M.D.B.&M.  
Application 63273 within the NW $\frac{1}{4}$  NW $\frac{1}{4}$  of Section 12, T.12S., R.63E., M.D.B.&M.  
Application 63274 within the NE $\frac{1}{4}$  NW $\frac{1}{4}$  of Section 15, T.13S., R.63E., M.D.B.&M.  
Application 63275 within the NE $\frac{1}{4}$  NE $\frac{1}{4}$  of Section 11, T.13S., R.63E., M.D.B.&M.  
Application 63276 within the SW $\frac{1}{4}$  SE $\frac{1}{4}$  of Section 13, T.11S., R.63E., M.D.B.&M.  
Application 63867 within the NW $\frac{1}{4}$  SW $\frac{1}{4}$  of Section 12, T.13S., R.63E., M.D.B.&M.  
Application 63868 within the NW $\frac{1}{4}$  SW $\frac{1}{4}$  of Section 13, T.13S., R.63E., M.D.B.&M.  
Application 63869 within the SW $\frac{1}{4}$  SW $\frac{1}{4}$  of Section 11, T.13S., R.63E., M.D.B.&M.  
Application 63870 within the SE $\frac{1}{4}$  SE $\frac{1}{4}$  of Section 12, T.13S., R.63E., M.D.B.&M.  
Application 63871 within the SE $\frac{1}{4}$  SE $\frac{1}{4}$  of Section 13, T.13S., R.63E., M.D.B.&M.  
Application 63872 within the SE $\frac{1}{4}$  SW $\frac{1}{4}$  of Section 11, T.12S., R.63E., M.D.B.&M.  
Application 63873 within the SW $\frac{1}{4}$  SW $\frac{1}{4}$  of Section 25, T.12S., R.63E., M.D.B.&M.  
Application 63874 within the SW $\frac{1}{4}$  SW $\frac{1}{4}$  of Section 13, T.12S., R.63E., M.D.B.&M.  
Application 63875 within the SW $\frac{1}{4}$  SW $\frac{1}{4}$  of Section 36, T.11S., R.63E., M.D.B.&M.  
Application 63876 within the NE $\frac{1}{4}$  NE $\frac{1}{4}$  of Section 22, T.11S., R.63E., M.D.B.&M.

The proposed place of use is described as being located within the S $\frac{1}{2}$  of Section 13, Sections 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 32, 33, 34 and 35 and W $\frac{1}{2}$  of Section 36, T.11S., R.63E., M.D.B.&M.; Lots 3 and 4, S $\frac{1}{2}$  NW $\frac{1}{4}$  and SW $\frac{1}{4}$  of Section 1, Lots 1, 2, 3 and 4, S $\frac{1}{2}$  N $\frac{1}{2}$  and S $\frac{1}{2}$  of Section 2, Lots 1, 2, 3 and 4, S $\frac{1}{2}$  N $\frac{1}{2}$  and S $\frac{1}{2}$  of Section 3, Sections 8, 10 and 11, and W $\frac{1}{2}$  W $\frac{1}{2}$  of Section 12, W $\frac{1}{2}$  of Section 13, Sections 14, 17, 20, N $\frac{1}{2}$  and SE $\frac{1}{4}$  of Section 23, W $\frac{1}{2}$  of Section 24, Section 25, E $\frac{1}{2}$  of Section 26 and Section 36, T.12S., R.63E., M.D.B.&M.; Lot 1, E $\frac{1}{2}$  SW $\frac{1}{4}$  NE $\frac{1}{4}$ , SE $\frac{1}{4}$  NE $\frac{1}{4}$ , E $\frac{1}{2}$  W $\frac{1}{2}$  SE $\frac{1}{4}$  and E $\frac{1}{2}$  SE $\frac{1}{4}$  of Section 1 and Sections 9 and 16, T.13S., R.63E., M.D.B.&M. The remarks section of Applications 63272 through 63276 indicate that the total duty of water sought under Applications 63272 through 63276 is 36,195 afa. The remarks section of Applications 63867, 63868, 63869, 63870, 63871, 63872, 63873, 63874, 63875 and 63876 indicate that the total duty of water sought under the applications is in addition to and non-supplemental to any water sought under Applications 63272 through 63276, which equates to an additional 72,390 afa for a total duty of 108,585 afa.<sup>13</sup>

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<sup>13</sup> Exhibit Nos. 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15 and 16, Public Administrative Hearing before the State Engineer, August 20-24, 27-28, 2001, official records in the Office of the State Engineer (CSI Hearing).

## VI.

Applications 63272, 63273, 63275, and 63276 were timely protested by the following people or entities: U.S. Department of Interior National Park Service and Nevada Power Company.<sup>14</sup>

Applications 63273 and 63274 were timely protested by the U.S. Department of Interior National Park Service.<sup>15</sup>

Applications 63867, 63868, 63869, 63870, 63871, 63872, 63873, 63874, 63875 and 63876 were timely protested by the following people or entities: U.S. Department of Interior National Park Service, Nevada Power Company, U.S. Department of Interior Bureau of Indian Affairs, U.S. Department of Interior Fish and Wildlife Service, Las Vegas Valley Water District and Moapa Valley Water District.<sup>16</sup>

Applications 63272, 63274, 63275, 63276, 63867, 63868, 63869, 63870, 63871, 63872, 63873, 63874, 63875 and 63876 were protested on various grounds summarized as follows:

1. The perennial yield of Coyote Spring Valley is about 2,000 afa from precipitation recharge. Groundwater inflow to Coyote Spring Valley is about 35,000 afa and originates from basins upgradient from the valley. Discharge from the valley is primarily by subsurface outflow (about 37,000 afa) to the Muddy River Springs Area and the Muddy River. Rights to the water in the Muddy River were decreed by the Tenth Judicial District Court of the State of Nevada. The committed resources in the area of Coyote Spring Valley and the Muddy River Springs Area nearly equal the estimated groundwater underflow in the area and recharge; thus, there is no water available for appropriation in Coyote Spring Valley or the Muddy River Springs Area.
2. Coyote Spring Valley is already over-appropriated.
3. The use of the water will impair the water rights of the United States by reducing the discharge of the Muddy River from which others hold senior water rights.
4. The use of the water will reduce the discharge of springs at Lake Mead National Recreation Area and impair water rights of the United States on those spring sources.

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<sup>14</sup> Exhibit Nos. 17, 18 and 19 CSI Hearing.

<sup>15</sup> Exhibit No. 17 CSI Hearing.

<sup>16</sup> Exhibit Nos. 20, 21, 22, 23, 24 and 25 CSI Hearing.

5. The use of the water will threaten to prove detrimental to the public interest in that the groundwater resources of Coyote Spring Valley will be mined and the water and water-related resources of the Lake Mead National Recreation Area will be impaired.
6. No further permits should be issued in the Coyote Spring Valley until an approved monitoring plan has been established.
7. The use of the water could impair the senior water rights of the Moapa Valley Water District in the downgradient basin (Muddy River Springs Area - Basin 219). The Moapa Valley Water District provides public water supplies from springs (Baldwin Spring Permit 28791, and Pipeline Jones Spring Permit 22739), and wells (MX well Permit 46932 and Arrow Canyon Well Permits 52520, 55450, and 58269) and use of water under the applications has the potential to impact the quantity and quality of these rights.
8. Granting the applications would not be in the public interest.
9. Model simulations suggest there may be an immediate and substantial impact on spring discharge from the proposed withdrawals with the effect especially pronounced at the Muddy River Springs. The results from the model suggest that even the current level of pumping of already permitted rights (8,600 afa permitted to Aerojet) will affect spring discharge at the Muddy River Springs.
10. The use of the water could impair the senior water rights of the U.S. Fish and Wildlife Service at the Moapa Valley National Wildlife Refuge, which is 10 to 20 miles east of the proposed points of diversion and at the Pahrnagat National Wildlife Refuge, which is 20 to 30 miles north of the proposed points of diversion. The springs that emerge at these national wildlife refuges are part of the White River Flow System, which is the same source of water the Applicant CSI proposes to appropriate and Coyote Spring Valley is physically and hydrologically connected to these regional springs.
11. The use of the water may damage habitat for species that are endangered or threatened under the Endangered Species Act or other species of concern; therefore, the use of the water would threaten to prove detrimental to the public interest. This includes the endangered Moapa dace, a minnow that is endemic to the headwaters of the Muddy River system, on the Moapa Valley National Wildlife Refuge, the endangered southwest willow flycatcher and the threatened bald eagle found at the Pahrnagat National Wildlife Refuge.

12. The use of the water could impact groundwater resources beneath the Moapa Indian Reservation and the surface waters of the Muddy River.
13. The use of the water will impair the rights of the U.S. National Park Service to the Muddy River and to the springs at the Lake Mead National Recreation Area.
14. The use of the water is not in the public interest because it would result in groundwater mining.
15. The use of the water is not in the public interest given the potential sale of existing water rights by the Applicant only to apply for new water rights is speculative and indicates the Applicant has no intention of applying the water to beneficial use.

#### **VII.**

By Notice of Pre-hearing Conference dated September 15, 2000, the State Engineer held a pre-hearing conference on October 25, 2000, in the matter of the above-referenced applications.

#### **VIII.**

After notice to all parties, the State Engineer held two separate hearings on the above-referenced applications. In the matter of the LVVWD Applications 54055 through 54059, the State Engineer held a public administrative hearing on July 16-20, 23-24, and August 31, 2001. In the matter of the CSI's Applications 63272, 63273, 63274, 63275, 63276, 63867, 63868, 63869, 63870, 63871, 63872, 63873, 63874, 63875, and 63876, the State Engineer held a public administrative hearing on August 20-24, 27 and 28, 2001.

### **FINDINGS OF FACT**

#### **I.**

#### **Order 1169 and 1169A**

After the close of the above-referenced hearings, the State Engineer issued State Engineer's Order No. 1169 (Order 1169) on March 8, 2002. In that order, the State Engineer addressed what is known as the carbonate-rock aquifers, which are groundwater aquifers that exist underneath a significant portion of eastern and southern Nevada. The carbonate-rock aquifers have long been recognized as a potential water resource, but for which the water resources are not well defined, the hydrology and geology of the area are complex and data is sparse. The State Engineer noted that since 1984 it has been known that to arrive at some reasonable understanding of the carbonate-rock aquifer system, substantial amounts of money would be required to develop the science, that a significant period of study would be required,

and “unless this understanding is reached, the development of carbonate water is risky and the resultant effects may be disastrous for the developers and current users.”<sup>17</sup>

The State Engineer noted that previous studies suggested that confidence in predictions regarding the effect of development was low and would remain low until observations of the initial hydrologic results of development were analyzed. The State Engineer was concerned that the adverse effects of development would overshadow the benefits and found that the development of the carbonate-rock aquifer system must be undertaken in gradual stages together with adequate monitoring. The State Engineer noted that it is unknown what additional quantity, if any, of groundwater could be appropriated in the Coyote Spring Valley Hydrographic Basin without unreasonable and irreversible impacts. The State Engineer pointed out that the Applicants’ own experts were unable to make a suggestion as to what part of the water budget could be captured without a great deal of uncertainty and that the question could not be resolved without stressing the system.

Order 1169 noted that testimony and evidence indicated approximately 50,000 afa of underflow comes into the Coyote Spring Valley from northern groundwater basins and approximately 53,000 afa of subsurface water flows out of the Coyote Spring Valley. Of that 53,000 afa that flows out of Coyote Spring Valley, approximately 37,000 afa of water discharges at the Muddy River Springs, which is appropriated under the Muddy River Decree.<sup>18</sup> Testimony and evidence indicated another approximately 16,000-17,000 afa is believed to flow to the groundwater basins farther south. Additionally, the State Engineer found that another 50,465 afa of groundwater was already appropriated in Coyote Spring Valley and the surrounding basins identified as Black Mountains Area, Garnet Valley, Hidden Valley, Muddy River Springs Area (a.k.a. Upper Moapa Basin) and Lower Moapa Valley Hydrographic Basins. Because very few of these groundwater rights had actually been pumped, and water rights already issued in Coyote Spring Valley alone equaled the estimate of the amount of flow that by-passes the region, the State Engineer ordered additional study before consideration of granting any additional water rights in Coyote Spring Valley.

Order 1169 ordered that all applications for new appropriations from the carbonate-rock aquifer system in Coyote Spring Valley (Basin 210), Black Mountains Area (Basin 215), Garnet

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<sup>17</sup> State Engineer’s Order No. 1169, dated March 8, 2002, p. 2, official records in the Office of the State Engineer.

<sup>18</sup> Judgment and Decree, *In the Matter of the Determination of the Relative Rights In and To the Waters of the Muddy River and Its Tributaries in Clark County, State of Nevada*, March 12, 1920, Tenth Judicial District Court of the State of Nevada, In and For the County of Clark.



Valley (Basin 216), Hidden Valley (Basin 217), Muddy River Springs Area a.k.a. Upper Moapa Valley (Basin 219) and Lower Moapa Valley (Basin 220) would be held in abeyance until further information could be gathered by stressing the aquifer system by way of a pumping test. *See*, Attachment 1, Location Map of the Order 1169 Hydrographic Basins, Clark County and Lincoln County, Nevada. Unlike other basins in Nevada, the above listed basins were tied together in Order 1169 because it was well established that the spring discharge in the Muddy River Springs Area was produced from a distinct regional carbonate-rock aquifer that underlies and uniquely connects the basins. There is a very high hydraulic transmissivity found in most of this area of the carbonate-rock aquifer which results in a flat potentiometric surface in these basins. Changes in the potentiometric surface in any one of these basins occur in lockstep directly affecting the other basins, further demonstrating the regional nature of the aquifer across these basins.

In Order 1169, the State Engineer ordered a study under the provisions of NRS § 533.368 that required at least 50% (8,050 afa) of the water rights then currently permitted in Coyote Spring Valley be pumped for at least two consecutive years, and that data be gathered from others who currently held water rights in the Order 1169 area. At the end of the study, the study participants, which included the Las Vegas Valley Water District, Southern Nevada Water Authority, Coyote Springs Investment, LLC, Nevada Power Company, Moapa Valley Water District, Dry Lake Water Company, LLC, Republic Technologies, Inc., Chemical Lime Company, Nevada Cogeneration Associates or their successors, were required to submit reports identifying the information obtained and any impacts seen to the groundwater or surface water resources of the carbonate-rock aquifer system or alluvial system from the pumping. The State Engineer also ordered the LVVWD to update a model it had presented during the course of its case-in-chief at the LVVWD hearing with the new data. The State Engineer indicated that he would then decide whether sufficient information had been gathered to act on the pending applications. By State Engineer's Ruling No. 5115, dated April 18, 2002, the California Wash Hydrographic Basin (Basin 218) was included in Order 1169 because of its hydrologic connection.

By letter dated May 26, 2010, the Moapa Band of Paiute Indians indicated their concern that the pumping test itself was likely to impact water resources at the Muddy River Springs, which are the source of water for the Muddy River.

At a meeting of the Order 1169 study participants on June 22, 2010, each of the participants agreed that the pumping test would provide sufficient information even if the minimum 8,050 afa was not pumped. In response to that meeting, in a letter dated July 1, 2010, the State Engineer expressed his concern that it had been eight years since the pumping test was ordered, that the pumping requirements of the study had not even begun, and found that decisions regarding future appropriations in the basins subject to the order could not be deferred indefinitely. The State Engineer ordered that the test was to go forward even if the 8,050 afa minimum amount of pumping designated in Order 1169 was not pumped.

On December 21, 2012, the State Engineer issued Order 1169A, wherein he revised the requirements of Order 1169, indicating his belief that sufficient information had been obtained and declaring the pumping test completed as of December 31, 2012. Order 1169A provided the study participants the opportunity to address the information obtained from the study/pumping test, the impacts of pumping, and to opine as to the availability of additional water resources to support the pending applications. These reports were due in the Office of the State Engineer by June 28, 2013. The State Engineer finds that reports were submitted in a timely manner and that all the requirements of Order 1169 and 1169A have been satisfied.

## II.

### **Order 1169 and 1169A Pumping Test**

The Order 1169 pumping test originally required the participants to pump 8,050 afa from wells in Coyote Spring Valley for two years. As stated above, the State Engineer ordered on July 1, 2010, that the test go forward with reduced pumping. The test officially began on November 15, 2010. Water pumped from the MX-5 well was piped to the Moapa Valley Water District municipal infrastructure, and ultimately piped to Bowman Reservoir in Lower Moapa Valley. This water was released from Bowman Reservoir in an open channel to Lake Mead. Water pumped from wells operated by CSI was put to beneficial use in Coyote Spring Valley.

The pumping test officially ended on December 31, 2012, after a period of 25½ months. The total amount pumped between the CSI wells and the MX-5 well during the test period was 11,249 acre-feet, which translates to about 5,290 acre-feet per year, well short of the intended amount to be pumped in the study. There were a number of mechanical problems encountered during the test that required the MX-5 well to shut down. Even without the mechanical issues, the maximum pumping rate would not have resulted in a total pumpage from Coyote Spring Valley of 8,050 afa.

In addition to measuring pumping from wells in Coyote Spring Valley, pumpage was also measured and reported from 30 other wells in the Muddy River Springs Area, Garnet Valley, California Wash, Black Mountains Area, and Lower Meadow Valley Wash. Stream diversions from the Muddy River to the Reid Gardner power plant were reported by NV Energy. Measurements of the natural discharge of the Muddy River and of several of the Muddy River's headwater springs were collected daily. Water-level data were collected for 79 monitoring and pumping wells. Barometric data were collected at three sites; two sites in Coyote Spring Valley and one site in California Wash. The State Engineer finds the pumping test proceeded as required and all of the required data was collected and made available to each of the parties and the public.

### **III.**

#### **Pumping Test Reports**

Order 1169A provided the study participants the opportunity to file reports and requested they address three questions: (1) what information was obtained from the study/pumping test; (2) what were the impacts of pumping under the pumping test; and (3) what is the availability of additional water resources to support the pending applications. Reports or letters were submitted by the Southern Nevada Water Authority (SNWA), the U.S. Department of Interior Bureaus of Fish and Wildlife Service, National Park Service and Land Management (DOI Bureaus), Moapa Band of Paiute Indians (MBOP), Moapa Valley Water District (MVWD), Coyote Springs Investment, LLC (CSI), Great Basin Water Network (GBWN) (who was not a party to the hearings or a protestant) and Center for Biological Diversity (CBD) (who also was not a party to the hearings or a protestant).

#### **1. Southern Nevada Water Authority**

SNWA prepared a comprehensive report that discusses water levels in monitoring wells throughout the Order 1169 basins and stream flows in the Muddy River Springs Area. As to Question 2, SNWA did not differentiate water-level decline due to pumping at the MX-5 well from other pumping in the area.

SNWA recognized that declines in spring flow occurred at Pedersen and Pederson East springs, and that the spring flows declined as a result of new pumping at the MX-5 well. Decline in flow at Warm Springs West was characterized as minimal, and it did not recognize any other surface flow reductions caused by groundwater pumping at the MX-5 well. SNWA provided figures that illustrate how groundwater levels and some spring flows are highly correlated with

climate. Figure 12 of SNWA's report clearly shows how the long-term declining trend in groundwater levels recovered after the wet winter of 2005.<sup>19</sup> A similar correlation is noted for flows at the Warm Springs West gage, where a declining trend in spring discharge reversed after the winter of 2005.<sup>20</sup> SNWA points out that the flows of the Muddy River at Moapa did not decline during the period of the pumping test and asserts that the river flows are primarily impacted by valley fill pumping, primarily by NV Energy, and not carbonate pumping.

As to the availability of additional water for appropriation, SNWA states that:

It remains unclear if additional resource development beyond existing permitted rights could take place in Coyote Spring Valley at locations north of the Kane Spring fault in the area near CSMV-3. However, the presence of boundaries and variations in hydraulic conductivity suggest that, at a minimum, these areas may have the potential to be used for redistributing development of existing rights. Whether pending applications in Coyote Spring Valley are approved or denied, in whole or in part, they should be considered in order of priority with all other groundwater applications held in abeyance by Order 1169.<sup>21</sup>

## 2. Coyote Springs Investment, LLC

CSI submitted a letter in which they stated that they agree with the SNWA report. CSI believes water can be developed in Coyote Spring Valley north of the Kane Springs fault without impacting the Muddy River Springs and that pending applications of both CSI and SNWA should be granted in whole or part.

## 3. U.S. Department of Interior Bureaus

DOI Bureaus provided documentation and interpretations of the effects of the pumping test as well as predictions of the effects of various pumping scenarios. They analyzed water levels, spring and stream flows, and climate in the Order 1169 basins and some adjacent areas.

DOI Bureaus found the pumping test was sufficient to document the effects of the pumping, identify regional drawdown, predict future effects of pumping on water levels and spring flow, and to determine the availability of water pursuant to the applications. Their analyses of impacts under the test were extensive. They used SeriesSEE<sup>22</sup> to discern and partition the effects of pumping at the MX-5 well from pumping at other locations. Their

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<sup>19</sup> Southern Nevada Water Authority, *Nevada State Engineer Order 1169 and 1169A Study Report*, pp. 23 – 25, June 2013, official records in the Office of the State Engineer.

<sup>20</sup> *Id.* at 26.

<sup>21</sup> *Id.* at 57 - 58.

<sup>22</sup> Halford, K., Garcia, C.A., Fenelon, J., and Mirus, B., 2012, *Advanced methods for modeling water-levels and estimating drawdowns with SeriesSEE, an Excel add-in*, U.S. Geological Survey Techniques and Methods 4-F4, 29 pp.

reported findings are that water-level decline due to MX-5 pumping (drawdown) encompasses 1,100 square miles and extends from northern Coyote Spring Valley through the Muddy River Springs Area, Hidden Valley, Garnet Valley, California Wash, and the northwestern part of the Black Mountains Area. Drawdown due to MX-5 pumping is estimated to be 1 to 1.6 feet in this area. They also found minor drawdown of 0.5 feet or less in the northern part of Coyote Spring Valley north of the Kane Springs Wash fault zone, in disagreement with SNWA. They found that water-level decline did not extend into Lower Moapa Valley. They estimate 80-90% of the pumped groundwater was derived from storage (hence the drawdown) and the remainder from capture of spring flow or from reductions in the flow of the Muddy River.<sup>23</sup>

They completed an in-depth analysis of spring flows in relation to nearby carbonate water levels and found a direct correlation. Measurable flow decline at Pedersen, Plummer and Aparca units and Baldwin Spring are highly correlated with water levels in adjacent carbonate wells. If linear trends continue, spring flow can be estimated as a function of water levels in the adjacent carbonate aquifer. They argue that all pumping from carbonate aquifers will ultimately capture spring flow.

They also compared observed water level changes to water levels simulated in a groundwater flow model of the region.<sup>24,25</sup> The model was updated to include pumping through 2012.<sup>26</sup> If the applications, which are the subject of this ruling, were pumped along with current water rights, they predict springs in the headwaters of the Muddy River, and the Muddy River itself above Moapa, would cease to flow in less than 200 years. The effects would occur much sooner if all of the pending applications held in abeyance pursuant to Order 1169 were granted and pumped. They report that the model under-predicts drawdown, and also would therefore under-predict flow losses in the springs. After analyzing model results and observations made from monitor wells and springs, they believe that pumping at current (Order 1169) rates of less

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<sup>23</sup> U.S. Fish and Wildlife Service, U.S. Bureau of Land Management and U.S. National Park Service Order 1169A Report, *Test Impacts and Availability of Water Pursuant to Applications Pending Under Order 1169*, June 28, 2013, official records in the Office of the State Engineer.

<sup>24</sup> Tetra Tech, *Development of a Numerical Groundwater Flow Model of Selected Basins within the Colorado Regional Groundwater Flow System, Southeastern Nevada*, September 28, 2012. References provided along with the DOI Report, official records in the Office of the State Engineer.

<sup>25</sup> Tetra Tech, *Predictions of the Effects of Groundwater Pumping in the Colorado Regional Groundwater Flow System Southeastern Nevada*, September 28, 2012. References provided along with the DOI Report, official records in the Office of the State Engineer.

<sup>26</sup> Tetra Tech, *Comparison of Simulated and Observed Effects of Pumping from MX-5 Using Data Collected to the End of the Order 1169 Test, and Prediction of the Rates of Recovery from the Test*, June 10, 2013. References provided along with the DOI Report, official records in the Office of the State Engineer.

than one-half of existing permits, will result in both of the Pedersen springs going dry in 3 years or less.<sup>27</sup>

The overall conclusions of the DOI Bureaus' report are that the effects of pumping from the MX-5 well are spread out over a 1,100 square-mile area. They suggest that five basins within that area, Coyote Spring Valley, Muddy River Springs Area, Hidden Valley, Garnet Valley, and California Wash should be managed as one hydrographic area because of their uniquely immediate hydrologic connection. Pumping within any of these five basins, with the possible exception of the northernmost part of Coyote Spring Valley, will have substantially similar effects on groundwater levels throughout the area because of the hydrologic connection, and will eventually capture water that discharges in the Muddy River Springs Area.<sup>28</sup>

As to the availability of water pursuant to the pending applications, the DOI Bureaus indicated that their review of the water budget and perennial yield information for Coyote Spring Valley leads to the conclusion that there is no water available for new appropriation within the five-basin area delineated through their groundwater analyses. The five-basin area that the DOI Bureaus referenced includes Coyote Spring Valley, Muddy River Springs Area, Hidden Valley, Garnet Valley and California Wash. They assert that the water budget information and pumping test results suggest that all available water in Coyote Spring Valley is appropriated and that the basin may currently be over-appropriated. Additionally, the groundwater modeling simulation results, which examined progressively greater pumping of pending water right applications in these five basins, provide supporting evidence of the wide-ranging effects that can be expected in these five basins with increased pumping in a very short period of time.

The DOI Bureaus point out that groundwater that was withdrawn in the Coyote Spring Valley over the period of the pumping test is only one-third of the groundwater rights that already exist in the basin. The DOI Bureaus assert that the pumping test provides evidence that even this reduced volume of groundwater pumping cannot be developed long-term without adverse impacts to springs, endangered fish, Federal trust resources, and downstream senior water rights. They argue that the five-basin area uniquely behaves as one connected aquifer, and pumping in any of the basins will have similar effects on the whole. Consequently, they conclude that no additional groundwater is available for appropriation to satisfy the pending

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<sup>27</sup> U.S. Fish and Wildlife Service, U.S. Bureau of Land Management and U.S. National Park Service Order 1169A Report, *Test Impacts and Availability of Water Pursuant to Applications Pending Under Order 1169*, p. 85, June 28, 2013, official records in the Office of the State Engineer.

<sup>28</sup> *Id.* at 84.

water right applications that are currently being held in abeyance for this portion of the carbonate-rock aquifer.<sup>29</sup>

#### 4. Moapa Band of Paiute Indians

MBOP provided a report that analyzed varying lines of evidence in addition to data collected during the pumping test. They analyzed water budgets, climatic effects, stream base flow identification, water demand for power generation, and water temperature-electrical conductivity and mixing models. MBOP argues that the drawdown due to MX-5 pumping was significantly less than that cited by the DOI Bureaus, and that the limit of detection of drawdown due to MX-5 pumping extended only five miles from the MX-5 well.<sup>30</sup> Nevertheless, they contend that carbonate pumping in Coyote Spring Valley and Muddy River Springs Area will have a 1:1 impact on Muddy River flows. They interpret total flux of the system in the Muddy River Springs Area as variable, ranging from about 35,000 afa to 42,000 afa, with the average being about 38,000 afa. Their average annual estimate is similar to Eakin's estimate of 36,000 afa.<sup>31</sup> MBOP asserts that some of the regional water-level decline during the period of the pumping test, and much of the annual fluctuation, is attributed to changes in the water level in Lake Mead. MBOP argues that crustal loading and deformation is associated with the rising and falling Lake Mead surface, which in turn causes pore-pressure changes and pore-volume reductions in the carbonate aquifer. They argue that these crustal effects cause carbonate water levels to rise and fall in near tandem with lake levels. They assert that these conditions have resulted in the water-level decline on the MBOP reservation that others have attributed to MX-5 pumping. They also argue for the existence of a southern carbonate aquifer flow field separated from Coyote Spring Valley and the Muddy River Springs Area by a northeasterly-trending barrier. MBOP argues this southern flow field, which includes California Wash, Hidden and Garnet valleys, and portions of the Black Mountains Area, is hydrologically isolated and could be developed without impacting spring flows. They estimate that groundwater supply to the southern flow field is 15,000 to 20,000 afa.<sup>32</sup>

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<sup>29</sup> *Id.* at 5.

<sup>30</sup> Johnson and Mifflin, *Summary of Order 1169 Testing Impacts, per Order 1169A*, p. 25, June 28, 2013, official records in the Office of the State Engineer.

<sup>31</sup> T.E. Eakin, *A Regional Interbasin Ground-water System in The White River Area, Southeastern Nevada*, Water Resources Bulletin No. 33, (Department of Conservation and Natural Resources, Division of Water Resources and U.S. Department of Interior, Geological Survey), p. 264, 1966.

<sup>32</sup> Johnson and Mifflin, *Summary of Order 1169 Testing Impacts, per Order 1169A*, p. 26, June 28, 2013, official records in the Office of the State Engineer.

As to the availability of additional water resources, the MBOP asserts that the Order 1169 test results indicate that the 1989 LVVWD applications for approximately 27,000 afa should be denied. Their rationale is that these applications equal about 72% of the flux in the carbonate-rock aquifer that discharged as pre-development base flows of the Muddy River and that all the hydrogeological evidence indicates such production would reduce the flux to the discharge area by a similar amount over a relatively short time. They assert that almost one-third of pre-development Muddy River flows are currently consumed before reaching the Moapa gage, and these applications should be denied on the grounds that they would impact senior rights by the full amount.<sup>33</sup>

The MBOP argues for the creation of a new water management unit that would include upgradient basins including at least the Muddy River Springs Area, Coyote Spring Valley and Kane Springs Valley. They assert to prevent future desiccation of the headwater springs, the currently undeveloped permits within the proposed management unit must be largely revoked, restricted, or otherwise creatively managed because they total up to a similar order of magnitude as the current flow of the Muddy River.<sup>34</sup> They indicate that the water-resource potential of the southern flow field should be evaluated with a large interim pumping experiment in the northern portion of the southern flow field near the MBOP reservation.<sup>35</sup>

#### 5. Moapa Valley Water District

MVWD evaluated only data for water levels and flows in the Muddy River Springs Area. MVWD's report recognizes that water-level declines are attributable to MX-5 pumping, as are spring flow decreases at the two Pedersen springs, Warm Springs West gage, and Baldwin Spring, but it does not recognize effects at Jones Spring or Muddy Spring at LDS.

As to the availability of additional water resources, MVWD did not provide a direct response. However, MVWD submitted a supplemental report analyzing its applications in the Lower Moapa Valley, coming to the conclusion that those applications could be developed without impacting the springs.

#### 6. Great Basin Water Network

GBWN provided both a technical report by Dr. Tom Myers and a letter summarizing their position and interpretation of the test. Their report recognized a water-level decline in

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<sup>33</sup> *Id.* at 30.

<sup>34</sup> *Ibid.*

<sup>35</sup> *Id.* at 31.



Coyote Spring Valley and the Muddy River Springs Area and decreases in spring flow that they assert are directly attributable to the MX-5 well pumping. The report states that the test did not provide adequate data to analyze water availability in the other Order 1169 basins. As to the availability of additional water resources for the pending applications, GBWN argues against granting any of the pending applications and states that pumpage of even the existing water rights in Coyote Spring Valley and the Muddy River Springs Area will result in spring flow reductions to rates that are insufficient to maintain a known endangered species.

GBWN somewhat contradicts their own report with a statement that the test did not provide adequate data to analyze water availability, and asserts that the information obtained was sufficient to make determinations on the effects of the pumping and of the availability of water not just in Coyote Spring Valley, but in all of the Order 1169 basins. The letter also argues that their report supports a conclusion that full pumping of existing rights in the Order 1169 basins will unacceptably decrease spring discharge.

#### 7. Center for Biological Diversity

CBD used the same report from Dr. Myers that was filed by the GBWN. CBD believes that pumping of existing water rights will have unacceptable effects on the springs, and, therefore, all pending applications in the Order 1169 basins should be denied. Furthermore, they assert that all applications in the entire White River Flow System up to Cave Valley should be denied. CBD also recommends that the State Engineer take administrative action to reduce permits in the Order 1169 basins to sustainable levels.

Based on the responses received and the State Engineer's own interpretations of the test, the State Engineer finds that sufficient information has been obtained from the Order 1169 pumping test to rule on the pending applications.

Based on reports filed pursuant to Orders 1169 and 1169A and the State Engineer's analysis of the pumping test, the State Engineer finds:

1. The information obtained from the pumping test satisfied the goal of the test and is sufficient to document the effects of pumping on water levels and spring flows in the Order 1169 basins. The information obtained from the test and reports is adequate to formulate an informed opinion as to the future impacts from groundwater pumping and the availability of groundwater in Coyote Spring Valley pursuant to the applications.
2. The impacts of pumping from the MX-5 well, and other existing wells, during the pumping test are widespread, and extend north in Coyote Spring Valley at least to Kane

Springs Valley, south to Hidden Valley and Garnet Valley, and southeast to the Muddy River Springs Area and California Wash. Pumping effects were seen in a small part of the Black Mountains Area, but were not observed in Lower Moapa Valley. Groundwater-level declines attributable to MX-5 pumping range from less than one foot in northern Coyote Springs Valley, two feet or more in central Coyote Spring Valley, and one foot or more in the carbonate aquifer in the Muddy River Springs Area and California Wash. The additional pumping at the MX-5 well contributed significantly to decreases in spring flow at high-elevation spring (Pedersen Springs) sources of the Muddy River, and contributed to measurable decreases in flow at Baldwin and Jones Springs and to the numerous springs whose combined flows are measured at the Warm Springs West and Iverson gages. The pumping test effects documented in Coyote Spring Valley, Muddy River Springs Area, Hidden Valley, Garnet Valley, California Wash, and part of Black Mountains Area provide clear proof of the close hydrologic connection of the basins that distinguishes these basins from other basins in Nevada.

3. Most of the groundwater in Coyote Spring Valley flows to the Muddy River Springs Area, whose surface waters are fully appropriated. After pumping approximately 5,300 afa in the Coyote Spring Valley basin for just over two years, flows in some of the Muddy River springs decreased significantly, and the decrease in flow continued through the end of pumping. The results of the pumping test and opinions provided by the DOI Bureaus, the MBOP, GBWN and CBD are persuasive, and therefore the State Engineer finds that any additional pumping from the pending applications in addition to existing rights would result in a significant regional water-level decline and an associated decrease in spring and river flows, and would conflict with existing rights at the headwater springs to the Muddy River in a few years or less. There is no unappropriated water available in Coyote Spring Valley to satisfy the subject applications.

#### IV.

##### **Perennial Yield**

Nevada Revised Statute § 533.370(2) requires that the State Engineer reject an application to appropriate water where there is no unappropriated water at the source of supply. For groundwater appropriations, the State Engineer uses the perennial yield of a basin as the measure of the amount of water available for appropriation. The perennial yield is based on water budgets for the basin in question. Water budgets and perennial yield were significant issues raised in the 2001 hearings on the pending applications that needed additional information.

The perennial yield of a groundwater basin has been defined in numerous State Engineer rulings. It can be defined as the maximum amount of groundwater that can be withdrawn each year over the long-term without depleting the groundwater reservoir. Perennial yield is ultimately limited to the maximum amount of natural discharge that can be utilized for beneficial use. The perennial yield cannot be more than the natural recharge to a groundwater basin and in some cases is less. If the perennial yield is exceeded, groundwater levels will decline and steady state conditions will not be achieved, a situation commonly referred to as groundwater mining. Additionally, withdrawals of groundwater in excess of the perennial yield may contribute to adverse conditions such as water quality degradation, storage depletion, diminishing yield of wells, increased pumping costs, and land subsidence.

In the eleven years since Order 1169 was issued, much additional hydrologic information has been made available, including publications by the U.S. Geological Survey and others. There have also been hearings before the Office of the State Engineer for water rights in nearby hydrographic basins. Technical exhibits and expert testimony in those hearings include hydrological analyses of the carbonate aquifers and water budgets in the Order 1169 basins. This information significantly expands on the available knowledge of the hydrology and water resources of the Lower White River Flow System in Coyote Spring Valley, the Muddy River Springs Area and the surrounding basins. In hearings held in the fall of 2011 concerning SNWA applications in Delamar Valley, Dry Lake Valley, and Cave Valley, several exhibits and expert testimony were presented that revise and update information presented at the Coyote Spring Valley water rights hearings.<sup>36</sup>

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<sup>36</sup> SNWA Exhibit Nos. 258 and 452, In the Matter of Applications 53987 through 53992 filed by the SNWA to Appropriate the Groundwater in Spring Valley, Cave Valley, Dry Lake Valley and Delamar Valley Hydrographic Basins (180, 181, 182, 184), September 26 through October 14 and October 31 through November 18, 2011, official records in the Office of the State Engineer.

SNWA Exhibit No. 452 from the 2011 hearing on Delamar, Dry Lake and Cave valleys is an Excel workbook that is designed to estimate groundwater recharge for all of the basins contributing to the White River Flow System from the Muddy River Springs Area northward. The exhibit was accepted by the State Engineer with some revisions,<sup>37</sup> and basin recharge and interbasin flows are specified for both Coyote Spring Valley and the Muddy River Springs Area hydrographic basins. From that exhibit, the supply of water to the Coyote Spring Valley is estimated to be approximately 41,000 afa, of which, 39,000 is subsurface inflow from upgradient basins and 2,000 afa is derived from in-basin recharge. Prior to groundwater pumping in the region, all of this water flowed in the subsurface to the Muddy River Springs Area.

The total pre-development supply of water to the Muddy River Springs Area is estimated to be approximately 49,000 afa. The basin receives roughly 41,000 afa from subsurface inflow from Coyote Spring Valley, and an estimated 8,000 afa from the Lower Meadow Valley Wash. In-basin recharge is minimal. Discharge from the basin by surface flow is estimated to be 33,600 afa, evapotranspiration is approximately 6,000 afa, and subsurface outflow to downgradient basins is an estimated 9,900 afa.<sup>38</sup> It is noted here that during periods of flood, inflows and outflows can be significantly greater than average. Flood flows are not included in these calculations, in part because these sources are transitory and not amenable to capture and long-term supply.

For basins similar to Coyote Spring Valley, where there is no groundwater evapotranspiration and all of the groundwater flows in the subsurface to an adjacent basin, recent rulings have limited the perennial yield to the portion of recharge from precipitation in that basin that was not needed to satisfy rights in the immediate downgradient basin.<sup>39</sup> In State Engineer's Ruling Nos. 6165, 6166, and 6167, there was a consideration for how long it might take for an existing water right to be impacted, and the State Engineer found that where no significant effects would be felt for hundreds of years, the upgradient groundwater could be appropriated. Other early decisions of the State Engineer had allowed one-half of the total subsurface groundwater discharge to be appropriated as the perennial yield of such basins. State of Nevada

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<sup>37</sup> State Engineer's Ruling No. 6166, dated March 22, 2012, pp. 72 – 73, official records in the Office of the State Engineer.

<sup>38</sup> SNWA Exhibit Nos. 258 and 452, In the Matter of Applications 53987 through 53992 filed by the SNWA to Appropriate the Groundwater in Spring Valley, Cave Valley, Dry Lake Valley and Delamar Valley Hydrographic Basins (180, 181, 182, 184), September 26 through October 14 and October 31 through November 18, 2011, official records in the Office of the State Engineer.

<sup>39</sup> State Engineer's Ruling Nos. 6165, 6166, and 6167, dated March 22, 2012, official records in the Office of the State Engineer.

Water Planning Report No. 3 lists the perennial yield of Coyote Spring Valley as 18,000 acre-feet, approximately one-half of the basin subsurface discharge.<sup>40</sup> One of the goals of the Order 1169 test was to determine the perennial yield of Coyote Spring Valley.

The vast majority of the scientific literature supports the premise that, unlike other separate and distinct basins in Nevada that do not feature carbonate-rock aquifers, all of the Order 1169 basins share virtually all of the same supply of water. The Order 1169 pumping test further supports the conclusion that pumping from any of the five basins with a close hydrologic connection (Coyote Spring Valley, Muddy River Springs Area, Hidden Valley, Garnet Valley and California Wash) will have a similar impact on water levels in the five-basin area and on the Muddy River spring flows. Therefore, because these basins share a unique and close hydrological connection and share virtually all of the same source and supply of water, unlike other basins in Nevada, these five basins will be jointly managed. The perennial yield of these basins cannot be more than the total annual supply of 50,000 acre-feet. Because the Muddy River and Muddy River springs also utilize this supply, and are the most senior water rights in the region, the perennial yield is further reduced to an amount less than 50,000 acre-feet. The State Engineer finds that the amount and location of groundwater that can be developed without capture of and conflict with senior water rights on the Muddy River and springs remains unclear, but the evidence is overwhelming that unappropriated water does not exist.

## V.

Recent rulings by the State Engineer for groundwater applications in other basins within the White River Flow System allowed for the appropriation of additional water.<sup>41</sup> These basins, Cave Valley, Dry Lake Valley, and Delamar Valley Hydrographic Basins, lie 40 to 100 miles north of the Muddy River Springs. Groundwater from both Dry Lake Valley and Delamar Valley is believed to contribute to discharge from the springs. Water rights were granted in the Cave Valley, Dry Lake Valley and Delamar Valley basins based on two critical points that do not exist in the basins in Order 1169. First, the groundwater appropriated in the Cave Valley, Dry Lake Valley and Delamar Valley basins is recharged within the basins. Water is available at the source and can be developed without depleting the supply. Second, the water can be developed without conflicting with any existing rights for hundreds of years. In contrast, neither of these conditions is met in the Order 1169 basins. Recharge in each of the Order 1169 basins is

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<sup>40</sup> Office of the State Engineer, *Water for Nevada, State of Nevada Water Planning Report No. 3*, Oct. 1971.

<sup>41</sup> State Engineer's Ruling Nos. 6165, 6166 and 6167, dated March 22, 2012, official records in the Office of the State Engineer.

already appropriated. Subsurface inflow is appropriated as well. Development of additional water will conflict with existing rights in months to years. The State Engineer finds the basins of Order 1169 fail on both statutory requirements.

## VI.

### Existing Rights

Nevada Revised Statute § 533.370(2) requires that the State Engineer reject an application to appropriate water where the use of the water conflicts with existing rights or with protectable interests in existing domestic wells. There are 16,200 acre-feet of senior groundwater rights in Coyote Spring Valley as well as approximately 33,000 acre-feet of senior groundwater rights in the other Order 1169 basins. The Muddy River and springs, the discharge location of the bulk of the region's water, have approximately 30,000 afa of decreed and appropriative rights.

One of the main goals of Order 1169 and the associated pumping test was to observe the effects of increased pumping on groundwater levels and spring flows. The Pedersen and Pedersen East springs, the highest elevation springs in the area and which are considered to be the "canary in the coal mine" with respect to impacts from pumping, showed an unprecedented decrease in flow during the pumping test. Pedersen spring flow decreased to 0.08 cfs, down from its average of about 0.22 cfs prior to the test. Pedersen East decreased to 0.12 cfs, down from its average flow of 0.2 cfs prior to the test.<sup>42,43</sup> The Warm Springs West gage, the site at which trigger levels have been set among parties to a memorandum of agreement,<sup>44</sup> declined from 3.6 to 3.3 cfs during the test.<sup>45</sup> Baldwin and Jones Springs declined about 4% during the test.<sup>46</sup> The Muddy River at the Moapa gage did not display any decrease in flow,<sup>47</sup> although the

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<sup>42</sup> U.S. Fish and Wildlife Service, U.S. Bureau of Land Management and U.S. National Park Service Order 1169A Report, *Test Impacts and Availability of Water Pursuant to Applications Pending Under Order 1169*, pp. 43 – 46, June 28, 2013, official records in the Office of the State Engineer.

<sup>43</sup> <http://waterdata.usgs.gov/nv/nwis/>.

<sup>44</sup> In 2006, a Memorandum of Agreement (MOA) was signed by the Southern Nevada Water Authority, U.S. Fish and Wildlife Service, Coyote Springs Investment, LLC, Moapa Band of Paiute Indians, and Moapa Valley Water District pursuant to which, the parties agreed to certain conservation measures for the protection and recovery of the Moapa dace, an endangered species found in the Moapa Valley National Wildlife Refuge.

<sup>45</sup> <http://waterdata.usgs.gov/nv/nwis/>.

<sup>46</sup> U.S. Fish and Wildlife Service, U.S. Bureau of Land Management and U.S. National Park Service Order 1169A Report, *Test Impacts and Availability of Water Pursuant to Applications Pending Under Order 1169*, pp. 50 – 51, June 28, 2013, official records in the Office of the State Engineer.

<sup>47</sup> Southern Nevada Water Authority, *Nevada State Engineer Order 1169 and 1169A Study Report*, p. 41, June 2013, official records in the Office of the State Engineer.

MBOP report points out that total flux of the system is variable, and argues that flows in the river would have been even higher if Order 1169 pumping had not occurred.<sup>48</sup>

The State Engineer finds that pumping under the Order 1169 test measurably reduced flows in headwater springs of the Muddy River, and it is clear that if pending water right applications were permitted and pumped in addition to existing groundwater rights in Coyote Spring Valley and the other Order 1169 basins, headwater spring flows would be reduced in tens of years or less to the point that there would be a conflict with existing rights. The State Engineer finds the Muddy River and the Muddy River springs, the discharge location of the bulk of the region's water, is fully appropriated. As for the Muddy River, the State Engineer finds that evidence submitted by the DOI Bureaus and MBOP is convincing that pumping of groundwater under the pending applications in addition to existing rights would reduce the flow of the Muddy River in tens of years or less to the point where there would be a conflict with existing rights.

## VII.

### Public Interest

Nevada Revised Statute § 533.370(2) requires the State Engineer reject an application if the use of the water threatens to prove detrimental to the public interest. The State Engineer views this requirement in terms of Nevada water law and management of the public's water, but not to areas that are outside of his purview. The State Engineer finds to approve applications that will within a short period of time conflict with existing water rights threatens to prove detrimental to the public interest.

The Moapa dace is an endangered species that lives only in the headwater springs of the Muddy River. The USFWS holds water rights on some of the springs in the Muddy River Springs Area that were appropriated specifically for the protection of the dace. The State Engineer finds to permit the appropriation of additional groundwater resources in the Coyote Spring Valley, which is directly connected to the regional aquifer in the Order 1169 area, would impair protection of these springs and the habitat of the Moapa dace and therefore threatens to prove detrimental to the public interest.

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<sup>48</sup> Johnson and Mifflin, *Summary of Order 1169 Testing Impacts, per Order 1169A*, pp. 5 - 8, June 28, 2013, official records in the Office of the State Engineer.

## CONCLUSIONS

### I.

The State Engineer has jurisdiction over the parties and the subject matter of this action and determination.<sup>49</sup>

### II.

The State Engineer is prohibited by law from granting a permit under an application to appropriate the public water where:<sup>50</sup>

- A. there is no unappropriated water at the proposed source;
- B. the proposed use or change conflicts with existing rights;
- C. the proposed use or change conflicts with protectable interests in existing domestic wells as set forth in NRS § 533.024; or
- D. the proposed use or change threatens to prove detrimental to the public interest.

### III.

The State Engineer concludes that there is no additional groundwater available for appropriation in the Coyote Spring Valley Hydrographic Basin without conflicting with existing water rights in the Order 1169 basins.

### IV.

The State Engineer concludes that approval of the applications would threaten to prove detrimental to the public interest by removing water that in the past has been available for the endangered species in the Order 1169 basins. The State Engineer concludes that while the use of the water under these applications may have a public benefit, removing the water from the springs would threaten to prove detrimental to the public interest in that it would threaten the water resources upon which the endangered Moapa dace are dependent.

## RULING

The protests to Applications 54055, 54056, 54057, 54058, 54059, 63272, 63273, 63274, 63275, 63276, 63867, 63868, 63869, 63870, 63871, 63872, 63873, 63874, 63875, and 63876 are hereby upheld in part and the applications are hereby denied on the grounds that there is no unappropriated groundwater at the source of the supply, the proposed use would conflict with existing rights in the Order 1169 basins and the proposed use of the water would threaten to prove detrimental to the public interest in that it would threaten the water resources upon which

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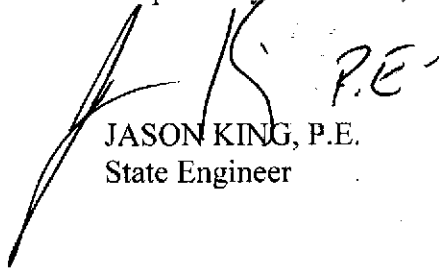
<sup>49</sup> NRS Chapters 533 and 534.

<sup>50</sup> NRS § 533.370(2).



the endangered Moapa dace are dependent. No ruling is made on the merits of the remaining protest grounds.

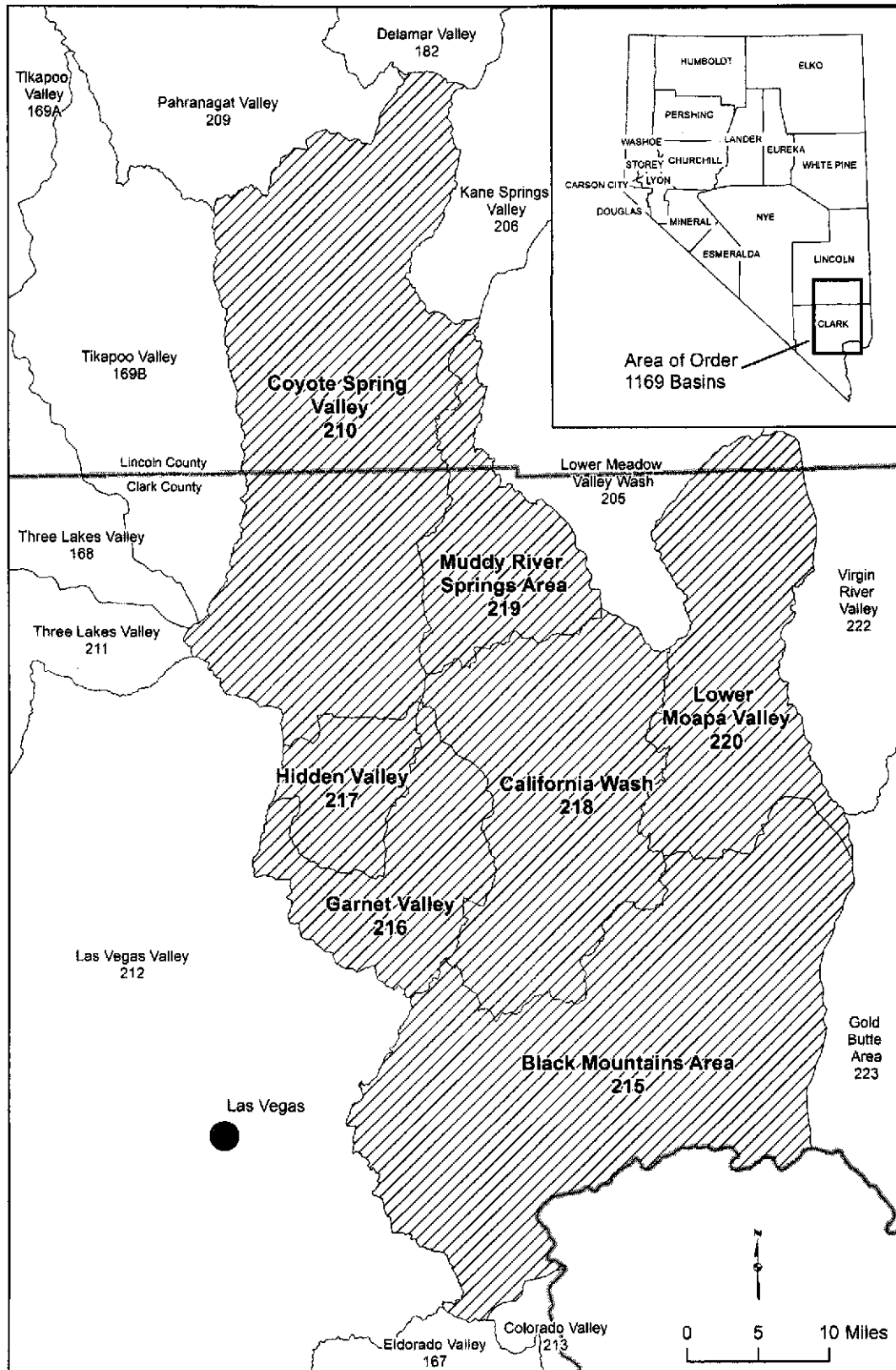
Respectfully submitted,

A handwritten signature in black ink, appearing to read 'JK P.E.', is written over the typed name and title.

JASON KING, P.E.  
State Engineer

Dated this 29<sup>th</sup> day of  
January, 2014.

ATTACHMENT 1



Location Map of the Order 1169 Hydrographic Basins, Clark County and Lincoln County, Nevada.

# Exhibit 3

IN THE OFFICE OF THE STATE ENGINEER  
OF THE STATE OF NEVADA

#1309

ORDER

**DELINEATING THE LOWER WHITE RIVER FLOW SYSTEM HYDROGRAPHIC BASIN WITH THE KANE SPRINGS VALLEY BASIN (206), COYOTE SPRING VALLEY BASIN (210), A PORTION OF BLACK MOUNTAINS AREA BASIN (215), GARNET VALLEY BASIN (216), HIDDEN VALLEY BASIN (217), CALIFORNIA WASH BASIN (218), AND MUDDY RIVER SPRINGS AREA (AKA UPPER MOAPA VALLEY) BASIN (219) ESTABLISHED AS SUB-BASINS, ESTABLISHING A MAXIMUM ALLOWABLE PUMPING IN THE LOWER WHITE RIVER FLOW SYSTEM WITHIN CLARK AND LINCOLN COUNTIES, NEVADA, AND RESCINDING INTERIM ORDER 1303**

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**I. BACKGROUND OF THE ADMINISTRATION OF THE LOWER WHITE RIVER FLOW SYSTEM BASINS**

WHEREAS, the State Engineer has actively managed and regulated the Coyote Spring Valley Hydrographic Basin (Coyote Spring Valley), Basin 210, since August 21, 1985; the Black Mountains Area Hydrographic Basin (Black Mountains Area), Basin 215, since November 22, 1989; the Garnet Valley Hydrographic Basin (Garnet Valley), Basin 216, since April 24, 1990; the Hidden Valley Hydrographic Basin (Hidden Valley), Basin 217, since April 24, 1990; the California Wash Hydrographic Basin (California Wash), Basin 218, since April 24, 1990; and the

Muddy River Springs Area Hydrographic Basin (Muddy River Springs Area), Basin 219, since July 14, 1971.<sup>1</sup>

**WHEREAS**, in 1984, the United States Department of Interior, Geological Survey (USGS), Water Services Division, proposed a ten-year investigation into carbonate-rock aquifers that underlay approximately 50,000 square miles of eastern and southern Nevada.<sup>2</sup> In 1985, a program for the study and testing of the carbonate-rock aquifer system of eastern and southern Nevada was authorized by the Nevada Legislature. In 1989, a report was published by the USGS summarizing the first phase of the study.<sup>3</sup> Included in the summary was a determination that:

Large-scale development (sustained withdrawals) of water from the carbonate-rock aquifers would result in water-level declines and cause the depletion of large quantities of stored water. Ultimately, these declines would cause reductions in the flow of warm-water springs that discharge from the regional aquifers. Storage in other nearby aquifers also might be depleted, and water levels in those other aquifers could decline. In contrast, isolated smaller ground-water developments, or developments that withdraw ground water for only a short time, may result in water-level declines and springflow reductions of manageable or acceptable magnitude.

Confidence in predictions of the effects of development, however, is low; and it will remain low until observations of the initial hydrologic results of development are analyzed. A strategy of staging developments gradually and adequately monitoring the resulting hydrologic conditions would provide information that eventually could be used to improve confidence in the predictions.<sup>4</sup>

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<sup>1</sup> See NSE Ex. 9, *Order 905*, Hearing on Interim Order 1303, official records of the Division of Water Resources. See NSE Ex. 8, *Order 1018*, Hearing on Interim Order 1303, official records of the Division of Water Resources. See NSE Ex. 5, *Order 1025*, Hearing on Interim Order 1303, official records of the Division of Water Resources. See NSE Ex. 6, *Order 1024*, Hearing on Interim Order 1303, official records of the Division of Water Resources. See NSE Ex. 4, *Order 1026*, Hearing on Interim Order 1303, official records of the Division of Water Resources. See NSE Ex. 7, *Order 1023*, Hearing on Interim Order 1303, official records of the Division of Water Resources; NSE Ex. 11, *Order 392*, Hearing on Interim Order 1303, official records of the Division of Water Resources.

<sup>2</sup> Memorandum dated August 3, 1984, from Terry Katzer, Nevada Office Chief, Water Resources Division, United States Department of Interior Geologic Survey, Carson City, Nevada to Members of the Carbonate Terrane Study.

<sup>3</sup> Michael D. Dettinger, *Distribution of Carbonate-Rock Aquifers in Southern Nevada and the Potential for their Development, Summary of Findings, 1985-1988*, Summary Report No. 1, U.S. Geological Survey, Department of Interior and Desert Research Institute, University of Nevada System, 1989, p. Forward. See also NSE Ex. 3, *Order 1169*, Hearing on Interim Order 1303, official records of the Division of Water Resources.

<sup>4</sup> *Id.*, p. 2.

**WHEREAS**, beginning in 1989 and through the early 2000s, numerous groundwater applications were filed in Coyote Spring Valley, Black Mountains Area, Garnet Valley, Hidden Valley, California Wash, and Muddy River Springs Area Hydrographic Basins seeking to appropriate more than 300,000 acre-feet annually (afa) of groundwater from the carbonate-rock aquifer underlying these basins.<sup>5</sup> The State Engineer held a hearing on July 12-20, 23-24, and August 31, 2001, for pending Applications 54055–54059, filed by Las Vegas Valley Water District (LVVWD) to appropriate 27,510 afa of water in Coyote Spring Valley.<sup>6</sup> The State Engineer conducted a hearing on Coyote Springs Investments LLC (CSI) Applications 63272–63276 on August 20-24, 27-28, 2001.<sup>7</sup>

**WHEREAS**, following the conclusions of these hearings, the State Engineer issued Order 1169 on March 8, 2002, requiring all pending applications in Coyote Spring Valley, Black Mountains Area, Garnet Valley, Hidden Valley, Muddy River Springs Area, and Lower Moapa Valley Hydrographic Basin (Basin 220), be held in abeyance pending an aquifer test of the carbonate-rock aquifer system to better determine whether the pending applications and future appropriations could be developed from the carbonate-rock aquifer.<sup>8</sup>

**WHEREAS**, in Order 1169, the State Engineer found that he did not believe that it was prudent to issue additional water rights to be pumped from the carbonate-rock aquifer until a significant portion of the then existing water rights were pumped for a substantial period of time to determine whether the pumping of those water rights would have a detrimental impact on existing water rights or the environment.<sup>9</sup>

**WHEREAS**, Order 1169 required that at least 50%, or 8,050 afa, of the water rights then currently permitted in Coyote Spring Valley be pumped for at least two consecutive years.<sup>10</sup> On April 18, 2002, the State Engineer added the California Wash to the Order 1169 aquifer test basins.<sup>11</sup>

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<sup>5</sup> See NSE Exs. 14–20, *Ruling 6254–Ruling 6260*, Hearing on Interim Order 1303, official records of the Division of Water Resources.

<sup>6</sup> See NSE Ex. 14.

<sup>7</sup> *Id.*

<sup>8</sup> See NSE Ex. 3.

<sup>9</sup> *Id.*

<sup>10</sup> *Id.*

<sup>11</sup> See State Engineer's Ruling 5115, dated April 18, 2002, official records of the Division of Water Resources.

**WHEREAS**, subsequent to the issuance of Order 1169, the United States Fish and Wildlife Service (USFWS) expressed concern that current groundwater pumping coupled with additional groundwater withdrawals in Coyote Spring Valley and California Wash may cause reduction of spring flow to the Warm Springs area, tributary thermal springs in the upper Muddy River, which serves as critical habitat to the Moapa dace (*Moapa corciacea*), an endemic fish species federally listed as endangered in 1967.<sup>12</sup> Due to these concerns, on April 20, 2006, the Southern Nevada Water Authority (SNWA), USFWS, CSI, the Moapa Band of Paiute Indians (MBOP) and the Moapa Valley Water District (MVWD) entered into a Memorandum of Agreement (MOA).<sup>13</sup>

**WHEREAS**, the MOA stated that all the parties shared “a common interest in the conservation and recovery of the Moapa dace and its habitat.” The MOA established certain protections to the Moapa dace, including protocols relating to pumping from the regional carbonate-rock aquifer that may adversely impact spring flow to the dace habitat in the Warm Springs area. Specifically, the MOA identified conservation measures, which included protections for minimum instream flows in the Warm Springs area with trigger levels set at 3.2 cubic feet per second (cfs) at the Warm Springs West gage requiring initial action by the MOA parties, and the most stringent action required at a flow rate of 2.7 cfs.<sup>14</sup>

**WHEREAS**, the MBOP raised concerns that pumping 8,050 afa from the Coyote Spring Valley as part of the aquifer test would adversely impact the water resources at the Warm Springs area, and consequently the Moapa dace, and that the impacts would persist such that protective measures established in the MOA would be inadequate to protect the dace.<sup>15</sup> As a result, the Order 1169 study participants, which included the LVVWD, SNWA, CSI, Nevada Power Company,<sup>16</sup> MVWD, Dry Lake Water Company, LLC, Republic Environmental Technologies, Inc. (Republic),

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<sup>12</sup> USFWS, *Fish and Aquatic Conservation - Moapa dace*, <https://bit.ly/moapadace> (last accessed June 3, 2020). See also SNWA Ex. 8, p. 1-1.

<sup>13</sup> See NSE Ex. 236, *2006 Memorandum of Agreement between the Southern Nevada Water Authority, United States Fish and Wildlife Service, Coyote Springs Investment LLC, Moapa Band of Paiute Indians and Moapa Valley Water District*, Hearing on Interim Order 1303, official records of the Division of Water Resources.

<sup>14</sup> *Id.*

<sup>15</sup> See May 26, 2010, letter from Darren Daboda, Chairperson, Moapa Band of Paiutes, to Jason King, Nevada State Engineer, official records of the Division of Water Resources.

<sup>16</sup> Nevada Power Company, following the merger with Sierra Pacific Power Company and Sierra Pacific Resources subsequently began doing business as NV Energy. See, e.g., NV Energy, *Company History*, <https://bit.ly/NVEhistory> (last accessed April 20, 2020).

Chemical Lime Company, Nevada Cogeneration Associates, and the MBOP, or their successors, agreed that even if the minimum 8,050 afa was not pumped, sufficient information would be obtained to inform future decisions relating to the study basins.<sup>17</sup>

**WHEREAS**, on November 15, 2010, the Order 1169 aquifer test began, whereby the study participants began reporting to the Nevada Division of Water Resources (Division) on a quarterly basis the amounts of water pumped from wells in the carbonate-rock and alluvial aquifers during the pendency of the aquifer test.

**WHEREAS**, on December 21, 2012, the State Engineer issued Order 1169A declaring the completion of the Order 1169 aquifer test to be December 31, 2012, after a period of 25½ months. The State Engineer provided the study participants the opportunity to file reports with the Division until June 28, 2013, to present information gained from the aquifer test in order to estimate water to support applications in the Order 1169 study basins.<sup>18</sup>

**WHEREAS**, during the Order 1169 aquifer test, an average of 5,290 acre-feet per year (afy) was pumped from carbonate-rock aquifer wells in Coyote Spring Valley, and a cumulative reported total of 14,535 afy of water was pumped throughout the Order 1169 study basins. Of this total, approximately 3,840 afy was pumped from the Muddy River Springs Area alluvial aquifer with the balance pumped from the carbonate-rock aquifer.<sup>19</sup>

**WHEREAS**, during the aquifer test, pumpage was measured and reported from 30 other wells in the Coyote Spring Valley, Muddy River Springs Area, Garnet Valley, California Wash, Black Mountains Area, and Lower Meadow Valley Wash Hydrographic Basin (Lower Meadow Valley Wash). Stream diversions from the Muddy River were reported, and measurements of the natural discharge of the Muddy River and from the Warm Springs area springs were collected daily. Water-level data were collected from a total of 79 monitoring and pumping wells within the Order 1169 study basins. All of the data collected during the aquifer test were made available to each of the study participants and the public.<sup>20</sup>

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<sup>17</sup> See July 1, 2010, letter from Jason King, Nevada State Engineer, to Order 1169 Study Participants, official records of the Division of Water Resources.

<sup>18</sup> See NSE Ex. 2, *Order 1169A*, Hearing on Interim Order 1303, official records of the Division of Water Resources.

<sup>19</sup> See, e.g., NSE Ex. 1, Appendix B.

<sup>20</sup> See Division, *Water Use and Availability – Order 1169*, <https://bit.ly/Order1169>



**WHEREAS**, during the Order 1169 aquifer test, the resulting water-level decline encompassed 1,100 square miles and extended from southern Kane Springs Valley, northern Coyote Spring Valley through the Muddy River Springs Area, Hidden Valley, Garnet Valley, California Wash, and the northwestern portion of the Black Mountains Area.<sup>21</sup> The water-level decline was estimated to be 1 to 1.6 feet throughout this area with minor drawdowns of 0.5 foot or less in the northern portion of Coyote Spring Valley north of the Kane Springs Wash fault zone.<sup>22</sup>

**WHEREAS**, results of the two-year aquifer test demonstrated that pumping 5,290 afa from the carbonate-rock aquifer in Coyote Spring Valley, in addition to the other carbonate-rock aquifer pumping in Garnet Valley, Muddy River Springs Area, California Wash and the northwest portion of the Black Mountains Area, caused sharp declines in groundwater levels and flows in the Pederson and Pederson East springs, two springs considered to be sentinel springs for the overall condition of the Muddy River due to being higher in altitude than other Muddy River source springs, and therefore are proportionally more affected by a decline in groundwater level in the carbonate-rock aquifer.<sup>23</sup> The Pederson spring flow decreased from 0.22 cfs to 0.08 cfs and the Pederson East spring flow decreased from 0.12 cfs to 0.08 cfs. Additional headwater springs at lower altitude, the Baldwin and Jones springs, declined approximately 4% in spring flow during the test.<sup>24</sup> All of the headwater springs contribute to the decreed and fully-appropriated Muddy River and are the predominant source of water that supplies the habitat of the endangered Moapa dace.

**WHEREAS**, Order 1169A provided the study participants an opportunity to submit reports addressing three specific questions presented by the State Engineer: (1) what information was obtained from the study/pumping test; (2) what were the impacts of pumping under the pumping test; and, (3) what is the availability of additional water resources to support the pending applications. SNWA, USFWS, National Park Service (NPS) and Bureau of Land Management

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<sup>21</sup> USFWS Ex. 5, *Report in Response to Order 1303*, Hearing on Interim Order 1303, official records of the Division of Water Resources, pp. 21, 67. *See, e.g.*, NSE Ex. 14. *See also* NSE Ex. 256, *Federal Bureaus Order 1169A Report*, Hearing on Interim Order 1303, official records of the Division of Water Resources. There was no groundwater pumping in Hidden Valley, but effects were still observed in the Hidden Valley monitor well.

<sup>22</sup> *See, e.g.*, NSE Ex. 14. *See also* NSE Ex. 256.

<sup>23</sup> *See* NSE Ex. No. 236.

<sup>24</sup> NSE Ex. 256, pp. 43–46, 50–51. *See also*, USGS, *Water Data for Nevada*, <https://bit.ly/nvwater>.

(BLM), MBOP, MVWD, CSI, Great Basin Water Network (GBWN) and Center for Biological Diversity (CBD) submitted either reports or letters.

**WHEREAS**, in its report, SNWA addressed water levels throughout the Order 1169 basins. SNWA acknowledged that hydrologic connectivity supported the potential need for redistribution of existing pumping, and indirectly acknowledged the limitation on availability of water to satisfy the pending applications.<sup>25</sup> SNWA further acknowledged declines to spring flow in the Pederson and Pederson East springs as a result of the aquifer test, but characterized the decline in spring flow at the Warm Springs West location as minimal. SNWA further correlated the declining trends as associated with climate but opined that Muddy River flow did not decline as a result of the aquifer test and carbonate-rock aquifer pumping; rather, impact to Muddy River flows were due to alluvial aquifer pumping.<sup>26</sup>

**WHEREAS**, CSI, through a letter, agreed with SNWA's report and asserted that additional water resources could be developed within the Coyote Spring Valley north of the Kane Springs Fault, which supported granting new appropriations of water.<sup>27</sup>

**WHEREAS**, the United States Department of Interior Bureaus (USFWS, NPS and BLM) concluded that the aquifer test provided sufficient data to determine the effects of the aquifer drawdown as well as identify drawdown throughout the region and was sufficient to project future pumping effects on spring flow. Based upon their analysis, the Department of Interior Bureaus concluded that water-level declines due to the aquifer test encompassed 1,100 square miles throughout the Order 1169 study basins. Additionally, the Department of Interior Bureaus' analysis found a direct correlation between the aquifer test pumping and flow declines at Pederson, Plummer and Apcar units and Baldwin Spring, all springs critical to the Moapa dace habitat, and asserted that pumping at the Order 1169 rate at well MX-5 in Coyote Spring Valley could result in both of the high-altitude Pederson and Pederson East springs going dry in 3 years or less.<sup>28</sup>

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<sup>25</sup> See NSE Ex. 245, *Southern Nevada Water Authority Order 1169 Report*, Hearing on Interim Order 1303, official records of the Division of Water Resources, pp. 23–25.

<sup>26</sup> *Id.*

<sup>27</sup> NSE Ex. 247, *Coyote Springs Investments, LLC Order 1169 Report*, Hearing on Interim Order 1303, official records of the Division of Water Resources.

<sup>28</sup> See, e.g., NSE Ex. 14, pp.15–18. See also NSE Ex. 256.

**WHEREAS**, the Department of Interior Bureaus further found that the groundwater withdrawals that occurred in Coyote Spring Valley during the Order 1169 aquifer test represented approximately one-third of the then existing water rights within Coyote Spring Valley, concluding that even one-third of the existing water rights could not be developed without adversely impacting spring flow to the headwaters of the Muddy River and habitat for the Moapa dace.<sup>29</sup> Ultimately, the Department of Interior Bureaus concluded that there was insufficient water available for the pending applications, and that the area that was subject to the Order 1169 aquifer test behaved as one connected aquifer and pumping in one basin would have similar effects on the whole aquifer.<sup>30</sup>

**WHEREAS**, MBOP's report disagreed with the magnitude of drawdown resulting from the Order 1169 aquifer test, but ultimately concluded carbonate-rock aquifer pumping in Coyote Spring Valley and the Muddy River Springs Area would have a one-to-one impact on Muddy River flows.<sup>31</sup> MBOP opined to the existence of a southern flow field, which included California Wash, Hidden Valley, Garnet Valley, and the northwest portion of the Black Mountains Area, that could be developed without depleting spring flows. MBOP also argued that changes in the groundwater levels were directly tied to water level declines in Lake Mead.<sup>32</sup>

**WHEREAS**, MVWD's report was limited to water levels and flows within the Muddy River Springs Area. In its report, MVWD acknowledged the groundwater level declines resulting from the aquifer test, including decreased spring flow at the Pederson springs, Warm Springs West gage and Baldwin Spring, but not at Jones Spring or Muddy Spring.<sup>33</sup> Ultimately, MVWD concluded that additional water was available in the Lower Moapa Valley, as that aquifer did not appear hydrologically connected to the regional carbonate-rock aquifer.

**WHEREAS**, GBWN presented a report that recognized the decline in the groundwater levels in Coyote Spring Valley and discharge to the Muddy River Springs Area resulting from the

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<sup>29</sup> *Id.*

<sup>30</sup> *Id.*

<sup>31</sup> See NSE Ex. 252, *Moapa Band of Paiute Indians Order 1169 Report*, Hearing on Interim Order 1303, official records of the Division of Water Resources, p. 25.

<sup>32</sup> *Id.*

<sup>33</sup> NSE Ex. 250, *Moapa Valley Water District Basin 220 Well Site Analysis*, Hearing on Interim Order 1303, official records of the Division of Water Resources; NSE Ex. 251, *Moapa Valley Water District Evaluation of MX-5 Pumping Test on Springs and Wells in the Muddy Springs Area*, dated June 24, 2013, Hearing on Interim Order 1303, official records of the Division of Water Resources.

aquifer test.<sup>34</sup> However, GBWN believed that the aquifer test failed to provide sufficient data to determine water availability throughout the other study basins. GBWN did assert that pumping of existing rights within all of the study basins would unacceptably decrease spring discharge.<sup>35</sup>

WHEREAS, CBD, relying on GBWN's technical report, opined that pumping existing water rights within the Order 1169 study basins would result in unacceptable decline in spring flow, ultimately threatening the Moapa dace and the habitat necessary for the species survival.<sup>36</sup>

WHEREAS, based upon the findings of the Order 1169 aquifer test, in denying the pending applications the State Engineer found: (1) that the information obtained from the Order 1169 aquifer test was sufficient to document the effects of pumping from the carbonate-rock aquifer on groundwater levels and spring flow and that the information could assist in forming opinions regarding future impacts of groundwater pumping and availability of groundwater in the study basins; (2) that the impacts of aquifer test pumping in Coyote Spring Valley was widespread throughout the Order 1169 aquifer test study basins and that the additional pumping in Coyote Spring Valley was a significant contributor to the decline in the springs that serve as the headwaters of the Muddy River and habitat for the Moapa dace; and, (3) that additional pumping from the then pending applications would result in significant regional water-level decline, and decreases in spring and Muddy River flows.<sup>37</sup>

WHEREAS, the basins that were included in the Order 1169 aquifer test were acknowledged to have a unique hydrologic connection and share the same supply of water.<sup>38</sup> The State Engineer further went on to find that the total annual supply to the basins could not be more than 50,000 acre-feet, that the perennial yield is much less than that because the Muddy River and the springs in the Warm Springs area utilize the same supply, and that the quantity and location of

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<sup>34</sup> NSE Ex. 246, *Great Basin Water Network Order 1169 Report*, Hearing on Interim Order 1303, official records of the Division of Water Resources.

<sup>35</sup> *Id.*

<sup>36</sup> NSE Ex. 248, *Center for Biological Diversity Order 1169 Report*, Hearing on Interim Order 1303, official records of the Division of Water Resources.

<sup>37</sup> NSE Exs. 14–21. The study basins include Coyote Spring Valley, Garnet Valley, Hidden Valley, Muddy River Springs Area, California Wash, and that portion of the Black Mountains Area lying within the LWRFS was defined as those portions of Sections 29, 30, 31, 32, and 33, T.18S., R.64E., M.D.B.&M.; Section 13 and those portions of Sections 1, 11, 12, and 14, T.19S., R.63E., M.D.B.&M.; Sections 5, 7, 8, 16, 17, and 18 and those portions of Sections 4, 6, 9, 10, and 15, T.19S., R.64E., M.D.B.&M.

<sup>38</sup> *See, e.g.*, NSE Ex. 14, p. 24.

any groundwater that could be developed without conflicting with senior rights on the Muddy River and the springs was uncertain.<sup>39</sup>

## II. INTERIM ORDER 1303

**WHEREAS**, on January 11, 2019, the State Engineer issued Interim Order 1303 designating the Lower White River Flow System (LWRFS), a multi-basin area known to share a close hydrologic connection, as a joint administrative unit for purposes of administration of water rights. The Interim Order defined the LWRFS to consist of the Coyote Spring Valley, Muddy River Springs Area, California Wash, Hidden Valley, Garnet Valley, and the portion of the Black Mountains Area Hydrographic Basins as described in the Interim Order.<sup>40</sup> Pursuant to Interim Order 1303, all water rights within the LWRFS were to be administered based upon their respective dates of priority in relation to other rights within the regional groundwater unit.

**WHEREAS** Interim Order 1303 recognized the need for further analysis of the LWRFS because the pre-development discharge of 34,000 acre-feet of the Muddy River system plus the more than 38,000 acre-feet of existing groundwater appropriations within the LWRFS greatly exceed the total water budget, which was determined to be less than 50,000 acre-feet.<sup>41</sup> Stakeholders with interests in water right development within the LWRFS were invited to file a report with the Office of the State Engineer addressing four specific matters, generally summarized as: 1) The geographic boundary of the LWRFS, 2) aquifer recovery subsequent to the Order 1169 aquifer test, 3) the long-term annual quantity and location of groundwater that may be pumped from the LWRFS, and 4) the effect of movement of water rights between alluvial and carbonate wells within the LWRFS. Stakeholders were also invited to address any other matter believed to be relevant to the State Engineer's analysis.

**WHEREAS**, on May 13, 2019, the State Engineer amended Interim Order 1303 modifying the deadlines for the submission of reports and rebuttal reports by interested stakeholders. Reports

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<sup>39</sup> *Id.*

<sup>40</sup> See NSE Ex. 1, *Order 1303 and Addendum to Interim Order 1303*, Hearing on Interim Order 1303, official records of the Division of Water Resources.

<sup>41</sup> *Id.*, p. 7.

submitted by interested stakeholders were intended to aid in the fact-finding goals of the Division.<sup>42</sup>

**WHEREAS**, a public hearing was held in Carson City, Nevada between, September 23, 2019, and October 4, 2019. The purposes of this hearing were to afford stakeholder participants who submitted reports pursuant to the solicitation in Interim Order 1303 an opportunity to provide testimony on the scientific data analysis regarding the five topics within the Interim Order and to test the conclusions offered by other stakeholder participants.

**WHEREAS**, during the Interim Order 1303 hearing, testimony was provided by expert witnesses for the participants CSI, USFWS, NPS, MBOP, SNWA and LVVWD<sup>43</sup>, MVWD, Lincoln County Water District and Vidler Water Company (LC-V), City of North Las Vegas (CNLV), CBD, Georgia Pacific Corporation (Georgia Pacific) and Republic, Nevada Cogeneration Associates Nos. 1 and 2 (collectively "NCA"), Muddy Valley Irrigation Company (MVIC), Western Elite Environmental, Inc. and Bedroc Limited, LLC (collectively "Bedroc"), and NV Energy.

**WHEREAS**, following the conclusion of the Interim Order 1303 hearing, stakeholder participants were permitted to submit written closing statements no later than December 3, 2019. The specific area evaluated, data analyzed, and methodology used varied by participant. Generally, participants relied on spring and streamflow discharge, groundwater level measurements, geologic and geophysical information, pumping data, climate data, and interpretations of aquifer hydraulics. Methodologies applied ranged from conceptual observations to statistical analysis to numerical and analytical models; the level of complexity and uncertainty differing for each.

**WHEREAS**, each of the participants' conclusions with respect to the topics set forth in Interim Order 1303 are summarized as follows:

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<sup>42</sup> *Id.*, pp. 16–17.

<sup>43</sup> SNWA is a regional water authority with seven water and wastewater agencies, one of which is LVVWD. References to SNWA include its member agency, LVVWD, which too retains water rights and interests within the LWRFS.

*Center for Biological Diversity*

The primary concern of the CBD was to ensure adequate habitat for the survival and recovery of the Moapa dace. CBD felt "that the Endangered Species Act is the primary limiting factor on the overall quantity of allowable pumping within the [LWRFS] and thus [...] geared [the] analysis toward that goal of protecting the dace." The Moapa dace primarily resides in the springs and pools of the Muddy River; protecting those areas of habitat are of the utmost importance to CBD's goal and have the collateral benefit of protecting the Muddy River decreed rights. Furthermore, CBD "believe[d] that withdrawals from the carbonate aquifer that cause a reduction in habitat quantity for the dace are a take under the Endangered Species Act and thus prohibited."<sup>44</sup>

CBD urges that Kane Springs Valley Hydrographic Basin (Kane Springs Valley) be included and managed as part of the LWRFS; otherwise CBD did not dispute the boundary as presented in Interim Order 1303. The inclusion of Kane Springs Valley was based on a shallow hydraulic gradient between Coyote Spring Valley and Kane Springs Valley; propagation of water level decline into Kane Springs Valley during the Order 1169 aquifer test; and a finding that the carbonate-rock aquifer extends into Kane Springs Valley. In CBD's opinion, adequate management of the LWRFS does not require that the administrative boundary include the White River Flow System north of Coyote Spring Valley.<sup>45</sup>

CBD identified a long-term, declining trend commencing in the 1990s in carbonate-rock aquifer water levels within the Muddy River Springs Area, which was accelerated by the Order 1169 aquifer test. Although CBD observed a partial, immediate recovery in the carbonate-rock aquifer water levels and spring flows, CBD finds that full recovery to pre-Order 1169 aquifer test conditions were never realized. Concurring with multiple other participants, CBD identified higher water levels in response to wet years despite the continued decline in the overall trend in the hydrographs. However, with regards to long-term drought, in their review of the Climate Division Data for southern Nevada, CBD saw no indication of a 20-year drought and disagreed with the conclusions and analysis presented by MBOP. Decreased spring flows in conjunction with

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<sup>44</sup> See CBD Ex. 3, *CBD Order 1303 Report by Dr. Tom Myers*; 27 pp., Hearing on Interim Order 1303, official records of the Division of Water Resources, p. 1; Transcript 1504–1505.

<sup>45</sup> See CBD Ex. 3, pp. 1, 2, 12, 17, 19; See CBD Ex. 4, *CBD Order 1303 Rebuttal in Response to Stakeholder Reports by Dr. Tom Myers*; 30 pp., Hearing on Interim Order 1303, official records of the Division of Water Resources, pp. 17–21; Tr. 1516; 1520–1521; 1526–1527; 1538–1539; CSI Ex. 2, p. 38; LC-V Ex. 2, pp. 11–14.

increased carbonate-rock aquifer pumping, led the CBD to infer the dependency of spring flows on carbonate-rock aquifer water supply.<sup>46</sup>

Again, with emphasis on protecting spring flows, and thus the Moapa dace habitat, CBD did not support any pumping of the carbonate-rock aquifer. CBD's desired outcome would be to avoid decreases in spring flow in the Warm Springs area attributed to continued carbonate-rock aquifer pumping. CBD postulated that surface water rights on the Muddy River will be protected by limiting carbonate-rock aquifer pumping.

Alternatively, CBD speculated that some alluvial aquifer pumping, within the Muddy River Springs Area and Coyote Spring Valley, could be sustained without significantly impacting the Warm Springs area. A preliminary estimate of 4,000 afa of sustainable alluvial aquifer pumping was proposed, based on the existing pumping within the Muddy River Springs Area and considering pumping in the 1990s near 5,000 afa when alluvial aquifer water levels were stable.<sup>47</sup>

#### *Church of Jesus Christ of Latter-day Saints*

The Church of Jesus Christ of Latter-day Saints (the Church) chose not to directly participate in the hearing but joined the evidentiary submissions of CNLV.<sup>48</sup> In response to the directives set forth in Interim Order 1303 and considering the testimony provided, the Church requests the continued administration and management of the LWRFS as identified in Interim Order 1303, and to allow for change applications throughout the LWRFS basins that move pumping of groundwater further away from the Muddy River Springs Area and from the alluvial aquifer to the carbonate-rock aquifer. The Church further requests that the testimony and recommendation of Dwight Smith, PE, PG on behalf of CNLV be considered and adopted.<sup>49</sup>

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<sup>46</sup> See CBD Ex. 3, pp. 1, 24; See CBD Ex. 4, p. 8–10, 21–25; Tr. 1508–1525; LC-V Ex. 2, p. 12, GP-REP Ex. 2, p. 3; CBD's expert suggest that the Palmer Drought Severity Index is more robust to evaluate for drought rather than using precipitation.

<sup>47</sup> See CBD Ex. 3, pp. 20–26; See CBD Ex. 4, p. 28–29; Tr. 1525-1528.

<sup>48</sup> See Letter from the Church, received August 15, 2019, Hearing on Interim Order 1303, official records of the Division of Water Resources.

<sup>49</sup> See *Closing Brief of the Church of Jesus Christ of Latter-Day Saints* (Church closing), Hearing on Interim Order 1303, official records of the Division of Water Resources.



*City of North Las Vegas*

In CNLV's report submissions and closing statement it addressed four questions set forth in Interim Order 1303.<sup>50</sup> CNLV generally urges for more analysis and study of the LWRFS before administrative decisions are made due to lack of agreement on fundamental interpretations of the water availability and basin connectivity. It was agreed to by CNLV that most of Garnet Valley and a small portion of the Black Mountains area were within the larger carbonate-rock aquifer underlying the LWRFS basins, but that there is uncertainty in the boundaries of Garnet Valley with California Wash and Las Vegas Valley Hydrographic Basin (Las Vegas Valley).<sup>51</sup> With respect to the recovery of the groundwater aquifer following the Order 1169 aquifer test, CNLV concluded that the record and evidence demonstrates a long-term declining trend in the groundwater level since the late 1990s and that pumping responses can propagate relatively quickly through the carbonate-rock aquifer and drawdown is directly related to the pumping.<sup>52</sup>

While CNLV did consider the long-term quantity of groundwater that may be developed without adversely impacting discharge to the Warm Springs area, its opinions were limited to the sustainability of pumping within Garnet Valley.<sup>53</sup> CNLV concluded that the safe yield concept should be applied to the management of pumping within the LWRFS and that pumping between 1,500 afa to 2,000 afa does not appear to be causing regional drawdown within the LWRFS carbonate-rock aquifer and that pumping this quantity of water may be sustainable within the APEX Industrial Park area of Garnet Valley.<sup>54</sup> Finally, CNLV asserted that movement of alluvial water rights from the Muddy River Springs Area along the Muddy River would reduce the capture

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<sup>50</sup> See CNLV Ex. 5, *City of North Las Vegas Utilities Department: Interim Order 1303 Report Submittal from the City of North Las Vegas – July 2, 2019*, Hearing on Interim Order 1303, official records of the Division of Water Resources. See CNLV Ex. 6, *Rebuttal Document submitted on behalf of the City of North Las Vegas, to Interim Order 1303 Report Submittals of July 3, 2019 – Prepared by Interflow Hydrology – August 2019*, Hearing on Interim Order 1303, official records of the Division of Water Resources. See Tr. 1416–66, and *City of North Las Vegas' Closing Statement (CNLV Closing)*, Hearing on Interim Order 1303, official records of the Division of Water Resources.

<sup>51</sup> See CNLV Ex. 5, pp. 2–3. See also CNLV Ex. 3, *Garnet Valley Groundwater Pumping Review for APEX Industrial Complex, City of North Las Vegas, Clark County, Nevada- Prepared by Interflow Hydrology, Inc.- July 2019*, pp. 7–8, 38.

<sup>52</sup> *Id.*, p. 3, Technical Memo, pp. 14–16.

<sup>53</sup> *Id.*, pp. 3–4.

<sup>54</sup> *Id.*, p. 4., Technical Memo, p. 45.

of Muddy River flow, move more senior water rights into Garnet Valley to support a secure water supply for the municipal uses within the APEX area, and would support overall objectives relating to the management of the LWRFS.<sup>55</sup> CNLV advocated that transferring water rights between alluvial aquifer and carbonate-rock aquifer should be considered on a case-by-case basis with consideration given as to location, duration, and magnitude of pumping.<sup>56</sup>

CNLV disagreed with certain conclusions of the NPS relating to the inclusion of the entirety of the Black Mountains Area within the LWRFS boundaries and had concerns relating to the reliability of the Tetra Tech model for future water resource management within the LWRFS.<sup>57</sup> CNLV further disagreed with stakeholder conclusions that movement of groundwater withdrawals from the alluvial aquifer along the Muddy River to the carbonate-rock aquifer in Garnet Valley will not alleviate the conflicts to Muddy River flow, rather concluding that there may be benefits for overall management of the LWRFS.<sup>58</sup> Further, CNLV disagreed with certain findings regarding water flow through the carbonate-rock aquifer, finding that it is likely that some groundwater can be pumped within Garnet Valley without capturing groundwater that would otherwise discharge to the Warm Springs area and the Muddy River.<sup>59</sup> Finally, in its rebuttal the CNLV joined other stakeholders in supporting the conclusion that there is a quantity of water that may be sustainably developed within the LWRFS and that use of carbonate-rock aquifer groundwater in Garnet Valley is critical to the short-term and long-term management and development of the APEX Industrial Complex.<sup>60</sup>

#### *Coyote Springs Investments*

In presenting its opinions and conclusions CSI's focus was primarily on climate as the foundation for groundwater elevation declines after the Order 1169 aquifer test, and additional geophysical research that provided evidence of a structural block isolating the west side of Coyote Spring Valley.

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<sup>55</sup> *Id.*, Technical Memo, p. 48–49.

<sup>56</sup> *Id.*

<sup>57</sup> *See* CNLV Ex. 6, pp. 1–2.

<sup>58</sup> *Id.*, p. 2.

<sup>59</sup> *Id.*, pp. 2–3.

<sup>60</sup> *Id.*, p. 3.

CSI did a statistical analysis of climate data, and determined from the results that 1998, 2004, 2005, and 2010 were wetter than normal, with a drying trend from 2006 to 2017.<sup>61</sup> The Order 1169 aquifer test took place toward the end of an extended dry period when all water resources throughout the LWRFS were negatively affected.<sup>62</sup> Additionally, annual cyclical patterns of groundwater pumping should not be confused with long-term climate variability.<sup>63</sup>

CSI challenged the basic assumption that the LWRFS, as proposed in Interim Order 1303, is a homogenous unit.<sup>64</sup> CSI could not duplicate the results of the SeriesSEE, and its own Theis solution modeling concluded that a greater impact occurred from pumping at a well closer in proximity to Pederson Spring than pumping from a well further away, or the combined effect of both wells.<sup>65</sup> CSI also acknowledged that due to the fragmented nature of the LWRFS, the Theis solution is of limited utility.<sup>66</sup>

CSI presented geologic and geophysical information in support of the idea that the LWRFS administrative unit is a geophysically and hydrogeologically heterogenous area, characterized by multiple flow paths defined by faults and structural elements that control the occurrence and movement of regional and local groundwater along the western side of Coyote Spring Valley, the eastern side of Coyote Spring Valley, and from Lower Meadow Valley Wash into the LWRFS.<sup>67</sup> CSI stated that the LWRFS does not include Kane Springs Valley.<sup>68</sup>

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<sup>61</sup> CSI Ex. 1, *CSI July 3, 2019 Order 1303 Report*, Hearing on Interim Order 1303, official records of the Division of Water Resources, pp. 4–5; Tr. 53.

<sup>62</sup> CSI Ex. 1, p. 5.

<sup>63</sup> CSI Ex. 2, *CSI August 16, 2019 Rebuttal Report*, Hearing on Interim Order 1303, official records of the Division of Water Resources, pp. 2, 7.

<sup>64</sup> CSI Ex. 1, p. 7.

<sup>65</sup> CSI Ex. 1, p. 7; Tr. 131–132.

<sup>66</sup> Tr. 154.

<sup>67</sup> CSI Ex. 2, p. 2; *CSI Closing Statement (CSI Closing)*, Hearing on Interim Order 1303, official records of the Division of Water Resources; CSI recommended including Lower Meadow Valley Wash in its Rebuttal report. See CSI Ex. 2, p. 12; Mr. Herrema said Lower Moapa Valley, but the report said Lower Meadow Valley 10:10.

<sup>68</sup> CSI Ex. 1, p. 15; the outflow from Kane Springs Valley is included in the water budget, but due to isolating geologic features, groundwater elevations in Kane Springs Valley are not impacted by pumping in the LWRFS, Tr. 135:7–137:3, 160:2–12.

CSI engaged a geophysicist to conduct a CSAMT survey at multiple points in the valley.<sup>69</sup> CSI's CSAMT study showed evidence of a prominent carbonate block bounded on either side by normal faults.<sup>70</sup> CIS asserts that the carbonate block isolates recharge from the zone west of the block, such that it eliminates or limits contribution of local recharge to the Warm Springs area.<sup>71</sup> Faulting has created a preferred path for groundwater flow "from the east side Coyote Spring Valley to the Muddy River Springs Area".<sup>72</sup>

CSI relied on a water budget as the best method to determine available water in the LWRFS, accounting for recharge and subsurface flow as well as climatic variations.<sup>73</sup> Comparing several models of recharge, CSI estimated recharge at 5,280 afa from the Sheep Range to the western side of Coyote Spring Valley.<sup>74</sup> CSI stated that 30,630 afa can be pumped from the LWRFS, but there would be impacts from pumping the water, and that the Coyote Spring Valley can sustain 5,280 afa of pumping from the western side without impact to the Warm Springs area or the Muddy River.<sup>75</sup>

As asserted by CSI, groundwater pumping from the carbonate-rock aquifer in the Muddy River Springs Area affects flow in the carbonate-rock aquifer to the alluvial aquifer, which then affects flow from the alluvial aquifer to the Muddy River.<sup>76</sup> CSI argues that effects are dependent on well location, geologic formations, hydraulic gradients, and elevation.<sup>77</sup> Transfers between carbonate and alluvial pumping should be made on a case-by-case basis, analyzing place of use, points of diversion, and quantity of groundwater.<sup>78</sup> Movement of water rights between alluvial wells and carbonate-rock aquifer wells will only serve to shift the timing and location of impacts and not the amount of the impact.<sup>79</sup>

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<sup>69</sup> CSI Ex. 1, p. 25

<sup>70</sup> CSI Ex. 1, p. 25.

<sup>71</sup> CSI Ex. 1, p. 29; evidence of impermeability, Tr. 181.

<sup>72</sup> CSI Ex. 1, p. 29.

<sup>73</sup> CSI Closing.

<sup>74</sup> CSI Ex. 1, pp. 31-40.

<sup>75</sup> Tr. 221-223; CSI Closing, pp. 8-9.

<sup>76</sup> CSI Closing.

<sup>77</sup> CSI Closing, p. 19.

<sup>78</sup> CSI Closing.

<sup>79</sup> CSI Ex. 1, p. 58.

As a consequence of the heterogenous nature of the LWRFS, CSI recommended sustainable management of the LWRFS through the creation of "Management Areas" that recognize flow paths and their relative contributions to spring flow, surface flow, evapotranspiration, and sub-surface outflow.<sup>80</sup> For example, though pumping in the Muddy River Springs Area near the Warm Springs area would have a direct impact on available surface water resources, structural blocks and faults isolate the effect of groundwater pumping in other areas of the LWRFS.<sup>81</sup> Thus CSI does not recommend a blanket ban on carbonate-rock aquifer pumping, or a decrease in carbonate-rock aquifer pumping in exchange for alluvial aquifer pumping.

#### *Georgia Pacific and Republic*

Dry Lake Water, LLC, Georgia Pacific and Republic submitted initial and rebuttal responses to Interim Order 1303 and offered testimony during the hearing.<sup>82</sup> In their response, Georgia Pacific and Republic acknowledged impacts to groundwater elevations throughout the LWRFS, including wells in the Black Mountains Area and Garnet Valley, which does demonstrate a degree of hydraulic connectivity throughout the carbonate-rock aquifer. However, Georgia Pacific and Republic called for collection of more scientific evidence to further understand the LWRFS and its boundaries. Further, it was their opinion that climate, seasonal fluxes and pumping within Garnet Valley and the Black Mountains Area resulted in the groundwater declines observed during the Order 1169 aquifer test.<sup>83</sup> Ultimately, Georgia Pacific and Republic do not believe sufficient information exists to draw distinct conclusions as to the cause of the groundwater declines during the Order 1169 aquifer test and whether carbonate-rock aquifer pumping within

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<sup>80</sup> CSI Closing.

<sup>81</sup> CSI Ex. 2, p. 17.

<sup>82</sup> The initial response was submitted on behalf of Dry Lake Water, LLC, Georgia Pacific, and Republic. See GP-REP Ex. 1, *Broadbent July 2, 2019 Initial Report*, Hearing on Interim Order 1303, official records of the Division of Water Resources. The rebuttal response was submitted on behalf of Dry Lake Water, LLC, Georgia Pacific Gypsum LLC, and Republic. See GP-REP Ex. 2, *Broadbent August 16, 2019 Rebuttal Report*, Hearing on Interim Order 1303, official records of the Division of Water Resources. However, the expert only appeared at the Hearing on Interim Order 1303 on behalf of Georgia Pacific and Republic. See Tr. 1588-91.

<sup>83</sup> See GP-REP Ex. 01, GP-REP Ex. 02, and *Closing Argument of Georgia Pacific Corporation and Republic Environmental Technologies, Inc.* (Closing GP-REP), Hearing on Interim Order 1303, official records of the Division of Water Resources.

the Garnet Valley and the Black Mountains Area has a measurable impact to spring flow in the Warm Springs area.<sup>84</sup>

#### *Great Basin Water Network*

GBWN elected to pose procedural suggestions relating to public involvement, availability of documents and data, transparency, and decision making, and did not submit a report with an independent analysis addressing the questions in Interim Order 1303.<sup>85</sup> GBWN advocates for sustainable management of the entirety of the White River Flow System as one unit based on the interconnected nature of all of the hydrologically connected basins, although no analysis to support which areas this would include was provided. GBWN relies on conclusory statements to establish the interconnected nature of the system as support for its position. Later, GBWN chose not to participate in the hearing nor submit a rebuttal report, closing arguments, or public comment.

#### *Lincoln County Water District and Vidler Water Company*

LC-V's participation in the LWRFS hearing was driven by their existing and pending groundwater rights in Kane Springs Valley, and an interest in excluding Kane Springs Valley from the LWRFS management area.<sup>86</sup> They disputed that Kane Springs Valley should be included within the LWRFS boundary based on their assertion of: prior decisions of the State Engineer that acknowledged the separate nature of the basin from the rest of the LWRFS, groundwater elevation comparisons, precipitation and recharge data, groundwater chemistry, and geophysical study results. In general, Kane Springs Valley should be managed based on its perennial yield, recognizing that there is groundwater flow to the LWRFS as there are from other basins into the LWRFS, but where they are excluded from the proposed management area.<sup>87</sup>

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<sup>84</sup> See Closing GP-REP.

<sup>85</sup> *GBWN Report on Order 1303*, (GBWN Report), Hearing on Interim Order 1303, official records of the Division of Water Resources.

<sup>86</sup> LC-V Ex. 1, *Lower White River Flow System Interim Order #1303 Report Focused on the Northern Boundary of the Proposed Administrative Unit*, prepared by Lincoln County Water District and Vidler Water Company in Association with Zonge International Inc., dated July 3, 2019, Hearing on Interim Order 1303, official records of the Division of Water Resources, p. 2-1.

<sup>87</sup> LC-V Ex. 2, *Rebuttal Submittal to Reports Submitted in Response to Interim Order #1303*, dated August 16, 2019 and Attachments A, B, C, D and E containing the reports or technical memorandums of Greg Bushner, Peter Mock, Thomas Butler, Todd Umstot and Norman Carlson., Hearing on Interim Order 1303, official records of the Division of Water Resources, pp. 7, 14-15.

Various rulings of the State Engineer have previously addressed whether appropriation of groundwater from Kane Springs Valley would affect the Muddy River Springs Area.<sup>88</sup> LC-V states that these findings have not been challenged by any of the Order 1169 participants.<sup>89</sup> However, to the extent that SNWA relied on multiple linear regression models to establish groundwater flow from Kane Springs Valley to the LWRFS, LC-V do not agree.<sup>90</sup>

LC-V identified a distinct “break,” or local increase, in water levels in the regional hydraulic gradient between wells drilled in the LWRFS versus wells drilled in Kane Springs Valley and northern Coyote Spring Valley.<sup>91</sup> It attributed the break to geologic structures located throughout the carbonate-rock aquifer. Although wells within the LWRFS exhibit very consistent groundwater levels, indicative of high transmissivity values across the area, the gradient between well KPW-1 and down-basin wells is much steeper, implying an impediment to groundwater flow near the mouth of Kane Springs Valley.<sup>92</sup>

In a 2006 hearing for protested water rights applications, LC-V presented an analysis of the regional geochemistry data including stable isotopes, temperature, and carbon-14 data.<sup>93</sup> That analysis found that the groundwater pumped from Kane Springs Valley could not be identified in the source water for the Big Muddy Spring, nor other springs farther south and outside the boundaries of the LWRFS.<sup>94</sup> LC-V concluded that groundwater pumped from production well KPW-1 is on a different groundwater flow path from the springs, consistent with the differences in hydraulic gradients, groundwater levels, and geophysical data.<sup>95</sup> CSVM-4, a well located in Coyote Spring Valley, and KPW-1, in Kane Springs Valley, have similar temperatures compared to the other wells in the basin, and a lower percentage difference on other markers tracked throughout groundwater in the basin.<sup>96</sup> LC-V argues that the water from these wells is chemically

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<sup>88</sup> LC-V Ex. 1, pp. 2-2 through 2-3, citing State Engineer’s Rulings 5712, 6254, 5712.

<sup>89</sup> LC-V Ex. 1, p. 2-3.

<sup>90</sup> Testimony generally at Tr. 1311–1318. “... simply having correlation is not proof of causation. Causation is neither proved nor evaluated in a regression analysis.” Tr. 1303.

<sup>91</sup> LC-V Ex. 1, p. 3-1.

<sup>92</sup> LC-V Ex. 1, pp. 1-1, 3-1 through 3-4. LC-V went on to conclude that local groundwater recharge occurs in Kane Springs Valley that does not flow to the LWRFS, and therefore there is available unappropriated water in the basin. LC-V Ex. 1, p. 3-5.

<sup>93</sup> LC-V Ex. 1, Appendix C, pp. 111–153.

<sup>94</sup> *Id.*, pp. 124–125.

<sup>95</sup> “Gradient alone does not mean flow.” Thomas Butler, witness on behalf of LC-V, Tr. 1281.

<sup>96</sup> Tr. 1281–1282; LC-V Ex. 1, pp. 3-7 through 3-11.

unique and does not appear in any other wells in the LWRFS.<sup>97</sup> LC-V concludes carbon isotope data also confirmed that the water from Kane Springs Valley does not appear in the Muddy River Springs area.<sup>98</sup>

LC-V engaged a geophysical company to perform a CSAMT survey across the boundary line between Kane Springs Valley and Coyote Spring Valley, and identified significant geologic structures in southern Kane Springs Valley and northern Coyote Spring Valley.<sup>99</sup> Several transect lines were conducted perpendicular to the axis of the Kane Springs Valley, and one was also conducted along the axis of the southern part of the basin.<sup>100</sup> Additional transects were run in Coyote Spring Valley.<sup>101</sup> The results of the geophysical data validated concealed faulting indicated on existing maps, and was ground-truthed with observations in the field.<sup>102</sup> Results indicated a previously unmapped fault at the mouth of Kane Springs Valley, which LC-V named the Northern Boundary LWRFS fault, with a potentially 2,500-foot offset of materials with different resistivities.<sup>103</sup> LC-V argues that the extensive faulting that occurs in southern Kane Springs Valley and northern Coyote Spring Valley form the basis for the exclusion of Kane Springs Valley from the LWRFS.<sup>104</sup>

LC-V gave no opinion on the long-term annual quantity of groundwater that could be pumped from the LWRFS.<sup>105</sup> LC-V attributes all reduction in flows of the Muddy River and its associated springs to carbonate-rock aquifer pumping within the Muddy River Springs Area, and finds no discernable effect from carbonate-rock aquifer pumping occurring in Coyote Springs

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<sup>97</sup> Tr. 1284.

<sup>98</sup> Tr. 1286.

<sup>99</sup> LC-V Ex. 1, pp. 1-1, 4-1 through 4-10.

<sup>100</sup> LC-V Ex. 1, p. 4-3.

<sup>101</sup> LC-V Ex. 1, p. 4-3.

<sup>102</sup> LC-V Ex. 1, p. 4-8, Tr. 1322.

<sup>103</sup> Tr. 1271-1272; LC-V Ex. 1, p. 4-9.

<sup>104</sup> LC-V Ex. 1, p. 7-1 through 7-2; Tr. 1408. Questions from the National Park Service and the State Engineer inquired whether the areas of high resistivity in the CSAMT necessarily implied low transmissivity, low permeability of the rock. LC-V conceded that the resistivity information alone does not provide data about the hydraulic properties of either side of the resistive area, but when considered with all available information, LC-V concluded that the fault is likely an impediment to groundwater flow. Tr. 1327-1328, 1363-1364.

<sup>105</sup> LC-V Ex. 1, p. 5-2.



Valley.<sup>106</sup> As a result, LC-V finds that the efforts to protect the Warm Springs area must focus on groundwater pumping within the Muddy River Springs Area itself.<sup>107</sup>

*Moapa Band of Paiutes*

The MBOP participated in the administrative hearing due to their interest in the outcome of the proceedings and how it may affect their pending water right applications within California Wash. A regional approach, spanning a large aerial expanse, was taken by MBOP; the analysis and modeling efforts extended into central Nevada and Utah. MBOP stands apart from other participants with their interpretation of the data.<sup>108</sup> MBOP opposed management of the LWRFS as one basin and argues the scientific consensus is lacking amongst participants.<sup>109</sup> Regarding the interpretation of other participants, MBOP disagreed with the methodology and application of the 2013 USFWS SeriesSEE analysis and SNWA's multiple linear regression and requests repudiation of both.<sup>110</sup>

While not agreeing with the proposed boundaries of the LWRFS, MBOP did not provide a clear suggestion for which basins or portions therein should be included or excluded. MBOP suggested that pumping in California Wash has little to no impact on the Warm Springs area.<sup>111</sup> MBOP further suggested there are two capture zones, separated by a hydrodynamic and hydrochemical divide, which transects the Moapa River Indian Reservation area and results in south-flowing groundwater into the Las Vegas Valley through the LWRFS, bypassing the Muddy

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<sup>106</sup> LC-V Ex. 1, p. 5-3.

<sup>107</sup> LC-V Ex. 1, p. 5-3.

<sup>108</sup> Tr. 772– 773; 839.

<sup>109</sup> See *Closing Statement by the Moapa Band of Paiute Indians for Order 1303 Hearing* (MBOP Closing), Hearing on Interim Order 1303, official records of the Division of Water Resources, pp. 1–2, 6.

<sup>110</sup> *Id.*, pp. 7–12, 15–16; See MBOP Ex. 3, Johnson, C., and Mifflin, M. *Rebuttal Report of the Moapa Band of Paiutes in Response to Stakeholder Technical Reports Filed under Order #1303: unpublished report and appendices, August 16, 2019. 27 p.*, Hearing on Interim Order 1303, official records of the Division of Water Resources.

<sup>111</sup> See MBOP Ex. 2, Johnson, C., and Mifflin, M. *Water Level Decline in the LWRFS: Managing for Sustainable Groundwater Development. Initial Report of the Moapa Band of Paiutes in Response to Order #1303: unpublished report and appendices, July 3, 2019. 84 p.*, Hearing on Interim Order 1303, official records of the Division of Water Resources, pp. 2, 4, 14, 35; Tr. 819.

River Springs Area.<sup>112</sup> This hydrodynamic divide theory was not shared by SNWA, CBD, CSI, and NPS.<sup>113</sup>

Several participants agree that climate impacts were observed in the hydrographs, e.g., periods of wet and dry; however, MBOP interpreted the existing data to show that climate-driven decline, specifically drought, as the primary response observed in the long-term declining groundwater levels.<sup>114</sup> Thus, MBOP concluded that no reduction in pumping will restore high-elevation spring flows.<sup>115</sup> MBOP did not agree with other participants that decreasing groundwater levels and spring flows were attributed to increased carbonate-rock aquifer pumping beginning in the early 1990s.<sup>116</sup>

A quantity available for sustainable pumping was not proposed, but MBOP presumed more water is available in California Wash than previously thought.<sup>117</sup> A flux of approximately 40,000 cfs of south-flowing groundwater into the Las Vegas Valley, bypassing the Muddy River Springs Area, was postulated in the initial report as possible with the hydrodynamic divide; however, during the hearing this quantity was given a range of plus or minus an order of magnitude based on assumptions for calculations.<sup>118</sup>

MBOP acknowledged that the Muddy River is connected to the alluvial aquifer and thus pumping from the alluvial and carbonate-rock aquifers in the Muddy River Springs Area impact the Muddy River flows.<sup>119</sup> Therefore, to mitigate impacts to the Muddy River, MBOP proposed that alluvial aquifer pumping, specifically between Arrow Canyon and White Narrows, can be moved to the carbonate-rock aquifer in basins to the south, such as California Wash, with minimal anticipated impacts to the Muddy River flows, rather than moving alluvial aquifer pumping from the Muddy River Springs Area to the carbonate-rock aquifer in connected areas, where impacts

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<sup>112</sup> See MBOP Ex. 2, pp. 2, 4, 12, 14, 20, 35, 55; Tr. 812; 845.

<sup>113</sup> SNWA Ex. 9, pp. 12–13; CBD Ex. 4, p. 15; CSI Ex. 2, p. 23; NPS Ex. 3, *National Park Service's Response to July 2019 Interim Order 1303 Reports, Waddell, August 16, 2019*, Hearing on Interim Order 1303, official records of the Division of Water Resources, p. 4.

<sup>114</sup> See MBOP Ex. 2, pp. 3, 26–32, 35; Tr. 764–771; 805.

<sup>115</sup> See MBOP Ex. 2, pp. 3, 35; Tr. 821–826.

<sup>116</sup> See MBOP Ex. 2, p. 29; Tr. 775, 838–840; 848.

<sup>117</sup> See MBOP Ex. 2, pp. 2, 20, 35.

<sup>118</sup> See MBOP Ex. 2, pp. 6, 19, 35; Tr. 850–851.

<sup>119</sup> See MBOP Ex. 2, pp. 23–24, 35; Tr. 836.

proportional to pumping may be expected.<sup>120</sup> Thus, MBOP proposed favoring temporary over permanent uses and transferring of rights between the carbonate-rock and alluvial aquifers on a case-by-case basis.<sup>121</sup>

*Moapa Valley Water District*

MVWD was created by the Nevada legislature in 1983, pursuant to NRS Chapter 477, to provide water service “vital to the economy and well-being of Moapa Valley.”<sup>122</sup> MVWD provides municipal water service to approximately 8,500 people with 3,250 metered service connections, including service to the MBOP.<sup>123</sup>

MVWD supported the inclusion of Kane Springs Valley within the LWRFS boundary.<sup>124</sup> Data indicated a direct connection between Kane Springs Valley and Coyote Spring Valley. This data included observations that the water level in KMW-1/KSM-1 decreased 0.5 foot over the duration of the Order 1169 aquifer test.<sup>125</sup> State Engineer’s rulings have concluded that geochemical evidence and groundwater gradient data indicate that groundwater flows from the Kane Springs Valley into Coyote Spring Valley, and MVWD supports LVVWD’s 2001 calculation of that quantity of water at approximately 6,000 afy.<sup>126</sup> MVWD performed its own calculations of the groundwater gradients from Kane Springs Valley at KMW-1 to EH-4, and concluded that the gradient was “an uninterrupted, continuous, exceptionally flat gradient,” unlike gradients commonly seen in the western U.S., especially in highly fractured areas.<sup>127</sup> MVWD also

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<sup>120</sup> See MBOP Ex. 2, pp. 23, 35.

<sup>121</sup> See MBOP Closing.

<sup>122</sup> Tr. 1172.

<sup>123</sup> MVWD Ex. 3, *District July 1, 2019 Report in response to Interim Order 1303*, p.5, Hearing on Interim Order 1303, official records of the Division of Water Resources; MVWD Ex. 4, *District August 16, 2019 Rebuttal Report*, p. 1, Hearing on Interim Order 1303, official records of the Division of Water Resources. MVWD has 3,147 afa of water rights in Arrow Canyon. Tr. 1169–1170.

<sup>124</sup> MVWD Ex. 3, p. 1; Tr. 1175.

<sup>125</sup> MVWD Ex. 3, p. 1; MVWD Ex. 4, p. 2.

<sup>126</sup> MVWD Ex. 3, pp. 1–2, referring to State Engineer’s Ruling 5712 (*see*, NSE Ex. 12, *Ruling 5712*, Hearing on Interim Order 1303, official records of the Division of Water Resources) and MVWD Ex. 8, *Las Vegas Valley Water District, Water Resources and Ground-Water Modeling in the White River and Meadow Valley Flow Systems, Clark, Lincoln, Nye, and White Pine Counties, Nevada (2001)*, Hearing on Interim Order 1303, official records of the Division of Water Resources, p. 6-3.

<sup>127</sup> Tr. 1177–1178.

introduced evidence of a stipulation between LC-V and the USFWS that bases a reduction in pumping in Kane Springs Valley on a lowering of spring discharges in the Warm Springs area, and introduced a letter from SNWA to the State Engineer, as additional support that the participants to the Interim Order 1303 hearing have previously recognized Kane Springs Valley is part of the LWRFS.<sup>128</sup>

MVWD disagreed that a hydrologic barrier exists between Coyote Springs Valley and Kane Springs Valley.<sup>129</sup> Relying on a 2006 report prepared by another consultant, MVWD said the evidence indicated that the fault at the mouth of Kane Springs Valley was not an impediment to flow, and that there was no evidence of having encountered hydraulic barriers to groundwater flow during a seven-day aquifer test.<sup>130</sup> Additionally, the “highly transmissive fault zone” is continuous across the basin boundary between Kane Springs Valley and Coyote Spring Valley.<sup>131</sup> MVWD found further support for its position from evidence that KMW-1 showed drawdown during both the seven-day aquifer test on KPW-1, as well as from the Order 1169 aquifer test pumping that occurred from MX-5.<sup>132</sup> MVWD considered the water level data collected before, during and after the Order 1169 aquifer test, and Warm Springs area spring discharge to support its finding that the fault is not interrupting groundwater flow.<sup>133</sup> MVWD found it “questionable” that the first suggestion of a fault that impedes southward groundwater flow would be prepared by LC-V for this hearing.<sup>134</sup>

Although water levels and spring discharge did not recover to the levels measured before the Order 1169 aquifer test, MVWD believed that the LWRFS is at or near steady-state conditions

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<sup>128</sup> Tr. 1195–1197.

<sup>129</sup> Tr. 1176–1177.

<sup>130</sup> Tr. 1181–1182. MVWD also quoted from the report that “the fracturing was so extensive that the fractured aquifer system really behaved as an equivalent porous media.” *Id.* MVWD later agreed that this would behave like a sandy aquifer. Tr. 1224.

<sup>131</sup> Tr. 1185.

<sup>132</sup> Tr. 1250.

<sup>133</sup> Tr. 1219.

<sup>134</sup> *Post-Hearing Brief of Moapa Valley Water District (MVWD Closing)*, Hearing on Interim Order 1303, official records of the Division of Water Resources, p. 5.

regarding aquifer recovery.<sup>135</sup> MVWD viewed this as being consistent with the State Engineer's statements in Interim Order 1303.<sup>136</sup>

Finally, MVWD did not provide a specific quantity of available water but did acknowledge that the "actual safe pumpage" is less than current pumping rates, and recognized a direct relationship between pumping from the carbonate-rock aquifer, spring and Muddy River flows, and alluvial aquifer pumping.<sup>137</sup> The timing and magnitude of carbonate-rock aquifer pumping effects on spring discharge is dependent on the volume of water pumped and the proximity of a pumping center to the springs; however, all cumulative carbonate-rock aquifer pumping in the seven interconnected basins will eventually cause depletions on the Warm Springs area springs.<sup>138</sup> Further, if carbonate rights are transferred to the alluvial aquifer there will be depletions to Muddy River flows and impacts to senior Muddy River water right owners.<sup>139</sup>

MVWD raised additional matters that they believed relevant to the analysis under Interim Order 1303. First, they stressed the importance of municipal water rights, and the necessity for a reasonably certain supply of water for future permanent uses without jeopardizing the economies of the communities that depend on the water supply, and to protect the health and safety of those who rely on the water supply.<sup>140</sup> To that end, MVWD requested that the State Engineer consider designating municipal use as the most protected and highest use of water, and to give MVWD the perpetual right to divert 6,791 afa of permitted and certificated rights from its carbonate-rock aquifer wells.<sup>141</sup> Second, MVWD stated that it had already satisfied its obligation to protect Moapa dace habitat and senior water rights when it dedicated 1cfs/724 afa, or approximately 25% of the MVWD current diversions, from its most senior water right, to the enhancement of the Moapa dace habitat.<sup>142</sup>

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<sup>135</sup> Tr. 1198, MVWD Ex. 3, p. 4.

<sup>136</sup> Tr. 1199.

<sup>137</sup> Tr. 1199–1200; MVWD Closing, pp. 9–10.

<sup>138</sup> MVWD Ex. 3, p. 5.

<sup>139</sup> *Id.*

<sup>140</sup> MVWD Ex. 3, p. 5.

<sup>141</sup> MVWD Ex. 3, p. 6; Tr. 1203–1204; 6,791 afa constitutes an increase in the carbonate-rock aquifer pumping for MVWD. Tr. 1228.

<sup>142</sup> MVWD Ex. 3, pp. 6–7; Tr. 1202–1203.

*Muddy Valley Irrigation Company*

The MVIC is a non-profit Nevada corporation with the senior decreed water rights to the Muddy River, who provided testimony that SNWA is a majority shareholder while other participants such as CSI, LC-V, and MVWD are minority shareholders of the decreed rights.<sup>143</sup> MVIC concurred with SNWA's conclusions regarding aquifer recovery, long-term quantity of groundwater, and movement of water between the alluvial and the carbonate-rock aquifers.<sup>144</sup> Specifically, that any groundwater pumping, from both alluvial or carbonate-rock aquifers, within the Muddy River Springs Area impacts Muddy River flows, thus violating the Muddy River Decree.<sup>145</sup> MVIC did not dispute the geographic boundaries as identified in Interim Order 1303.<sup>146</sup> MVIC argued that the Muddy River and all of its sources are fully appropriated and emphasized the decreed seniority to groundwater rights, and further asserts that these surface water rights are protected by the Muddy River Decree and the prior appropriation doctrine.<sup>147</sup>

*United States Department of the Interior, National Park Service*

NPS submitted both an initial and rebuttal report in response to the Interim Order 1303 solicitation and presented testimony during the hearing.<sup>148</sup> Based upon NPS's evaluation of the evidence relating to the Order 1169 aquifer test, the use of an updated numerical groundwater flow model previously developed to predict conditions within the LWRFS, data compiled since the conclusion of the Order 1169 aquifer test, and review of other available data, NPS came to multiple conclusions relating to the delineation and management of the LWRFS. NPS advocates for the

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<sup>143</sup> Tr. 1693–1696, 1705.

<sup>144</sup> MVIC Ex. 1, *MVIC Rebuttal Report dated August 15, 2019*, Hearing on Interim Order 1303, official records of the Division of Water Resources. MVIC identified sections from the SNWA report, but the references do not correspond with sections in SNWA's report. The State Engineer assumes that these section numbers correspond to page numbers of the SNWA report; *See also*, SNWA Ex. 7, Burns, A., Drici, W., Collins, C., and Watrus, J., 2019, *Assessment of Lower White River Flow System water resource conditions and aquifer response, Presentation to the Office of the Nevada State Engineer: Southern Nevada Water Authority, Las Vegas, Nevada*, Hearing on Interim Order 1303, official records of the Division of Water Resources.

<sup>145</sup> MVIC Ex. 1, p. 5; Tr. 1698.

<sup>146</sup> *See* MVIC Ex. 1, p. 3; Tr. 1697–1968.

<sup>147</sup> *Muddy Valley Irrigation Company Post Hearing Closing Statement (MVIC Closing)*, Hearing on Interim Order 1303, official records of the Division of Water Resources; Tr. 1967, 1700–1708. *See also*, NSE Ex. 333, *Muddy River Decree*, Hearing on Interim Order 1303, official records of the Division of Water Resources.

<sup>148</sup> *See* NPS Ex. 2, *Prediction of the Effects of Changing the Spatial Distribution of Pumping in the Lower White River Flow System*, Waddell, July 3, 2019; Tr. 494–597.

inclusion of the entirety of the Black Mountains Area within the geographic boundary of the LWRFS based upon its review of geologic conditions that facilitate flow from the southern portion of the LWRFS through the Muddy Mountains thrust sheet and discharging in Rogers Spring and Blue Point Spring.<sup>149</sup> Further supporting this opinion, NPS cites to spring chemistry and isotopic composition of the water discharging from Rogers Spring and Blue Point Spring and the hydraulic head conditions that NPS believes supports the flow of groundwater beneath the Muddy Mountains from the carbonate-rock aquifer to those springs.<sup>150</sup> NPS acknowledge that there is a weak hydraulic connection between Rogers Spring and Blue Point Spring to the LWRFS based upon the geologic conditions within the Muddy Mountains, but argues that the entirety of the Black Mountains Area should be included to allow for management of the regional carbonate-aquifer to protect against diminished discharge to those springs.<sup>151</sup>

In addition to advocating for the inclusion of the entirety of the Black Mountains Area, the NPS provided evidence and analysis to support its conclusion that Kane Springs Valley too should be included within the geographic boundary of the LWRFS.<sup>152</sup> Based upon a review of the hydrologic data, geology of the Kane Springs Valley and basin boundaries, Coyote Spring Valley, and data from the Order 1169 aquifer test, NPS concludes that there is a clearly established hydrological connection between Kane Springs Valley and the other LWRFS basins, including discharge to the Warm Springs area.<sup>153</sup> While NPS advocates for the inclusion of the entire Black Mountains Area and Kane Springs Valley, it did not find any evidence to support the inclusion of the Las Vegas Valley within the LWRFS based upon a similar review of the geology and hydrological data.<sup>154</sup>

In interpreting data since the conclusion of the Order 1169 aquifer test, NPS reviewed the available data, concluding that the decades long decline of groundwater levels is not attributable to climate, but rather that the groundwater pumping within the LWRFS is the contributing

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<sup>149</sup> See NPS Ex. 2, p. 22. See also, Tr. 569–70; NPS, *Closing Statements Interim Order 1303 Hearing Testimony* (NPS Closing), Hearing on Interim Order 1303, official records of the Division of Water Resources, p. 2.

<sup>150</sup> NPS Ex. 2, p. 22; NPS Closing, pp. 2–4.

<sup>151</sup> *Id.*

<sup>152</sup> NPS Ex. 2, p. 22; NPS Ex. 3, pp. 5–11; Tr. 550–551; NPS Closing, pp. 4–5.

<sup>153</sup> NPS Ex. 2, p. 22; NPS Ex. 3, pp. 5–11; Tr. 550–551; NPS Closing, pp. 5–6.

<sup>154</sup> NPS Ex. 2, p. 22; Tr. 552–554.

factor.<sup>155</sup> NPS opined that if recent pumping withdrawals continued, the current declining trend would be accelerated, adversely impacting spring discharge in the Warm Springs area and Muddy River flow.<sup>156</sup> Further, NPS's review of the data lead to its conclusion that it will take many years, if not decades for the LWRFS carbonate-rock aquifer to reach equilibrium, particularly at the current groundwater pumping withdrawals and even longer if pumping withdrawals occurred at Order 1169 aquifer test levels.<sup>157</sup> However, NPS did not provide an opinion as what rate of groundwater withdrawals would be sustainable within the LWRFS.

Finally, NPS concluded that the movement of groundwater withdrawals from the alluvial aquifer within the Muddy River Springs Area to the carbonate-rock aquifer within the LWRFS would ultimately have little impact on capture of Muddy River flow. Specifically, NPS found that while there may be near-term benefits to the Warm Springs area and Muddy River flow, those benefits would eventually disappear, as the impact would only be delayed and not eliminated.<sup>158</sup>

#### *Nevada Cogeneration Associates*

NCA submitted a Rebuttal Report Pertaining to Interim Order 1303 and provided testimony at the Interim Order 1303 hearing.<sup>159</sup> NCA objected to the inclusion of certain non-profit organizations on the basis that those organizations were not stakeholders and did not have an interest to protect as the non-governmental organizations did not have water rights within the LWRFS basins effected by the proceedings.<sup>160</sup>

With respect to the geographic boundary of the LWRFS, in its Rebuttal Report, NCA is of the opinion that the northwestern portion of the Black Mountains Area, as identified by the State Engineer, should be within the LWRFS basins, but expressed its disagreement with other opinions advocating for the inclusion of the entire Black Mountains Area based upon NCA's analysis of the geology and groundwater elevations.<sup>161</sup> During the Interim Order 1303 hearing and in its Post-Hearing Brief, NCA's opinion shifted to advocate for the boundary of the LWRFS to be adjusted

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<sup>155</sup> NPS Ex. 2, pp. 7, 22–23. *See also* NPS Closing, pp. 5–6.

<sup>156</sup> *Id.*

<sup>157</sup> *Id.*

<sup>158</sup> NPS Ex. 2, p. 23. *See also* NPS Closing, p. 6, and Tr. 593–594.

<sup>159</sup> NCA Ex. 1, *NCA Rebuttal Report Pertaining to Interim Order 1303 August 16, 2019*, Hearing on Interim Order 1303, official records of the Division of Water Resources; Tr. 1602–50.

<sup>160</sup> NCA Ex. 1, pp. 1, 23.

<sup>161</sup> *Id.*, pp. 2, 23.



to exclude its production wells in the Black Mountains Area; however, NCA did not alter its opinion regarding the remaining portion of the Black Mountains Area staying within the LWRFS.<sup>162</sup>

NCA further expressed that the Lower Meadow Valley Wash should not be included in the LWRFS boundaries based upon the fact that observed groundwater levels do not indicate a hydrologic response to carbonate-rock aquifer pumping and that insufficient data supports a finding of continuity between water level trends to support its inclusion in the LWRFS.<sup>163</sup> However, NCA advocated for the inclusion of the Kane Springs Valley within the LWRFS based upon its opinion that the groundwater data demonstrated hydrologic connectivity between Coyote Spring Valley and Kane Springs Valley, acknowledging that the data is slightly attenuated resulting from the Kane Springs fault.<sup>164</sup> Ultimately, NCA concluded that Kane Springs Valley is tributary to the Coyote Spring Valley and the other LWRFS basins, which justify its inclusion within the boundary of the LWRFS.<sup>165</sup>

Similarly, based upon the groundwater data from the northern portion of Coyote Spring Valley demonstrating similar water level responses as other wells throughout the LWRFS and pumping data demonstrating high hydrologic connectivity across all the LWRFS basins, NCA concluded that there was no basis to exclude the northern portion of Coyote Spring Valley.<sup>166</sup> Finally, NCA rejected a suggestion that the entirety of the White River Flow system, which extends into northeastern Nevada, be included within the management area.<sup>167</sup> Specifically, NCA concluded that the Pahrangat Shear Zone creates a significant barrier to the northwestern portion of the LWRFS and that review of groundwater levels does not support a finding that groundwater level declines propagate into the northern reaches of the White River Flow System.<sup>168</sup> NCA concluded, advocating that proper management of the LWRFS is appropriate and sufficient for the

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<sup>162</sup> *Post-hearing brief of Nevada Cogeneration Associates Nos. 1 and 2 pertaining to Amended Notice of Hearing Interim Order #1303 following the hearing conducted September 23, 2019, through October 4, 2019, before the Nevada State Engineer (NCA Closing), Hearing on Interim Order 1303, official records of the Division of Water Resources, pp. 2–10. See also* Tr. 1619–22.

<sup>163</sup> NCA Ex. 1 pp. 3–7, 23. *See also* NCA Closing, pp. 15–16.

<sup>164</sup> NCA Ex. 1, pp. 8–17, 23. *See also* NCA Closing, pp. 10–14, and Tr. 1629–44.

<sup>165</sup> NCA Ex. 1, pp. 11–16.

<sup>166</sup> *Id.*, pp. 17–18, 23.

<sup>167</sup> *Id.*, pp. 19, 24.

<sup>168</sup> *Id.*

purpose of managing discharge of groundwater to the Warm Springs area to support habitat for the Moapa dace and serve senior Muddy River decreed rights.<sup>169</sup>

In addressing the annual amount of groundwater that could be developed within the LWRFS without adversely impacting senior decreed rights on the Muddy River or Warm Springs area discharge supporting the habitat for the Moapa dace, NCA supported a target of 9,318 afa, a recent three-year average of annual pumping within the LWRFS,<sup>170</sup> as it did not believe there to be sufficient data to support either an increase or decrease from this amount.<sup>171</sup> However, in its post-hearing brief, NCA opined that if their production wells located within the northwestern portion of the Black Mountains Area were excluded from the LWRFS boundary, then the annual amount of water that could be sustainably developed was less than the 9,318 afa.<sup>172</sup>

Finally, NCA did not support movement of water rights from the Muddy River Springs Area alluvial aquifer to the carbonate-rock aquifer, as it was of the opinion that the movement of those rights would not mitigate impact to the Warm Springs area.<sup>173</sup> Rather, NCA concluded that movement of those rights would compound the impact of pumping from the carbonate-rock aquifer.<sup>174</sup> However, NCA did express some support for movement of senior alluvial water rights as a management tool to offset existing junior carbonate-rock aquifer pumping within the LWRFS.<sup>175</sup>

#### *NV Energy*

NV Energy submitted a rebuttal report outlining its responses to the five matters the State Engineer solicited in Interim Order 1303 and presented its opinions and conclusions during the Interim Order 1303 hearing.<sup>176</sup> In its rebuttal report, NV Energy opined that the geographic boundary of the LWRFS should be as established in Interim Order 1303.<sup>177</sup> NV Energy further

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<sup>169</sup> *Id.*

<sup>170</sup> NCA Ex. 1, p. 19. *See, e.g.* Draft order of the State Engineer distributed to LWRFS stakeholders at the LWRFS Working Group meeting, September 19, 2018, official records of the Division of Water Resources.

<sup>171</sup> *Id.*, pp. 18, 24.

<sup>172</sup> NCA Closing, pp. 14–15.

<sup>173</sup> NCA Ex. 1, pp. 19–23, 24.

<sup>174</sup> *Id.*

<sup>175</sup> *Id.*

<sup>176</sup> NVE Ex. 1, *NV Energy Rebuttal Report to State Engineer's Order 1303 Initial Reports by Respondents*, Hearing on Interim Order 1303, official records of the Division of Water Resources.

<sup>177</sup> *Id.*, pp. 1–2.

opined that the existence of subsurface outflow from Kane Springs Valley into the LWRFS basins was insufficient to support its inclusion.<sup>178</sup>

NV Energy, in its rebuttal report, disagreed with MBOP's conclusion that the groundwater level declines observed during and after the Order 1169 aquifer test were primarily caused by drought. Rather, NV Energy agreed with SNWA's and MVWD's conclusions that the groundwater recovery occurred between 2–3 years following the conclusion of the aquifer test, but that continued pumping within the carbonate-rock aquifer has inhibited recovery to pre-Order 1169 aquifer test groundwater levels, and that at the current rate of carbonate-rock aquifer pumping the aquifer has nearly reached steady-state conditions and discharge to the Warm Springs area has reached equilibrium.<sup>179</sup>

NV Energy further agreed in its rebuttal report with MBOP's and CNLV's conclusions that some groundwater flowing within the carbonate-rock aquifer bypassed the Muddy River Springs Area, and ultimately the Muddy River. NV Energy also agreed that groundwater development within the southern boundary of the LWRFS would likely have less of an effect on discharge to the Warm Springs area and the river. NV Energy did not opine as to the quantity of water that bypassed the springs, but inferred that the current 7,000–8,000 acft of carbonate-rock aquifer pumping appeared to support the conclusion that steady-state conditions had been reached.<sup>180</sup> NV Energy also opined that movement of senior certificated alluvial water rights in the Muddy River Springs Area to carbonate-rock aquifer wells located in the southern portion of the LWRFS may be considered acceptable as Nevada law allows for the reasonable lowering of the groundwater table, and such movement would not necessarily result in a conflict to existing rights.<sup>181</sup> NV Energy further concluded that, contrary to the conclusions of MBOP, drought was not a significant cause for the groundwater level declines observed.<sup>182</sup> Finally, NV Energy concluded with suggestions that the State Engineer either: (1) combine the LWRFS basins into a single hydrographic basin and declare the new basin to be a Critical Management Area pursuant to NRS 534.037 and 534.110; or, (2) for the State Engineer to, under his authority in NRS 534.020 and

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<sup>178</sup> *Id.*

<sup>179</sup> *Id.*, pp. 2–7.

<sup>180</sup> NVE Ex. 1, p. 8.

<sup>181</sup> *Id.*, pp. 8–9; *Nevada Energy's Closing Statements* (NV Energy Closing), Hearing on Interim Order 1303, official records of the Division of Water Resources, pp. 4–5.

<sup>182</sup> *Id.*, pp. 9–12.

534.120, require the water right holders within the LWRFS to develop a conjunctive management plan.<sup>183</sup>

After considering all of the evidence and testimony presented at the Interim Order 1303 hearing, NV Energy ultimately altered its opinion and found compelling arguments to both support the inclusion of Kane Springs Valley in the LWRFS as well as its exclusion.<sup>184</sup> Ultimately, NV Energy changed its opinion with respect to the geographic boundary of the LWRFS and in its closing statement expressed support for the inclusion of Kane Springs Valley within the LWRFS boundary due to the connection with Coyote Spring Valley and thus the potential for impacts to LWRFS from pumping within Kane Springs Valley.<sup>185</sup> NV Energy proposes that the current pumping regime of 7,000 to 8,000 afy be maintained to evaluate the potential for steady-state conditions and the continued monitoring of the Warm Springs West gage and agrees that moving pumping further south may reduce impact to the Muddy River and springs. With regards to moving water between the alluvial and carbonate-rock aquifers, similar to others, NV Energy agrees with the evaluation of change applications on a case-by-case basis with demonstration that impacts are reduced or unchanged by the proposed point of diversion compared to the existing point of diversion. NV Energy supports an agreement that would include all water users within the LWRFS for the purposes of not exceeding stresses within system and protecting the Moapa dace.<sup>186</sup>

*Southern Nevada Water Authority and Las Vegas Valley Water District*

The SNWA and LVVWD submitted multiple reports in response to the Interim Order 1303 solicitation.<sup>187</sup> SNWA and LVVWD supported the boundary of the LWRFS as identified in Interim Order 1303, and argued that there was a general consensus of the participants regarding the

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<sup>183</sup> *Id.*, p. 12.

<sup>184</sup> Tr. 1761–1762.

<sup>185</sup> NV Energy Closing, pp. 2–3.

<sup>186</sup> *Id.*, pp. 3–6.

<sup>187</sup> SNWA Ex. 7; SNWA Ex. 8, *Marshall, Z.L., and Williams, R.D., 2019, Assessment of Moapa dace and other groundwater-dependent special status species in the Lower White River Flow System, Presentation to the Office of the Nevada State Engineer: Southern Nevada Water Authority, Las Vegas, Nevada*, Hearing on Interim Order 1303, official records of the Division of Water Resources; SNWA Ex. 9, *Burns, A., Drici, W., and Marshall Z.L., 2019, Response to stakeholder reports submitted to the Nevada State Engineer with regards to Interim Order 1303, Presentation to the Office of the Nevada State Engineer: Southern Nevada Water Authority, Las Vegas, Nevada*, Hearing on Interim Order 1303, official records of the Division of Water Resources.

boundaries based upon the hydraulic connectivity within the identified basins.<sup>188</sup> Further, SNWA and LVVWD argued against the exclusion of the northern and western portions of Coyote Spring Valley, that management of adjoining basins should be done in a manner recognizing an impact on pumping from those basins on water availability in the LWRFS basins, and that the Las Vegas Valley should be excluded from the LWRFS.<sup>189</sup>

With respect to the evaluation of the carbonate-rock aquifer recovery since the conclusion of the Order 1169 aquifer test, SNWA and LVVWD concluded that the aquifer has not returned to pre-Order 1169 levels, and that the evidence demonstrates a continued declining trend within the carbonate-rock aquifer as a result of continued groundwater pumping.<sup>190</sup> SNWA and LVVWD concluded that the current pumping continues to capture groundwater storage and that based upon the current rate of groundwater withdrawals, water levels within the carbonate-rock aquifer will continue to decline for the foreseeable future.<sup>191</sup> Further, SNWA and LVVWD rejected the premise that climate was a significant factor over groundwater withdrawals for the observed groundwater level decline.<sup>192</sup>

Based upon a review of the evidence, SNWA and LVVWD concluded that current rate of groundwater withdrawals were not sustainable without adversely impacting senior Muddy River water rights and Moapa dace habitat.<sup>193</sup> Based upon the analysis performed by SNWA and LVVWD, examining the discharge from the Muddy River Springs Area and groundwater production within the carbonate-rock aquifer within the LWRFS, SNWA and LVVWD concluded that any groundwater development within the carbonate-rock aquifer resulted in a one-to-one (1:1) ratio of capture of Muddy River flow, and that regardless of where that pumping occurred, it still resulted in a 1:1 ratio of capture, only that the period of time that the capture was realized was longer.<sup>194</sup> Ultimately, SNWA and LVVWD concluded that while any amount of pumping results

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<sup>188</sup> SNWA Ex. 7, pp. 5-1 through 5-18, 8-1. *See also*, Tr. 953.

<sup>189</sup> *Closing Brief of Southern Nevada Water Authority and Las Vegas Valley Water District* (SNWA Closing), pp. 4-9, Hearing on Interim Order 1303, official records of the Division of Water Resources. *See also* SNWA Ex. 9 at sections 6, 7 and 12.

<sup>190</sup> SNWA Closing, pp. 9-12. *See also* SNWA Ex. 7, pp. 5-1 through 5-18, and SNWA Ex. 9, pp. 15-20.

<sup>191</sup> SNWA Closing, pp. 11-12. *See also* Tr. 932.

<sup>192</sup> SNWA Closing, pp. 12-14. *See also* SNWA Ex. 9, pp. 15-17.

<sup>193</sup> SNWA Ex. 7, pp. 6-3 through 6-4, 8-2 through 8-4.

<sup>194</sup> *Id.*, pp. 6-4 through 6-11, 8-2 through 8-4; SNWA Ex. 9, pp. 22-27.

in a conflict with senior decreed Muddy River rights, approximately 4,000 to 6,000 afa could be sustainably pumped from the aquifer.<sup>195</sup> In conjunction with SNWA and LVVWD's evaluation of the quantity of water that may be sustainably developed within the LWRFS, SNWA and LVVWD reviewed the interrelationship between discharge from the carbonate-rock aquifer underlying the LWRFS, groundwater pumping and the impact on the habitat and recovery of the Moapa dace.<sup>196</sup> SNWA and LVVWD ultimately concluded that the flow required to sustain the Moapa dace from adverse effects, including habitat loss and fish population declines was a minimum 3.2 cfs at the Warm Springs West gage.<sup>197</sup>

Finally, it was SNWA and LVVWD's opinion that movement of water rights from the Muddy River Springs Area alluvial aquifer to the carbonate-rock aquifer within the LWRFS may delay the capture of water serving senior decreed rights on the Muddy River, but that movement of water from the alluvial aquifer to the carbonate-rock aquifer would adversely impact the habitat of the Moapa dace.<sup>198</sup> Thus, SNWA and LVVWD concluded transfer of water rights from the Muddy River Springs Area alluvial aquifer to the LWRFS carbonate-rock aquifer would result in further depletion of flow to the Warm Springs area.<sup>199</sup>

#### *Technichrome*

Technichrome submitted a response and additional response to the Interim Order in July 2019 but did not participate in the hearing.<sup>200</sup> Technichrome stated that it had no objection to a "joint administrative basin" consisting of Coyote Spring Valley, Black Mountain Area, Garnet Valley, Hidden Valley, Muddy River Springs Area, and Lower Moapa Valley, expressed no comment regarding the inclusion of Kane Springs Valley, but questioned whether the entirety of the White River Flow System should be included in the State Engineer's analysis.<sup>201</sup> However,

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<sup>195</sup> Tr. 921–22. *See also* SNWA Ex. 7, pp. 8-1 through 8-5; SNWA Ex. 9, p. 27.

<sup>196</sup> *See* SNWA Ex. 8.

<sup>197</sup> *Id.*, pp. 8-1 through 8-2. *See also* SNWA Closing, pp. 17–19.

<sup>198</sup> *See* SNWA Closing, pp. 19–20. *See also* SNWA Ex. 7, pp. 6-3 through 6-11, 8-4; SNWA Ex. 9, pp. 21–22.

<sup>199</sup> SNWA Closing, p. 20. *See also* Tr. 904–05.

<sup>200</sup> *Response to Interim Order #1303 Submitted [sic] by Technichrome* (Technichrome Response), Hearing on Interim Order 1303, official records of the Division of Water Resources, and *Additional Comments from Technichrome* (Technichrome Addendum), Hearing on Interim Order 1303, official records of the Division of Water Resources.

<sup>201</sup> Technichrome Response, pp. 1–3.

Technichrome did note that it believed that combining all water rights into a single management structure reduced the State Engineer's ability to control groundwater withdrawals. Technichrome stated that it believed that the State Engineer should have the ability to control withdrawals in small areas to best manage the discharge to the Warm Springs area, and that more targeted control over the groundwater withdrawals would be more effective in managing the discharge.<sup>202</sup> Technichrome supported this opinion with some analysis of the results of the Order 1169 aquifer test and its opinion that pumping farther from the Warm Springs area had little to no impact on discharge to Pederson Spring.<sup>203</sup>

In Technichrome's additional comments, Technichrome addressed concerns regarding the injury that would result from a system-wide reduction of groundwater rights throughout the LWRFS.<sup>204</sup> Finally, Technichrome addressed concerns regarding reliance on the priority system, as utilization of the prior appropriation system would benefit senior irrigation uses over the junior industrial uses, and that removal of basin boundaries would remove limitations on movement of water rights between the existing hydrographic basins, which would disrupt junior uses in areas where senior rights may be moved.<sup>205</sup>

#### *U.S. Fish and Wildlife Service*

USFWS holds several water rights within the LWRFS and its mission is consistent with the scientific and management aspects of the LWRFS and the management area as established in Interim Order 1303.<sup>206</sup> USFWS opted to participate in the proceeding by submitting initial and rebuttal reports and providing testimony during the administrative hearing.<sup>207</sup> The approach of

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<sup>202</sup> *Id.*

<sup>203</sup> *Id.*, and Technichrome Addendum.

<sup>204</sup> Technichrome Addendum.

<sup>205</sup> *Id.*

<sup>206</sup> The USFWS' mission is to work with others to conserve, protect and enhance fish, wildlife and plants and their habitats for the continuing benefit of the American people. *See also*, USFWS, *About the U.S. Fish and Wildlife Service*, <https://bit.ly/aboutusfws> (last accessed June 4, 2020).

<sup>207</sup> USFWS Ex. 5, *Report in Response to Order 1303*, Hearing on Interim Order 1303, official records of the Division of Water Resources; USFWS Ex. 7, *Rebuttal to: Water Level Decline in the LWRFS: Managing for Sustainable Groundwater Development by Cady Johnson and Martin Mifflin [sic], Mifflin & Associates, Inc., submitted by the Moapa Band of Paiutes in accordance with Order 1303*, Hearing on Interim Order 1303, official records of the Division of Water Resources.

USFWS was to review available data, develop a hydrogeologic conceptual model, and answer the specific questions posed in Interim Order 1303.

USFWS proposed that the boundary be based on geologic breaks rather than the surface drainage areas. The boundary would then encompass all Muddy River Springs Area, Hidden Valley, Garnet Valley, most of Coyote Spring Valley, most of California Wash, the northwest portion of the Black Mountains area, Kane Springs Valley, and most of Lower Meadow Valley Wash. The extent to which Kane Springs Valley and Lower Meadow Valley Wash are included would depend on the data from an aquifer test that has not yet been performed.<sup>208</sup>

Although, USFWS did not directly opine their view on recovery, their report discusses a conceptual model with insight into lag times and hydraulic connections, and how current conditions relate to sustainable pumping. An “undiminished state of decline” in water levels and spring flows indicated that the system was not in equilibrium at the end of the Order 1169 aquifer test. USFWS postulated there was generally good connectivity within the aquifer system with areas of higher and lower transmittivity. Trends in water levels and spring flows allude to the connection between high elevation springs and carbonate-rock aquifer pumping, with a time lag observed in the recovery of carbonate-rock aquifer water levels and spring flows following the cessation of the Order 1169 aquifer test. The exception is Big Muddy Spring where surface water level trends appeared to be unrelated to the carbonate-rock aquifer water levels.<sup>209</sup>

USFWS determined that the optimum method currently available to estimate the maximum allowable rate of pumping in the LWRFS is the average annual rate of pumping from 2015–2017.<sup>210</sup> USFWS considered the period from 2015 to 2017 because it found that the groundwater withdrawals, the discharge of the Muddy River Springs, and the flow of the Muddy River were all relatively constant; flow rates from Plummer, Pederson, Jones and Baldwin springs, though generally lower than before the Order 1169 aquifer test, were reasonably stable compared to earlier

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<sup>208</sup> See USFWS Ex. 5, pp. 2, 28–36.

<sup>209</sup> USFWS Ex. 5, pp. 3, 32–33, 35, 37–45; Tr. 266–270, 273–281, 299–301, 433–435.

<sup>210</sup> USFWS Ex. 5, p. 3.



periods.<sup>211</sup> Using the pumpage inventories for this time period, USFWS estimated the sustainable groundwater withdrawals to be 9,318 afa.<sup>212</sup>

Even if total carbonate-rock and alluvial aquifer pumping is maintained at a “sustainable” overall level, USFWS did not support increased carbonated-rock aquifer pumping in exchange for reductions in alluvial aquifer pumping, nor did USFWS support increased alluvial aquifer pumping in exchange for reductions in carbonate-rock aquifer pumping. USFWS suggested that carbonate-rock aquifer pumping should not be moved closer to the springs or the river. Similarly, USFWS suggests that alluvial aquifer pumping in the vicinity of the river should not be moved closer to the river. USFWS opines that any movement of water nearer to the springs or the river is anticipated to decrease the lag time for observing responses from pumping and shorten the time to respond to unfavorable impacts.<sup>213</sup>

Moving forward with management of the LWRFS, USFWS supported the use of the triggers at the Warm Springs West gage, as established under the 2006 MOA. Continuing to use these Warm Springs West flows as a trigger for management will protect and provide habitat for the Moapa dace; a reduction in the flow translates to a reduction in habitat.<sup>214</sup>

USFWS did not deny that water levels were independent of a climate response signal. Using observed data for Nevada Climate Divisions, USFWS visually inspected hydrographs for climate signals. USFWS opined that response to wet periods are observed for wells in both the carbonate-rock and alluvial aquifers and springs that discharge from the carbonate-rock aquifer but stated that response to dry periods cannot be separated from the impacts of pumping. USFWS did not observe these same climate signals in the hydrographs for Jones and Baldwin Springs or the Big Muddy Spring. USFWS disagreed with the conclusion of the MBOP regarding long-term, regional drought, as well as the analytical methods.<sup>215</sup>

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<sup>211</sup> USFWS Ex. 5, pp. 3, 37; Tr. 269–270, 433–435.

<sup>212</sup> USFWS Ex. 5, pp. 3, 36–38; Tr. 268–270.

<sup>213</sup> See USFWS Ex. 5, pp. 3–4, 38–39; Tr. 272–273.

<sup>214</sup> See USFWS Ex. 5, pp. 4, 39–45; Tr. 273–282; See also, NSE Ex. 256; NSE Ex. 244, 2006 Memorandum of Agreement Trigger Levels agreed to by the Southern Nevada Water Authority, Moapa Valley Water District, Coyotes Springs Investments LLC and Moapa Band of Paiute Indians, Hearing on Interim Order 1303, official records of the Division of Water Resources.

<sup>215</sup> See USFWS Ex. 5, pp. 24–28, 34–35; See USFWS Ex. 7, pp. 2–16; Tr. 258–260, 299–322, 429–432.

*Western Elite Environmental/Bedroc*

Bedroc is the land holding and water-right holding entity for Western Elite Environmental, Inc., a provider of construction and recyclable waste collection and disposal in Southern Nevada.<sup>216</sup> Bedroc submitted an undated rebuttal report signed by Derek Muaina, General Counsel, and a closing statement.<sup>217</sup> Bedroc presented Jay Dixon as its expert to give a presentation and to discuss the rebuttal report.<sup>218</sup> Mr. Dixon stated that he contributed to the report, and that he agreed with it, but he did not sign the report because he was working for another participant in the hearing (NCA).<sup>219</sup> Mr. Dixon did provide testimony consistent with the report, and adopted the findings of that report, and both the testimony and the report will be considered in this Order.<sup>220</sup>

Bedroc presented testimony and evidence that its source of groundwater is hydraulically disconnected from the regional carbonate aquifer of the LWRFS and that additional groundwater may be available for pumping in their part of Coyote Spring Valley. Bedroc also argued that its basin fill alluvial groundwater pumping should be managed outside of the proposed LWRFS joint administrative unit.<sup>221</sup>

To show the hydraulic disconnect, Bedroc presented geologic information demonstrating its unique location.<sup>222</sup> Bedroc showed that a confining shelf of sedimentary rock was noticeably absent in the vicinity of the Bedroc site where recharge from the Sheep Range rises toward the surface between two faults, which results in shallow groundwater that is subject to ET and capture from shallow groundwater wells at the Bedroc site.<sup>223</sup> Recharge from the Sheep Range was estimated to be 750 afy, an average of the high and low estimates of the maximum recharge

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<sup>216</sup> Bedroc Ex. 2, *Interim Order 1303- Rebuttal Report- Prepared by Bedroc and Dixon Hydrologic, PLLC- August 2019*, Hearing on Interim Order 1303, official records of the Division of Water Resources.

<sup>217</sup> Bedroc Ex. 2; *Western Elite Environmental Inc.'s and Bedroc Limited, LLC's Closing Statement* (Bedroc Closing), Hearing on Interim Order 1303, official records of the Division of Water Resources.

<sup>218</sup> See Tr. 1718–1719.

<sup>219</sup> Tr. 1719, 1741.

<sup>220</sup> Tr. 1718–1757, 1749–1750.

<sup>221</sup> Bedroc Closing, pp. 13–14. Bedroc offered summary responses to the first four questions posed by Order 1303 but did no independent analysis. See Bedroc Closing, p. 12.

<sup>222</sup> Bedroc Closing, p. 2.

<sup>223</sup> *Id.*; Tr. 1726–1733.

available.<sup>224</sup> SNWA challenged this calculation, pointing out that the estimated recharge could be as low as 130 acre-feet.<sup>225</sup>

Bedroc believes that it is capturing the recharge that would otherwise be lost to evapotranspiration.<sup>226</sup> Groundwater conditions at Bedroc's site show a rise in water levels between 2003 and 2006.<sup>227</sup> Bedroc attributed this rise in part to the installation of an unlined storage pond upgradient from the well, but also to the 2005 recharge event that was discussed by many participants to the proceeding.<sup>228</sup> Between 2006 and 2011, Bedroc showed that groundwater levels had been relatively stable even though pumping by Bedroc was fairly constant.<sup>229</sup> Bedroc showed photo evidence of evapotranspiration occurring around the Bedroc site, pointing to areas of white surface soils and green occurring in the photo as evidence of salt residue and phreatophytes, both occurring as a result of shallow groundwater evaporation.<sup>230</sup> The area is estimated to be about 2,200 acres, and the ET range is estimated to be 0.2 to 0.3 feet per year.<sup>231</sup> This results in an estimate of 400 to 600 afa of groundwater that potentially could be captured every year without pulling groundwater from storage.<sup>232</sup> If pumping in this area exceeded ET, water levels to the east of Bedroc would be dropping.<sup>233</sup>

Bedroc considered the alluvial system at its location to be a separate aquifer from the carbonate-rock aquifer in the LWRFS.<sup>234</sup> CBD in its report also supports this conclusion, suggesting that some groundwater can be withdrawn from the Coyote Spring Valley alluvial aquifer system because that system is disconnected from and not responsible for substantial recharge to the carbonate-rock aquifer.<sup>235</sup> SNWA testified similarly during the hearing.<sup>236</sup>

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<sup>224</sup> Tr. 1724–1725, 1755.

<sup>225</sup> Tr. 1755.

<sup>226</sup> Bedroc Closing, pp. 5–9.

<sup>227</sup> Tr. 1735.

<sup>228</sup> *Id.*

<sup>229</sup> Tr. 1735–1736.

<sup>230</sup> Tr. 1734, 1738.

<sup>231</sup> Tr. 1739.

<sup>232</sup> Tr. 1739.

<sup>233</sup> Tr. 1739. *See also* Bedroc Closing, p. 8.

<sup>234</sup> Tr. 1746.

<sup>235</sup> Bedroc Ex. 2, p. 5.

<sup>236</sup> Tr. 1024.

Relying on a lack of connection between pumping at Bedroc and the carbonate-rock aquifer, Bedroc asserted that there is no likely impact to the Warm Springs area caused by Bedroc.<sup>237</sup> Bedroc compared groundwater elevations over time in two alluvial wells, CSV-3009M and CSVM-7, and showed an upward trend in groundwater elevations.<sup>238</sup> But, when comparing groundwater elevations of two monitoring wells in different sources, CSVM-7 in the alluvium and CSVM-4 in the carbonate-rock aquifers, the carbonate-rock aquifer well elevations showed a decline during the Order 1169 aquifer test, but the alluvial well elevation rose during the same period and leveled off after the conclusion of the test.<sup>239</sup> Bedroc concluded that these data illustrate 1) the hydraulic disconnect between the local alluvial aquifer and carbonate-rock aquifer and 2) if historical alluvial pumping at Bedroc has not impacted water levels in nearby alluvial wells, then there is likely no impact to spring or streamflow in the Muddy River Springs Area.

Finally, Bedroc stated that managing all users in the region under the same system would arbitrarily impact users whose water neither comes from the regional carbonate-rock aquifer system nor impacts the springs of concern downstream.<sup>240</sup> It urged caution in allowing transfer of water rights between alluvial and carbonate-rock aquifers due to potential impacts on senior users that are using local recharge that may not sustain pumping from additional users.<sup>241</sup> Transfers of senior alluvial rights from the Muddy River Springs Area to the area near Bedroc should be considered on a case-by-case basis to protect Bedroc's senior water rights.<sup>242</sup>

### III. PUBLIC COMMENT

**WHEREAS**, following the conclusion of the Interim Order 1303 hearing, opportunity for public comment was offered, including the opportunity to submit written public comment, which was due to be submitted to the Division no later than December 3, 2019. Lincoln County Board of

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<sup>237</sup> Bedroc Closing, p.11. *See also* SNWA testimony of Andrew Burns that pumping at Bedroc wells is not likely to impact the carbonate system or the Muddy River. Tr. 1024–1025.

<sup>238</sup> Bedroc Closing, p. 12. *See also* Tr. 1736–1737, 1752.

<sup>239</sup> Tr. 1737–1738.

<sup>240</sup> Bedroc Ex. 2, pp. 2–4.

<sup>241</sup> *Id.*, p. 6.

<sup>242</sup> Tr. 1740.

County Commissioners submitted written public comment in addition to the closing argument submitted by LC-V.<sup>243</sup>

#### IV. AUTHORITY AND NECESSITY

**WHEREAS**, NRS 533.024(1)(c) directs the State Engineer “to consider the best available science in rendering decisions concerning the availability of surface and underground sources of water in Nevada.”

**WHEREAS**, in 2017 the Nevada Legislature added NRS 533.024(1)(e), declaring the policy of the State to “manage conjunctively the appropriation, use and administration of all waters of this State regardless of the source of the water.”

**WHEREAS**, NRS 534.020 provides that all waters of the State belong to the public and are subject to all existing rights.

**WHEREAS**, as demonstrated by the results of the Order 1169 aquifer test and in the data collected in the years since the conclusion of the aquifer test, the LWRFS exhibits a direct hydraulic connection that demonstrates that conjunctive management and joint administration of these groundwater basins is necessary and supported by the best available science.<sup>244</sup>

**WHEREAS**, the pre-development discharge of 34,000 acre-feet of the fully appropriated Muddy River system plus the more than 38,000 acre-feet of groundwater appropriations within the LWRFS greatly exceed the total water budget that may be developed without impairment of senior existing rights or proving detrimental to the public interest.

**WHEREAS**, the available groundwater supply within the LWRFS that can be continually pumped over the long-term is limited to the amount that may be developed without impairing existing senior rights, rights on the Muddy River or adversely affecting the public interest in

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<sup>243</sup> See Board of County Commissioners, Lincoln County, Nevada, *Public Comment to Interim Order #1303 Hearing, Reports, and Evidence on the Lower White River Flow System*, Hearing on Interim Order 1303, official records of the Division of Water Resources.

<sup>244</sup> See, e.g., NSE Ex. 245; NSE Ex. 248; NSE Ex. 256; NSE Ex. 252; NSE Ex. 282, *Federal Bureaus Order 1169 Report Selected References: Comparison of Simulated and Observed Effects of Pumping from MX-5 Using Data Collected to the Endo of the Order 1169 Test, and Prediction of the Rates of Recovery from the Test*, TetraTech, 2013, Hearing on Interim Order 1303, official records of the Division of Water Resources. See also, e.g., CBD Ex. 3; MVWD Exs. 3–4; MVIC Ex. 1; NCA Ex. 1, SNWA Exs. 7–9; USFWS Exs. 5–6; NPS Exs. 2–3.

protection of the endangered Moapa dace and the habitat necessary to support the management and recovery of the Moapa dace.

**WHEREAS**, pursuant to NRS 532.120, the State Engineer is empowered to make such reasonable rules and regulations as may be necessary for the proper and orderly execution of the powers conferred by law.

**WHEREAS**, pursuant to NRS 534.110(6) the State Engineer is directed to conduct investigations in groundwater basins where it appears that the average annual replenishment of the groundwater is insufficient to meet the needs of all water right holders, and if there is such a finding, the State Engineer may restrict withdrawals to conform to priority rights.

**WHEREAS**, within an area that has been designated by the State Engineer, as provided for in NRS Chapter 534, and specifically, NRS 534.120, where, in the judgment of the State Engineer, the groundwater basin is being depleted, the State Engineer in his or her administrative capacity may make such rules, regulations and orders as are deemed essential for the welfare of the area involved.<sup>245</sup>

**WHEREAS**, the State Engineer has the authority to hold a hearing to take evidence and the interpretation of the evidence with respect to its responsibility to manage Nevada's water resources and to allow willing participants to present evidence and testimony regarding the conclusions relating to the questions presented in Interim Order 1303. The State Engineer recognizes that the MBOP is a federally recognized tribe, and that its participation in the hearing was to facilitate the understanding of the interpretation of data with respect to the Interim Order 1303 solicitation.

#### V. ENDANGERED SPECIES ACT

**WHEREAS**, the Endangered Species Act (ESA), 16 U.S.C. §1531 et seq. is a federal law designed to serve the purpose of identifying, conserving and ultimately recovering species declining toward extinction.<sup>246</sup> Specifically, while the ESA is primarily a conservation program, a critical element of the conservation component seeks to encourage cooperation and coordination

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<sup>245</sup> See also NRS 534.030, NRS 534.110.

<sup>246</sup> 16 U.S.C. § 1531(a)-(b).

with state and local agencies.<sup>247</sup> The responsibility of enforcement and management under the ESA rests predominately with the federal government; however, the ultimate responsibility is shared.<sup>248</sup>

WHEREAS, the ESA makes it unlawful for any person to “take” an endangered species — or to attempt to commit, solicit another to commit, or cause to be committed, a taking.<sup>249</sup> The term “person” is broadly defined to include the State and its instrumentalities.<sup>250</sup> “Take” encompasses actions that “harass, harm” or otherwise disturb listed species, including indirect actions that result in a take.<sup>251</sup> For example, a state regulator is not exempted from the ESA for takings that occur as a result of a licensee’s regulated activity. States have been faced with the impediment of their administrative management actions being subservient to the ESA. For example, the Massachusetts Division of Marine Fisheries was subject to an injunction prohibiting it from issuing commercial fishing licenses because doing so would likely lead to the taking of an endangered species.<sup>252</sup> In *Strahan v. Coxe*, the court’s decision relied on reading two provisions of the ESA— the definition of the prohibited activity of a “taking” and the causation by a third party of a taking— “to apply to acts by third parties that allow or authorize acts that exact a taking and that, but for the permitting process, could not take place.”<sup>253</sup> Although Massachusetts was not the one directly causing the harm to the endangered species, the court upheld the injunction because “a governmental third party pursuant to whose authority an actor directly exacts a taking of an endangered species may be deemed to have violated the provisions of the ESA.”<sup>254</sup> At least three other circuits have held similarly.<sup>255</sup> In each case, “the regulatory entity purports to make lawful an activity that allegedly violates the ESA.”<sup>256</sup> Thus the action of granting the permit for the regulated activity has been considered an indirect cause of a prohibited taking under the ESA.

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<sup>247</sup> 16 U.S.C. § 1531(c); 16 U.S.C. § 1536.

<sup>248</sup> 16 U.S.C.A. § 1536.

<sup>249</sup> 16 U.S.C.A. § 1538(g).

<sup>250</sup> 16 U.S.C.A. § 1532(13).

<sup>251</sup> 16 U.S.C.A. § 1532(19). The term “harm” is defined by regulation, 50 C.F.R. § 17.3 (1999).

<sup>252</sup> *Strahan v. Coxe*, 127 F.3d 155 (1st Cir.1997), *cert denied* 525 U.S. 830 (1998).

<sup>253</sup> *Id.*, p. 163.

<sup>254</sup> *Id.*

<sup>255</sup> See *Sierra Club v. Yeutter*, 926 F.2d 429 (5th Cir.1991); *Defenders of Wildlife v. EPA*, 882 F.2d 1294 (8th Cir. 1989); *Loggerhead Turtle v. County Council*, 148 F.3d 1231 (11th Cir.1998); *Palila v. Hawaii Dept. of Land & Natural Resources*, 852 F.2d 1106 (9th Cir.1988).

<sup>256</sup> *Loggerhead Turtle*, 148 F.3d at 1251.

**WHEREAS**, the use of water in Nevada is a regulated activity.<sup>257</sup> It is the responsibility of the State to manage the appropriation, use and administration of all waters of the state.<sup>258</sup> Based on *Strahan* and similar decisions, the act of issuing a permit to withdraw groundwater that reduces the flow of the springs that form the habitat of the Moapa dace and were to result in harm to the Moapa dace exposes the Division, the State Engineer and the State of Nevada to liability under the ESA.

**WHEREAS**, a USFWS biological opinion for the MOA found that the reduction in spring flow from the warm springs could impact the dace population in multiple ways. First, the USFWS found that declines in groundwater levels will reduce the flow to the Warm Springs area and allow for cooler groundwater seepage into streams. With reduced spring flow, Moapa dace habitat is reduced.<sup>259</sup> Additionally, USFWS determined that the reduced flows of warm water from the springs will also result in cooler water available throughout the dace habitat, reducing spawning habitat and resulting in a population decline.<sup>260</sup>

**WHEREAS**, based upon the testimony and evidence offered in response to Interim Order 1303, it is clear that it is necessary for spring flow measured at the Warm Springs West gage to flow at a minimum rate of 3.2 cfs in order to maintain habitat for the Moapa dace.<sup>261</sup> A reduction of flow below this rate may result in a decline in the dace population. This minimum flow rate is not necessarily sufficient to support the rehabilitation of the Moapa dace.<sup>262</sup>

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<sup>257</sup> NRS 533.030; 533.325; 534.020.

<sup>258</sup> NRS 533.325; 533.024(1)(e); 534.020.

<sup>259</sup> USFWS Ex. 5, pp. 50–52.

<sup>260</sup> SNWA Ex. 8, pp. 6-2 through 6-3; SNWA Ex. 40, *Hatten, J.R., Batt, T.R., Scopettone, G.G., and Dixon, C.J., 2013, An ecohydraulic model to identify and monitor Moapa dace habitat. PLoS ONE 8(2):e55551, doi:10.1371/journal.pone.0055551.*, Hearing on Interim Order 1303, official records of the Division of Water Resources; SNWA Ex. 41, *U.S. Fish and Wildlife Service, 2006a, Intra-service programmatic biological opinion for the proposed Muddy River Memorandum of Agreement regarding the groundwater withdrawal of 16,100 acre-feet per year from the regional carbonate aquifer in Coyote Spring Valley and California Wash basins, and establish conservation measures for the Moapa Dace, Clark County, Nevada. File No. 1-5-05 FW-536, January 30, 2006.*, Hearing on Interim Order 1303, official records of the Division of Water Resources.

<sup>261</sup> Tr. 1127–1128.

<sup>262</sup> Tr. 401–402, 1147, 1157–1158.



**WHEREAS**, the ESA prohibits any loss of Moapa dace resulting from actions that would impair habitat necessary for its survival. Some groundwater users are signatories to an MOA that authorizes incidental take of the Moapa dace; however, the State Engineer and many other groundwater users are not covered by the terms of the MOA.<sup>263</sup> Not only would liability under the ESA for a “take” extend to groundwater users within the LWRFS, but would so extend to the State of Nevada through the Division as the government agency responsible for permitting water use.

**WHEREAS**, the State Engineer concludes that it is against the public interest to allow groundwater pumping from the LWRFS that will reduce spring flow in the Warm Springs area to a level that would impair habitat necessary for the survival of the Moapa dace and could result in take of the endangered species.

#### **VI. GEOGRAPHIC BOUNDARY OF THE LWRFS**

**WHEREAS**, the geographic boundary of the hydrologically connected groundwater and surface water systems comprising the LWRFS, as presented in Interim Order 1303, encompasses the area that includes Coyote Spring Valley, Muddy River Springs Area, California Wash, Hidden Valley, Garnet Valley and the northwest portion of the Black Mountains Area.<sup>264</sup> The rationale for incorporating these areas into a single administrative unit included the presence of a distinct regional carbonate-rock aquifer that underlies and uniquely connects these areas; the remarkably flat potentiometric surface observed within the area; the diagnostic groundwater level hydrographic pattern exhibited by monitoring wells distributed across the area; and the area-wide diagnostic water level response to pumping during the Order 1169 aquifer test. Each of these characteristics were previously identified and examined in the hydrological studies and subsequent hearing that followed the completion of the Order 1169 aquifer test. Indeed, these characteristics were the foundational basis for the State Engineer’s determination in Rulings 6254–6261 that the

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<sup>263</sup> NSE Ex. 236; SNWA Ex. 8, pp. 5-1 through 5-8.

<sup>264</sup> See NSE Ex. 1, p. 6.

close hydrologic connection<sup>265</sup> and shared source and supply of water in the LWRFS required joint management.<sup>266</sup>

**WHEREAS**, evidence and testimony presented during the Interim Order 1303 hearing indicated a majority consensus among stakeholder participants that this originally defined area is appropriately combined into a single unit.<sup>267</sup> Evidence and testimony was also presented on whether to add adjacent basins, or parts of basins to the administrative unit; to modify boundaries within the existing administrative unit; or to eliminate the common administrative unit boundaries. The State Engineer has considered this evidence and testimony on the basis of a common set of criteria that are consistent with the original characteristics considered critical in demonstrating a close hydrologic connection requiring joint management in Rulings 6254–6261 and more specifically, include the following:

1) Water level observations whose spatial distribution indicates a relatively uniform or flat potentiometric surface are consistent with a close hydrologic connection.

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<sup>265</sup> The State Engineer notes that the terminology “*hydrologic connection*” and “*hydraulic connection*” have been used by different parties sometimes interchangeably, and commonly with nearly the same meaning. The State Engineer considers a hydraulic connection to be intrinsically tied to the behavior and movement of water. With regard to aquifers, it may be thought of as the natural or induced movement of water through permeable geologic material. The degree of hydraulic connection can be considered a measure of the interconnection between locations as defined by a cause and effect change in potentiometric surface or a change in groundwater inflow or outflow that reflects characteristics of both the aquifer material and geometry, and groundwater behavior. It is commonly characterized by a response that is transmitted through the aquifer via changes in hydraulic head, ie., groundwater levels. Hydrologic connections may include hydraulic connections but can also represent more complex system interactions that can encompass all parts of the water cycle, and in some cases may focus on flow paths, water budgets, geochemical interactions, etc. The State Engineer’s use of the term “*close hydrological connection*” is intended to encompass and include a direct hydraulic connection that is reflected in changes in groundwater levels in response to pumping or other fluxes into or out of the aquifer system within a matter of days, months, or years. The closeness, strength, or directness of the response is indicated by timing, with more distinct and more immediate responses being more “close”.

<sup>266</sup> See NSE Ex. 14, p. 12, 24.

<sup>267</sup> See Participant testimony from SNWA (Tr. 875–876), CNLV (Tr. 1418), and CSI (Tr. 95–96). Several other participants agreed, too, that the State Engineer’s delineation of the LWRFS as defined in Interim Order 1303 was acceptable. See also Bedroc Closing, p. 12, Church Closing, p. 1; Technichrome Response, p. 1. Other participants recommended larger areas be included within the LWRFS boundary. See Tr. 261–266 (USFWS), 1571–1572 (CBD), 1697–1698 (MVIC). See also NV Energy Closing, pp. 2–3; NPS Closing pp. 2–5.

2) Water level hydrographs that, in well-to-well comparisons, demonstrate a similar temporal pattern, irrespective of whether the pattern is caused by climate, pumping, or other dynamic is consistent with a close hydrologic connection.

3) Water level hydrographs that demonstrate an observable increase in drawdown that corresponds to an increase in pumping and an observable decrease in drawdown, or a recovery, that corresponds to a decrease in pumping, are consistent with a direct hydraulic connection and close hydrologic connection to the pumping location(s).

4) Water level observations that demonstrate a relatively steep hydraulic gradient are consistent with a poor hydraulic connection and a potential boundary.

5) Geological structures that have caused a juxtaposition of the carbonate-rock aquifer with low permeability bedrock are consistent with a boundary.

6) When hydrogeologic information indicate a close hydraulic connection (based on criteria 1-5), but limited, poor quality, or low resolution water level data obfuscate a determination of the extent of that connection, a boundary should be established such that it extends out to the nearest mapped feature that juxtaposes the carbonate-rock aquifer with low-permeability bedrock, or in the absence of that, to the basin boundary.

**WHEREAS**, some testimony was presented advocating to include additional areas to the LWRFS based principally on water budget considerations and/or common groundwater flow pathways.<sup>268</sup> Indeed, some participants advocate to include the entire White River Flow System, or other basins whose water may ultimately flow into or flow out of the system.<sup>269</sup> Other participants used, but did not rely on, water budget and groundwater flow path considerations to support their analysis. Like those participants, the State Engineer agrees that while water budget and groundwater flow path analysis are useful to demonstrate a hydrologic connection, additional information is required to demonstrate the relative strength of that connection. Thus, the State

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<sup>268</sup> See e.g., CNLV Ex. 3, p. 33, Tr. 1430; NPS Closing, p. 2. See also Tr. 253–257; Sue Braumiller, *Interpretations of available Geologic and Hydrologic Data Leading to Responses to Questions Posed by the State Engineer in Order 1303 regarding Conjunctive Management of the Lower White River Flow System* (USFWS Braumiller presentation), slide 11, Item 6., bullet 1, official records of the Division of Water Resources; MBOP Ex. 2, p. 11.

<sup>269</sup> See e.g., GBWN Report, pp. 1–2.

Engineer recognizes that while any hydrologic connection, weak or strong, needs to be considered in any management approach, many of the connections advocated based principally on a water budget or flow path analysis, including those between nearby basins like Las Vegas Valley and Lower Meadow Valley Wash, are not demonstrated to provide for the uniquely close hydraulic connection that require joint management.

**WHEREAS**, in their closing statement, NPS proposes that all adjacent hydrographic areas to the original Interim Order 1303 administrative unit where a hydraulic interconnection exists, whether weak or strong, be included in the LWRFS.<sup>270</sup> It does so to alleviate the need for developing new management schemes for the excluded remnants and to provide for appropriate management approaches based on new information and improved understanding of differing degrees of hydraulic interconnection in various sub-basins. The State Engineer agrees with this logic, up to a point, and has applied these concepts to the extent practical as demonstrated in his criteria for determining the extent of the LWRFS. However, the State Engineer also finds that there must be reasonable and technically defensible limits to the geographic boundary. Otherwise, if management were to be based on the entire spectrum of weak to strong hydraulic interconnection, then exclusion of an area from the LWRFS would require absolute isolation from the LWRFS; every sub-basin would have its own management scheme based on some measure of its degree of connectedness; and proper joint management would be intractable.

**WHEREAS**, evidence and testimony was also presented by the NPS regarding the specific inclusion of the entirety of the Black Mountains Area in the LWRFS.<sup>271</sup> The State Engineer recognizes that there may be a hydrologic connection between the Black Mountains Area and upgradient basins that are sources of inflow, and that outflow from the LWRFS carbonate-rock aquifer may contribute to discharge from Rogers and Blue Point Springs. However, the State Engineer does not find that this supports inclusion of the entirety of the Black Mountains Area. This determination is made based on the lack of contiguity of the carbonate-rock aquifer into this

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<sup>270</sup> NPS Closing, pp. 3–5.

<sup>271</sup> NPS Closing pp. 3–4. *See also* Tr.534, 555–569; Richard K. Waddell, Jr., *Testimony of Richard K. Waddell on behalf of the National Park Service*, presentation during hearing for Interim Order 1303 (NPS Presentation), slides 32–46, official records of the Division of Water Resources.

area,<sup>272</sup> the difference in observed water level elevations compared to those in adjacent carbonate-rock aquifer wells to the north and west,<sup>273</sup> and the absence of observed diagnostic hydrographic patterns and responses that define the uniquely close hydraulic connection that characterizes the LWRFS.<sup>274</sup>

**WHEREAS**, evidence and testimony presented by USFWS relied principally on SeriesSEE analysis of water level responses submitted by the Department of Interior Bureaus following the Order 1169 aquifer test to establish the general extent of the LWRFS. This was supported by the application of hydrogeology and principles of groundwater flow to define specific boundary limits to the LWRFS. It proposed that most of the Lower Meadow Valley Wash be considered for inclusion in the LWRFS based on the potential geologic continuity between carbonate rocks underlying the Lower Meadow Valley Wash and the carbonate-rock aquifer underlying Coyote Spring Valley, the Muddy River Springs Area, and California Wash.<sup>275</sup> Additionally, it asserted that the alluvial aquifer system in Lower Meadow Valley Wash contributes to and is connected to both the Muddy River and the alluvial aquifer system in California Wash. The State Engineer finds that while carbonate rocks may underlie the Lower Meadow Valley Wash and be contiguous with carbonate rocks to the south and west, data are lacking to characterize the potential hydraulic connection that may exist. Regarding the hydraulic connection between the Lower Meadow Valley Wash alluvial aquifer and the LWRFS, the State Engineer agrees with USFWS that a connection exists, but finds that any impacts related to water development in the Lower Meadow Valley Wash alluvial aquifer are localized, and unrelated to the carbonate-rock aquifer, and can be appropriately managed outside the LWRFS joint management process.

**WHEREAS**, NCA advocated for the exclusion of the portion of the Black Mountains Area from the LWRFS that contains their individual production wells. NCA premise this primarily on testimony and analysis performed by SNWA with respect to the impact of pumping from this area

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<sup>272</sup> See CSI Ex. 14, Plate 2, Map and Plate 4, Cross section K-K', in Peter D. Rowley et. al., *Geology and Geophysics of White Pine and Lincoln Counties, Nevada and Adjacent Parts of Nevada and Utah: The Geologic Framework of Regional Groundwater Flow Systems*, Nevada Bureau of Mines and Geology Report 56.

<sup>273</sup> See, e.g., USFWS Ex. 5, p. 30.

<sup>274</sup> *Id.*, p. 17.

<sup>275</sup> *Id.*, pp. 19-24.

on discharge to the Warm Springs area.<sup>276</sup> It also used hydrogeologic and water level response information to conclude that strike-slip faulting and a weak statistical correlation between water levels at NCA well EBM-3 and EH-4 in the Warm Springs area support a boundary to the north of the NCA production wells. While the State Engineer finds logic in NCA's position, other testimony describing flaws in the SNWA analysis make for a compelling argument against relying on SNWA's statistically-based results.<sup>277</sup> The substantial similarity in observed water level elevation and water level response at EBM-3 compared to EH-4<sup>278</sup> and limitations in relying on poor resolution water level measurements for statistical or comparative analysis<sup>279</sup> requires a more inclusive approach that places the boundary to the south of the NCA production wells to a geological location that coincides with the projection of the Muddy Mountain Thrust. This more closely coincides with the measurable drop in water levels recognized to occur south of the NCA wells, between EBM-3 and BM-ONCO-1 and 2, that is indicative of a hydraulic barrier or zone of lower permeability.<sup>280</sup> It also better honors the State Engineer's criteria by acknowledging the uncertainty in the data while reflecting a recognized physical boundary in the carbonate-rock aquifer. Specifically, this shall be defined to include that portion of the Black Mountains Area lying within portions of Sections 29, 30, 31, 32, and 33, T.18S., R.64E., M.D.B.&M.; portions of Sections 1, 11, 12, 14, 22, 23, 27, 28, 33, and 34 and all of Sections 13, 24, 25, 26, 35, and 36, T.19S., R.63E., M.D.B.&M.; portions of Sections 4, 6, 9, 10, and 15 and all of Sections 5, 7, 8, 16, 17, 18, 19, 20, 21, 29, 30, and 31, T.19S., R.64E., M.D.B.&M.<sup>281</sup>

**WHEREAS**, numerous participants advocated to include Kane Springs Valley in the LWRFS basins.<sup>282</sup> Other participants advocated to exclude Kane Springs Valley.<sup>283</sup> Several expert witnesses recommended the exclusion of Kane Springs Valley based on their characterization of water level elevation data, temporal hydrographic response patterns, geochemistry, and/or the

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<sup>276</sup> See, Tr. 1622, 1624; NCA Closing.

<sup>277</sup> See, e.g., Tr. 1467–1469 CNLV presentation, slides 21–23; Tr. 1784–1786; NV Energy presentation, slides 32–33.

<sup>278</sup> NCA Closing, p. 18, Figure 3.

<sup>279</sup> NCA Closing, p. 8.

<sup>280</sup> See e.g., USFWS Ex. 5.

<sup>281</sup> See map of the LWRFS Hydrographic Basin as defined by this Order, Attachment A.

<sup>282</sup> See, e.g., NV Energy Closing, p. 2; NCA Closing, p. 10–14; MVWD Closing, p. 2–8.

<sup>283</sup> See e.g., *Written Closing Statement of Lincoln County Water District and Vidler Water Company, Inc.* (LC-V Closing), Hearing on Interim Order 1303, official records of the Division of Water Resources, p. 3–6; CSI Closing, p. 2.

geophysically-inferred presence of structures that may act as flow barriers. Others recommended inclusion based on the same or similar set of information. Water level elevations observed near the southern edge of Kane Springs Valley are approximately 60 feet higher than those observed in the majority of carbonate-rock aquifer wells within the LWRFS to the south; consistent with a zone of lower permeability.<sup>284</sup> Some experts suggested that the hydrographic response pattern exhibited in wells located in the southern edge of Kane Springs Valley is different compared to that exhibited in wells in the LWRFS, being muted, lagged, obscured by climate response, or compromised by low-resolution data.<sup>285</sup> In this regard, the State Engineer recognizes these differences. However, he finds that the evidence and testimony supporting a similarity in hydrographic patterns and response as provided by expert witnesses, like that of the NPS, to be persuasive.<sup>286</sup> Namely, that while attenuated, the general hydrographic pattern observed in southern Kane Springs Valley reflects a response to Order 1169 pumping, consistent with a close hydraulic connection with the LWRFS. The State Engineer also finds that occurrence of the carbonate-rock aquifer in the southern Kane Springs Valley indicates that there is no known geologic feature at or near the southern Kane Springs Valley border that serves to juxtapose the carbonate-rock aquifer within the LWRFS with low permeability rocks in Kane Springs Valley.<sup>287</sup> He also finds that while geologic mapping<sup>288</sup> indicates that the carbonate-rock aquifer does not extend across the northern portion of the Kane Springs Valley, there is insufficient information available to determine whether the non-carbonate bedrock interpreted to underlie the northern part of the Kane Springs Valley represents low-permeability bedrock that would define a hydraulic boundary to the carbonate-rock aquifer.<sup>289</sup> After weighing all of the testimony and evidence relative to his criteria

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<sup>284</sup> LC-V Closing, p. 7.

<sup>285</sup> See, e.g., LC-V Closing, pp. 5-6; LC-V Ex. 1, pp. 3-3-3-4; CSI Closing, pp. 5-6.

<sup>286</sup> See Tr. 524-55. See, e.g., NPS presentation, slides 23-27.

<sup>287</sup> Pursuant to the criteria requiring joint management of hydrographic basins and the sixth criteria establishing that the boundary should extend to the nearest mapped feature that juxtaposes the carbonate-rock aquifer with low-permeability bedrock, or where a mapped feature cannot be adequately identified, to the basin boundary, the State Engineer includes the entirety of Kane Springs Valley.

<sup>288</sup> See, e.g., NSE Ex. 12; Page, W.R., Dixon, G.L., Rowley, P.D., and Brickey, D.W., 2005, *Geologic Map of Parts of the Colorado, White River, and Death Valley Groundwater Flow Systems, Nevada, Utah, and Arizona*: Nevada Bureau of Mines and Geology Map 150, Plate plus text.

<sup>289</sup> See, e.g., SNWA Ex. 7, pp. 2-4, 2-5, 2-10, 2-11, and 4-1, that describe volcanic rocks as important aquifers, and calderas as both flow paths and barriers depending on structural controls

for inclusion into the LWRFS, the State Engineer finds that the available information requires that Kane Springs Valley be included within the geographic boundary of the LWRFS.

**WHEREAS**, limited evidence and testimony were provided by participants advocating to either include or exclude the northern portion of Coyote Spring Valley. The State Engineer finds that while information such as that provided by Bedroc is convincing and supports a finding that local, potentially discrete aquifers may exist in parts of the northern Coyote Springs Valley, his criteria for defining the LWRFS calls for the inclusion of the entirety of the basin in the LWRFS. However, the State Engineer also acknowledges that there may be circumstances, like in the northern Coyote Spring Valley, where case-by-case considerations for proper management are warranted.

**WHEREAS**, evidence and testimony from Georgia-Pacific and Republic, and MBOP advocated against creating a single LWRFS administrative unit. Their arguments were principally based on concerns that there was insufficient consensus on defining the LWRFS geographic boundaries and that there were inherent policy implications to establishing an LWRFS administrative unit. MBOP recommended continuing to collect data and focusing on areas of scientific consensus. Georgia-Pacific and Republic asserted that boundaries are premature without additional data and without a legally defensible policy and management tools in place. They expressed concern that creating an administrative unit at this time inherently directs policy without providing for due process. The State Engineer has considered these concerns and agrees that additional data and improved understanding of the hydrologic system is critical to the process. He also believes that the data currently available provide enough information to delineate LWRFS boundaries, and that an effective management scheme will provide for the flexibility to adjust boundaries based on additional information, retain the ability to address unique management issues on a sub-basin scale, and maintain partnership with water users who may be affected by management actions throughout the LWRFS.

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to flow, citing Peter D. Rowley, and Dixon, G.L., 2011, *Geology and Geophysics of Spring, Cave, Dry Lake, and Delamar Valleys, White Pine and Lincoln Counties, and Adjacent Areas, Nevada and Utah: The Geologic Framework of Regional Flow Systems*,



**WHEREAS**, evidence and testimony support the delineation of a single hydrographic basin as originally defined by the State Engineer in Interim Order 1303, with the adjustment of the Black Mountain Area boundary and the addition of Kane Springs Valley. The State Engineer acknowledges that special circumstances will exist with regard to both internal and external management. Water development both inside and outside of the perimeter of the LWRFS will continue to be evaluated on the best available data and may become subject to or excluded from the constraints or regulations of the LWRFS.

**WHEREAS**, the geographic extent of the LWRFS is intended to represent the area that shares both a unique and close hydrologic connection and virtually all of the same source and supply of water, and therefore will benefit from joint and conjunctive management. In that light, the State Engineer recognizes that different areas, jointly considered for inclusion into the LWRFS, have been advocated both to be included and to be excluded by the different hearing participants based on different perspectives, different data subsets, and different criteria. For the Muddy River Springs Area, California Wash, Garnet Valley, Hidden Valley, Coyote Spring Valley, and a portion of the Black Mountain Area, there is a persuasive case previously laid out in Rulings 6254–6261, and the consensus amongst the participants support their inclusion in the LWRFS. For other sub-basins such as Kane Springs Valley and the area around the NCA production wells in the Black Mountain Area, there is persuasive evidence to support their inclusion or exclusion; however, the State Engineer’s criteria and available data mandate their inclusion. Their inclusion in the LWRFS provides the opportunity for conducting additional hydrologic studies in sub-basins such as these, to determine the degree to which water use would impact water resources in the LWRFS and to allow continued participation by holders of water rights in future management decisions. Thus, these sub-basins, and any other portions of the LWRFS that may benefit from additional hydrological study, can be managed more effectively and fairly within the LWRFS. For other basins whose inclusion was advocated, such as the northern portion of Las Vegas Valley and the Lower Meadow Valley Wash, the State Engineer finds that data do not exist to apply his criteria, and therefore they cannot be considered for inclusion into the LWRFS. These types of areas may require additional study and special consideration regarding the potential effects of water use in these areas on water resources within the LWRFS.

## VII. AQUIFER RECOVERY SINCE COMPLETION OF THE ORDER 1169 AQUIFER TEST

WHEREAS, during the Order 1169 aquifer test an average of 5,290 afa were pumped from the carbonate-rock aquifer wells in Coyote Spring Valley and a cumulative total of 14,535 afa were pumped throughout the Order 1169 study basins. A portion of this total, approximately 3,840 acre-feet per year, was pumped from the alluvial aquifer in the Muddy River Springs Area.<sup>290</sup> In the years since completion of the Order 1169 aquifer test, pumping from wells in the LWRFS has gradually declined.<sup>291</sup> Pumping in 2013-2014 averaged 12,635 afa; pumping in 2015-2017 averaged 9,318 afa.<sup>292</sup> Pumpage inventories for 2018 that were published after the completion of the hearing report a total of 8,300 afa.<sup>293</sup> Pumping from alluvial aquifer wells in the Muddy River Spring Area has consistently declined since closure of the Reid Gardner power plant beginning in 2014, while pumping from the carbonate-rock aquifer since the completion of the aquifer test has consistently ranged between approximately 7,000 and 8,000 afa.

WHEREAS, the information obtained from the Order 1169 aquifer test and in the years since the conclusion of the test demonstrates that while, following conclusion of the aquifer test, there was a recovery of groundwater levels, the carbonate-rock aquifer has not recovered to pre-Order 1169 test levels.<sup>294</sup> Evidence and testimony submitted during the 2019 hearing does not refute the conclusions made by the State Engineer in Rulings 6254–6261 regarding interpretations of the Order 1169 aquifer test results, which were based on observations and analysis by multiple technical experts. Groundwater level recovery reached completion approximately two to three years after the Order 1169 aquifer test pumping ended.<sup>295</sup>

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<sup>290</sup> NSE Ex. 1, p. 4.

<sup>291</sup> See, e.g. NSE Ex. 50, *Pumpage Report Coyote Spring Valley 2017*; NSE Ex. 67, *Pumpage Report Black Mountains Area 2017*; NSE Ex. 84, *Pumpage Report Garnet Valley Area 2017*; NSE Ex. 86, *Pumpage Report California Wash Area 2017*; Ex. 88, *Pumpage Report Muddy River Springs Area 2017*, Hearing on Interim Order 1303, official records of the Division of Water Resources.

<sup>292</sup> *Id.*

<sup>293</sup> *Id.*

<sup>294</sup> See, e.g., SNWA Ex. 7, pp. 5-17–5-18, 8-2; NPS Closing, p. 4; MVWD Closing, p. 8. See also Tr. 1807; NV Energy presentation, p. 11.

<sup>295</sup> SNWA Ex. 7, pp. 5-17–5-18; NVE Ex. 1, p. 2

**WHEREAS**, several participants testified about the effects of drought and climate on the recovery of groundwater levels and spring discharge after the Order 1169 aquifer test. Droughts, or periods of drier than normal conditions that last weeks, months, or years can lead to declines in groundwater levels.<sup>296</sup> The LWRFS is within National Oceanic and Atmospheric Administration's Nevada Climate Division 4 (Division 4). Precipitation records for Division 4 from 2006 to the 2019 season records indicate that 10 of those 14 seasons received lower than average precipitation.<sup>297</sup> Despite low precipitation, several participants submitted evidence that water levels continue to rise under current climate conditions in other areas with a relative lack of pumping that are tributary to the LWRFS, such as Dry Lake Valley, Delamar Valley, Garden Valley, Tule Desert, Dry Lake Valley, and other areas.<sup>298</sup> These rises have been attributed to efficient winter recharge that has occurred despite low cumulative precipitation.<sup>299</sup> Based on these observations, it was argued that the continued stress of pumping in the LWRFS carbonate-rock aquifer is limiting the recovery of water levels.<sup>300</sup> The State Engineer acknowledges that spring discharge is affected by both pumping and climate, and finds that groundwater levels remain a useful tool for monitoring the state of the aquifer system in the LWRFS regardless of the relative contribution of climate and drought to the measured groundwater levels. The State Engineer only has the authority to regulate pumping, not climate, in consideration of its potential to cause conflict or to be detrimental to the public interest and must do so regardless of the relative contributing effects of climate.

**WHEREAS**, evidence and testimony during the 2019 hearing was divided on whether water levels in the Warm Springs area and carbonate-rock aquifer indicate the system has reached or is approaching equilibrium,<sup>301</sup> or is still in a state of decline.<sup>302</sup> Hydrographs and evidence presented show that water levels at well EH-4 near the Warm Springs area have been relatively stable for several years following recovery from the Order 1169 aquifer test.<sup>303</sup> However, other

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<sup>296</sup> See USGS, 1993, *Drought*, US Geological Survey Open File Report 93-642, accessible at <https://bit.ly/93-642>, (last accessed June 6, 2020).

<sup>297</sup> SNWA Ex. 7, pp. 4-1-4-4.

<sup>298</sup> Tr. 577, 304-307.

<sup>299</sup> NPS Ex. 3, Appendix A.

<sup>300</sup> See, e.g., SNWA Closing, p. 11. NPS Closing, p. 4. See also Tr. 642, 644-45, 1545.

<sup>301</sup> MVWD Closing, pp. 8-9. See also NV Energy Closing, p. 3; CNLV Closing, pp. 5-7.

<sup>302</sup> SNWA Closing, pp. 11-12. NPS Closing, pp. 4-5.

<sup>303</sup> SNWA Ex. 7, pp. 5-7.

carbonate-rock aquifer wells located further away from the Warm Springs area such as CSVM-1, TH-2, GV-1, and BM-DL-2 appear to have reached peak recovery from the Order 1169 aquifer test in 2015-2016 and have exhibited downward trends for the past several years.<sup>304</sup> The State Engineer agrees that water levels in the Warm Springs area may be approaching steady state with current pumping conditions. However, the trend is of insufficient duration to make this determination with absolute assurance and continued monitoring is necessary to determine if this trend continues or if water levels are continuing to decline slowly.

### VIII. LONG-TERM ANNUAL QUANTITY OF WATER THAT CAN BE PUMPED

**WHEREAS**, the evidence and testimony presented at the 2019 hearing did not result in a consensus among experts of the long-term annual quantity of groundwater that can be pumped. Recommendations range from zero to over 30,000 afa, though most experts agreed that the amount must be equal to or less than the current rate of pumping. There is a near consensus that the exact amount that can be continually pumped for the long-term cannot be absolutely determined with the data available and that to make that determination will require more monitoring of spring flows, water levels, and pumping amounts over time.

**WHEREAS**, evidence and testimony were presented arguing that the regional water budget demonstrates that far more groundwater is available for development within the LWRFS than is currently being pumped. CSI argues that the total amount of groundwater available for extraction from the LWRFS may be up to 30,630,<sup>305</sup> which is an estimate of the entirety of natural discharge from the system that occurs through groundwater evapotranspiration and subsurface groundwater outflow. Nearly all other experts disagreed that pumping to that extent could occur without causing harm to the Moapa dace or conflict with senior Muddy River decreed rights. The disagreement is not about the amount of the water budget, but rather the importance of the water budget in determining the amount of groundwater in the LWRFS that can continually be pumped,<sup>306</sup> not the amount of inflow and outflow to the system. In addition, availability of groundwater for pumping based on water budget should consider whether the same water is appropriated for use in upgradient and downgradient basins, and CSI did not account for this.

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<sup>304</sup> *Id.*

<sup>305</sup> CSI Closing, p. 2.

<sup>306</sup> See e.g., SNWA Ex. 9, p. 24.; MVWD Ex. 3, p. 4; NPS Ex. 3, p. 23.

The State Engineer recognizes that the water budget is important to fully understand the hydrology of the regional flow system but also agrees with nearly all participants that the regional water budget is not the limiting measure to determine water available for development in the LWRFS. The potential for conflict with senior rights and impacts that are detrimental to the public interest in the LWRFS is controlled by aquifer hydraulics and the effect of pumping on discharge at the Warm Springs area rather than the regional water budget.

**WHEREAS**, evidence and testimony were presented arguing that the location of pumping within the LWRFS is an important variable in the determination of the amount that can be pumped. Participants representing groundwater users in Garnet Valley and the APEX area at the south end of the LWRFS testified that pumping within Garnet Valley does not have a discernable signal at wells near the Warm Springs area and that the hydraulic gradient from north-to-south within the LWRFS indicates that there is a component of groundwater flow in Garnet Valley that does not discharge to the Warm Springs area.<sup>307</sup> Several participants agreed that moving pumping to more distal locations within the LWRFS will lessen the effect of that pumping on spring flows. NV Energy testified that there would be a lesser effect because pumping areas around the periphery of the main carbonate-rock aquifer are less well-connected to the springs, and because of the likelihood that some amount of subsurface outflow occurs along and southern and southeastern boundary of the LWRFS and it is possible to capture some of that subsurface outflow without a drop-for-drop effect on discharge at the Warm Springs area.<sup>308</sup> Others drew the same conclusion based on their review of the data and characterization of a heterogeneous system<sup>309</sup> or on weak connectivity between peripheral locations and the Warm Springs area.<sup>310</sup>

CSI argues that more groundwater development can occur in the LWRFS because subsurface fault structures create compartmentalization and barriers to groundwater flow that reduce the effects of pumping on discharge at the Warm Springs area.<sup>311</sup> They rebut the contention by others that spring flow is affected homogeneously by pumping within the LWRFS.<sup>312</sup> CSI used geophysical data to map a north-south trending subsurface feature that bisects Coyote Spring

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<sup>307</sup> See CNLV Ex. 3, pp. 45–47; GP-REP Ex. 1, pp. 2–3.

<sup>308</sup> NVE Ex. 1, pp. 8–9.

<sup>309</sup> See e.g. MBOP Ex. 2, p. 23; GP-REP Ex. 2, pp. 4–5. See also Technichrome Response.

<sup>310</sup> See e.g. NCA Closing, pp. 2–10; LC-V Closing, pp. 4–6; Bedroc Closing, pp. 9–11.

<sup>311</sup> CSI Closing, pp. 2–5.

<sup>312</sup> CSI Ex. 2, pp. 40–41.

Valley. They hypothesize that this structure is an impermeable flow barrier that creates an isolated groundwater flow path on the west side of Coyote Spring Valley from which pumping would capture recharge from the Sheep Range without spring flow depletion at the Warm Springs area.<sup>313</sup> MBOP also contends that the system is far too complex to characterize it as a homogeneous “bathtub” and that preferential flow paths within the region mean that pumping stress will greatly differ within the LWRFS depending on where the pumping occurs.<sup>314</sup> Rebuttals to MBOP and CSI contend that an emphasis on complexities in geologic structure is a distraction from the question at hand, and that the hydraulic data collected during and after the Order 1169 aquifer test clearly demonstrate close connectivity and disproves CSI’s hypothesis.<sup>315</sup>

The State Engineer finds that the data support the conclusion that pumping from locations within the LWRFS that are distal from the Warm Springs area can have a lesser impact on spring flow than pumping from locations more proximal to the springs. The LWRFS system has structural complexity and heterogeneity, and some areas have more immediate and more complete connection than others. For instance, the Order 1169 aquifer test demonstrated that pumping 5,290 afa from carbonate-rock aquifer wells in Coyote Spring Valley caused a sharp decline in discharge at the springs, but distributed pumping since the completion of the aquifer test in excess of 8,000 afa has correlated with a stabilization of spring discharge. The data collected during and after the Order 1169 aquifer test provide substantial evidence that groundwater levels throughout the LWRFS rise and fall in common response to the combined effects of climate and pumping stress, which controls discharge at the Warm Springs area.<sup>316</sup> The State Engineer finds that the best available data do not support the hypotheses that variable groundwater flow paths and heterogeneous subsurface geology are demonstrated to exist that create hydraulically isolated compartments or subareas within the LWRFS carbonate-rock aquifer from which pumping can occur without effect on the Warm Springs area. However, there remains some uncertainty as to the extent that distance and location relative to other capturable sources of discharge either delay, attenuate, or reduce capture from the springs.

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<sup>313</sup> *Id.* See also CSI Ex. 1, pp. 31–40.

<sup>314</sup> MBOP Closing, p. 7.

<sup>315</sup> See e.g., SNWA Ex. 9, pp. 23–24.

<sup>316</sup> NSE Exs. 15–21.

**WHEREAS**, evidence and testimony were presented to argue that no amount of groundwater can be pumped from the carbonate-rock aquifer or from the LWRFS without conflicting with the Muddy River decree or causing harm to the Moapa dace habitat. This argument is predicated on the interpretation that lowering of groundwater level anywhere within the LWRFS, whether caused by climate or pumping, eventually has an effect on spring discharge, and that any reduction in spring discharge caused by pumping conflicts with senior decreed rights or harms the Moapa dace or both.<sup>317</sup> MVIC and SNWA agree that capturing discharge from the Warm Springs area springs and the Muddy River are a conflict with the Muddy River decree, which appropriates "all of the flow of the said stream, its sources of supply, headwaters and tributaries."

The Muddy River Decree was finalized in 1920, decades before any significant amount of groundwater development within the Muddy River springs area or the LWRFS. The statement quoted above, or something similar to it, is a common conclusion in decrees to establish finality to the determination of relative priority of rights. By including this statement, the decreed right holders are afforded the assurance that no future claimants will interject a new priority right. However, it is also common on decreed systems for junior rights to be appropriated for floodwater or other excess flows, provided that no conflict occurs with the senior priorities. Similarly, groundwater development almost always exists in the tributary watersheds of decreed river systems, even though groundwater in a headwater or tributary basin is part of the same hydrologic system. There is no conflict as long as the senior water rights are served.

The State Engineer disagrees with SNWA and MVIC that the above quoted statement in the decree means that any amount of groundwater pumped within the headwaters that would reduce flow in the Muddy River conflicts with decreed rights. The State Engineer finds that capture or potential capture of the waters of a decreed system does not constitute a conflict with decreed right holders if the flow of the source is sufficient to serve decreed rights. Muddy River decreed rights were defined by acres irrigated and diversion rates for each user.<sup>318</sup> The sum of diversion rates greatly exceeds the full flow of the River, but all users are still served through a rotation schedule managed by the water master. The total amount of irrigated land in the decree is 5,614 acres.<sup>319</sup>

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<sup>317</sup> See, e.g., CBD Ex. 3, p. 23; SNWA Ex. 7, p. 8-4; MVIC Ex. 1, p. 3.

<sup>318</sup> NSE Ex. 333.

<sup>319</sup> *Id.*

Flow in the Muddy River at the Moapa Gage has averaged approximately 30,600 afa since 2015,<sup>320</sup> which is less than the predevelopment baseflow of about 33,900.<sup>321</sup> If all decreed acres were planted with a high-water use crop like alfalfa, the net irrigation water requirement would be 28,300 afa, based on a consumptive use rate of 4.7 afa.<sup>322</sup> Conveyance loss due to infiltration is an additional consideration to serve all decreed users; however, this is limited in the Muddy River because the alluvial corridor is narrow and well defined so water stays within the shallow groundwater or discharges back to the river. The State Engineer finds that the current flow in the Muddy River is sufficient to serve all decreed rights in conformance with the Muddy River Decree, and that reductions in flow that have occurred because of groundwater pumping in the headwaters basins is not conflicting with Decreed rights.

**WHEREAS**, the majority of experts agree that there is an intermediate amount of pumping approximated by recent pumping rates that can continue to occur in the LWRFS and still protect the Moapa dace and not conflict with decreed rights. USFWS and NCA endorsed the use of average pumping over the years 2015-2017 (9,318 afa as reported by State Engineer pumpage inventories) as a supportable amount that can continue to be pumped, because the system appears to have somewhat stabilized.<sup>323</sup> CSI also endorsed this approach as an initial phase, though they suggested 11,400 afa, which was the average pumping reported by State Engineer inventories over the years 2010-2015 that included the period of the Order 1169 aquifer test.<sup>324</sup> CNLV makes a rough estimate that no more than 10,000 afa can be supported throughout the entire region, based on their professional judgment and review of the data.<sup>325</sup> NV Energy concludes that 7,000–8,000 afa can continue to be pumped, based on the amount of pumping in recent years from carbonate-rock aquifer wells and the observation that steady-state conditions in Warm Springs area spring

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<sup>320</sup> NSE Ex. 211, *USGS 09416000 Muddy River Moapa 1914-2013*, Hearing on Interim Order 1303, official records of the Division of Water Resources.

<sup>321</sup> SNWA Ex. 7, p. 5-4.

<sup>322</sup> *See, e.g.*, Huntington, J.L. and R. Allen, (2010), *Evapotranspiration and Net Irrigation Water Requirements for Nevada*, Nevada State Engineer's Office Publication, accessible at <https://bit.ly/etniwr>, (last accessed June 7, 2020), official records of the Division of Water Resources.

<sup>323</sup> USFWS Ex. 5, p. 3; NCA Ex. 1, p. 19.

<sup>324</sup> CSI Closing, p. 2.

<sup>325</sup> CNLV Ex. 3, p. 2.



flow are being reached.<sup>326</sup> SNWA estimates that only 4,000–6,000 afa of carbonate-rock aquifer pumping can continually occur within the LWRFS.<sup>327</sup>

**WHEREAS**, the State Engineer finds that the evidence and testimony projecting continual future decline in spring flow at the current rate of pumping is compelling but not certain. Several participants pointed out rising trends in groundwater levels at many locations in Southern Nevada, outside of the LWRFS, that are distant from pumping<sup>328</sup> even though total precipitation has been below average and since 2006 has been described as a drought.<sup>329</sup> This suggests that climate and recharge efficiency may have actually buffered the full effect of pumping on discharge at the Warm Springs area, and that the system could not support the current amount of groundwater pumping during an extended dry period with lesser recharge. In addition, slight declining trends that are observed in Garnet Valley monitoring wells are not evident in wells close to the Warm Springs area.<sup>330</sup> If drawdown in Garnet Valley has not yet propagated to the Muddy Springs area, then the resilience of the apparent steady state of spring flow is in doubt. Projections of continued future decline in spring discharge suggests that the current amount of pumping in the LWRFS is a maximum amount that may need to be reduced in the future if the stabilizing trend in spring discharge does not continue.

**WHEREAS**, there is an almost unanimous agreement among experts that data collection is needed to further refine with certainty the extent of groundwater development that can be continually pumped over the long term. The State Engineer finds that the current data are adequate to establish an approximate limit on the amount of pumping that can occur within the system, but that continued monitoring of pumping, water levels, and spring flow is essential to refine and validate this limit.

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<sup>326</sup> NVE Ex. 1, p. 8.

<sup>327</sup> SNWA Ex. 7, p. 8-4.

<sup>328</sup> NPS Ex. 3, Appendix A. *See also* Tr. 304–307, 577.

<sup>329</sup> Tr. 1292–1300. *See, also* LC-V Ex. 11, *PowerPoint Presentation of Todd G. Umstot, entitled Drought and Groundwater*, Hearing on Interim Order 1303, official records of the Division of Water Resources, slides 3–10.

<sup>330</sup> CNLV Ex. 3, pp. 45–46.

**WHEREAS**, pumping from wells in the LWRFS has gradually declined since completion of the Order 1169 aquifer test and is approaching 8,000 afa. This coincides with the period of time when spring discharge may be approaching steady state. The State Engineer finds that the maximum amount of groundwater that can continue to be developed over the long term in the LWRFS is 8,000 afa. The best available data at this time indicate that continued groundwater pumping that consistently exceeds this amount will cause conditions that harm the Moapa dace and threaten to conflict with Muddy River decreed rights.

### **IX. MOVEMENT OF WATER RIGHTS**

**WHEREAS**, the data and evidence are clear that location of pumping within the LWRFS relative to the Warm Springs area and the Muddy River can influence the relative impact to discharge to the Warm Springs area and/or senior decreed rights on the Muddy River. The transfer of groundwater pumping from the Muddy River Springs Area alluvial wells to carbonate-rock aquifer wells may change the timing of any impact to Muddy River flows and amplify the effect on discharge to the Warm Springs area, thus potentially adversely impacting habitat for the Moapa dace. And the transfer of groundwater withdrawals from the carbonate-rock aquifer into the Muddy River alluvial aquifer may reduce the impact to the Moapa dace habitat but increase the severity of impact to the senior decreed rights on the Muddy River. The State Engineer recognizes that the LWRFS is fundamentally defined by its uniquely close hydrologic interconnection and shared source and supply of water. However, the State Engineer also recognizes that there can be areas within the LWRFS that have a greater or lesser degree of hydraulic connection due to distance, local changes in aquifer properties, or proximity to other potential sources of capturable water.

**WHEREAS**, Rulings 6254–6261 acknowledge that one of the main goals of Order 1169 and the associated pumping test at well MX-5 was to observe the effects of increased pumping on groundwater levels and spring flows. Coyote Spring Valley carbonate-rock aquifer pumping during the Order 1169 aquifer test was the largest localized carbonate-rock aquifer pumping in the LWRFS. In addition, concurrent carbonate-rock aquifer and alluvial aquifer pumping in Garnet Valley, Muddy River Springs Area, California Wash, and the northwest portion of the Black Mountains Area occurred during the test period. Rulings 6254–6261 described the data and analysis used to determine that additional pumping at the MX-5 well contributed significantly to decreases in high elevation springs (Pederson Springs) and other springs that are the sources to the

Muddy River. Evidence and reports provided under Interim Order 1303 do not challenge the findings in Rulings 6254–6261 that pumping impacts were witnessed. There is a strong consensus among participants that pumping during the Order 1169 aquifer test along with concurrent pumping caused drawdowns of water levels throughout the LWRFS.<sup>331</sup> However, the effects of pumping from different locations within the LWRFS on discharge at the Warm Springs area is not homogeneous.<sup>332</sup> The State Engineer finds that movement of water rights that are relatively distal from the Warm Springs area into carbonate-rock aquifer wells that have a closer hydraulic connection to the Warm Springs area is not favorable.

**WHEREAS**, evidence and testimony provided by participants during the Interim Order 1303 hearing provides a strong consensus that alluvial aquifer pumping in the Muddy River Springs Area affects Muddy River discharge.<sup>333</sup> There is also strong evidence that carbonate-rock aquifer pumping throughout the LWRFS affects spring flow but can also be dependent on proximity of pumping to springs.<sup>334</sup> No participant is a proponent of moving additional water rights closer to the headwaters of the Muddy River within the Muddy River Springs Area, and most participants agree that carbonate-rock aquifer and alluvial aquifer pumping in the Muddy River Springs Area captures Muddy River flow. The State Engineer finds that any pumping within close proximity to the Muddy River could result in capture of the Muddy River. The State Engineer also finds that any movement of water rights into carbonate-rock aquifer and alluvial aquifer wells in the Muddy River Springs Area that may increase the impact to Muddy River decreed rights is disfavored.

**WHEREAS**, the Order 1169 aquifer test demonstrated that impacts from the test along with concurrent pumping was widespread within the LWRFS encompassing 1,100 square miles and supported the conclusion of a close hydrologic connection among the basins.<sup>335</sup> While the effects of movement of water rights between alluvial aquifer wells and carbonate-rock aquifer wells on deliveries of senior decreed rights to the Muddy River or impacts to the Moapa dace may not be uniform across the entirety of the LWRFS, the relative degree of hydrologic connectedness

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<sup>331</sup> See SNWA Closing, pp. 10, 16; MVIC Closing, p. 6.

<sup>332</sup> See, e.g., SNWA Closing, p. 10.

<sup>333</sup> CNLV Closing, p. 8; Tr. 1456–1457, 1458. See also SNWA Closing, p. 16; MVWD Closing, p. 11; MVIC Closing, p. 6.

<sup>334</sup> CNLV Closing, pp. 8–10; Tr. 1457, 1458; NV Energy Closing, p. 4; MVIC Closing, p. 6.

<sup>335</sup> NSE Ex. 256. See also NSE Ex. 14, pp. 20–21; NSE Ex. 17, p. 19; SNWA Closing pp. 2, 3.

in the LWRFS will be the principle factor in determining the impact of movement of water rights. The State Engineer recognizes that there may be discrete, local aquifers within the LWRFS with an uncertain hydrologic connection to the Warm Springs area. Determining the effect of moving water rights into these areas may require additional scientific data and analysis. Applications to move water rights under scenarios not addressed in this Order will be evaluated on their individual merits to determine potential impact to existing senior rights, potential impact to the Warm Springs area and Moapa dace habitat, and impacts to the Muddy River.

## **X. ORDER**

**NOW THEREFORE**, the State Engineer orders:

1. The Lower White River Flow System consisting of the Kane Springs Valley, Coyote Spring Valley, Muddy River Springs Area, California Wash, Hidden Valley, Garnet Valley, and the northwest portion of the Black Mountains Area as described in this Order, is hereby delineated as a single hydrographic basin. The Kane Springs Valley, Coyote Spring Valley, Muddy River Springs Area, California Wash, Hidden Valley, Garnet Valley and the northwest portion of the Black Mountains Area are hereby established as sub-basins within the Lower White River Flow System Hydrographic Basin.
2. The maximum quantity of groundwater that may be pumped from the Lower White River Flow System Hydrographic Basin on an average annual basis without causing further declines in Warm Springs area spring flow and flow in the Muddy River cannot exceed 8,000 afa and may be less.
3. The maximum quantity of water that may be pumped from the Lower White River Flow System Hydrographic Basin may be reduced if it is determined that pumping will adversely impact the endangered Moapa dace.
4. All applications for the movement of existing groundwater rights among sub-basins of the Lower White River Flow System Hydrographic Basin will be processed in accordance with NRS 533.370.

5. The temporary moratorium on the submission of final subdivision or other submission concerning development and construction submitted to the State Engineer for review established under Interim Order 1303 is hereby terminated.
6. All other matters set forth in Interim Order 1303 that are not specifically addressed herein are hereby rescinded.

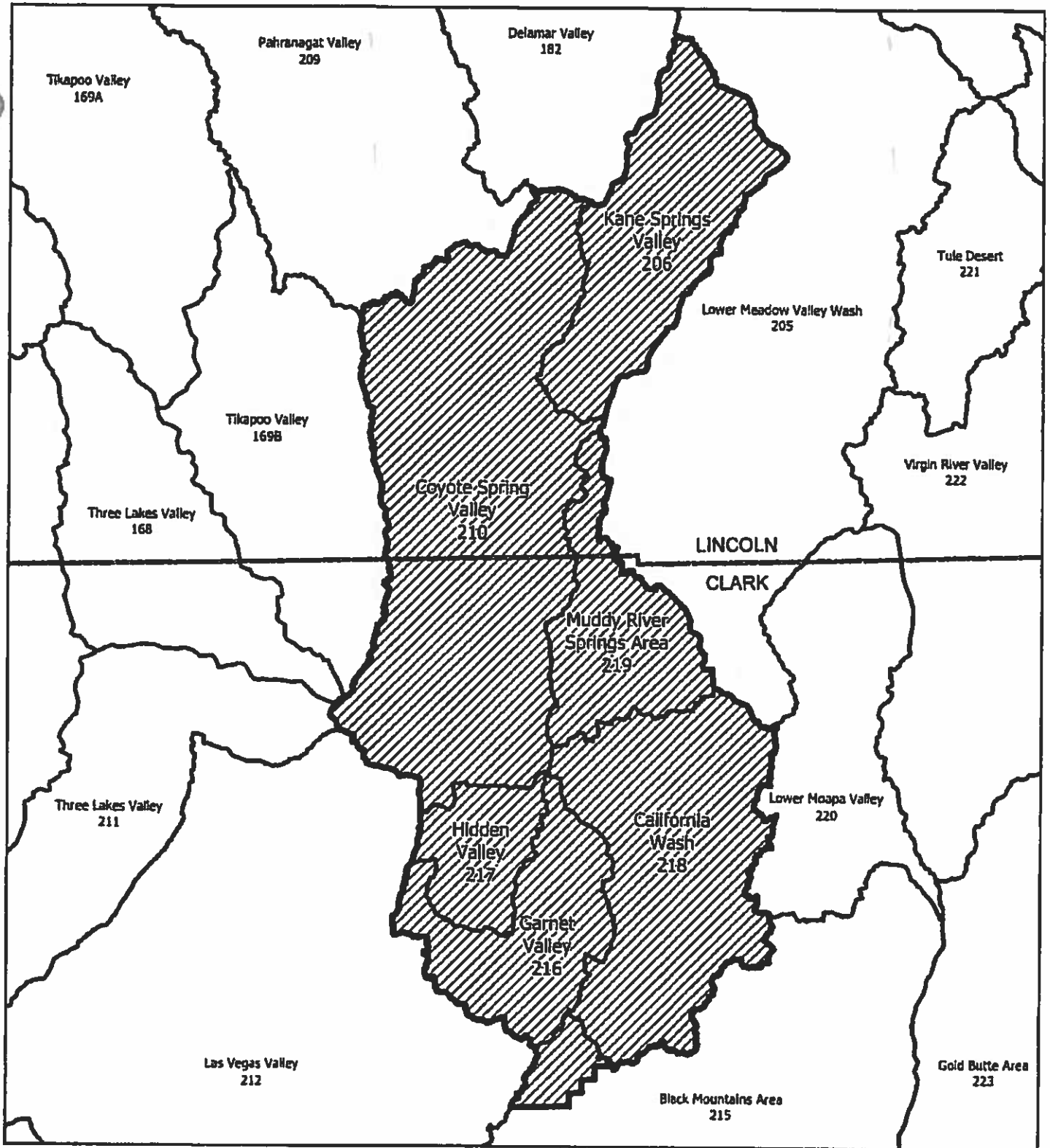


TIM WILSON, P.E.  
State Engineer

Dated at Carson City, Nevada this

15th day of June, 2020.

# ATTACHMENT A

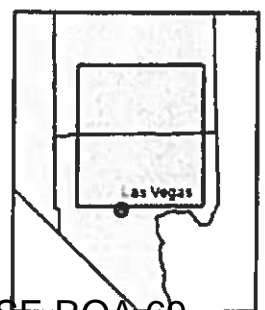


Location and Extent of LWRFS Hydrographic Basin,  
Clark and Lincoln Counties, Nevada




State of Nevada  
Department of Conservation and  
Natural Resources  
Office of the State Engineer  
Division of Water Resources

Tim Wilson PE  
State Engineer

June 2020



SE ROA 69

-  LWRFS Boundary
-  Hydrographic Basin Boundary
-  County Boundary

