

J. Craig Smith, UT Bar No. 4143
jcsmith@SHutah.law
Lisa Watts Baskin, UT Bar No. 5236
lwbaskin@SHutah.law

J. Adam Snow, UT Bar No. 20380
jasnow@SHutah.law

SMITH HARTVIGSEN, PLLC
257 East 200 South, Suite 500
Salt Lake City, Utah 84111
Telephone: (801) 413-1600

Attorneys for Appellants Beaver County, Utah; Juab County, Utah; White Pine County, Nevada; City of Milford, Utah; Mark Wintch; Wah Wah Ranch, Wallace Peak Water Company, LLC, Wintch & Company, LLC; Barbara Wintch; John Carter; Lyle Carter; Dean Eyre; Dustin Kesler; Brandon Yardley; and Gilbert ("Gib") T. Yardley

Iris Thornton, NM Bar No. 28205

iris@communityandenvironment.net

ADVOCACY FOR COMMUNITY AND ENVIRONMENT

P.O. Box 120

13 La Canada Road

Arroyo Seco, New Mexico 87514

Telephone: (505) 504-2610

Attorney for Appellants Beaver County, Utah; Millard County, Utah; Central Nevada Regional Water Authority; Nevada Grazing Board of District No. 4; and Great Basin Water Network

**DEPARTMENT OF THE INTERIOR
OFFICE OF HEARINGS AND APPEALS
INTERIOR BOARD OF LAND APPEALS**

BEAVER COUNTY, UTAH; MILLARD COUNTY, UTAH; JUAB COUNTY, UTAH; WHITE PINE COUNTY, NEVADA; CITY OF MILFORD, UTAH; CENTRAL NEVADA REGIONAL WATER AUTHORITY; NEVADA GRAZING BOARD OF DISTRICT NO. 4; GREAT BASIN WATER NETWORK; MARK WINTCH; WAH WAH RANCH, WALLACE PEAK WATER COMPANY, WINTCH & COMPANY LLC; BARBARA WINTCH; JOHN CARTER; LYLE CARTER; DEAN EYRE; DUSTIN KESLER; BRANDON YARDLEY; AND GILBERT ("GIB") T. YARDLEY,

Appellants,

v.

BUREAU OF LAND MANAGEMENT,

Respondent.

IBLA No. _____

RE: PINE VALLEY WATER SUPPLY PROJECT

DOI-BLM-UT-C010-2020-0012-EIS
(2026)

**COUNTY AND COMMUNITY APPELLANTS'
NOTICE OF APPEAL & PETITION FOR STAY**

NOTICE OF APPEAL

Pursuant to 43 C.F.R. § 4.402, appellants Beaver County, Utah; Millard County, Utah; Juab County, Utah; White Pine County, Nevada; City of Milford, Utah; Central Nevada Regional Water Authority; Nevada Grazing Board of District No. 4; Great Basin Water Network; Mark Wintch; Wah Wah Ranch, Wallace Peak Water Company, Wintch & Company LLC; Barbara Wintch; John Carter; Lyle Carter; Dean Eyre; Dustin Kesler; Brandon Yardley; and Gilbert (“**Gib**”) T. Yardley (Collectively “**County & Community Appellants**”) jointly submit this timely *Notice of Appeal & Petition for Stay* (“**Appeal**” or “**Petition**” as appropriate) in the above-captioned matter.

In this Appeal, County & Community Appellants challenge the Bureau of Land Management (“**BLM**”) Cedar City Field Office’s Final Environmental Impact Statement (“**Final EIS**”) and Acting State Director Heinlein’s Record of Decision (“**ROD**”) for the Pine Valley Water Supply Project, (“**PVWSP**” or “**Project**”) DOI-BLM-UT-C010-2020-0012-EIS (March 2026). Pursuant to 43 C.F.R. § 4.403(a)(1), a copy of the BLM’s Record of Decision for the PVWSP is attached hereto as **Exhibit A**.

Pursuant to 43 C.F.R. § 43.403(a)(3), County & Community Appellants provide the following statement regarding this Appeal’s timeliness. A Notice of Appeal is timely if it is filed no later than thirty (30) days “after the date of receiving notice of the decision.” 43 C.F.R. § 4.403(c)(1). County & Community Appellants received notice of the notice of decision, i.e. ROD when it was posted to BLM’s ePlanning website for the Project on March 2, 2026.¹ *See id.* §

¹ The Record of Decision was accompanied by a press release in satisfaction of the notice provisions of 43 C.F.R. § 4.403(c)(2)(iii). *See* Bureau of Land Management, *Record of Decision Signed Approving Issuance of Temporary and Long-Term Right of Way Grants* (Mar. 2, 2026), <https://www.blm.gov/announcement/record-decision-signed-approving-issuance-temporary-and-long-term-right-way-grants> (last visited Mar. 10, 2026).

4.403(c)(2)(iii), (v). Thirty days from March 2, 2026, is April 1, 2026. Therefore, this Notice of Appeal is timely. Notices of Appearance by all listed counsel shall follow.

STATEMENT ON STANDING

County & Community Appellants are proper parties to maintain and pursue this Appeal. Parties have standing to appeal this agency decision if they meet two requirements: they (1) must be a party to the case; and (2) must be adversely affected by the decision being appealed. 43 C.F.R. § 4.402(a); *W. Watersheds Project*, 185 IBLA 293, 298 (2015). All County & Community Appellants meet both of these requirements. A party “is a person or entity that has taken action that is the subject of the decision on appeal or is the object of that decision, or has otherwise participated in the process leading to the decision under appeal, ... by commenting on an environmental document, or by filing a protest to a proposed action.” *Id.* § 4.401. All County and Community Appellants filed comments with the BLM on, at minimum, the draft Environmental Impact Study (“**Draft EIS**”) for the PVWSP. *See* Standing Declarations attached hereto as **Exhibits B-1 - B-20**.

Similarly, all County & Community Appellants are adversely affected by the BLM’s ROD. A party to a case is adversely affected by a BLM decision when the party “has a legally cognizable interest, and the decision on appeal has caused or is substantially likely to cause injury to that interest. A legally cognizable interest may include, but is not limited to, a property or economic interest in the affected lands or resources, or a cultural, recreational, or aesthetic interest in the affected lands or resources.” *Id.* Specifically, a party may establish that it is adversely affected by setting forth interests in resources or in other land or its resources, including adjacent land, and “showing how the decision has caused or is substantially likely to cause injury to those interests.” *Bd. of Cnty. Comm’rs of Pitkin Cnty., Colo.*, 173 IBLA 173, 178 (2007).

A political subdivision of the State of Utah or Nevada, such as Beaver, Juab, and Millard Counties (Utah) and White Pine County, and Central Nevada Regional Water Authority, (Nevada) and Milford City, (Utah), may demonstrate a legally cognizable interest by identifying a concrete governmental interest, such as land-use planning, the provision of governmental services, tax revenues, property, or natural resources, that is injured or impaired by federal action, including where that action interferes with the subdivision's ability to exercise its management authority or to pursue its policies and objectives. *See Bd. of Cnty. Comm'rs of Pitkin Cnty., Colo.*, 186 IBLA 288 (2015); *Moffat County*, 198 IBLA 265, 266 (2024); *Catron Cnty. Bd. of Comm'rs v. U.S. Fish & Wildlife Serv.*, 75 F.3d 1429, 1433 (10th Cir. 1996).²

Similarly, an organization, such as Great Basin Water Network, may demonstrate a legally cognizable interest based on adverse effects to its own organizational interests. *Umpqua Watersheds, Inc.*, 191 IBLA 1, 6 (2017). Alternatively, an organization can establish that one or more of its staff or members has a legally cognizable interest, coinciding with the organization's purpose, that could be adversely affected by the outcome of the appeal. *Id.*; *Bd. of Cnty. Comm'rs of Pitkin Cnty., Colo.*, 173 IBLA at 178.

Importantly, “[t]he appellant need not prove that an adverse effect will, in fact, occur as a result of the BLM action, but we have long held that the threat of injury and its effect on the appellant must be more than hypothetical.” *Front Range Equine Rescue*, 187 IBLA at 32 (citing *Missouri Coalition for the Environment*, 124 IBLA 216 (1992)). Finally, the legally cognizable

² IBLA has “long acknowledged that the Department’s requirement of standing is properly informed by the judicial requirement of ‘injury in fact,’ noting that decisions by Federal courts concerning judicial standing ‘provide a useful guide as to the types of interests which have been deemed relevant and the concerns which are properly considered in adjudicating administrative appeals.’” *Bd. of Cnty. Comm'rs of Pitkin Cnty., Colo.*, 186 IBLA 288, 307 (2015) (citing *In re Pacific Coast Molybdenum Co.*, 68 IBLA 325, 332 (1982)).

interest must be shown to have been held by the appellant at the time of the decision that it seeks to appeal. *See id.* at 32 (citations omitted).

As detailed in the Standing Declarations attached as Exhibits B-1 - B-20, County & Community Appellants all are proper parties to the case and are adversely affected by BLM's decision to approve the Central Iron County Water Conservancy District's Right of Way Applications for the Pine Valley Water Supply Project, and to authorize use of those Rights of Way for construction and operation of the Project and for the Project's groundwater pumping, which will directly result in real, demonstrable, and concrete injuries to County & Community Appellants. As such, County & Community Appellants have standing to bring this appeal.

PETITION FOR STAY

County & Community Appellants respectfully submit this Petition for Stay ("**Petition**") to the Interior Board of Land Appeals ("**IBLA**" or the "**Board**") pursuant to 43 C.F.R. § 4.405(b). Pursuant to 43 C.F.R. § 4.405(b)(2), the Petition is filed concurrently with the above Notice of Appeal.

County & Community Appellants seek immediate relief to stay the BLM's Monday, March 2, 2026, ROD for the PVWSP. *See Exhibit A.* Acting BLM State Director, Jerry Davis, signed the ROD the business day immediately following BLM's Cedar City Field Office's release of a Final EIS for the Project.³ *See* Final EIS , PVWSP (DOI-BLM-UT-C010-2020-0012-EIS) .

³ BLM released the Final EIS on Friday, February 27, 2026. The Final EIS can be accessed at https://eplanning.blm.gov/public_projects/%2F74d9f5cd-94f2-f011-8407-001dd80db62a%2FDocuments%2FPVWS%20Final%20EIS.pdf.

I. FACTUAL BACKGROUND

A. The Pine Valley Project

The Cedar Valley Water Conservancy District, formerly known as Central Iron County Water Conservancy District (“CICWCD”)⁴ provides water for municipal and other uses within Cedar Valley in Iron County, Utah, which includes the communities of Cedar City, Enoch, and Kanarraville. Final EIS at 1. Decades of over-extraction have resulted in significant declines in groundwater levels in Cedar Valley. According to the Cedar Valley Ground Water Management Plan⁵, the Cedar Valley Basin’s safe yield is approximately 21,000 acre-feet per year (“afy”), while current depletion is estimated at 28,000 afy, creating an ongoing deficit of approximately 7,000 afy. To address this deficit and projected future demand, CICWCD is pursuing new groundwater sources outside of Cedar Valley. *Id.*

The proposed PVWSP is intended to develop and convey groundwater from Pine Valley, in Beaver County, Utah to Cedar Valley, in Iron County, Utah. *Id.* As proposed, the Project includes 15 groundwater production wells within the Pine Valley basin; approximately 70 miles of lateral and main pipeline; a 200-acre solar field; 11.7 miles of power transmission lines; 6.1 miles of access roads; and a 10-million-gallon water storage tank site. *See* FEIS Chapter 2. PVWSP is identified as the first phase of the larger “West Desert Water Supply and Conservation Project” (“**West Desert Project**”), which contemplates groundwater development in Pine Valley, Wah Wah Valley, and Hamlin Valley. Final EIS at 47. Collectively, the three phases would involve

⁴ CICWCD recently changed its name to Cedar Valley Water Conservancy District. However, for continuity this Petition will continue to refer to the district as CICWCD which is the name utilized throughout the proceedings before the BLM.

⁵ Water Management Plans are developed by the Utah State Engineer (“**State Engineer**”), the appointed official who administers and manages all state appropriated water in Utah. *See generally* Utah Code Title 73, Chapter 2.

withdrawals of up to 36,000 afy, including 15,000 afy from Pine Valley, 11,000 afy from Wah Wah Valley, and 10,000 afy from Hamlin Valley. *See* Comment GRH-24, Final EIS at G-40. The valleys in question are dry, remote, and rugged valleys in western Utah, separated by low mountain ranges. They have no lakes, rivers, or even perennial streams, and remain largely unsettled due to lack of available water. Their underground water basins are located within the headwaters of the Great Salt Lake Desert Flow System and, in the case of Wah Wah Valley, the Sevier Lake Flow System, and contribute to flows in these systems through groundwater recharge. The total proposed withdrawals would represent approximately 18% of estimated annual recharge across the broader system and roughly one-third of recharge within Utah.

Available groundwater modeling indicates that Project pumping will cause severe drawdown in the Pine Valley aquifer: as much as 500 to 1000 feet at the wellfield in the near term, with effects propagating through hydrologically connected basins. *See* Brooks, L., Groundwater Model Analysis, LLC, Comment on the Draft Environmental Impact Statement, Pine Valley Water Supply Project, DOI-BLM-UT-C010-2020-0012-EIS, With Emphasis on Groundwater Resources Impact Assessment and GBCAAS-PV Model (Oct. 2, 2025) (attached hereto as **Exhibit C-1**); Brooks, L., *Technical Review of the Draft Environmental Impact Statement Pine Valley Water Supply Project*, DOI-BLM-UT-C010-2020-0012-EIS, (Oct. 13, 2025) (attached hereto as **Exhibit C-2**); Brooks, Groundwater Model Analysis, LLC, *Comment on the Draft Environmental Impact Statement, Pine Valley Water Supply Project, DOI-BLM-UT-C010-2020-0012-EIS, With Emphasis on Uncertainty of Model Predictions Calculated Using Modified GBCAAS 3.0 Model* (Oct. 23, 2025) (attached hereto as **Exhibit C-3**) (collectively, Exhibits C-1, C-2 and C-3 are referred to as the “**Brooks Technical Review**”). *See also* Brooks, L., *Comments on the Final Environmental Impact Statement, Pine Valley Water Supply Project, DOI-BLM-UT-C010-2020-*

0012-EIS, (March 1, 2026) (attached hereto as **Exhibit D**); Zdon, A. & Osborn, J., Roux Associates, Inc., *Technical Memorandum: Groundwater Impacts of the Proposed Pine Valley Water Supply Project, Utah on Nevada Groundwater Basins with a Focus on Snake Valley, Nevada & Utah* (Sept. 20, 2021) (attached hereto as **Exhibit E-1**); Zdon, A., Roux Associates, Inc., *Technical Memorandum: Comments regarding the Pine Valley Water Project DEIS and Associated Documents* (March 8, 2022) (attached hereto as **Exhibit E-2**).

When the Project's planned Wah Wah Valley pumping is considered, the models project declines ranging from several feet to hundreds of feet across large portions of Beaver County. This drawdown includes declines of 50 to 100 feet in the already overappropriated Beryl Enterprises Area within decades; of several to tens of feet in Snake Valley; and of and substantially greater, more widespread impacts over longer time horizons. *See* PVWSP Final Groundwater Resources Impact Assessment § 4.2.1.2; Brooks, USGS, *Groundwater Model of the Great Basin Carbonate Alluvial Aquifer System Version 3.0*, Fig. 33 (2017). These impacts are particularly concerning because the Project targets deep aquifers with very slow recharge, meaning that groundwater losses will be effectively permanent. *See* FEIS § 3.11.2.5.

B. Procedural History

In 2006, CICWCD commenced the West Desert Project by filing with the State Engineer Applications to Appropriate new groundwater rights in Pine Valley and Wah Wah Valley for 15,000 afy and 12,000 afy, respectively. Concurrently, CICWCD filed for 10,000 afy in Hamlin Valley. In May 2014, the State Engineer approved certain groundwater appropriations, subject to conditions. *See* FEIS §1.5.2. On February 27, 2019, challenges to the approved Applications to Appropriate were resolved through a stipulated judgment and settlement agreement entered by Utah's Fifth Judicial District Court. *Id.* Under the stipulated judgment, CICWCD obtained the

legal right to attempt to divert and beneficially use up to 15,000 afy from Pine Valley, 6,525 afy from Wah Wah Valley, and an additional 4,025 afy subject to specified conditions.⁶

The 2019 Amended State Engineer Orders (collectively “**SEO**”) attached to the stipulated judgment provided that “[t]he Parties acknowledge they have a difference of opinion regarding the amount of water available for development in the Wah Wah Valley and the Pine Valley - namely, the safe yield of the aquifers in those valleys...The non-State Engineer Parties expressly understand and acknowledge that the State Engineer is making no warranty or representation about the amount of water available for development in the Wah Wah Valley and the Pine Valley, and that approvals provided under this Agreement may be for more water than future facts demonstrate is actually available for long-term beneficial use...The non-State Engineer Parties expressly understand and acknowledge that proper exercise of [the State Engineer’s] authority may result in a reduction of the amount of water authorized for diversion under this Agreement.” CICWD’s Hamlin Valley PVWSP applications have not yet been acted on by the State Engineer.

Meanwhile, on June 15, 2017, CICWCD submitted an application to the BLM for rights-of-way (“**ROWS**”) for the Project. 85 Fed. Reg. 42914 (July 15, 2020). The BLM published a notice of intent to prepare an EIS for CICWCD’s Project ROW applications on July 15, 2020. *Id.* Public scoping was held during August of that year. *Id.* BLM prepared an Administrative Draft

⁶ The approval of an Application to Appropriate water is far from the final step in the process to obtain an actual right to use water (“water right”) which is a real property interest under Utah law. The holder of an “Approved Application to Appropriate” must also within a certain period of time allowed by the State Engineer file a “Proof of Beneficial Use” demonstrating that water under the approved Application has actually been found and diverted from the natural system and put to a recognized “Beneficial Use” such as irrigation or municipal use. Until a Proof of Beneficial Use is filed with the State Engineer, and the State Engineer reviews and approves the Proof of Beneficial Use by issuing a “Certificate of Beneficial Use” there is no water right only an Approved Application to Appropriate. If the holder of an Approved Application to Appropriate fails to submit a Proof of Beneficial Use within the time period allowed by the State Engineer, plus any extensions granted by the State Engineer, the Approved Application to Appropriate will lapse and the opportunity to obtain a water right will be lost.

EIS in 2021 and issued the Draft EIS in 2022. During the corresponding review period, cooperating agencies, members of the public and other interested parties including the County & Community Appellants raised significant concerns regarding fundamental flaws in the groundwater modeling, financial assumptions, mitigation measures, project scope, alternatives, compliance with a number of environmental laws, and consideration of impacts. In May of 2023, CICWCD requested a pause in the NEPA process to allow additional time to address those comments and issues, including revising its water needs assessment, further evaluating conservation and recharge programs, coordinating with affected Tribes, and refining mitigation measures. BLM granted the pause.

During and following the pause, and without further public process, an Administrative Final EIS and supporting reports were prepared and provided to cooperating agencies for comment during the spring and fall of 2025. On February 27, 2026, the Final EIS followed. The Final EIS includes updates to certain aspects of the analysis, but largely relies on the same underlying framework, data, and modeling as the Draft EIS. The record reflects limited revision in response to key deficiencies identified during the comment process, including deficiencies in groundwater modeling identified by extensive reviews of groundwater hydrology and modeling, financial projections, and mitigation planning. The Final EIS failed to include a finalized monitoring, management, or mitigation plan, and there is limited information regarding coordination with the State Engineer on such measures, despite the fact that such a plan is required as a State Engineer-imposed condition of the Project's water rights. In addition, information developed or refined during the multi-year pause was not circulated for additional public review or comment prior to issuance of the Final EIS.

II. Standard for Granting a Stay

For a stay to be granted, County & Community Appellants must demonstrate that (i) that they "will likely be irreparably harmed by implementation of the decision pending resolution of

the appeal, and the harm will be avoided by granting the stay"; (ii) that the irreparable harm to one or more of the appellants "exceeds the harm to the United States and other parties from a stay being granted"; and (iii) that when the Board reaches the merits of the Appeal, the County & Community Appellants are "likely to succeed." 43 C.F.R. §4.405(b)(4). An appellant satisfies its burden to demonstrate that a stay should be granted when it "show[s] that it likely meets each criterion." *See id.* §4.05(b)(5); *Pueblo of San Felipe*, 187 IBLA 342, 345 (2016). As set forth in this Petition, the County & Community Appellants meet each of these requirements and are entitled to a stay of the ROD.

III. County & Community Appellants Are Likely to Succeed on the Merits.

To establish a likelihood of success on the merits, the County & Community Appellants need only make a "persuasive showing" that their claims of legal or factual error have merit. *Las Vegas Paiute Tribe*, 200 IBLA 172, 181 (2025). To make a persuasive showing, "[a]n appellant need not show that their prospects of success are 'free from doubt.'" *Id.* (quoting *Tenn. Gas Pipeline Co.*, 189 IBLA 108, 115 (2016)). Rather, "the need for more deliberative investigation of the evidence and basis for the agency's decision" is a "hallmark" of an appeal that is likely to succeed. *Id.* (quoting *Pueblo of San Felipe*, 187 IBLA 342, 346 (2016)).

County & Community Appellants are likely to succeed upon the merits of this Appeal for several reasons. First, the FEIS relies on faulty scientific analysis. Second, the Final EIS affirmatively ignores new information that requires a Supplemental EIS. Third, this Petition outlines multiple independent NEPA and FLPMA violations that demonstrate arbitrary and capricious decision making. Finally, the Final EIS underwent an excessively limited review period. As such, the Final EIS and ROD are in violation of, at minimum, the Administrative Procedure Act ("APA"), 5 U.S.C. §§ 551–559, the Federal Land Policy and Management Act ("FLPMA"), 43 U.S.C. §§ 1701-1782, and the National Environmental Policy Act ("NEPA"), 42 U.S.C. §§

4331-4370(h).

A. BLM Violated NEPA by Failing to Take a “Hard Look” at the Reasonably Foreseeable Consequences of the ROW Grant.

NEPA “is our basic national charter for protection of the environment.” *WildEarth Guardians v. BLM*, 870 F.3d 1222, 1226 (10th Cir. 2017). NEPA recognizes “the profound impact of man’s activity on the interrelations of all components of the natural environment” and establishes a continuing federal policy “to use all practicable means and measures . . . to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans.” 42 U.S.C. § 4331(a). NEPA’s “sweeping policy goals” are “realized through a set of ‘action-forcing’ procedures” that require that agencies take a “hard look” at the reasonably foreseeable environmental consequences of major Federal actions, such as the PVWSP. *See Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 350 (1989); 42 U.S.C. § 4332(2)(C).

Therefore, to withstand NEPA review, “[t]he record must show that BLM took a ‘hard look’ at the proposed action, identified relevant areas of environmental concern, and reasonably found that the action has no significant effects not analyzed in the EIS.” *Powder River Basin Res. Council*, 200 IBLA 195, 205-06 (2025); *id.* n. 184 (citing *Colo. Env’t Coal. v. Dombeck*, 185 F.3d 1162, 1171-72 (10th Cir. 1999) (an EIS must “take a ‘hard look’ at the environmental consequences of proposed actions utilizing . . . the best available scientific information”) (emphasis added) (citations omitted)); *see also Bristlecone Alliance*, 179 IBLA 51, 60 (2010) (noting that an EIS “is judged by whether it ... takes a hard look at the potentially significant environmental consequences of the proposed Federal action and reasonable alternatives.”).

NEPA specifies that “reasonably foreseeable environmental effects” includes “adverse” effects that “cannot be avoided should the proposal be implemented”; “a reasonable range of

alternatives to the proposed agency action”; “the relationship between local short-term uses of man’s environment and the maintenance and enhancement of long-term productivity”; and “any irreversible and irretrievable commitments of Federal resources which would be involved in the proposed agency action should it be implemented.” 42 U.S.C. § 4332(2)(C)(i)-(v). The EIS must also discuss “steps that can be taken to mitigate adverse environmental consequences.” *Robertson*, 490 U.S. at 351. Importantly, agencies “shall ... ensure the professional integrity, including scientific integrity, of the discussion and analysis” in an EIS. 42 U.S.C. § 4332(2)(D); *see also* FLPMA, 43 U.S.C. § 1763 (“In order to minimize adverse environmental impacts and the proliferation of separate rights-of-way... [i]n designating right-of-way corridors and in ... the Secretary ... shall take into consideration national and State land use policies, environmental quality, economic efficiency, national security, safety, and good engineering and technological practices.”).

i. The Final EIS Did Not Analyze the Reasonably Foreseeable Environmental Effects of the Entire West Desert Project.

NEPA requires that, to the “to the fullest extent possible,” the responsible official shall prepare a detailed statement on the “reasonably foreseeable environmental effects of the proposed agency action.” 42 U.S.C. 4331 § 102(C)(1). Under longstanding NEPA practice, this includes a requirement that “connected” or “closely related” actions “be discussed in the same impact statement.” *See Citizens' Comm. to Save Our Canyons v. U.S. Forest Serv.*, 297 F.3d 1012, 1028 (10th Cir. 2002); DOI NEPA Handbook § 1.2(b)(1).⁷ Thus, an agency may not segment its analysis into smaller components to avoid full consideration of environmental impacts or to minimize their

⁷ An action is “connected” and should be addressed in a single EIS when it 1) the action automatically triggers another action requiring an environmental impact statement; 2) the action cannot or will not proceed unless other actions are taken previously or simultaneously; or 3) the action is an interdependent part of a larger action and depends on that larger action for its justification. *Citizens Comm. to Save Our Canyons*, 297 F.3d at 1028; DOI NEPA Handbook § 6.1(g).

apparent severity. *Citizens' Comm. to Save Our Canyons*, 297 F.3d at 1028–1029 (10th Cir. 2002); *Thomas v. Peterson*, 753 F.2d 754, 759 (9th Cir. 1985); *Save the Yaak Comm. v. Block*, 840 F.2d 714, 720 (9th Cir. 1988). This prohibition on segmentation ensures that agencies do not divide a single project into smaller actions that appear insignificant individually but have substantial cumulative impacts. *Thomas*, 753 F.2d at 758; *Utahns for Better Transp. v. U.S. Dep't of Transp.*, 305 F.3d 1152, 1183 (10th Cir. 2002). The rule exists to prevent “fractionalization” of a major federal action into components that obscure the project’s true environmental consequences. *Piedmont Heights Civic Club, Inc. v. Moreland*, 637 F.2d 430 (5th Cir. 1981); *Swain v. Brinegar*, 542 F.2d 364 (7th Cir. 1976) (*en banc*).

The rule against segmentation remains fully intact following the Supreme Court’s recent *Seven County Infrastructure Coalition v. Eagle County*, 605 U.S. 168 (2025). *Seven County* did not relax NEPA’s core requirement that agencies evaluate the full scope of the “project at hand,” it addressed only the distinct question of when effects from *separate projects* fall outside that scope. *Id.* at 187. In determining whether a proposed 88-mile rail line at issue was a “separate project” from upstream oil drilling or downstream oil refining, the Court considered whether there was a “reasonably close causal relationship” between the project at hand and the environmental effects of the unexamined project. *Id.* at 187, 191. The Court found no such connection when the other projects were geographically separate⁸, would be pursued by third parties, and would not be subject to the regulatory authority of the reviewing agency. *Id.* at 187–188. Nothing in *Seven County* authorizes an agency to segment a single, integrated course of action into artificial components to avoid full NEPA review. To the contrary, where activities are causally connected,

⁸ Importantly, the Court clarified that the “environmental effects of the project at issue may fall within NEPA even if those effects might extend outside the geographical territory of the project or might materialize later in time.” *Seven County*, 605 U.S. at 187. The question is whether the *project* is geographically remote.

functionally interdependent, or part of a coordinated development scheme, they remain part of the “project at hand” and must be analyzed together. As the Board recently stated, “*Seven County* does not excuse BLM from NEPA's requirement that it consider all potentially significant environmental impacts” of the project at hand. *Las Vegas Paiute Tribe*, 200 IBLA at 187.

In this case, BLM failed to consider the reasonably foreseeable effects of the entire West Desert when it declined to consider the West Desert Project in its Final EIS, stating “[t]hese future projects are excluded as reasonably foreseeable future actions because there is no existing proposal, no permit applications have been submitted to the BLM, and no commitment of resources has been made for these projects.” Final EIS at 47. This conclusion is contrary to the facts in the record.

The record contains a multitude of evidence that PVWSP is a precursor to and first phase of the West Desert Project as a whole. For one, the Final EIS itself notes that “the Iron County RMP specifically supports the ‘West Desert Pipeline Project,’ which is a precursor to the Project proposal.” Final EIS at 10. The State Engineer approved CICWCD’s Application to Appropriate in Pine Valley and Wah Wah Valley, and. maintains a pending application for Hamlin Valley. Second, the Wah Wah Valley development is specifically included in the CICWCD's Financial Business Plan and Water Needs Assessment. *See CICWCD, Financial Plan and Business Report* at Appendix A (2023), (hereinafter “**Water Needs Assessment**” or “**Carollo Report**,” attached hereto as **Exhibit F**) (considering the “one time economic impact” of combined infrastructure investments in Pine Valley and Wah Wah Valley).

Relatedly, an economic analysis prepared by Roux Associates for Appellant Beaver County raises serious questions regarding the financial feasibility of the PVSWP alone, making it quite likely that the larger West Desert project and the far greater amount of water it would bring

to customers of CICWCD would be necessary to justify the massive expenditure for the PVWSP. *See* Stifter, R. & Zdon, A., Roux Associates, Inc., *Review of Economic and Financial Analysis Supporting the Proposed Pine Valley Water Supply Project* (Jan. 5, 2026) (hereinafter “Roux Financial Analysis,” attached hereto as **Exhibit G**).

Further, the record reflects that CICWCD has repeatedly and publicly confirmed that PVWSP is merely phase one of the West Desert Project. Beaver County’s March 11, 2022, Draft EIS comments and supporting attachments note that CICWCD’s website contains a West Desert Water Supply Timeline, which notes “the first phase of the West Desert Water Supply Project will import water from Pine Valley[.]” The CICWCD website also includes an information page for the West Desert Project containing a map of the entire project and information on “the proposal to develop and import water from ... the Pine *and* Wah Wah Valleys.” *See* Beaver County Draft EIS Comments, at 5–9 and supporting attachments (Mar. 11, 2022); CICWCD project maps and planning documents (previously submitted in the record).

Finally, USGS report 2017-5072 identifies simulation of proposed pumping for both Pine and Wah Wah Valleys as a core objective. *See* Brooks, L., USGS, *Conceptual Model and Numerical Simulation of the Great Basin Carbonate and Alluvial Aquifer System—Version 3.0* (USGS Scientific Investigations Report 2017-5072) at 56 (2017). Each of these facts underscore that the effects of the West Desert Project in its entirety are reasonably foreseeable.

None of the *Seven County* criteria is present. The PVWSP and the West Desert Project are both proposed by the same proponent, are both geographically and physically interconnected, and are both within BLM’s regulatory scope. Therefore, PVWSP clearly fits the longstanding definition of a “connected action,” as the record shows PVWSP is an integrated component of a broader, coordinated undertaking. Under the BLM’s interpretation that the West Desert Project is

not a connected action simply because CICWD has yet to request ROW permits, *see* BLM Response to Comment NEPA-03, Final EIS at page G-119, applicants could effectively forego environmental impacts analysis altogether by submitting permits for their projects piecemeal. This interpretation of NEPA renders the operative requirements of the statute effectively unworkable, an effect which is contrary to well accepted principles of statutory interpretation. *See, e.g., Schwegmann Bros. v. Calvert Distillers Corp.*, 341 U.S. 384, 389 (1951) (rejecting interpretation under which “the exception swallows the proviso and destroys its practical effectiveness”). The Board should not allow CCWID to create a loophole in NEPA in this fashion or to dictate the scope of review to its advantage. Because BLM failed to evaluate the reasonably foreseeable impacts of the full West Desert Project in a single environmental impact statement, its analysis is legally deficient under NEPA.

ii. In PVWSP’s FEIS, BLM Failed to Ensure the Scientific Integrity of Its Analysis.

Setting aside the unlawful segmentation of PVWSP from the West Desert Project, the Final EIS for the PVWSP on its own does not pass NEPA muster. NEPA requires that BLM “ensure the professional integrity, including scientific integrity, of the discussion and analysis” in an environmental impact statement. 42 U.S.C. § 4332(2)(D). While Courts are deferential to an agency when it comes to the methodology the agency chooses to use, the agency's methodology must be rational—and not arbitrary or capricious.” *WildEarth Guardians v. U.S. Forest Serv.*, 137 F.4th 1068, 1086 (10th Cir. 2025) (quoting *Diné Citizens Against Ruining Our Env’t v. Haaland*, 59 F.4th 1016, 1036 (10th Cir. 2023) (hereinafter *Diné Citizens*)). In *Diné Citizens*, the 10th Circuit held that BLM's methodology was arbitrary and capricious when “it use[d] the emissions calculated for one year to represent the estimated direct and indirect emissions over a twenty-year period despite being able to create a similar estimate for downstream emissions,” because the BLM’s failed explain why it could not use a similar process to estimate direct emissions. *Diné*

Citizens, 59 F.4th at 1037. Assertions made by an agency rationalizing specific methodology are arbitrary and capricious when they “lack scientific support and are directly contradicted by the administrative record.” *WildEarth Guardians*, 137 F.4th at 1086–87.

1. BLM Relied on a Scientifically Flawed GBCAAS-PV Model.

BLM’s analysis of project impacts in the Final EIS rests almost entirely on a Groundwater Resources Impact Assessment (“**FGRIA**”) and the numerical groundwater modeling the FGRIA incorporates. *See* Groundwater Resources Impact Statement, Pine Valey Water Supply Project (December 2025).⁹ Because the Final EIS relies on that modeling to predict drawdown, spring depletion, and interbasin effects, the validity of the agency’s analysis rises or falls with the reliability, soundness, and scientific integrity of the modeling incorporated in the FGRIA.

The starting point for the FGRIA’s modeling framework is the universally recognized and followed U.S. Geological Survey’s 2017 GBCAAS v. 3.0 model. *See* Brooks, L., U.S. Geological Survey, Groundwater Model of the Great Basin Carbonate and Alluvial Aquifer System Version 3.0: Incorporating Revisions in Southwestern Utah and East Central Nevada, Scientific Investigations Report 2017–5072 (2017) (“**GBCAAS 3.0**”). The GBCAAS 3.0 model was designed to represent how groundwater moves across the broader Great Basin Carbonate and Alluvial system. GBCAAS 3.0 used calibration to non-pumping conditions to estimate key components of that system such as recharge and hydraulic conductivity and used water levels and measured or estimated discharge as observations. *Id.*

During the preparation of a Draft GRIA which was included in the Draft EIS and preceded the FGRIA, CICWCD’s consultant Formation Environmental developed a second, project-specific model (“**GBCAAS-PV**”). GBCAAS-PV is a localized “child” model derived from GBCAAS v.

⁹ A copy of the FGRIA is available at https://eplanning.blm.gov/public_projects/%2F74d9f5cd-94f2-f011-8407-001dd80db62a%2FDocuments%2F1.%20Final%20GRIA%20508_Compressed.pdf.

3.0, and is relied upon in both the Draft GRIA and FGRIA. In developing GBCAAS-PV, Formation Environmental used GBCAAS 3.0 as a starting point but modified inputs, assumptions, and parameters to simulate project-specific pumping and to predict impacts from PVWSP pumping. As reflected in the technical reports and comments submitted by both cooperating agencies and the public in response to the Administrative Draft EIS, Draft EIS, Administrative FEIS, and Final EIS, however, the GBCAAS-PV child model contains problems with parameterization and calibrations that raise serious concerns about whether the model can reliably predict the Project's impacts. *See* Brooks Technical Review, Exhibits C-1–C-3. *See also* Exhibits D, E-1, and E-2.

The Record indicates that fundamental issues with and failures of the GBCAAS-PV child model were presented to BLM prior to the issuance of the Final EIS. Specifically, the Brooks Technical Review of the Draft EIS, the Draft GRIA, and the GBCAAS-PV model reveals the following key concerns, which remain unaddressed by the FGRIA and Final EIS.

First, groundwater model predictions made using the GBCAAS-PV model do not include prediction confidence intervals, prediction scaled sensitivities, or prediction correlation coefficients, and do not present parameter uncertainty. Presenting prediction uncertainty is generally expected in the scientific community, as it is critical to understanding both whether the GBCAAS-PV model can make adequately precise predictions and whether the level of uncertainty in those predictions is consistent with NEPA's "hard look" requirement.

Second, the GBCAAS-PV model fails to account for historical groundwater pumping in nearby Snake Valley, the Beryl-Enterprise Area, and the Milford Area. Decades of pumping and water use have already created substantial drawdown cones and reduced the evapotranspiration that existed under pre-development conditions used to calibrate the GBCAAS-PV model. By

starting from a steady-state, no-pumping baseline, the GBCAAS-PV model is inherently flawed and cannot accurately capture or reflect these legacy impacts. As a result, the GBCAAS-PV model assumes evapotranspiration capture where little or none remains, artificially minimizing the extent of drawdown from the proposed wells in the PVWSP and understating the time required for aquifer recovery of the Pine Valley Aquifer.

Third, the GBCAAS-PV model treats future aquifer recharge as a fixed input despite substantial uncertainty and despite observational data that strongly inform recharge parameters, as reflected by large composite scaled sensitivities. Given this sensitivity, future aquifer recharge should have been estimated through regression rather than imposed as a known value.

Fourth, GBCAAS-PV model includes numerous spatially limited parameters that are weakly informed by observational data, as indicated by low composite scaled sensitivities. These parameters appear to have been manually adjusted to match localized water levels or spring discharge, rather than calibrated to reflect system-wide responses to pumping. This approach undermines the GBCAAS-PV model's predictive reliability. Overparameterization with insensitive inputs increases uncertainty, and here that concern is pronounced: of the 31 parameters added to the GBCAAS-PV model, only 7 were estimated through regression and carried into the final calibrated model.

Fifth, the proposed pumping area exhibits some of the highest water-level residuals in the calibrated GBCAAS-PV model. This mismatch suggests a potential conceptual error in model construction or parameterization, which could substantially affect the reliability of model predictions.

Finally, the GBCAAS-PV model assumes only a 50-year pumping period for the PVWSP and surrounding areas, which is an unreasonably short period for a Project of this size and

magnitude. The Final EIS and FGRIA deem any extraction of water beyond this relatively short period speculative. Yet the model applies a speculative—and highly specific—rate of zero pumping after 50 years, which artificially limits the projected long-term impacts of both the PVWSP and any further regional pumping. This defies practicality, common sense, and the principles of scientific integrity. Few, if any, water supply projects have a life expectancy of only 50 years. CICWCD's water rights are permanent and perpetual. Permanent water rights in Utah are routinely pumped for as long as water is available. Indeed, many water rights have been in continual use since the Utah Territory was first settled from 1847 - 1867. There is no reason to think that the Project proponent would (or could) abandon such a large quantity of valuable water rights, especially once CICWCD's service area has come to rely on the supply from the Project.

Moreover, capital costs for the PVWSP could total anywhere from \$259.1 million to \$679.2 million for the PVWSP phase of the West Desert Project alone. *See* Stifter, R. & Zdon, A., Roux Associates, Inc., Review of Economic and Financial Analysis Supporting the Proposed Pine Valley Water Supply Project (Jan. 5, 2026), attached hereto as **Exhibit G**. Surely, a Project of this financial magnitude would not be abandoned after only 50 years of pumping and assuming that to be the case defies logic, common sense, and scientific integrity.

Taken together, these six deficiencies render the GBCAAS-PV modeling framework upon which the Final EIS relies scientifically unreliable and inadequate to support reasoned decision-making required by NEPA. The Final EIS does not reflect best available science, but instead produces results characterized by a high degree of uncertainty, which uncertainty extends not only to the magnitude and geographic extent of impacts, but even to whether groundwater can be feasibly be found and pumped at the proposed well depths. Critically, that uncertainty is not neutral; it is structured in a manner that systematically biases the analysis toward underpredicting

the severity and scope of impacts. NEPA does not permit reliance on such a speculative and one-sided analytical foundation. Where, as here, the agency proceeds in the face of profound and largely unacknowledged uncertainty, it has failed to take the requisite “hard look” and cannot reasonably conclude that the Project’s impacts have been fully disclosed or understood.

2. Updates to the GRIA Found in the FGRIA Fail to Address the GRIA’s Fatal Flaws

The FEIS incorporates the FGRIA , including a newly added Appendix D, which, according to BLM, documents “several additional modeling evaluations that were conducted in response to comments on the Draft EIS and Draft GRIA.” *See* BLM Response to Comment GRH-40, FEIS at page G-48. Appendix D does not cure the Draft GRIA’s defects. It underscores them.

Appendix D reveals substantial and previously undisclosed model inaccuracies in the Draft GRIA. For example, Appendix D discusses the model fit to springs outside of the area modeled in the GBCAAS-PV Model. This discussion discloses incorrect and inherently flawed model simulations for the Southern Snake Valley. The GBCAAS-PV Model wrongly assumes and simulates approximately 32,000 acre-feet per year of discharge from three Snake Valley springs: Big Springs, Dearden Spring Group, and gha254__7. *See* FGRIA, figure D3-6. This assumed spring discharge more than doubles the observed total discharge of those springs, which amounts to only 14,100 acre-feet per year. The magnitude of this error makes the resulting flawed conclusions in the GBCAAS-PV Model impossible to dismiss or overlook. The GBCAAS-PV Model overestimates spring discharge by roughly 225%, errors exceeding the Project’s total proposed pumping rate. Discrepancies of this magnitude point to fundamental and fatal problems with parameter distribution in the GBCAAS-PV Model and call into serious question its ability to generate reliable predictions about the effects of Project pumping. Critically, these errors operate

to obscure the impacts of Project pumping in a manner that is inconsistent with ensuring that BLM takes a “hard look” at Project impacts and adhere to scientific integrity .

The FGRIA justifies the unrealistic, falsely inflated simulated Snake Valley spring discharge and high water levels near those springs by stating, “[h]owever, the fit to groundwater level observations in Hamlin Valley, south of LCAU4191hkp, was improved, as was intended during this calibration process.” *See* FGRIA, page D-16; *see also* FGRIA Figure D3-4 (showing improved simulated water levels observations in some regions, but worse model fit in others [Spring Valley]). While it is true that fit in some areas improved, the significantly degraded fit in others¹⁰ indicates the possibility that the changes made in the GBCAAS-PV Model are inappropriate and do not work with the regional system. While GBCAAS-PV Model is used to determine those areas are “minimally impacted by the Project,” *see* FGRIA, p. D-30, it is arbitrary and capricious to do so where the connection with those areas is not being simulated correctly.

The FGRIA attempts to sweep these significant defects in the GBCAAS-PV Model under the rug by stating: “[s]ince these springs are located outside the child model area and are minimally influenced by Project pumping compared to local pumping, this inconsistency was considered an acceptable tradeoff for Project impact analysis.” FGRIA at D-18. This assertion is arbitrary and capricious because it lacks scientific support and is directly contradicted by the administrative record. *See WildEarth Guardians*, 137 F.4th at 1086–87 (10th Cir. 2025).

First, the FGRIA never identifies the supposed “tradeoff”. A tradeoff implies a reasoned exchange of a quantified benefit gained in return for a known limitation. The FGRIA offers neither. It does not explain what analytical advantage is achieved by using artificially high spring flows, why it outweighs the error, or why that balance would be acceptable in a model intended to predict

¹⁰ Big Springs, Dearden Spring Group, spring gha254_7, and et37Snake.

environmental impacts. More fundamentally, it is scientifically indefensible. A model that cannot accurately reproduce known conditions cannot be relied upon to predict effects, or to exclude consideration of effects. Yet the FGRIA engages in this exact circular reasoning: it uses the GBCAAS-PV Model that materially misstates baseline conditions to assume minimal Project impacts, and proceeds to invoke the absence of those effects to dismiss their consideration and to dismiss the flaws in the GBCAAS-PV Model.. In fact, Appendix D clarifies that the FGRIA's approach to cumulative impacts relies on the scientifically questionable superposition of two models, the USGS GBCAAS 3.0 Model and GBCAAS-PV Model, precisely because the GBCAAS-PV Model which is the child model cannot be reconciled with its parent regional model the GBCAAS 3.0 Model.

Taken together, these updates do not remedy the Draft GRIA's fatal flaws. They expose the GBCAAS-PV Model as resting on inconsistent assumptions, failing to accurately simulate observed conditions, and relying on ad hoc methodologies to compensate for its core structural deficiencies and flaws. The FGRIA thus reinforces, rather than resolves, the fundamental unreliability of the Draft GRIA and the GBCAAS-PV Model, and supports the conclusion that relying on the FGRIA in the Final EIS was arbitrary and capricious.

B. BLM Violated NEPA by Failing to Prepare a Required Supplemental EIS.

Additional analysis through a supplemental environmental impact statement ("Supplemental EIS") is required if the appellant presents new information showing that the action will affect the human environment "in a significant manner or to a significant extent not already considered." *Marsh v. Or. Nat. Res. Council*, 490 U.S. 360, 373 (1989). To determine whether the agency should have undergone supplemental analysis, the Board must ask whether "a seriously different picture of the likely environmental consequences" of the proposed action exists. *Ctr. for Biological Diversity*, 181 IBLA 325, 344 (2012).

For example, courts invalidate NEPA documents where agencies disregard or fail to incorporate significant new information that post-dates earlier technical studies. *See Marsh*, 490 U.S. at 372–74 (1989); *Southern Utah Wilderness Alliance v. Norton*, 457 F. Supp. 2d 1253, 1264 (S.D. Utah 2006). In *Las Vegas Paiute Tribe*, the Board confronted a situation in which BLM had previously evaluated land transfers in the Las Vegas Valley and relied on projections of population growth, water demand, and the effects of conservation measures to conclude that the likely increase in water demand would be within the bounds of the Southern Nevada Water Authority’s (“SNWA”) planning assumptions. 200 IBLA at 181–86.

However, at the time of the appeal, BLM had not seriously reassessed water demand in light of more than twenty years of additional development, population growth, and regional water use data. *Id.* Therefore, the Board found that the existence of new, updated information, including ongoing urban expansion, additional land sales beyond those originally analyzed, and changing hydrologic conditions, presented a “seriously different picture” of the likely environmental consequences. *Id.* Because BLM had not incorporated this new information, the Board concluded that BLM likely failed to take the “hard look” required by NEPA before enabling additional development that could significantly affect finite water resources. *Id.*

Here, BLM’s current analysis found in the Final EIS relies on a patchwork of outdated materials that should have been updated with new information to reflect current conditions. Attempting to rectify these deficiencies, BLM made material additions to the Record which were not made public until the release of the Final EIS. Each circumstance independently requires the preparation of a Supplemental EIS.

i. BLM Failed to Address New Information Developed Following the Analyses Supporting the AFEIS.

During the AFEIS review period, the County Appellants presented BLM with significant new information that developed since the analyses supporting the AFEIS were prepared. This new information included (1) the Brooks Technical Review, containing significant new hydrologic and technical analyses already submitted to BLM by the Cooperating Agency Counties during the AFEIS comment period, *see Exhibits E-1–E-3*, and (2) the Roux Financial Analysis, containing new economic and cost developments, analysis, and information, as well as new information related to cost increases during the pause of the review period. *See Exhibit G.*

First, the Brooks Technical Review, as outlined above, highlights substantial deficiencies in the Draft GRIA in recharge assumptions, parameterization, pumping duration, and regional impacts relied upon in the AFEIS. Just as in *Las Vegas Paiute Tribe*, where updated information revealed that prior projections understated environmental consequences, the Brooks Review indicate that the Draft GRIA likely underestimates groundwater depletion and associated regional effects. *See* 200 IBLA at 181–86. This new information therefore alters the environmental baseline, presenting a “seriously different picture” of the project’s consequences and triggering the need for supplemental review.

Second, the Roux Financial Analysis, Exhibit G, found that the Carollo Report, Exhibit F, significantly underestimates Project costs by relying on outdated estimates, failing to account for inflation, and omitting major categories of expense, including groundwater monitoring and mitigation. The Analysis also concluded that the Water Needs Assessment relies on unrealistic financing assumptions, including heavy dependence on oversubscribed federal loan programs and understated debt service costs, while assuming that extreme water rate increases exceeding 500% will not affect demand. The analysis further found that Carollo Report relies on outdated population projections that overstate future demand and fails to account for price-driven

conservation trends which have been universally observed elsewhere. These flaws render the Carollo analysis an unreliable basis for evaluating Project feasibility or ratepayer impacts. *See, e.g., NRDC v. U.S. Forest Serv.*, 421 F.3d 797 (9th Cir. 2005) (requiring accurate market-demand information for reasoned decision-making). Again, the BLM failed to respond to this updated information.

BLM cannot rely on outdated and scientifically questionable analyses where new information, like substantial additional hydrology, financing, and water demand information, materially alters the predicted project effects analyzed in the FEIS. Just as in *Las Vegas Paiute Tribe*, BLM is required to base its analysis on current technical reports and up-to-date scientific information. Instead, BLM violates NEPA and the APA by insisting that it rely on incomplete, outdated materials and failing and refusing to conduct a Supplemental EIS.

ii. BLM Disclosed Novel Methodologies in the FEIS that Were Never Subjected to Review.

In addition to relying on outdated materials, the FEIS incorporates updated technical documents that were never disclosed for public review and comment. These materials constitute significant new information and may materially alter the analysis in the FEIS. In particular, the Draft GRIA was substantially revised after the Draft EIS and further modified following the cooperating Administrative FEIS comment period. Because the public review period for the FEIS was exceedingly short, the full scope of these changes cannot be fully assessed. Even on preliminary review, the FGRIA contains material revisions affecting groundwater impact predictions, model sensitivity, mitigation feasibility, and the overall scope and severity of hydrologic effects, none of which were subject to review and comment. For instance, as outlined above, Appendices D and E were absent from the Draft GRIA, and contain a plethora of information not included in the Draft GRIA or Draft EIS. These revisions qualify as “significant

new information” under NEPA and require supplemental analysis so that the public and cooperating agencies can meaningfully review and comment on the updated analysis. This is especially true where the Appendices reveal large model errors that were not previously disclosed. In addition to the modeling errors outlined above, the Appendix reveals a major change in pre-existing conditions, *see* FGRIA p. 140 (stating that “Pre-project pumping was therefore simulated to begin 30 years prior to beginning the simulation of PVWS Project pumping in order to give baseline conditions sufficient time to develop”); adds No-Action Alternative modeling which provides new data showing that project effects cannot be simulated, *see* FGRIA Figures 4-17, 4-23, and 4-24; adds several details about the simulation of Wah Wah Springs that were not included in the Draft GRIA or Draft EIS, *see* FGRIA, page A-43. Preliminary review reveals that this new information is critical, as it shows the GBCAAS-PV model used to simulate effects of the proposed pumping is not accurately simulating the groundwater system.

The fundamental errors revealed in Appendix D illustrate precisely why a Supplemental EIS should have occurred. When “a seriously different picture of the likely environmental consequences” of the proposed action was presented to BLM, public comment and supplemental review would have avoided the clear scientific errors present. *See Ctr. for Biological Diversity*, 181 IBLA 325, 344 (2012). Given the persistence of these errors, the conditions required for Supplemental EIS remain present.

C. BLM Independently Violated Several FLPMA and NEPA Provisions, Rendering the ROD Arbitrary and Capricious.

FLPMA serves as BLM’s organic statute and governs the agency’s management of public lands and resources. Congress expressly directed that public lands be managed “in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archeological values” and, “where appropriate, will preserve

and protect certain public lands in their natural condition.” 43 U.S.C. § 1701(a)(8). Under FLPMA Title V, Section 504, BLM may grant a Right-of-Way (“**ROW**”) only if it “will do no unnecessary damage to the environment.” 43 U.S.C. § 1764(a). Rights of way “shall be granted, issued or renewed ... consistent with ... any other applicable laws.” *Id.* § 1764(c). County & Community Appellants are likely to prevail on a claim that BLM was arbitrary and capricious because BLM failed to follow FLPMA’s mandate in granting ROWs for the project and did not issue the right-of-way consistent with other laws, including NEPA.

i. BLM Failed to Properly Consider Prevent Undue Environmental Degradation in Violation of FLPMA

FLPMA imposes an affirmative, substantive duty on BLM to prevent unnecessary or undue environmental degradation (“**UUD**”): “[i]n managing the public lands [BLM] shall, by regulation or otherwise, take any action necessary to prevent [UUD] of the lands.” 43 U.S.C. § 1732(b). Courts have repeatedly recognized that this obligation is “the heart of FLPMA,” *Mineral Policy Ctr. v. Norton*, 292 F. Supp. 2d 30, 33 (D.D.C. 2003), and that it “supplements requirements imposed by other federal laws and state law.” *Ctr. for Biological Diversity v. U.S. Dep’t of the Interior*, 623 F.3d 633, 644 (9th Cir. 2010). Because the statute is written in the disjunctive, BLM must prevent both degradation that is “unnecessary” and degradation that is “undue.” *Mineral Policy Ctr.*, 292 F. Supp. 2d at 41–43.

BLM’s duty to prevent UUD is not independent of its NEPA obligations; rather, the two are intertwined. Where BLM fails to take the requisite “hard look” under NEPA, it necessarily undermines its ability to comply with FLPMA’s substantive mandate. As the Board has explained, like NEPA, the UUD definition requires BLM to consider the nature and extent of surface disturbances resulting from a proposed operation and environmental impacts on resources and lands outside the area of operations. *See Kendall’s Concerned Area Residents*, 129 IBLA 130,

140–41 (1994); *Nez Perce Tribal Executive Comm.*, 120 IBLA 34, 36 (1991); *Sierra Club v. Hodel*, 848 F.2d 1068, 1078, 1091 (10th Cir. 1988) (holding that the nondegradation duty is mandatory). Therefore, to the extent BLM failed to meet its obligations under NEPA, it also failed to protect public lands from unnecessary or undue degradation. *See* *Island Mountain Protectors*, 144 IBLA 168, 202, 1998 WL 344223, at *28 (Interior Bd. of Land Appeals 1998) (internal citations omitted, emphasis added).

Accordingly, deficiencies in the NEPA analysis are not merely procedural errors; they directly implicate BLM’s independent, substantive obligation under FLPMA to prevent unnecessary or undue degradation of public lands.

ii. BLM Failed to Evaluate Effectiveness or Feasibility of Monitoring, Management, and Mitigation in Violation of NEPA and FLPMA

BLM was independently required to evaluate the effectiveness of monitoring, management, and mitigation required by FLPMA, NEPA, and by Order of the Division of Water Rights. Under FLPMA Title V, A right-of-way that “may have significant impact on the environment” requires submission of a plan of construction, operation, and rehabilitation of the right-of-way. *Id.* § 1764(d). Similarly, NEPA requires BLM to consider and analyze mitigation measures and their effectiveness. *See* DOI NEPA Handbook § 1.3(e). Mitigation must be analyzed in sufficient detail during the NEPA process itself, not deferred to future mitigation that is insulated from public review, and agencies must provide a “reasonably complete discussion” of mitigation to ensure that environmental consequences have been fairly evaluated. *See Robertson*, 490 U.S. at 352–53. An agency may not satisfy NEPA by merely listing potential mitigation measures without analyzing or evaluating their effectiveness. *Colorado Envtl. Coal. v. Dombeck*, 185 F.3d 1162, 1173 (10th Cir. 1999); *South Fork Band Council of W. Shoshone of Nev. v. U.S. Dep’t of the Interior*, 588 F.3d 718, 727 (9th Cir. 2009) (requiring “an assessment of whether the proposed

mitigation measures can be effective”); *Okanogan Highlands*, 236 F.3d at 473; *Idaho Sporting Congress*, 137 F.3d at 1151. Finally, CICWCD is bound to mitigation by 2019 Amended Order of the Division of Water Rights (“DRWi”). *See* Final EIS at page 11. The Order required, among other things, that a permanent record be maintained of diversions from each well and that CICWCD develop a monitoring program to ensure that existing water rights are not impaired and that groundwater withdrawals do not exceed the aquifer’s safe yield. *Id. See* Settlement Agreement 69-101 (February 24, 2019) (attached hereto as **Exhibit H-1**); Stipulated Judgement, *Central Iron Water Conservancy District et al. v. Jones et al.*, Case No. 14050016 (February 27, 2019) (attached hereto as **Exhibit H-2**).

The inadequate mitigation plan attached to the FEIS as Appendix F violates FLPMA, NEPA, and the DWRi Order, because BLM approved the Project ROW without requiring submission of monitoring, management, and mitigation information sufficient to evaluate whether those measures will actually work. The FEIS lacks critical required mitigation components such as properly sited monitoring wells, clear triggers, and enforceable thresholds to prevent or respond to impacts, leaving BLM unable to assess the severity of likely environmental harm. Instead of taking the requisite “hard look,” the agency defers meaningful analysis until impacts materialize during Project operations. This unlawful deferral is particularly stark given that the Project’s own materials acknowledge substantial uncertainty in baseline conditions, including that “there has been very little actual pumping of groundwater in Pine Valley to stress the groundwater system such that recharge estimates can be verified through a quantitative analysis,” *see* FEIS Appendix F at F-1, and that the monitoring program is intended only to provide “early warning” rather than prevent harm. *See id.* at F-2. However, effects from pumping will last long after pumping stops. Therefore, monitoring will never completely mitigate possible effects. The Brooks Technical

Review submitted this to the record, but the FEIS nonetheless fails to state how long monitoring and mitigation would be continued. *See* Brooks Technical Review, Exhibits C1-C2. Additionally, monitoring and mitigation is not designed to detect impacts in key areas such as Wah Wah Springs or potential ANWS well locations. *See* FGRIA Figure 2-5.

Meanwhile, BLM leaves fundamental questions unresolved, including whether sufficient water exists to sustain PVWSP, instead proposing to rely on a future State Engineer groundwater management plan that could curtail pumping only after substantial infrastructure investment has been made. *See* FEIS at page F-15 (stating “[i]f DWRi determines that safe yield is exceeded, DWRi may take action to impose Groundwater Management Plan, which would have the indirect effect of reducing the chances of an adverse ETg depletion effect...”). This is precisely the failure NEPA is designed to prevent. *Robertson*, 490 U.S. at 348. By postponing mitigation design, baseline development, and impact analysis until after construction and operation begin, the FEIS undermines NEPA’s action forcing purpose and deprives both the agency and the public of the ability to evaluate the Project’s true environmental consequences before approval. Because these deficiencies go to the heart of NEPA compliance and risk significant, unmitigated environmental harm, a stay is warranted pending preparation of a legally adequate mitigation and management analysis.

iii. BLM Relied on an Unsound and Outdated Financial Business Plan and Water Needs Assessment in Violation of NEPA and FLPMA

In Addition to NEPA’s “hard look requirement”, FLPMA independently requires that a ROW may be granted only where the agency is satisfied that the applicant has the technical and financial capability to construct the project. 43 U.S.C. § 1764. As the Counties explained in their comments on the AFEIS, the Carollo Report, Exhibit F, is patently insufficient to support informed decision-making or NEPA’s “hard look” requirement, and it does not demonstrate that CICWCD

can finance or construct the Project as required by 43 U.S.C. § 1764(j). Despite pausing the NEPA process for over three years to address known deficiencies in its water needs assessment, CICWCD did not update or revise the Carollo Report, and the FEIS continues to rely on that unchanged analysis with only minimal discussion of conservation and recharge programs. Critically, neither the underlying data, formulas, nor financial modeling supporting the Carollo Report were submitted to BLM or disclosed to the public. As a result, BLM lacked the factual basis necessary to evaluate Project cost, financing, or demand, rendering its decision arbitrary and uninformed.

This failure violates NEPA's prohibition against reliance on unsupported assumptions and conclusory analysis. An agency must provide sufficient factual specificity to permit meaningful review and may not rely on unsubstantiated determinations. *Committee to Preserve Boomer Lake Park v. Dep't of Transportation*, 4 F.3d 1543, 1553 (10th Cir. 1993). It must also disclose the data underlying expert opinions, *Idaho Sporting Congress v. Thomas*, 137 F.3d 1146, 1150 (9th Cir. 1998), and may not rely on incorrect or unsupported assumptions in an EIS. *Native Ecosystems Council v. U.S. Forest Serv.*, 418 F.3d 953, 964 (9th Cir. 2005); *WildEarth Guardians v. Mont. Snowmobile Ass'n*, 790 F.3d 920 (9th Cir. 2015). Although BLM may rely on applicant-prepared materials, it must independently evaluate them and take responsibility for their contents. 42 U.S.C. § 4336a(f). Here, however, BLM accepted the Carollo Report's conclusions at face value without access to, or evaluation of, the underlying financial model or supporting data, which are absent from the administrative record. Without that foundational information, BLM had no ability to assess the credibility or accuracy of CICWCD's claims regarding Project cost, financing, or need.

Compounding the problems outlined above, *see supra* § 2(A)(i), the Roux Financial Analysis, Exhibit G, determined that the underlying Excel financial model found in the Carollo Report does not calculate the water rate increases necessary to cover actual Project costs or account

for shortfalls in anticipated demand, making it impossible to evaluate CICWCD's claims regarding financial sustainability. *See* Exhibit F. Roux also found that the Carollo Report overstates economic benefits by assuming all expenditure remains in the local economy and ignoring the economic effects of significantly increased water rates. *Id.* These deficiencies are particularly significant because the Carollo Report also fails to evaluate the full-scope and long-term costs of the broader West Desert Project.

In sum, the FEIS rests on unsubstantiated assumptions, incomplete data, and undisclosed modeling, leaving BLM without a rational basis to conclude that CICWCD has the financial or technical capacity required under FLPMA or to satisfy NEPA's "hard look" requirement.

iv. BLM Failed to Properly Consider Consistency With Local Management Plans in Violation of FLPMA

Despite BLM's assertion that BLM's response that it "is not required to conform to adopted state or local plans," *see* FEIS at G-86, FLPMA requires BLM to consider applicable resource management and local land use plans and to ensure, to the greatest extent practicable, consistency with those plans. 43 C.F.R. §§ 1601.0-5(b), 1712(c)(9), 1732(a). In Utah, both resource management and land planning is delegated to the respective counties for areas outside of municipal boundaries. This delegation is found in the County Land Use Management and Development Act, ("CLUDMA") Title 17, Chapter 79, Utah Code.

CLUDMA grants wide ranging land and resource planning, management, and control to counties in Utah. Utah Code § 17-79-101(1)(b) states "to accomplish the purposes of this chapter, a county may enact all ordinances, resolutions, and rules and may enter into other forms of land use controls and development agreements that the county considers necessary or appropriate for the use and development of land within the unincorporated area of the county or a designated mountainous planning district, including ordinances, resolutions, rules, restrictive covenants,

easements, and development agreements governing: (i) uses; (ii) density; (iii) open spaces; (iv) structures; (v) buildings; (vi) energy-efficiency; (vii) light and air; (viii) air quality; (ix) transportation and public or alternative transportation; (x) infrastructure; (xi) street and building orientation and width requirements; (xii) public facilities; (xiii) fundamental fairness in land use regulation; and (xiv) considerations of surrounding land uses to balance the foregoing purposes with a landowner's private property interests and associated statutory and constitutional protections.”

Among many other powers delegated to counties in CLUDMA is the requirement to create a “General Plan” which includes a “Resource Management Plan” for the public lands within the county.¹¹ See Utah Code § 17-79-402. As mentioned above, the proposed Project is within Beaver County, whose General Plan includes a Resource Management Plan. *See* Beaver County, Utah Resource Management Plan. Adopted June 6, 2017 (ordinance 2017-03). https://beaver.utah.gov/DocumentCenter/View/1309/Beaver-CRMP_Final_Amended-121719.

The FEIS fails to consider and ensure consistency with the Beaver County Resource Management plan to the greatest extent practicable. The record indicates Beaver County’s Draft EIS comments identifying these deficiencies, including the limited set of resource management plans considered and the Project’s inconsistency with the Beaver County RMP’s requirement that the BLM take into account existing utility corridors designated by the County. The FEIS asserts consistency based on the “implementation of adequate monitoring and mitigation,” *see* FEIS at page 10, yet, as shown above, those measures are inadequate and lack the specificity and enforceability required under NEPA. BLM cannot rely on deficient or deferred mitigation to manufacture consistency with the Beaver County Resource Management Plan.

¹¹ “Public lands” are defined in Utah Code § 63L-5-102 and include federal land administered by the BLM.

BLM also failed to evaluate consistency with other applicable plans, including those of Millard, Juab, Tooele, and White Pine Counties and the Beryl Enterprise Groundwater Management Plan. Millard County's Resource Management Plan, for example, expressly prohibits out of basin groundwater diversions, but BLM conclusively states that PVWSP would reduce available groundwater by a small amount, and so the decision is not inconsistent with its plan. However, as this Petition demonstrates, that conclusion is arbitrary and capricious where the underlying analysis failed to evaluate the entire scope of the West Desert Project and relied on faulty scientific analysis. Therefore, the FEIS does not comply with FLPMA or NEPA. Withdrawal is required until BLM conducts a legally sufficient consistency analysis.

D. BLM Deprived the Public of Adequate Opportunity for Comment.

In addition to NEPA's "twin aims" of ensuring that federal agencies "consider every significant aspect of the environmental impacts of a proposed action" and "inform the public that it has considered environmental concerns in its decision making process," *Balt. Gas & Elec Co. v. NRDC*, 462 U.S. 87, 97 (1983), the Federal Land Policy and Management Act expressly requires BLM to provide adequate notice and an opportunity to comment, stating "the Secretary ... shall establish procedures, including public hearings where appropriate, to give the Federal, State, and local governments and the public adequate notice and an opportunity to comment upon the formulation of standards and criteria for, and to participate in, the preparation and execution of plans and programs for, and the management of, the public lands. *See* 43 U.S.C. § 1739(e).

Following an exceedingly limited thirteen business day opportunity for cooperating agencies to review and comment on the AFEIS, which comments resulted in the dedication of additional funds and the preparation of hydrology work, BLM published the FEIS on Monday Friday February 27, which contained several technical documents that were never disclosed for public or cooperating-agency review. These materials constitute significant new information and

may materially alter the analysis in the Final EIS. Despite several affected parties, including the cooperating agency counties coalition, requesting a Supplemental EIS, the BLM then issued its Record of Decision early Monday morning, March 2nd, 2026. Collectively, the document and its thousands of pages of supporting materials, was publicly available for approximately 5-6 business hours prior to the release of the ROD. Publishing the FEIS on a Friday followed by the ROD the next Monday, providing only a single weekend of public availability, precludes cooperating agencies, Tribes, technical experts, and the public (including property owners who would be directly impacted) from conducting any meaningful review and similarly deprives the BLM of critical information on which to make an informed reasoned decision. This rocket speed schedule conflicts with NEPA and FLPMA, longstanding agency practice, and controlling case law. NEPA's public participation requirements exist to allow cooperating agencies, Tribes, and the public to review new analyses, permit experts to evaluate complex hydrologic and financial modeling, and provide the agency an opportunity to identify and correct errors before irretrievably committing resources. Meaningful participation also promotes transparency and public confidence in the NEPA process.

As such, it is not reasonable to expect cooperating agencies, Tribes, technical experts, or the public to conduct a thorough review of this voluminous material over a single weekend. When the BLM proceeded to an ROD on that schedule, it: (1) violated NEPA's requirement for informed decision making and meaningful public participation; (2) undermined BLM's public participation obligations under FLPMA; (3) constituted arbitrary and capricious action under the APA; and (4) contravened basic principles of fairness and due process.

IV. County & Community Appellants Will Be Immediately & Irreparably Harmed Absent a Stay

An appellant demonstrates a likelihood of immediate and irreparable harm by “present[ing] a sufficient justification that shows the alleged harm is likely to occur.” *W. Watersheds Proj.*, 192 IBLA 72, 85 (2017). “Bare allegations of harm are not sufficient” nor are those that are “unsupported, vague, or speculative.” *Simpson*, 197 IBLA 241, 246 (2021). An appellant satisfies this standard by showing that harm is likely to occur. *W. Watersheds Proj.*, 192 IBLA 72, 85 (2017); *Simpson*, 197 IBLA 241, 246 (2021). However, the “irreparable harm requirement” for a stay “is met if a plaintiff demonstrates a significant risk that he or she will experience harm that cannot be compensated after the fact by monetary damages.” *Greater Yellowstone Coal. v. Flowers*, 321 F.3d 1250, 1258 (10th Cir. 2003). Environmental harms, by their nature, cannot be compensated by monetary damages, and as such, are typically irreparable. *Amoco Prod. Co. v. Village of Gambell*, 480 U.S. 531, 545 (1987).

County & Community Appellants have demonstrated a likelihood of immediate and irreparable harm because the challenged approval authorizes on-the-ground activities that will foreseeably result in environmental injury. Had the FEIS considered the reasonably foreseeable impacts of the entire project at hand, its analysis would have revealed foreseeable impacts far beyond the impacts of the PVWSP on its own. The full West Desert Project contemplates groundwater withdrawals of up to 36,000 acre-feet per year, an amount that more than doubles the volume analyzed in the EIS. Illustratively, the U.S. Geological Survey’s GBCAAS v. 3.0 Groundwater Model, which simulates pumping associated with two of the three valleys that comprise the West Desert Project, predicts impacts far exceeding those analyzed in the FEIS. See Brooks, L., USGS, *Conceptual Model and Numerical Simulation of the Great Basin Carbonate and Alluvial Aquifer System—Version 3.0* (USGS Scientific Investigations Report 2017-5072) at 56 (2017). Within 62 years, GBCAAS v. 3.0 predicts drawdowns of exceeding 1,900 feet near

withdrawal wells. *Id.* The model predicts five-foot drawdowns over a 10,500 square mile area, an area larger than the land area of nine U.S. States.¹² Here, the purpose of the PVWSP is to facilitate groundwater extraction and interbasin transfer, not merely to secure a paper entitlement. Approval of the right-of-way clears the final federal obstacle to construction and operation of the Project's infrastructure, including production wells, pipelines, access roads, and transmission facilities. Once construction begins, surface disturbance will occur through road building, well pad development, and installation of linear infrastructure. More significantly, once groundwater pumping is initiated, it will cause drawdown in the aquifer system that is expected to propagate over time and across basin boundaries. Such drawdown can reduce groundwater levels, alter subsurface flow patterns, and diminish discharge to springs and other groundwater-dependent resources. These impacts may affect existing water rights and connected hydrologic systems and, as reflected in the record, may continue to manifest and expand even after pumping is reduced or ceases.

These harms are not temporary or readily reversible. Groundwater systems respond slowly, and declines in aquifer storage can persist for decades or longer, with recovery occurring, if at all, over extended timescales. Interference with interconnected basins and spring systems may likewise result in long-term or permanent changes to hydrologic conditions. The Record also reflects uncertainty regarding baseline conditions, recharge rates, and the effectiveness of proposed monitoring and mitigation measures, further increasing the risk that impacts will occur without timely detection or effective response.

¹² Maryland, Vermont, New Hampshire, Massachusetts, New Jersey, Hawaii, Connecticut, and Rhode Island are each smaller than 10,500 square miles. Rhode Island, Delaware and Connecticut combined are less than 10,500 square miles.

For individuals, the Project threatens the stability and utility of existing water rights, including vested senior water rights. The approval of the project itself clouds those rights and their long-term reliability, directly impacting decision making and planning. By substantially lowering the water table and predicting severe reductions or elimination of spring flow, the Project undermines the reliability of these rights as permanent, transferable property interests. The effects on springs and groundwater-dependent resources are not readily mitigable through “wet water” substitutes. These impacts jeopardize the operational, planning, and financial decisions of ranchers in Pine Valley and Wah Wah Valley, creating immediate uncertainty regarding livestock management, irrigation, and long-term viability.

Counties and local governments face parallel immediate harms. The looming Project clouds ongoing land use and infrastructure planning, forcing counties to divert limited resources toward addressing or anticipating impacts of a project that may permanently alter regional hydrology. Property values in affected areas are also likely to be depressed immediately due to the uncertainty and perceived risk associated with large-scale groundwater extraction. These socioeconomic and administrative harms, combined with the environmental risks of aquifer depletion and ecosystem impacts, create a significant and immediate risk that cannot be remedied after the fact.

Similarly, Great Basin Water Network faces the immediate harm of needing to divert resources to adjust its organizational operations to respond to the approval of a project that undermines its mission and directly harms its members. As stated in the standing declaration of Kyle Roerink attached to County and Community Appellants’ Notice of Appeal, the work required would necessarily shift GBWN’s communications, outreach, educational activities, and operational focus toward defending property rights, diverting resources from GBWN’s work

advocating for responsible and sustainable water management. *See* Declaration of Kyle Roerink, Exhibit B-11.

Because the PVWSP is designed to withdraw substantial groundwater and the BLM approval authorizes construction, these harms are imminent. Construction and pumping will begin irreversible changes to surface and groundwater systems, affect senior water rights, disrupt ranch operations, impede local planning, and depress property values. Without a stay, the status quo will be lost, and both environmental and economic injuries will occur that cannot be fully remedied after the fact.

V. The Harm to County & Community Appellants Outweighs Any Harm to BLM

In cases involving the preservation of the environment, the balance of harm usually favors granting a stay. *See Wilderness Soc’y v. Tyrrel*, 701 F. Supp. 1473, 1479 (E.D. Cal. 1988) (noting that “when environmental injury is ‘sufficiently likely . . . the balance of harms will usually favor the issuance of an injunction to protect the environment’”) (citing *Amoco Prod. Co.*, 480 U.S. at 545) (“[C]ourts have not hesitated to enjoin an agency action that was taken in violation of NEPA”).

Appellants and local stakeholders face immediate and tangible harms. Ranchers cannot rely on their water rights as permanent property interests due to anticipated drawdowns that may eliminate spring flows. County planning, land management, and budgeting are already disrupted, and property values are threatened by the cloud of the Project. The activities of GBWN will need to shift to respond to the changed conditions and threat. These harms are largely irreversible; once groundwater is extracted and aquifers are drawn down, environmental, economic, and social impacts cannot be remedied by monetary compensation or later mitigation.

Harms of this nature tip the balance in favor of Appellants even when there is a strong public or federal interest. *Las Vegas Paiute Tribe*, 200 IBLA 172, 192 (2025) (“We do not find the

public interests against such temporary delay, for a project request that has been pending for 6 years, to outweigh the potential irreparable harms to the Tribe from implementation of a decision that may not withstand review.”). In this case, the water rights and ROW approvals already exist, and FEIS review took eight years, an extended timeline which was largely driven by the applicant. *Cf id.* Thus, a stay causes little significant disruption to broader water supply planning.

On the other hand, maintaining the status quo through a stay preserves both the natural and socioeconomic resources at risk while the merits of this appeal are considered. Where, as here, allowing the Project to proceed immediately risks irreversible harm to groundwater systems, senior water rights, local economies, and community planning, the public has a strong interest in preserving the status quo until a serious controversy can be fully adjudicated. *See, e.g., W. Watersheds Project v. BLM*, 195 IBLA 115, 137 (2020). Indeed, “[w]here there are strong substantive policy interests to consider on each side, the public interest in a robust NEPA analysis becomes even more evident.” *Las Vegas Paiute Tribe*, 200 IBLA at 192 (citing *Davis v. Mineta*, 302 F.3d 1104, 1116 (10th Cir. 2002)). A brief delay thus protects these vital public interests without imposing undue hardship on the Project proponents.

CONCLUSION

For the foregoing reasons, County & Community Appellants respectfully request that the Board immediately stay the PVWSP until the above-captioned matter is resolved on the merits.

Respectfully submitted this 1st Day of April 2026.

/s/ J. Craig Smith

J. Craig Smith, UT Bar No. 4143

jcsmith@SHutah.law

Lisa Watts Baskin, UT Bar No. 5236

lwbaskin@SHutah.law

J. Adam Snow, UT Bar No. 20380

jasnow@SHutah.law

Attorneys for Appellants Beaver County, Utah; Juab County, Utah; White Pine County, Nevada; City of Milford, Utah; Mark Wintch; Wah Wah Ranch, Wallace Peak Water Company, LLC, Wintch & Company, LLC; Barbara Wintch; John Carter; Lyle Carter; Dean Eyre; Dustin Kesler; Brandon Yardley; and Gilbert ("Gib") T. Yardley

/s/ Iris Thornton

Iris Thornton, NM Bar No.28205

iris@communityandenvironment.net

ADVOCACY FOR COMMUNITY AND ENVIRONMENT

P.O. Box 120

13 la Canada Road

Arroyo Seco, New Mexico 87514

Telephone: (505) 504-2610

Attorney for Appellants Beaver County, Utah; Millard County, Utah; Central Nevada Regional Water Authority; Nevada Grazing Board of District No. 4; and Great Basin Water Network

CERTIFICATE OF SERVICE

In accordance with 43 C.F.R. § 4.407(b), and the Office of Hearns and Appeals' Standing Order on Electronic Transmission, I hereby certify that on April 1, 2026, I served a true and correct copy of the foregoing **COUNTY AND COMMUNITY APPELLANTS' NOTICE OF APPEAL AND PETITION FOR STAY** on the following:

VIA BISON FILE AND SERVE AND E-MAIL:

Interior Board of Land Appeals
Office of Hearings and Appeals
U.S. Department of the Interior
801 N Quincy Street #300
Arlington, VA 22203
Email: ibla@oha.doi.gov

U.S. Department of the Interior
Office of the Solicitor
Acting Regional Solicitor Elizabeth Schulte
Intermountain Regional Office
125 South State Street, Suite 6201
Salt Lake City, Utah 84138-1180
Email: elizabeth.schulte@sol.doi.gov

Thomas A. Heinlein
Acting Utah State Director
Bureau of Land Management
440 West 200 South, Ste. 500
Salt Lake City, UT 84101
Email: blm_ut_state_director@blm.gov
Email: BLM_UT_appeals@BLM.gov

VIA USPS CERTIFIED PRIORITY MAIL AND EMAIL:

Bureau of Land Management
Gloria Tibbetts, District Manager
Cedar City Field Office
176 DL Sargent Drive
Cedar City, Utah 84721
Email: gtibbetts@blm.gov
Email: jrussell@blm.gov
Email: blm_ut_cedar_city@blm.gov

U.S. Department of the Interior
Office of the Solicitor
Acting Regional Solicitor Elizabeth Schulte
Intermountain Regional Office
125 South State Street, Suite 6201
Salt Lake City, Utah 84138-1180
Email: elizabeth.schulte@sol.doi.gov

Central Iron County Water Conservancy
District
(Renamed Cedar Valley Water Conservancy)
C/O Paul Monroe, General Manager
C/O David Harris, Board Chairman
C/O Scott Martin, Esq.
710 S Westview Drive
Cedar City, UT 84720
Email: p.monroe@cicwcd.org
Email: david@hughestax.com
Email: smartin@spencerfane.com

/s/ Jacob Clark
Jacob Clark
Paralegal
SMITH HARTVIGSEN, PLLC

EXHIBIT A

Pine Valley Water Supply Record of Decision
March 2026
DOI-BLM-UT-C010-2020-0012-EIS



U.S. DEPARTMENT OF THE INTERIOR
Bureau of Land Management



DOI-BLM-UT-C010-2020-0012-EIS

March 2026

**Pine Valley Water Supply
Record of Decision**



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FINAL AGENCY ACTION

Issuance of Right-of-Way Grant and Temporary Use Permit

The National Environmental Policy Act (NEPA) process concluded when the Bureau of Land Management (BLM) published the Pine Valley Water Supply Final Environmental Impact Statement (EIS) (DOI-BLM-UT-C010-2020-0012-EIS). I have reviewed the environmental analysis in the Final EIS and supporting documentation and have considered all relevant information raised in the NEPA process.

It is therefore my decision to approve the Proposed Action as described in Sections 2.2.2 and 2.2.3 of the EIS—including all design features described in EIS Appendix C, ROW stipulations described in EIS Appendix E, and the adaptive management measures identified in EIS Appendix F—and to approve the issuance of temporary and long-term right-of-way (ROW) grants for the purposes of constructing, operating, and maintaining a water transfer pipeline, production and monitoring wells, storage tanks, and associated facilities across BLM-managed land within the Cedar City Field Office. This decision will allow the BLM to fulfill the requirements of the Federal Land Policy and Management Act, as amended (43 U.S.C. 1701 et seq.) in responding to a properly submitted application for use of federal lands by Central Iron County Water Conservancy District (CICWCD). This decision is issued in full force and effect pursuant to 43 C.F.R. 2801.10(b).

Decision by:

THOMAS HEINLEIN

Digitally signed by THOMAS
HEINLEIN
Date: 2026.03.02 10:13:21 -07'00'

Thomas A. Heinlein
State Director, Acting
Bureau of Land Management, Utah

Date

RIGHT OF APPEAL

This decision may be appealed to the Interior Board of Land Appeals (IBLA), Office of Hearings and Appeals, in accordance with the regulations contained in 43 CFR Part 4. The notice of appeal must be filed no later than 30 days after the date of receiving notice of this decision. Any notice of appeal must be filed with the IBLA and must include a copy of the decision being appealed, a statement of standing, and a statement of timeliness.

If you wish to file a petition for a stay of the effectiveness of this decision during the time that your appeal is being reviewed by the Board, the petition for a stay must show sufficient justification based on the criteria at 43 CFR 4.405(b).

The appellant must serve a copy of the notice of appeal and any accompanying documents on the office of the officer who made the decision, each person or entity named in the decision, and the appropriate Office of the Solicitor at the time of filing with IBLA (see 43 CFR 4.403(b); 4.407(b)). Parties must serve the Office of the Solicitor at the address shown on Form 1842-1. Service on a party known to be represented by an attorney or other designated representative must be made on the representative. If a statement of reasons for the appeal is not included with the notice of appeal, it must be filed within 30 days after the record on appeal is filed with the IBLA. Failure to file a statement of reasons within the time required will subject the challenged decision to summary affirmance (see 43 CFR 4.412(a)).

1. INTRODUCTION

This Record of Decision (ROD) documents the Bureau of Land Management's (BLM) decision and rationale for authorizing two right-of-way (ROW) grants resulting in up to 273 acres of disturbance across Iron and Beaver counties within the Cedar City Field Office. This decision is made pursuant to the Federal Land Policy and Management Act of 1976, as amended (FLPMA; 43 U.S.C. 1701 et seq.) and the ROW regulations contained in 43 Code of Federal Regulations (CFR) Part 2800.

On July 10, 2019, the Central Iron County Water Conservancy District (CICWCD) applied for a long-term and short-term ROW to construct and operate infrastructure for transporting water from the Pine Valley Basin to the Cedar City Valley Basin. The CICWCD manages water resources for municipal and other uses in central Iron County, Utah, serving the communities of Cedar City, Enoch, and Kanarrville.

The CICWCD's objective in applying for the ROW grants is to develop and convey acquired and permitted water rights issued by the State of Utah (Water Right 14-118) to supply water to Iron County users that existing aquifers in Cedar City Valley cannot provide in perpetuity. The CICWCD applied for the water rights in 2006, with a final settlement completed and rights acquired in 2019.

The CICWCD's need for additional water arises from the lack of sufficient existing water resources within the overdrawn Cedar City Valley basin to respond to growing population needs and the gradual implementation of the Cedar City Valley Groundwater Management Plan that will affect the CICWCD's ability to extract groundwater from the basin. The Cedar City Valley basin is currently overdrawn, and the Utah State Engineer has adopted a Groundwater Management Plan that will impose phased reductions in depletions until the basin is back within safe yield estimates. Based on an analysis of the Cedar City Valley basin demand and projected savings from conservation efforts by the CICWCD, conservation alone cannot overcome the current deficit.

1.1 Purpose and Need

The purpose of the federal action is to respond to the ROW applications for the Pine Valley Water Supply Project (Project). The need for the federal action is established by the BLM's responsibility to respond to a ROW application under FLPMA and the ROW regulations contained in 43 CFR Part 2800.

1.2 Conformance with Land Use Plans

This decision complies with the Cedar City Field Office's Cedar/Beaver/Garfield/Antimony Resource Area Resource Management Plan (RMP) (1986), the Pinyon Management Framework Plan (1983), the Fillmore Field Office's Warm Springs Resource Area RMP (1986), and the Ely District's Ely District Approved RMP (2008).

Portions of the Project are within greater sage-grouse (GRSG) priority habitat management areas (PHMA) as detailed in the 2015 Utah GRSG Approved Resource Management Plan Amendment (2015 ARMPA) and ROD (BLM 2015). The Project must comply with the applicable plan objectives and management decisions. The Project's approach, which is in compliance with the 2015 ARMPA and includes applicant-committed design features to enhance GRSG habitat, is

discussed in detail in the Greater Sage-Grouse Net Conservation Gain Analysis associated planning document available at the BLM ePlanning site for the Project.

The Project was expected to publish a Final EIS in Fall 2025, but this was delayed to early 2026 because of a 43-day government shutdown. As the Final EIS and ROD were nearing completion, the BLM signed the 2025 Greater Sage-Grouse Approved RMP Amendment and ROD for Utah in December of 2025 (BLM 2025). The BLM acknowledges that the timing of the Pine Valley Water Supply Final EIS and ROD are exempted from the requirements of the 2025 GRSG ARMPA based on the following language from that decision:

To maintain the orderly administration and management of the public lands, the BLM will be consistent with the Approved RMP Amendment unless the BLM has a Draft EIS or Environmental Assessment for the project before the publication of the Approved RMP Amendment. The decision for such projects and any subsequent authorizations associated with the approval (such as the issuance of a ROW authorized by a decision) may be exempted from the requirements of this effort's approved GRSG planning decision. The BLM has the discretion to apply the Approved RMP Amendment to projects that are substantially underway and will seek input from the project proponent prior to exercising such discretion. (BLM 2025).

For information about the applicable decisions in the Management Framework Plan and the RMPs, see Section 1.4 of the Final EIS.

1.3 Consistency with other plans, statutes, and objectives

The Iron County RMP was completed in June 2017 and outlines Iron County positions and policies regarding resource management and coordination with resource management agencies (Iron County 2017). The Iron County RMP highlights the groundwater withdrawal rates for the Cedar Valley and Escalante Valley that exceed basin recharge rates and discusses the initiation of the Cedar City Valley GMP (Iron County 2017). Under “Future Plans for Groundwater Recharge,” the Iron County RMP specifically supports the “West Desert Pipeline Project,” which is a precursor to the Pine Valley Water Supply Project (Iron County 2017). The goal is to provide water from a basin open to new appropriation to Iron County users to reduce withdrawals within the Cedar City Valley basin.

The Beaver County RMP outlines land use policies and serves “as a basis for communicating and coordinating with the federal government on land and resource management issues” (Beaver County 2019). The Beaver County RMP discusses the fact that the Utah State Engineer manages potential drawdown of groundwater resources and that sections of western Beaver County are open to new appropriation (Beaver County 2019). It also highlights the dependence of many natural resources on groundwater and expresses concern regarding the “dependability of long-term supply, depletion of groundwater storage, reductions in streamflow, potential loss of groundwater-dependent ecosystems (GDE), and changes in groundwater quality” (Beaver County 2019). Beaver County’s land-use policy guideline 18.h states that BLM land use planning should “provide for the protection of existing water rights and the reasonable development of additional water rights” (Beaver County 2019). Groundwater objectives include “to preserve, improve, and develop groundwater resources for the use of man while supporting multiple use/sustained yield principles”

and “to recognize humans as a subset of groundwater dependent fauna, and development of resources for their use should be given priority” (Beaver County 2019).

The Millard County RMP prepared under Utah Code 17-27a-40 includes a county policy to “retain and preserve groundwater resources in the basin of origin” (Millard County 2017). The groundwater modeling performed for the Project action alternative found that drawdown in the groundwater levels in a portion of Millard County would eventually occur, although it is predicted to be less than levels that can be distinguished from ambient fluctuations.

Tied to the county RMPs, the Utah State Resource Management Plan (SRMP) is an aggregation of the land-use decisions and directives that emerge from county plans. The Utah SRMP supports maximized land use for its citizens, industries, and government purposes.

1.4 Project Description

On June 15, 2017, the CICWCD applied for long-term and short-term ROWs across BLM-administered lands in Beaver and Iron counties, Utah. The Project would develop and convey up to 15,000 acre-feet of groundwater, as permitted by the State of Utah, from Pine Valley in Beaver County to the Cedar City Valley in Iron County. The Project includes up to 15 production wells (up to 10 on BLM-administered lands); an estimated seven new monitoring wells (all on BLM-administered lands); up to 70 miles of underground main, lateral, and up to 42.6 miles of transmission pipeline on BLM-administered lands; and up to 11.7 miles of above-ground power lines (up to 11 miles on BLM-administered lands). The ROW would be 50 feet wide, for a term of 30 years. During construction, there would be an additional 70-foot-wide short-term ROW. There are also eight existing monitoring wells on BLM-administered lands drilled under a previous authorization that would be included in a new 30-year ROW grant. Additionally, the Project includes an ancillary solar energy field on private land and a 10-million-gallon underground water storage tank.

The Project would allow CICWCD to exercise groundwater rights previously approved by the State of Utah and to convey water to the Cedar City Valley to support municipal and regional water supply needs. The ROW grants will include design features, monitoring requirements, and operational constraints intended to avoid, minimize, and mitigate environmental impacts to groundwater resources, wildlife habitat, cultural resources, and other affected values. The BLM will also require ongoing coordination, reporting, and adaptive response should monitoring indicate impacts deviating from those analyzed in the Final EIS.

2. DECISION

After extensive review of the Pine Valley Water Supply Final EIS (DOI-BLM-UT-C010-2020-0012-EIS) that analyzed the impacts and mitigation measures associated with the Project, and in accordance with 43 CFR Part 2880, it is the decision of the BLM to select the Proposed Action and grant a long-term ROW UTUT106089002 and the associated short-term ROW UTUT106782297 for the construction, operation, maintenance, and termination of the Proposed Action as described in the Final EIS for the Pine Valley Water Supply Project across BLM-managed lands.

The long-term ROW grant will be for the route and facilities described in Sections 2.2.2 and 2.2.3 of the Final EIS and will include all design features described in EIS Appendix C, ROW

stipulations described in EIS Appendix E, and the adaptive management measures identified in EIS Appendix F. Specifically, the BLM has decided to:

- Grant a long-term ROW authorizing the construction, operation, and maintenance of up to 15 production wells and 70 total miles of pipeline alignment, including both main lines and lateral pipelines, plus other appurtenant Project facilities on BLM-managed lands. The term of the grant is thirty (30) years with the right of renewal. The width of the long-term ROW would be 50 feet wide.
- Grant a short-term ROW authorizing the use of temporary workspace outside of the long-term ROW during the construction of the project. A 70-foot-wide temporary construction ROW encompasses approximately 643 acres. The term of the short-term ROW grant will be up to 10 years with a right of renewal.

Both ROW grants will be issued under authority of the FLPMA, as amended (43 U.S.C. § 1701 et seq.). Under FLPMA, the BLM has significant discretion to approve or deny potential uses of the public lands in the course of managing those lands under principles of multiple use and sustained yield. See 43 USC 1732(a)-(b). The BLM's broad discretion under FLPMA extends specifically to its consideration of proposed ROWs under Title V of FLPMA and its implementing regulations, which authorize the BLM to grant, grant with modifications, or deny proposed ROWs over areas of public lands. *See* 43 USC 1761(a); 43 CFR 2802.10.

The BLM's federal action is limited to authorization of the ROWs on BLM-administered lands and does not include approval of water rights, which were granted by the Utah State Engineer in 2019 pursuant to a settlement agreement.

3. RATIONALE FOR DECISION

The BLM has selected the Proposed Action as described in Sections 2.2.2 and 2.2.3 of the Pine Valley Water Supply Final EIS because it supports the responsible development of valid existing water rights to meet regional water supply demands, is consistent with the BLM land use plans applicable to the federal lands where the Project is proposed, and the use meets Project objectives while minimizing adverse environmental impacts. I have determined that the Proposed Action is in the public interest and will not result in unnecessary or undue degradation of the public lands.

Due to overallocation in past years, the water rights in the Cedar City Valley aquifer (Basin 73) are subject to the approved Cedar City Valley Groundwater Management Plan, which was adopted in January 2021. Under this plan, the Utah Division of Water Rights (DWRi) will begin to curtail the use of water rights, starting with the most junior, to depletion and recharge, and bring the basin back to safe yield as determined by the Utah State Engineer. The current average depletion rate from the groundwater basin is estimated to be 28,000 acre-feet per year (afy), and it is estimated that average actual depletion must be reduced by 7,000 afy to balance recharge and depletion amounts in this groundwater basin (UTDNR 2021). The Groundwater Management Plan outlines a schedule for reaching the estimated safe yield of 21,000 afy by 2080. Over that same general time period, Iron County's population is expected to grow to between 94,290 and 169,658 by 2075, with a projected CICWCD service area population of 86,162 to 155,034 (Carollo 2023).

The demand of the CICWCD and key municipal and agricultural customers is anticipated to grow from 13,205 afy in 2025 to 36,472 afy by 2075 without factoring in further conservation enhancements (Carollo 2023). The net result is that demand within the basin is anticipated to eclipse the total available senior groundwater rights within the Cedar City Valley basin that will not be subject to phased reductions in depletions under the Groundwater Management Plan.

Existing CICWCD conservation programs, existing recharge projects, planned reuse projects, and meeting future statewide conservation targets are all current and anticipated future conditions that are incorporated into all alternatives analyzed in the Final EIS. Based on a review of the Cedar City Valley demand and projected savings from conservation efforts to meet or exceed these targets, the CICWCD assessed that conservation alone cannot overcome the current deficit (CICWCD 2020b). A review of the population growth scenarios shows that consumptive water usage would need to be reduced to somewhere between 62 gallons per capita per day (gpcd) and 112 gpcd, depending on the growth estimate used.

The CICWCD's Pine Valley Water Supply Project would facilitate conveyance of up to 15,000 afy with existing water rights that were acquired through approval by the State of Utah and a settlement agreement that was reached in 2019.

The Proposed Action is selected because it meets the BLM's responsibility to respond to a ROW application under the FLPMA and the ROW regulations contained in 43 CFR 2800 Title V. The Proposed Action effectively balances the anticipated socioeconomic and natural resource impacts. This decision is supported by a comprehensive evaluation of the environmental considerations detailed in the Final EIS, reflecting collaboration with various state and local agencies.

While the construction and operation of the Project may result in some adverse impacts, most of these are expected to be temporary or short-term, with some long-term effects on groundwater-dependent vegetation and springs. With the implementation of the avoidance, minimization, and other mitigation measures, including the Adaptive Management, Monitoring, and Mitigation Program (Final EIS Appendix F), the Project is expected to result in substantially minimized environmental impacts. Furthermore, no alternative method or route offers a significant environmental advantage over the Proposed Action. Therefore, the BLM concludes that issuance of the ROW grants is justified, as it aligns with Project objectives while effectively addressing environmental considerations.

3.1 Alternatives Considered in Detail

The BLM analyzed in detail two alternatives in addition to the Proposed Action. Table 1 compares the pipeline lengths, disturbance acres, resource and design factors, and estimated cost by alternative.

Under the No Action alternative, the BLM would not approve the ROWs and associated infrastructure or ground disturbance. CICWCD would need to pursue other water source alternatives including those described in 2.2.1 of the EIS.

The No Action alternative would prevent the CICWCD from exercising groundwater rights previously approved by the State of Utah and would not support municipal and regional water supply needs related to the existing water deficit in the Cedar City Valley.

Under the Adaptive Northern Well Sites (ANWS) alternative, the BLM would grant the CICWCD the authorization to construct the associated wellfield, pipelines, and other supporting

infrastructure as described in Section 2.2.2 of the Final EIS but would require the wellfield construction to be expanded farther north within Pine Valley to decrease aquifer stress in the southern area of Pine Valley as described in 2.2.4 of the Final EIS.

The additional seven miles of pipeline and associated infrastructure under the ANWS alternative increase the amount of disturbance, and associated impacts to socioeconomic and natural resources, without substantially reducing the effects of groundwater drawdown when compared to the Proposed Action.

Table 1. Comparison of Alternatives Considered in Detail

Alternative	Water Provision (AFY)	Pipeline Length (miles)	Disturbance (total acres/ PHMA* acres)	Resource and Design Factors	Estimated Cost (\$ million)
No Action Alternative	-	-	-	-	\$247
Proposed Action	15,000	70.0	1,307 / 536	Minimizes total ground disturbance	\$309
ANWS Alternative	15,000	77.3	1,457 / 536	Decreases aquifer stress in the southern portion of Pine Valley	\$357

*PHMA – Priority Habitat Management Area for greater sage-grouse, covering Federal and non-Federal lands

3.2 Alternatives Considered but Eliminated from Detailed Analysis

Five additional alternatives were identified during Project scoping and considered in the Final EIS. These alternatives were eliminated from further analysis for the reasons explained in EIS Section 2.2.5.

4. PUBLIC INVOLVEMENT

The BLM posted a Notice of Intent to prepare an EIS in the Federal Register on July 15, 2020 (85 FR 42914) followed by a 35-day public scoping period ending on August 19, 2020. Agencies and private landowners crossed by the alignment were mailed a scoping letter, including 12 mailings to ROW holders and 20 mailings to grazing permittees. The BLM hosted an online public scoping meeting on August 5, 2020, with approximately 40 members of the public in attendance.

A total of 98 comment letters were received from the public, agencies, and Tribes during the public scoping period, including 11 from federal, state, or local agencies or elected officials; 3 from Tribes; 11 from non-governmental organizations; and the remaining 83 from private landowners or citizens. A scoping report summarizing the pertinent comments within these submissions and the public scoping process is available on the project website.

The BLM published the Notice of Availability (NOA) of the Draft EIS in the Federal Register on January 7, 2022, which initiated a 45-day public comment period. At the request of commenters, the BLM extended the public comment period to March 11, 2022, for a total duration of 63 days. An online public meeting was held by the BLM on Wednesday, February 9, 2022, during which the BLM summarized the Proposed Action, alternatives, and the findings of the environmental

analysis and encouraged the public to submit comments on the Draft EIS. The BLM received a total of 6,183 submitted comment letters and/or emails on the Draft EIS. Summary statistics of the public comments received and the BLM response to each comment are included in Appendix G of the EIS. Where multiple comments were received that pertained to the same concern, the BLM summarized the comments in a single “issue statement” and provided a single response.

5. CONSULTATION AND COORDINATION

5.1 Cooperating Agencies

The following entities contributed to the development of this EIS as cooperating agencies: United States Geological Survey, United States Fish and Wildlife Service (USFWS), Utah’s Public Lands Policy Coordinating Office, Utah State Historic Preservation Office, Utah Trust Lands Administration, Nevada Department of Wildlife, Enoch City, Iron County, Beaver County, Millard County, Juab County, Tooele County, White Pine County, Paiute Indian Tribe of Utah, and the Indian Peaks Band of Paiutes.

Cooperating agencies attended online informational meetings hosted by the BLM and reviewed administrative drafts of the Draft EIS and/or Final EIS prior to publication.

5.2 Endangered Species Act Section 7 Consultation

Section 7(a)(2) of the Endangered Species Act (ESA) requires that each Federal agency ensure that any action it authorizes, funds, or carries out is not likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of designated critical habitat. If an action agency determines a proposed action may affect listed species or designated critical habitat, consultation between that agency and the USFWS is required under section 7 of the ESA.

The BLM prepared a Biological Assessment to analyze potential effects of the Project on the Utah prairie dog and transmitted it to the USFWS on April 6, 2020. On May 20, 2020, the USFWS concurred with a Not Likely to Adversely Affect determination for the Utah prairie dog. The USFWS issued a second concurrence letter confirming the Not Likely to Adversely Affect determination on August 8, 2024, after reviewing an updated Biological Assessment prepared for the Final EIS, which addressed issues raised during public comment.

5.3 State Historic Preservation Office Consultation

The BLM completed compliance with Section 106 of the National Historic Preservation Act (NHPA). Cultural Resources Inventory Reports were submitted on June 23, 2020, and October 20, 2020, to the Utah State Historic Preservation Office. Concurrence of the BLM’s determination of eligibility and the BLM’s finding of no adverse effect were received on June 24, 2020, and October 26, 2020.

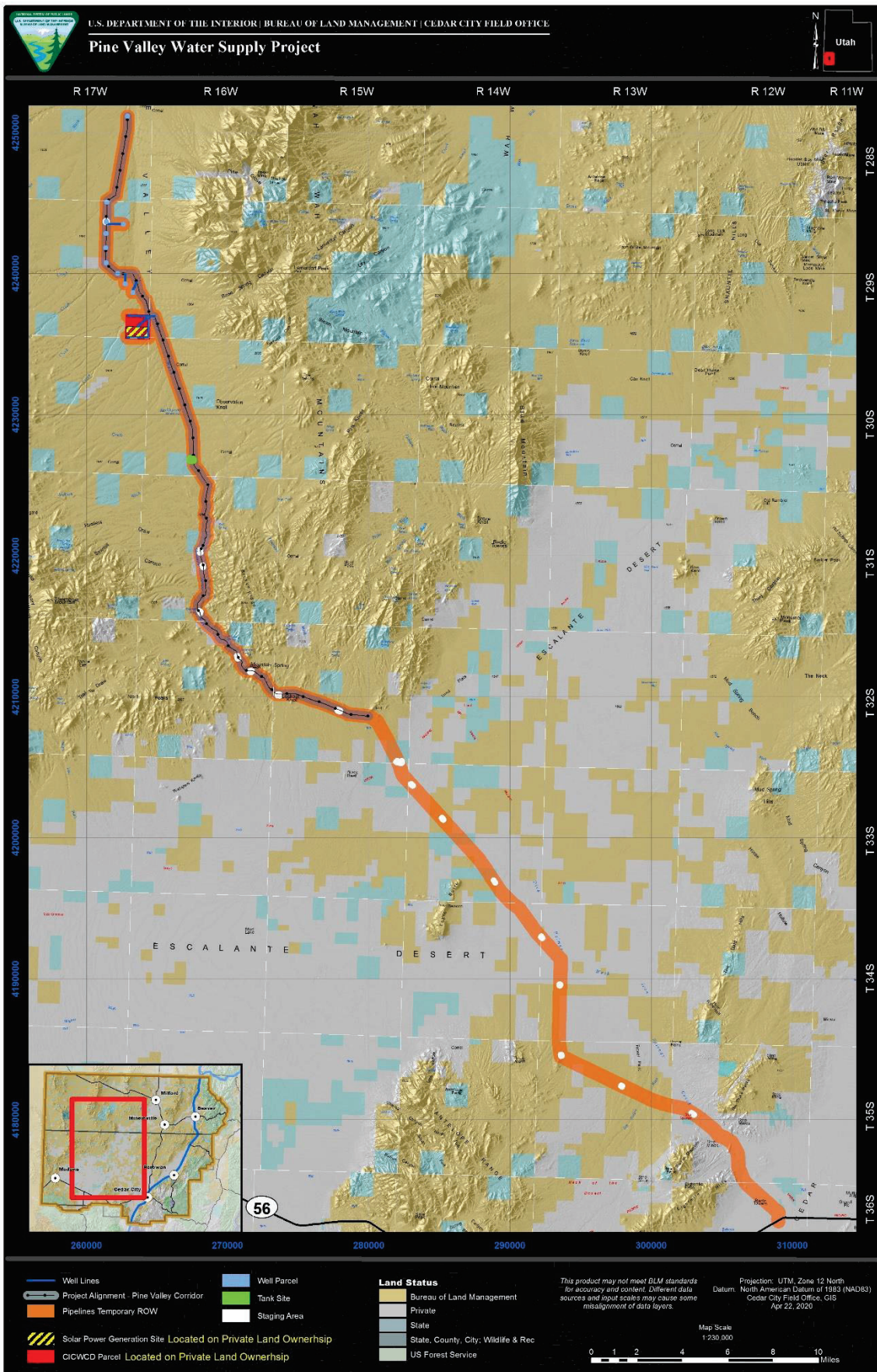
Traces of the Old Spanish National Historic Trail are avoided by a reroute of the pipeline that became part of the Proposed Action and ANWS Alternative. The BLM consulted with the National Park Service regarding the Cultural Resources Inventory report for the Trail in June of 2020. The National Park Service responded on July 1, 2020, with no additional comments or concerns.

5.4 Tribal Consultation

Fifteen Tribes or Bands were sent letters on September 3, 2020, inviting them to participate in government-to-government consultation including: Cedar Band of Paiutes, Kanosh Band of Paiute

Indians, Indian Peaks Band of Paiutes, Moapa Band of Paiutes, Paiute Indian Tribe of Utah, Shivwits Band of Paiutes, Ute Indian Tribe, Kaibab Band of Paiute Indians, Pueblo of Zuni, Confederated Tribes of the Goshute Reservation, Hopi Tribe, Navajo Nation, San Juan Southern Paiute Tribe, Southern Ute Indian Tribe, and Ute Mountain Ute Tribe. Prior to the September 3, 2020, letter, the Kanosh Band of Paiutes, Cedar Band of Paiutes, and the Confederated Tribes of the Goshute Reservation had already provided comments during the scoping period from July 15 to August 19, 2020. Government-to-government consultation efforts have been ongoing throughout the preparation of the EIS and are described in detail in Section 4.3 of the Final EIS.

Appendix A: Project Map



PINE VALLEY WATER SUPPLY PROJECT – RECORD OF DECISION

EXHIBIT B-1

Declaration of Beaver County, Utah
(Tammy T. Pearson, Commissioner)

**DEPARTMENT OF THE INTERIOR
OFFICE OF HEARINGS AND APPEALS
INTERIOR BOARD OF LAND APPEALS**

BEAVER COUNTY, UTAH; MILLARD COUNTY, UTAH; JUAB COUNTY, UTAH; WHITE PINE COUNTY, NEVADA; CITY OF MILFORD, UTAH; CENTRAL NEVADA REGIONAL WATER AUTHORITY; NEVADA GRAZING BOARD OF DISTRICT NO. 4; GREAT BASIN WATER NETWORK; MARK WINTCH; WAH WAH RANCH, WALLACE PEAK WATER COMPANY, WINTCH & COMPANY LLC; BARBARA WINTCH; JOHN CARTER; LYLE CARTER; DEAN EYRE; DUSTIN KESLER; BRANDON YARDLEY; AND GILBERT (“GIB”) T. YARDLEY,

Appellants,

v.

BUREAU OF LAND MANAGEMENT,

Respondent.

IBLA No. _____

RE: PINE VALLEY WATER SUPPLY
PROJECT
DOI-BLM-UT-C010-2020-0012-EIS
(2026)

DECLARATION OF TAMMY T. PEARSON

BEAVER COUNTY COMMISSIONER

I, TAMMY T. PEARSON, Beaver County Commissioner, declare as follows:

1. I have personal knowledge of each of the facts set forth below and, if called upon to do so, could and would testify regarding the following. This declaration is filed in support of Beaver County, Utah, et al.’s *Notice of Appeal* and *Petition for Stay* in the above-captioned matter and in support of standing for Beaver County, Utah.

2. I have lived in Beaver County, Utah since 1983 and have been a farmer and rancher for my entire life.
3. I own and operate the Pearson Ranch & Farms in Minersville, located in Beaver County, which operation includes grazing 600 head of Hereford and Angus beef cattle.
4. I own groundwater and spring water rights under Utah law that support these operations and which also supply residential needs.
5. Natural springs have been developed at Pearson Ranch & Farms to supply livestock and wildlife with drinking water.
6. Water conservation has long been central to the Pearson Ranch & Farm's commitment to responsible land stewardship and agricultural innovation.
7. My ranch depends on spring and groundwater resources and rights that support its operations, and any drawdown to the water table or drying of springs on my ranch would result in a direct impact to my ranching operations, property value, and the associated taxes I pay to Beaver County.
8. I currently am a Beaver County Commissioner and have been authorized to submit this declaration in support of standing for the County.
9. I have been a member of the Beaver County Commission since 2015, and am its longest standing member.
10. I also serve on the Southern Utah Grazing Improvement Board that focuses on funding water and grazing projects to improve habitat for livestock and wildlife.
11. In addition, I serve on the BLM National Wild Horse and Burro Advisory Board that focuses on the range conditions, water availability, and impacts on the Wild Horse and Burro Herd Management Areas.

12. I serve as Chairman of the Utah Association of Counties Natural Resource Committee that advocates for proper management of all natural resources for the benefit of the producers, the public and the Counties.
13. I serve on the Advisory Board for the Institute for Land, Water and Air, which focuses on the impacts and use of natural resources and the effect this use has on life in Utah.
14. I serve as a Board member for the LeRay McCallister Fund, “The Working Farm & Ranch Funding Program.”
15. Finally, I work with agricultural producers, farmers, and ranchers on conserving water and implementing water saving systems on cropland.
16. My work for Beaver County has included watershed restoration projects, wild horse management, actively pursuing Mineral Company leases, and exploration in the Blawn Mountain SITLA block parcels, which parcels would be affected by an impact to their water rights and resources.
17. As a Beaver County Commissioner, I approved Beaver County’s participation in the BLM’s environmental review process for the Pine Valley Water Supply Project (“Project”) as a cooperating agency and its submission of extensive comments to the BLM at every stage of the process, including scoping, Administrative Draft EIS, Draft EIS, Administrative Final EIS, and Final EIS comments.
18. Beaver County includes portions of the following groundwater Basins: Pine Valley, Wah Wah Valley, Snake Valley, Hamlin Valley, Beryl Enterprises Area, Milford Area, and Beaver Valley, most of which stand to be impacted by the Project’s groundwater pumping according to USGS groundwater modeling, project proponent consultant groundwater modeling, and Beaver County’s own hydrology consultants’ groundwater modeling.

19. As a direct result, Beaver County’s groundwater dependent natural resources will be directly impacted by project pumping and water table drawdown.
20. Beaver County is home to the cities of Milford, Minersville, and Beaver, whose economies rely on ranching, agriculture, and tourism, all of which are groundwater dependent.
21. Any impact to the water table in these communities will directly negatively impact those activities.
22. Beaver County derives a substantial portion of its revenue from agriculture, ranching, and recreation and tourism in Pine Valley and in hydrologically connected downgradient valleys in Beaver County.
23. Therefore, any impact to agriculture, ranching, or recreation in these valleys will directly impact Beaver County’s tax base.
24. With regard to agriculture, Beaver County’s Resource Management Plan provides that “[t]he 2012 Census of Agriculture indicates there are 277 farms or ranches in Beaver County occupying 190,000 acres of private land. The average farm size is 686 acres and the average land value is \$1,997 per acre. The average farm is valued at \$1,370,000. Of the county’s 1,657,656 total acreage, agriculture activity occupies 11.5% of the land. The County had 37,000 acres of cropland, of which 32,000 acres were irrigated and harvested. Alfalfa is the dominant crop with 125,000 tons produced. Corn is the second leading crop with 284,400 bushels of grain and 35,000 tons of silage produced.” Beaver County, Utah, Resource Management Plan, § 3.1 (Amended September 6, 2022), available at <https://rmp.utah.gov/documents/PLPCO::beaver-county-management-plan/>. (“Beaver County RMP” or “RMP”).
25. The RMP further provides that “Beaver County leads all counties in Utah in total market value of agricultural products at \$288.5 million as well as total livestock revenues valued at

\$266.9 million. This is primarily attributable to the commercial hog production facilities in the County. In cattle production, there were over 21,000 head of cows in the county, of which 13,000 were raised for the beef market. The number of dairy cows has fallen to about 700 in 2012.” *Id.*

26. Beaver County’s objectives with regard to agriculture, as documented in its RMP are as follows: “1. To preserve and protect the agricultural lifestyle, heritage, culture and rural character of the County; 2. To actively coordinate with federal and state agencies to foster management goals and decisions that are favorable to the County’s agricultural industry; 3. To take action to encourage responsible stewardship of water and rangeland resources to foster a strong agriculture based economy; and 4. To adopt policies and principles that promote local agriculture to increase the state’s food security while decreasing its dependence on imported food and produce.” *Id.*

27. With regard to livestock and grazing, Beaver County’s Resource Management Plan provides that “grazing on public land is vital to the agricultural industry of the county.” RMP at § 3.2.

28. In particular, the Resource Management Plan notes that livestock grazing has a positive a positive impact on the County’s economy, accounting “for 93.7% of the total agricultural cash receipts in Beaver County, the highest in the state.” *Id.*

29. Consistent with the importance of livestock and grazing to the County’s revenue, economy, and cultural heritage, the Beaver County Resource Management Plan establishes the following objectives for livestock and grazing that are relevant here and that will be undermined by BLM’s grant of the Project right-of-way and the associated groundwater pumping: to preserve livestock grazing on public lands as an important historic, cultural and economic activity; to maintain the AUM’s at current levels and encourage increases as range conditions provide; to

improve range conditions through vegetation treatments and proper management, all federal agency resource management planning on public lands within Beaver County, must involve active participation from the County and grazing permittees as contributing members; have all Federal policies and management plans acknowledge and consider the cultural, economic, and environmental importance of the livestock industry to the county and its citizens; protect AUM's from displacement by solar energy developments on public lands; and protect surface and groundwater resources for livestock use. *Id.*

30. With regard to water rights and irrigation, the Beaver County Resource Management Plan includes the following objective that would be directly harmed by Project pumping: to retain adequate water to meet its diverse current and future needs. Further, “[p]rivately held water rights shall be protected from federal and/or state encroachment or coerced acquisition. Beaver County opposes any movement toward nationalization or federal control of Utah water rights and water resources.” RMP § 3.3.

31. Further, the Resource Management Plan provides that “NEPA analysis for projects that impact irrigation resources shall include detailed socio economic impacts to irrigators, especially small farmers, water companies and municipalities. Provisions of the Regulatory Flexibility Act will serve as a model for such analysis.” *Id.*

32. With regard to noxious weeds, the Beaver County Resource Management Plan provides that it is Beaver County's objective: “[t]o fulfill its responsibility to its citizens to protect lands, crops and livestock from the harmful and costly invasion of noxious weeds by preventing their introduction, establishment and spreading.” The Plan further provides that “Beaver County calls upon the federal agencies who administer lands within the county to: ... Maintain and enhance desired plant communities that benefit watersheds, water quality, wildlife, livestock, recreation,

and are weed free [...and] Refrain from any planning decisions and management actions that will undermine, restrict or diminish the goals, purposes and policies of Beaver County as stated in this resolution.” RMP § 3.4.

33. With regard to water resources, Beaver County’s RMP provides that “[w]ater is one of the most important natural resources in Beaver County.” RMP § 4.

34. Further, “[t]he utility of all lands in the county, whether public or private, are fully dependent on water flows from watersheds or underground sources for their productivity.” RMP § 4.1.

35. “The rivers and streams flowing from watersheds on public lands supply important water for municipal, industrial, agricultural and recreational use.” *Id.*

36. The RMP provides that one of its objectives with regard to Beaver County’s hydrology is “[t]o demand that land managers coordinate programmatic agreements, best management practices, and prioritization schedules for improving hydrologic functions and conditions within Beaver County.” RMP § 4.1.

37. The RMP further refers to Section 63J-8-104 of the Utah Code, which “states that federal land management agencies shall manage the watershed on federal lands to achieve and maintain water resources at the highest reasonably sustainable levels...” *Id.*

38. Specifically, “[w]atersheds shall be managed to preserve the quality and quantity of water for current and future uses.” *Id.*

39. With regard to recreation and tourism, Beaver County’s RMP provides that “[r]ecreation and tourism resulting from Beaver County’s unique character, history, and culture plays a critical role in the local economy.” RMP § 5.

40. “According to the Utah Department of Workforce Services, leisure and hospitality jobs had a 17.4% non-agricultural industry share in 2015, ranking 13th out of Utah’s 29 counties. According to the Utah State Tax Commission, in 2015, travel-related tax revenues totaled approximately \$343,178.” *Id.*

41. “Beaver County offers many world-class outdoor recreation opportunities. The majestic Tushar Mountain Range marks the eastern boundary of Beaver County. The range includes two of the highest mountains in the state, Delano Peak (12,173 feet) and Mount Belknap (12,139 feet). In addition to breathtaking hiking and backpacking trails, Beaver County has mountain biking opportunities, including a mountain traversing bike race each summer. Horse riding and packing trails and ATV trails are numerous and popular. The Tushar Mountains do not just offer summer activities, skiing, snowmobiling and ice fishing are very popular winter activities enjoyed by many locals and visitors. The large granite rock formations of the Mineral Mountains provides an adventurous wonderland for exploring as well as highly technical climbing and rappelling opportunities for more advanced climbers. Frisco Peak has been the destination for hang gliders who are bold enough to launch off the steep precipice into the rising desert thermals.” *Id.*

42. “Beaver County is also known for its high quality hunting and fishing opportunities. Beaver County is home to many huntable species including big game, waterfowl, and predators. The trophy-class elk and deer found in Beaver County are highly sought after and a prized resource. Minersville Reservoir is managed to produce trophy-sized trout, wipers and smallmouth bass. The high mountain lakes and streams of the Tushar Mountains have Rainbow, Brown, Cutthroat, and Tiger trout varieties.” *Id.*

43. Beaver County's RMP provides that "[i]t is the policy of Beaver County to support outdoor recreation on public lands as part of a balanced plan of economic growth and quality of life." *Id.*

44. Pine Valley and downgradient hydrologically connected groundwater basins in Beaver County are characterized by largely undeveloped landscapes valued for their pristine character, wildlife habitat, and intact rangeland. These landscapes support substantial economic activity in Beaver County through hunting, camping, and other outdoor recreation that generate tourism revenue. They also sustain ranching operations that depend on the valleys' groundwater and forage resources and that contribute materially to the County's agricultural economy and tax base.

45. Beaver County will be directly injured by the BLM's decision to grant a right-of-way for the Pine Valley Water Supply Project because the Project authorizes both surface disturbance and large-scale groundwater withdrawals in Pine Valley that will extend into neighboring hydrologically connected downgradient basins located within Beaver County.

46. Available groundwater modeling indicates that Project pumping will cause substantial drawdown in the Pine Valley aquifer, from 500 to 1000 feet at the wellfield in the near term, and that these effects will propagate through hydrologically connected basins. The groundwater modeling projects groundwater level declines ranging from several feet to hundreds of feet across large portions of Beaver County, including Pine and Wah Wah Valleys, with declines of 50 to 100 feet in the very northern portion of the already overappropriated Beryl Enterprises Area within decades, and substantially greater and more widespread impacts over longer time horizons. *See* Project Final Groundwater Resources Impact Assessment § 4.2.1.2; Brooks, USGS, *Groundwater Model of the Great Basin Carbonate Alluvial Aquifer System Version 3.0*,

Fig. 33 (2017). These impacts are particularly concerning because the Project targets deep aquifers with very slow recharge, meaning that groundwater losses will be effectively permanent. *See* Final EIS § 3.11.2.5.

47. Additionally, based on Beaver County’s review of the hydrologic analyses prepared by the Central Iron County Water Conservancy District (“CICWCD”) for the EIS, as well as materials prepared by the U.S. Geological Survey and Beaver County’s consultants, there remains substantial uncertainty regarding both the geographic scope and severity of groundwater impacts from the Project. *See* Beaver County, et al.’s *Notice of Appeal* and *Petition for Stay*, Exhibit C (Brooks Technical Reports).

48. The uncertainty in the model is compounded by a series of limiting modeling choices that collectively constrain and understate potential effects. The EIS models only fifty years of pumping, despite the Project’s reliance on permanent water rights that would reasonably be exercised for as long as water is available once the Project investment is made. FEIS modeling also evaluates only a portion of the total pumping contemplated under the much larger planned West Desert Pipeline Project and fails to adequately model reasonably foreseeable withdrawals from Wah Wah Valley and Hamlin Valley, which also lie within Beaver County. In addition, the modeling relies on a southern wellfield configuration in Pine Valley that does not reflect other reasonably foreseeable pumping locations. Each of these assumptions independently narrows the modeled area and magnitude of impacts, and together they substantially limit the model’s ability to capture the full extent of drawdown and interbasin flow effects, including impacts within Hamlin Valley, Wah Wah Valley, and to hydrologically connected basins to the east, including the Milford area and including the area near Minersville where my family has its ranch.

49. In addition to the artificially limited modeling effort, the model predictions themselves are also highly uncertain, as reflected in U.S. Geological Survey's GBCAAS v. 3.0 parent model report, and that uncertainty is further compounded by internal inconsistencies in the modeling of groundwater levels and spring discharge described in the Groundwater Resources Impact Assessment prepared by CICWCD for the EIS. These inconsistencies can mask or minimize the appearance of drawdown effects, particularly in areas downgradient of the proposed pumping. At the same time, portions of the broader regional groundwater system that extend into Beaver County are either excluded from or minimized within the predicted zone of impact based on those same constrained model outputs. Given these limitations, Beaver County does not have confidence that the EIS modeling reliably identifies the full geographic extent of potential impacts to the interconnected basin and range aquifer system on which the County's water resources depend.

50. Beaver County contains multiple basins and valleys that are hydrologically connected to Pine Valley and the broader regional groundwater system, including Hamlin Valley, Wah Wah Valley, and basins to the east such as the Milford area, all of which rely on interbasin groundwater flow. As a result, the County's water resources stand to be directly affected by the Project's interception and export of groundwater. Beaver County depends on these groundwater and groundwater-dependent resources for agricultural production, ranching operations, municipal and domestic supply, tourism and recreation, and overall economic stability. In light of the limitations described above, Beaver County is concerned that Project-related pumping, including pumping in Wah Wah and Hamlin Valleys, will result in greater and more widespread drawdown within the County than disclosed in the EIS. Such impacts would impair the County's water resources, interfere with existing and future water uses, diminish the viability of agriculture and

rural communities, and harm groundwater-dependent ecosystems that are integral to the County's character and economy.

51. Depletion of groundwater in Pine Valley and in downgradient hydrologically connected basins within Beaver County will impair the water availability that supports ranching operations within the County. Reduced groundwater availability will diminish the carrying capacity, productivity, and value of ranch properties, including ranches such as the Wah Wah Ranch, T&D Ranch, Runnin C Ranch Family Partnership, Platts Livestock, S&W Hall Enterprises, Robert Holt Co., Kevin Wood, Kelly Wood, Reed Carter, Alan Gurney, Dale Gardner, and Achin Foot LLC which contribute tax revenue to Beaver County as a direct result of income generated by ranching operations. *See* Declarations of Mark Wintch, Dean Eyre, and Lyle Carter.

52. Through these impacts, the Project will directly injure Beaver County's proprietary and economic interests in Pine Valley and in hydrologically connected downgradient basins within the County, including injury to the County's tax base and to land owned by ranchers operating within the County who contribute taxes to Beaver County as a direct result of ranching revenue and groundwater and spring dependent property values.

53. Project groundwater modeling, as well as modeling conducted by the U.S. Geological Survey and Beaver County's consultants, confirms that the Project's groundwater withdrawals will directly impact land and water resources in Beaver County, which will diminish the value of property within the County.

54. Groundwater declines resulting from Project groundwater pumping are expected to increase pumping depths, reduce yield, degrade water quality, and require costly mitigation or replacement measures.

55. Project groundwater pumping is also expected to result in reduced land productivity, loss of vegetation, loss of wildlife habitat, introduction of invasive species and noxious weeds, subsidence risk, and diminished recreational value, which will result in reduced market value of land and water resources in Beaver County.

56. These groundwater declines and associated ecosystem, or environmental, impacts are expected to impair the scenic, recreational, ecological, and otherwise pristine character of Pine Valley and hydrologically connected downgradient valleys in Beaver County. These intact landscapes support tourism and related economic activity, including visitation, lodging, recreation spending, and other tourism-related income, from which Beaver County derives tax revenue.

57. The BLM's approval of the Project right-of-way in its Record of Decision is also inconsistent with Beaver County's Resource Management Plan objectives, policies, and guidelines described above and in Beaver County's comments on the 2022 Draft EIS and the Administrative Final EIS, and more specifically frustrates Beaver County's implementation of that Plan and its objectives.

58. Additionally, as noted in the Pine Valley Water Supply Project Final EIS, Beaver County's "RMP policies designate a 1,000-foot utility corridor, along State Route 21 and the TransWest Express powerline to the Millard County line (Beaver County 2019)." FEIS at § 1.5.1. The Project pipeline alignment chosen by the BLM and the applicant fails to make use of this existing utility corridor designated by Beaver County for such projects, frustrating Beaver County's ability to effectively engage in local land use planning and to plan for future growth and development.

59. Beyond the Project's frustration of Beaver County's designated utility corridor and land-use planning framework, its groundwater withdrawals will independently and substantially impair the County's ability to plan for future growth and development. Project pumping is expected to reduce groundwater availability within Pine Valley and hydrologically connected basins that the County reasonably relies upon in planning for future residential, commercial, agricultural, ranching, and industrial development.

60. There is also a large mineral deposit of alunite and potash in the Blawn Mountain SITLA block of property. There was a mining company actively pursuing the mineral lease, but the CICWCD project shut it down, because they wanted to lease the mine's water for a high premium to fund CICWCD's pipeline project into Iron County. This decision had a significant impact on Beaver County.

61. Finally, the surface disturbance in the Project area would interfere with county roads, sage grouse lekking, grazing, and general recreation & tourism activities.

62. Finally, there has been no demonstration by the Central Iron County Water Conservancy District or the BLM that the impact to water resources and groundwater dependent resources within Beaver County will be adequately protected or mitigated, or that Beaver County or its residents will be made financially whole after withdrawal of groundwater causes the predicted environmental harm, and thus, Beaver County anticipates the need to expend significant financial resources to mitigate the loss of ecological and water resources that will be a direct result of Project groundwater pumping, including but not limited to the need to deepen wells, augment spring flow, manage transitions in vegetation, and mitigate increased fugitive dust.

63. As a result, the Project threatens the County's institutional and proprietary interests in orderly land-use planning, infrastructure investment, and long-range economic development.

64. These concrete fiscal and proprietary harms to the County's revenues, interests, and planning authority constitute direct injuries to Beaver County itself.

65. Beaver County's injuries will be remedied by a decision to stay, set aside, and remand the BLM's Record of Decision for the Pine Valley Water Supply Project because the ground disturbance and groundwater pumping activities authorized therein, including pipeline and wellfield construction and operation, road construction, solar field construction, and groundwater pumping, would not occur and therefore would not injure Beaver County's interests and property rights described herein.

Pursuant to 28 U.S.C. § 1746, I declare, under penalty of perjury, that the foregoing is true and correct.

DATED: Mar. 30, 2026

Tammy T. Pearson
Tammy T. Pearson, Beaver County Commissioner

EXHIBIT B-2

Declaration of Millard County, Utah
(Vicki Lyman, Commissioner)

**DEPARTMENT OF THE INTERIOR
OFFICE OF HEARINGS AND APPEALS
INTERIOR BOARD OF LAND APPEALS**

**BEAVER COUNTY, UTAH; MILLARD
COUNTY, UTAH; JUAB COUNTY,
UTAH; WHITE PINE COUNTY,
NEVADA; CITY OF MILFORD, UTAH;
CENTRAL NEVADA REGIONAL
WATER AUTHORITY; NEVADA
GRAZING BOARD OF DISTRICT NO. 4;
GREAT BASIN WATER NETWORK;
MARK WINTCH; WAH WAH RANCH,
WALLACE PEAK WATER COMPANY,
WINTCH & COMPANY LLC; BARBARA
WINTCH; JOHN CARTER; LYLE
CARTER; DEAN EYRE; DUSTIN
KESLER; BRANDON YARDLEY; AND
GILBERT (“GIB”) T. YARDLEY,**

Appellants,

v.

BUREAU OF LAND MANAGEMENT,

Respondent.

IBLA No. _____

RE: PINE VALLEY WATER SUPPLY
PROJECT
DOI-BLM-UT-C010-2020-0012-EIS
(2026)

DECLARATION OF VICKI LYMAN

MILLARD COUNTY COMMISSIONER

I, VICKI LYMAN, Millard County Commissioner, declare as follows:

1. I have personal knowledge of each of the facts set forth below and, if called upon to do so, could and would testify regarding the following. This declaration is filed in support of Beaver County, Utah, et al.’s *Notice of Appeal* and *Petition for Stay* in the above-captioned matter and in support of standing for Millard County, Utah.

2. I was born and raised in Millard County, Utah.
3. I own agricultural land and a home near Delta, Utah, which has been in my husband's family for many generations.
4. My husband and I own groundwater rights under Utah law for domestic, irrigation, and stock water use, the oldest of which holds a priority date of 1916.
5. I also am currently a Millard County Commissioner.
6. I have been a member of the Millard County Commission since 2023.
7. Millard County participated at every stage of the BLM's environmental review process for the Pine Valley Water Supply Project ("Project") as a cooperating agency, and submitted comments to the BLM at every stage of the process, including scoping, Administrative Draft EIS, Draft EIS, Administrative Final EIS, and Final EIS comments.
8. Farming and ranching are truly a way of life in Millard County, and we all understand just how vital water is to sustain that way of life.
9. Right now, the aquifer beneath our valley is declining to a critically low level, which is a serious concern for our entire community.
10. For example, since drilling a new well at our home in or about 2005, we noticed the water level dropped 10 feet.
11. We're also seeing the impact on the bird refuge between Fillmore and Delta—an area that has long been important not only for waterfowl but also for tourism. Unfortunately, water levels have dropped so significantly that the artesian spring that once sustained it is drying up. The Utah Department of Natural Resources is actively working to explore every possible option to restore water to this important habitat, and we're hopeful that, together, we can find a path forward.

12. As a rancher and Millard County Commissioner, I've been working with a group of local farmers, along with the Utah State Engineer, to help find a meaningful solution. The livelihoods of our farmers and ranchers depend on it.

13. Given that the water table in Millard County already is in decline, any impact to the groundwater levels as a result of Pine Valley Water Supply Project pumping would result in harm our way of life, making it so that home owners are no longer able to use their wells, and forcing local farmers out of business.

14. Millard County includes the northern portion of Pine Valley, where project pumping is planned, and numerous other groundwater basins described more fully below which are hydrologically connected to, downgradient of, and stand to be impacted by the Project's groundwater pumping according to my review of portions of the Final EIS for the project and technical reports prepared by the project proponent's consultants, the USGS, and Beaver County hydrology consultants.

15. As a result, Millard County's groundwater dependent natural resources will be directly impacted by project pumping and water table drawdown.

16. A number of groundwater basins are present in Millard County: Pine Valley, Snake Valley, Tule Valley, Wah Wah Valley, Milford Area, Fish Springs Flat, and Sevier Desert.

17. Millard County is also home to the cities of Gandy, Eskdale, Garrison, and Burbank, Delta, Hinckley, Abraham, Sutherland, Sugarville, Lynndyl, Leamington, Oak City, Deseret, Oasis, Fillmore, Kanosh, Medow, Flowell, Holden, and Scipio. The economies of all of these communities depend on ranching, agriculture, and tourism, all of which are groundwater dependent.

18. Any impact to the water table in these communities will directly negatively impact those groundwater dependent activities.
19. Millard County derives revenue from agriculture, ranching, and recreation and tourism in all of these communities.
20. Any impact to agriculture, ranching, or recreation in these valleys will directly impact Millard County's tax base.
21. Pine Valley and downgradient hydrologically connected groundwater basins in Millard County are characterized by largely undeveloped landscapes valued for their pristine character, wildlife habitat, and intact rangeland. These landscapes support substantial economic activity in Millard County through hunting, camping, and other outdoor recreation that generate tourism revenue.
22. Fish Springs National Wildlife Refuge also is located just to the north of Millard County in Fish Springs Flat, which Valley extends into Millard County. The Refuge is downgradient from, and sustained by interbasin flows originating in Pine Valley, and is therefore at risk from Project pumping. It serves as a critical stopover along the Pacific flyway and supports a large and diverse bird population, with hundreds of species observed and many nesting on site. The Refuge depends on stable groundwater to sustain its wetlands.
23. Millard County also is home to Clear Lake Waterfowl Management Area, which provides important migratory bird habitat along the Pacific Flyway and supports a substantial number of bird species. Groundwater drawdown affecting these connected systems would threaten the Management Area and the ecological function and the wildlife it supports.
24. Section 2.5 of Millard County's Resource Management Plan ("RMP") provides that "[w]ater is one of the most important if not the most important natural resource in Millard

County. About 76% of Millard County is federal land, and most of the approximately 13% private lands are concentrated in valley bottoms and along water courses. Consequently, almost all surface water and the majority of watersheds are located on federal land.”

25. Further, “Millard County contains approximately 508,000 acres in farms or ranches with an average size of about 700 acres. The County has about 115,000 acres in cropland which are irrigated. Sprinkler irrigation has been an important part of Utah’s agricultural production since the early 1950s. About 40% of Utah’s 1.3 million irrigated acres are watered with sprinklers, including hand move, wheel move, center pivot and other types. Although many smaller ponds and reservoirs exist, DMAD Reservoir and Gunnison Bend Reservoir are the primary irrigation storage facilities in the County. As of 2015, 28 irrigation or canal companies were listed on Utah’s open data catalog.”

26. The RMP sets as a water resources policy: “Millard County will cooperate and coordinate with private landowners, permittees, state agencies, and federal partners with planning and implementation efforts to improve water quality and quantity on private and public lands.”

27. With regard to water rights and irrigation, Section 2.5.2 of the RMP provides that “Utah is one of the driest states in the nation, and water is Millard County’s most precious natural resource. Existing water supplies have been carefully managed through established law; and developing any significant new supplies may be difficult and costly.”

28. With regard to groundwater resources, Section 2.5.4 of the RMP states: “[g]roundwater is the County’s principal reserve of fresh water and represents much of its potential future water supply. Groundwater on federal lands is a major contributor to flow in many streams and rivers and has a strong influence on the health and diversity of plant and animal species in forests, rangelands, grasslands, riparian areas, lakes, wetlands, and springs. It also provides drinking

water for all of the public water systems and is connected to many of the private water systems in Millard County.”

29. Further, “[a]wareness of groundwater’s importance, the need for safe drinking water and requirements to maintain healthy ecosystems are increasing. Many of the concerns about groundwater resources on private and public lands involve questions regarding dependability of long term supply, depletion of groundwater storage, reductions in streamflow, potential loss of groundwater-dependent ecosystems, and changes in groundwater quality. The effects human activities common to more populated areas, land subsidence and saltwater intrusion are not applicable to Millard County. Contamination from landfills, septic tanks, leaky underground gas tanks, and from overuse of fertilizers and pesticides is prevented and controlled through various federal, state and local regulatory mechanisms.”

30. “Groundwater and surface water are interconnected and interdependent in almost all ecosystems. Groundwater plays a significant role in sustaining the flow, chemistry, and temperature of streams, lakes, springs, wetlands, and other hydrologic systems, while surface waters provide valuable recharge to groundwater resources. Groundwater has a major influence on rock weathering, streambank erosion, and the progression of stream channels. In steep terrain, it governs slope stability; in flat terrain, it limits soil compaction and land subsidence. Pumping of groundwater can reduce river flows, lower lake levels, and reduce or eliminate discharges to wetlands and springs. Pumping can also influence the sustainability of drinking-water supplies and maintenance of critical groundwater-dependent habitats.”

31. “Groundwater wells in the County are utilized primarily for drinking water and livestock watering with a limited amount also used for irrigation. The low amount of oil and gas development in Millard County has not affected groundwater development. All wells must be

drilled in accordance with the standards of the Utah State Engineer's Office and implement best management practices. Groundwater quality has been identified as a major concern for aquifers and recharge zones underlying the County."

32. The RMP recognizes the importance of protecting Millard County's limited groundwater resources as follows: "[w]hereas, groundwater resources in the State of Utah and in Millard County are being developed at unprecedented rates to enable agricultural and residential consumption; it is in the interest of Millard County to protect and preserve groundwater aquifers throughout the county from over-appropriation and groundwater mining."

33. Consequently, "[i]t shall be the policy of Millard County to question and/or protest groundwater developments on private, county, state, and/or federal lands within its borders. The county will encourage the State Engineer to conduct exhaustive hydrological studies prior to granting new appropriations in Areas 14, 18, 19, 68, 69, and 71. Millard County encourages land managers, to the extent allowed by state and federal law, to conduct hydrological studies to preserve and protect groundwater resources and to take action where necessary."

34. Perhaps most importantly, the RMP states that "[i]t shall be the policy of Millard County to retain and preserve groundwater resources in the basin of origin. Movement of groundwater to another basin causes environmental harm and negative socio-economic impacts to Millard County and shall be prohibited to the extent allowed by law."

35. With regard to livestock grazing, Section 3.2 of Millard County's RMP provides, "[l]ivestock grazing on federal lands has been declared an activity of historic and cultural significance in Millard County and has been placed on the County's register of cultural resources. In addition, the State of Utah has passed legislation recognizing the value of the livestock industry and outlining basic concepts to preserve its vigor. The American cowboy has

been recognized by the Congress and the President of the United States for his role in settling the West. Livestock grazing may be the last human endeavor of the American West that continues to pit man against nature and is shaped by the environment. Livestock grazing continues to play a vital role in the health, welfare, safety, custom, culture and heritage of Millard County.”

36. “In spite of ongoing improvements in livestock management and federal, state and local recognition of its importance, inflexible federal regulations, altered fire regimes, encroachment of undesirable vegetation (cheatgrass, pinyon/juniper, rabbitbrush, etc.), and private efforts to eliminate public land grazing put the industry at significant risk. “

37. “Grazing, one of the earliest and longest uses of Millard County’s public lands, continues to be an important activity for those same lands today. Livestock grazing now competes with more uses than it did in the past, as other industries and the general public look to the public lands as sources of both conventional and renewable energy and as places for outdoor recreation, including primitive and motorized use. Among the key issues that face land managers today are drought, severe wildfires, invasive plants, loss of historic plant communities, and dramatic increases in recreation.”

38. The RMP sets as a livestock grazing goal to “[p]reserve the history, culture, custom, and values of the grazing industry within the County [and to] [m]aximize efficient and responsible preservation, enhancement, and development of grazing resources, practices and affected natural, historical, and cultural activities within Millard County.”

39. With regard to agriculture, Section 3.8 of the RMP states that “[t]he 2012 Census of Agriculture indicated there were 728 farms or ranches in the county with an average size of 793 acres. Total acreage was listed as 577,405 acres. 363 or 50% of the farmers/ranchers derived their primary living from agricultural operations. The county had 26.3% of the land in farms as

cropland and 65.8% as pastureland. Cattle and calves were the largest livestock item with 21,164 units. Livestock generated \$105,800,000 of products sold. Crops produce \$74,824,000 of sales, and total production was \$180,624,000.”

40. Further, “[a]dditional water needs to be developed for agriculture and livestock interests on public and private land.”

41. Section 3.3 of the RMP recognizes that “[r]ecreation/tourism has become one of the major resource uses within the region. The term recreation includes a variety of activities that affect and are affected by resources and other resource uses. Millard and its adjoining counties offer a wide variety of recreational opportunities, especially for dispersed use, which rely on developed and undeveloped open space. These activities include wildlife viewing, hunting, hiking, backpacking, horseback riding, OHV use, fishing, bicycling, photography, camping, orienteering, river running, rock climbing, mountain biking, and sightseeing, among others.”

42. The RMP further notes that “[r]ecreation resources include infrastructure, recreation sites and dispersed public lands, wildlife resources, visual resources, waterways, lakes, and other resources (physical, historical, etc.), each of which provides different recreational opportunities. In areas where recreation resources receive heavy use, developed recreation sites or facilities are often constructed to aid in managing impacts. Consequently, developed recreation sites are primarily located near high-use recreation attractions. Developed recreation areas may include such permanent features as picnic tables, drinking water, vault toilets/shower facilities, campsites, signage, and interpretive areas.”

43. Finally, Section 4.4.3 confirms that there are six Areas of Environmental Concern designated in Millard County: Pahvant Butte, Tabernacle Hill, Wah Wah Mountain, Gandy Saltwater Marsh, Gandy Warm Springs, and Fossil Mountain.

44. Additionally, Section 6.02 of Millard County’s General Plan, on water use and conservation states “While Millard County does not directly provide water services, it plays an essential role in land use decisions that impact water resources through its planning authority. Water is essential for supporting residential, industrial, commercial, agricultural, and recreational needs throughout the county. Millard County is committed to sustainable water use and management. We acknowledge that every development has a hydrologic cost, and our community operates within a hydrologic budget. Our planning approach considers new land uses in the context of their impact on existing networks, fiscal sustainability, and water supply.”

45. Section 6.04 further provides that “[a]gricultural uses, particularly irrigation, account for a significant portion of our water consumption. Residential development, though limited, contributes to increasing demand for culinary water. Industrial development, including mineral extraction and energy production, requires substantial water resources.”

46. All of these resources and uses are critically important to Millard County, most contribute to Millard County’s tax base, and all of them are water dependent. The BLM’s approval of the Project right-of-way in its Record of Decision is inconsistent with Millard County’s Resource Management Plan objectives, policies, and guidelines described above and in Millard County’s and Beaver County’s comments on the 2022 Draft EIS and the Administrative Final EIS, and more specifically frustrates Millard County’s implementation of that Plan and its objectives.

47. Additionally, although Millard County raised this issue in its comments, BLM failed to consider whether the Project complies with the House Range Resource Management Area Resource Management Plan. Instead, BLM asserted that its modeling, covering well under half of the anticipated West Desert Pipeline pumping and which also failed to simulate project pumping beyond fifty years, shows no impacts in that area.

48. This is important, because the goals and objectives section related to watersheds contained in the House Range RMP includes the following goals: “[i]mprove watershed conditions on areas identified with significant erosion condition problems and on other sensitive watershed and riparian areas; (2) Avoid deterioration or improve watershed conditions on all other public lands; (3) Assure an adequate supply of water for existing and proposed BLM management activities; (4) Ensure production of quality water as required by state and federal legislative acts and regulations for on-site and downstream users; and (5) Coordinate with the proper local, state, and federal authorities on water-related issues.” BLM, House Range RMP at 81.

49. Millard County will be directly injured by the BLM’s decision to grant a right-of-way for the Pine Valley Water Supply Project because the Project authorizes large-scale groundwater withdrawals in Pine Valley, part of which extends into Millard County, and which pumping will capture interbasin flows that serve neighboring hydrologically connected downgradient basins located within Millard County.

50. Groundwater modeling conducted by the U.S. Geological Survey and for the EIS demonstrates that Project pumping will draw down the Pine Valley aquifer by 500 to 1000 feet at the Project well field in the short term and will also affect downgradient, hydrologically connected basins by drawing down the water table from approximately five to hundreds of feet across a large area of Millard County in Pine and Wah Wah Valley within decades, with far more severe impacts over a much broader geographic area the longer the wells are pumped. Formation Environmental, Groundwater Resources Impact Assessment, Pine Valley Water Supply Project (“GRIA”) § 4.2.1.2 (Dec. 2025); Brooks, L., USGS, *Groundwater Model of the Great Basin Carbonate Alluvial Aquifer System Version 3.0*, Fig. 33 (2017). Modeling prepared by the

applicant's consultants for the BLM's EIS predicts lesser, but still extreme impacts over a large area in Millard County. GRIA § 4.2.1.2.

51. These impacts are especially troubling for Millard County considering the Project well field may be moved north to the Northern Well Field, which pumping likely would have more severe and more immediate impacts on groundwater levels and groundwater dependent ecosystems in Millard County.

52. Additionally, based on Millard County's review of the hydrologic analyses prepared by the Central Iron County Water Conservancy District ("CICWCD") for the EIS, as well as materials prepared by the U.S. Geological Survey and hydrologists working with the Project's Cooperating Agency counties, there is substantial uncertainty regarding both the geographic scope and severity of groundwater impacts from the Project. That uncertainty is compounded by a series of limiting modeling choices that collectively constrain and understate potential effects on downgradient basins, including those within Millard County. *See Brooks Technical Reports attached to Beaver County, et al.'s Notice of Appeal and Petition for Stay as Exhibit C.*

53. First, the EIS models only fifty years of pumping, despite the Project's reliance on permanent water rights that would reasonably be exercised for as long as water is available. It also evaluates only a portion of the total pumping contemplated under the broader West Desert Pipeline Project, which project would include additional withdrawals from hydrologically connected basins of Wah Wah and Hamlin Valleys. Each of these assumptions independently narrows the modeled area and magnitude of impacts, and together they substantially limit the model's ability to capture the full extent of drawdown and interbasin flow effects on downgradient valleys within Millard County that receive and depend on groundwater originating in Pine Valley and adjacent basins.

54. The model predictions themselves are also highly uncertain, as reflected in the U.S. Geological Survey's GBCAAS v. 3.0 parent model, and that uncertainty is further compounded by internal inconsistencies in the modeling of groundwater levels and spring discharge described in the Groundwater Resources Impact Assessment prepared by CICWCD for the EIS. GRIA, Appendix D. This fact concerns Millard County as such inconsistencies can mask or minimize the appearance of drawdown effects, particularly in downgradient areas. At the same time, portions of the broader regional groundwater system that extend into Millard County are either excluded from or minimized within the BLM's predicted zone of impact based on those same constrained model outputs. Given these limitations, Millard County does not have confidence that the EIS modeling reliably identifies the full geographic extent of potential impacts to the interconnected basin and range aquifer system on which the County's water resources depend.

55. Millard County contains basins and valleys that are hydrologically connected to Pine Valley and that receive and rely upon interbasin groundwater flow from that system. EIS modeling clearly demonstrates that the County's natural resources stand to be impacted by drawdown caused by project pumping. Additionally, in light of the limitations described above, Millard County is concerned that the Project's interception and export of groundwater from Pine Valley will result in greater and more widespread drawdown in downgradient areas within the County than disclosed in the EIS. Such impacts would impair the County's water resources, interfere with existing and future water uses, diminish the viability of agriculture and rural communities, and harm groundwater-dependent ecosystems that are integral to the County's character and economy and tax base.

56. Project groundwater modeling prepared for the EIS, as well as modeling conducted by the U.S. Geological Survey and partner Beaver County's hydrology consultants, confirms that

the Project's groundwater withdrawals will directly impact land and water resources in Millard County, which will diminish the value of property within the County.

57. Depletion of groundwater in Pine Valley and in downgradient hydrologically connected basins within Millard County will impair the water availability that supports ranching operations within the County. Reduced groundwater availability will diminish the carrying capacity, productivity, and value of ranch properties, including operations such as Conrad Farms and Hayward Farms, Bunker Farms, Howlett Farms, Dave's Farms, Stanworth Farms, Harward Farms, Bateman Farms, Swallow Farms, and Lyman Feedlot, all of which contribute tax revenue to Millard County as a direct result of income generated by their groundwater dependent operations.

58. Through these impacts, the Project will directly injure Millard County's proprietary and economic interests in Pine Valley and in hydrologically connected downgradient basins within the County, including injury to the County's tax base and to land owned by ranchers operating within the County who contribute taxes to Millard County as a direct result of ranching revenue and groundwater and spring dependent property values.

59. Groundwater declines resulting from Project groundwater pumping are expected to increase pumping depths, reduce yield, degrade water quality, and require costly mitigation or replacement measures.

60. Project groundwater pumping is also expected to result in reduced land productivity, loss of vegetation, loss of wildlife habitat, introduction of invasive species and noxious weeds, subsidence risk, and diminished recreational value, which will result in reduced market value of land and water resources in Millard County.

61. These groundwater declines and associated ecosystem, or environmental, impacts are expected to impair the scenic, recreational, ecological, and otherwise pristine character of Pine Valley and hydrologically connected downgradient valleys in Millard County. These intact landscapes support tourism and related economic activity, including visitation, lodging, recreation spending, and other tourism-related income, from which Millard County derives tax revenue.

62. The Project's groundwater withdrawals will also substantially impair the County's ability to plan for future growth and development. Project pumping is expected to reduce groundwater availability within Pine Valley and hydrologically connected basins that the County reasonably relies upon in planning for future residential, commercial, agricultural, ranching, and industrial development.

63. Finally, there has been no demonstration by the Central Iron County Water Conservancy District or the BLM that the impact to water resources and groundwater dependent resources within Millard County will be adequately mitigated, or that Millard County will be made financially whole after withdrawal of groundwater causes the predicted environmental harm, and thus, Millard County anticipates the need to expend significant financial resources to mitigate the loss of ecological and water resources that will be a direct result of Project groundwater pumping, including but not limited to the need to deepen wells, augment spring flow, manage transitions in vegetation, and mitigate increased fugitive dust.

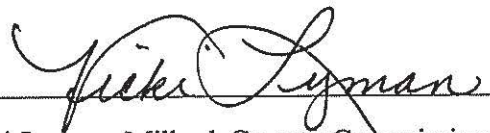
64. As a result, the Project threatens the County's institutional and proprietary interests in orderly land-use planning, infrastructure investment, and long-range economic development.

65. These concrete fiscal and proprietary harms to the County's revenues, interests, and planning authority constitute direct injuries to Millard County itself.

66. Millard County's injuries will be remedied by a decision to stay, set aside, and remand the BLM's Record of Decision for the Pine Valley Water Supply Project because the ground disturbance and groundwater pumping activities authorized therein, including pipeline and wellfield construction and operation, road construction, solar field construction, and groundwater pumping, would not occur and therefore would not injure Millard County's interests and property rights described herein.

Pursuant to 28 U.S.C. § 1746, I declare under penalty of perjury that the foregoing is true and correct.

DATED: 3/31/2026



Vicki Lyman, Millard County Commissioner

EXHIBIT B-3

Declaration of Juab County, Utah
(Marvin Kenison, Commissioner)

**DEPARTMENT OF THE INTERIOR
OFFICE OF HEARINGS AND APPEALS
INTERIOR BOARD OF LAND APPEALS**

**BEAVER COUNTY, UTAH; MILLARD
COUNTY, UTAH; JUAB COUNTY, UTAH;
WHITE PINE COUNTY, NEVADA; CITY
OF MILFORD, UTAH; CENTRAL NEVADA
REGIONAL WATER AUTHORITY;
NEVADA GRAZING BOARD OF DISTRICT
NO. 4; GREAT BASIN WATER NETWORK;
MARK WINTCH; WAH WAH RANCH,
WALLACE PEAK WATER COMPANY,
WINTCH & COMPANY LLC; BARBARA
WINTCH; JOHN CARTER; LYLE
CARTER; DEAN EYRE; DUSTIN KESLER;
BRANDON YARDLEY; AND GILBERT
("GIB") T. YARDLEY,**

Appellants,

v.

BUREAU OF LAND MANAGEMENT,

Respondent.

IBLA No. _____

RE: PINE VALLEY WATER SUPPLY
PROJECT
DOI-BLM-UT-C010-2020-0012-EIS
(2026)

**DECLARATION OF MARVIN KENISON
JUAB COUNTY COMMISSIONER**

I, MARVIN KENISON, Juab County Commissioner, declare as follows:

1. I have personal knowledge of each of the facts set forth below and, if called upon to do so, could and would testify regarding the following. This declaration is filed in support of Beaver County, Utah, et al.'s *Notice of Appeal* and *Petition for Stay* in the above-captioned matter and in support of standing for Juab County, Utah.
2. I live in Juab County, Utah, and I have been a farmer for 47 years.

3. I run ground in the Sevier River Basin. In that time, I have personally experienced an ever-declining aquifer which has not recovered. The west desert is directly linked to the aquifer and with the water levels dropping, some irrigated pastures have been dry for years due to the over-allocation. It is reasonable to conclude the aquifer will continue to drop and would only be accelerated by additional pumping.

4. I currently serve as a Juab County Commissioner in my second term, and I have been authorized to submit a declaration on behalf of Juab County.

5. Juab County is home to the cities and towns of Rocky Ridge, Mona, Nephi, Levan, Eureka, Callao, Trout Creek, and Partoun, whose economies rely in large part on ranching, agriculture, and tourism.

6. My work for Juab County has included my representation of the interests of many farmers and ranchers in my community. The ranchers and farmers in the western end of Juab County have experienced ever declining water tables which has caused them to begin limiting the amount of acreage that they water and forcing some to buy feed from other sources to care for their livestock. Some farmers or ranchers have been able to market their excess feed to help address the ever-thin margins in agriculture.

7. In the Callao Partoun Area, the aquifer is considered shallow and the farmers' and ranchers' wells are not very deep at the moment. The concern there is the increased pressure on the aquifer will force those who live out there to drill new wells. Then the well drilling will be a race to the bottom as has occurred in other areas where water is over-allocated.

8. I also serve as trustee on the Board of the Central Utah Water Conservancy District and drawing upon my experience, I help manage water in central and northern Utah.

9. The taxes that are paid to Juab County are tied to property holdings or ranching operations which are dependent upon water. Our tax base will be impacted by groundwater withdrawals that will impact the ranching operations. Many ranchers in the western end of Juab County raise bulls for breeding but are limited to the number of animals they can raise thus affecting their income and the amount of money they can return to the county for making improvements to their operations. Likewise, some ranchers have cow-calf operations which are impacted, requiring them to raise smaller and smaller numbers of pairs because the pastures will not sustain the amount of cattle as they previously did. Likewise, the animal processing facility in the county is impacted because it must pay more freight to bring in the needed cattle to sustain their business.

10. I am concerned that the wildlife areas and the long-standing wildlife refuge will become nonexistent if too much water were removed from the aquifer.

11. As a Juab County Commissioner, I approved Juab County's participation in the BLM's environmental review process for the Pine Valley Water Supply Project ("Project") as a cooperating agency and its submission comments to the Bureau of Land Management at every stage of the process, including scoping, Administrative Draft EIS, Draft EIS, Administrative Final EIS, and Final EIS comments.

12. Juab County includes portions of the following sub-basin watersheds: Utah Lake, Lower Sevier, Southern Great Salt Lake, Tule Valley and Hamlin-Snake Valleys, most of which stand to be impacted by the Project's groundwater pumping according to USGS groundwater modeling and project proponent consultant groundwater modeling.

13. Of the county's 2,183,681 total acreage, the Federal Government controls 1,569,966 acres or 71.90% of the land area. With regard to agriculture, there are 297 farms or ranches in Juab County occupying 246,735 acres of private land. Agriculture activity occupies 11.3% of the

county's total acreage. The average farm size is 831 acres. The average farm/ranch land value is \$1,327 per acre. The County has 45,181 acres of cropland, of which 17,229 acres are irrigated and harvested. The County has 191,984 acres of pastureland. Hay is the dominant crop with 83,935 tons produced. Approximately 115,964 bushels of wheat, 115,762 bushels of corn grain, 44,174 tons of corn silage, and 36,268 bushels of barley are produced annually. Corn is the second leading crop with 284,400 bushels of grain and 35,000 tons of silage produced. *"Size and Scope of Juab County Agriculture 2019,"* June 2020, Utah State University Extension. *2022 Census of Agriculture*, County Profile, Juab County Utah. *Juab County Resource Management Plan*, 31 Jan 2011.

14. In livestock, there were over 17,771 head of cattle and calves, 6,892 sheep and lambs, and 952 horses and ponies in the county. *2022 Census of Agriculture*.

15. Some of Juab County's objectives and desires with regard to agriculture, as documented in its Resource Management Plan ("Juab County RMP" or "RMP") are as follows: 1) A permanent revenue source needs to be established to fund ongoing water resource projects that support and expand agriculture; 2) Additional water resources need to be developed to accommodate municipal growth without jeopardizing agricultural interests.; 3) Additional water needs to be developed for agriculture and livestock interests on public and private land.; 4) The agricultural lifestyle of the County needs to be preserved and enhanced; 5) The use and production of federal lands for livestock grazing is a cultural and ethnographic resource and shall be preserved and enhanced; and 6) The social and cultural value of local farms, ranches and agriculture needs to be identified, analyzed, and disclosed in NEPA analysis and land use plans developed by federal agencies. RMP at pp. 270 - 272.

16. With regard to livestock and grazing, Juab County's Resource Management Plan provides that "Agriculture and ranching interests are vital to the custom, culture, heritage and lifestyle of the County and shall be preserved and enhanced to the maximum extent allowed by law." RMP at p. 271.

17. In particular, the 2022 Census of Agriculture notes that agriculture has a positive impact on the County's economy, accounting for \$58,046,000 in annual sales. 2022 Census of Agriculture Juab County Profile at p. 1.

18. Consistent with the importance of livestock and grazing to the County's revenue, economy, and cultural heritage, the Juab County RMP establishes the following objectives for agriculture that are relevant here and that will be undermined by BLM's grant of the Project right-of-way and the associated groundwater pumping: 1) To the maximum extent allowed by law, federal actions are implemented in a way to ensure farmers and ranchers do not face undue or burdensome restrictions; 2) The social, custom, cultural and heritage value of local farms, ranches and agriculture are identified, analyzed and disclosed in NEPA analysis and land use plans developed by federal agencies; 3) Additional water is developed for agriculture and livestock interests on public and private land; 4) A permanent revenue source is established to fund ongoing water resource projects that support and expand agriculture; and additional water is developed to accommodate municipal growth without jeopardizing agricultural interests; 5) Federal and state agencies transfer suitable lands to private ownership for farming and ranching purposes; 6) The agricultural lifestyle of Juab County needs to be preserved and enhanced; 7) Federal and state agencies strictly adhere to the County's No Net Loss of Private Lands policy, especially regarding farms ranches and agricultural interests; 8) Federal and state agencies develop lands under their ownership for conservation of special status species, and, to the maximum extent allowed by law,

relieve the burdens on private agricultural lands imposed by the Endangered Species Act; 9) The use and production of federal lands for livestock grazing is preserved and enhanced; 10) Federal agencies eradicate noxious weeds in their jurisdiction which are suspected of being the seed source for private lands; 11) Federal agencies restore lands occupied by invasive conifers and annual grasses to desired vegetative communities, consistent with ecologic site descriptions. RMP, pp. 50-51.

19. Regarding water, the Juab RMP states, “Water is one of the most important if not the most important natural resource in Juab County. More than 72% of Juab County is federal land, and most of the 17% private lands are concentrated in valley bottoms and along water courses. Consequently, almost all surface water and the majority of watersheds are located on federal land. Juab County is home to 5 major sub basin watersheds: Utah Lake, Lower Sevier, Southern Great Salt Lake, Tule Valley and Hamlin-Snake Valleys.” RMP, pp. 69-70.

20. With regard to water rights and irrigation, the Juab County RMP includes the following objective that would be directly harmed by Project pumping: “[I]and managers need to continue recognizing the invaluable role of water and optimize scarce water resources.” Further, “Federal, state, local and private land managers shall cooperate and coordinate with the County to maximize beneficial use scarce water resources.” RMP, pp. 70-71.

21. Further, the RMP provides that “NEPA analysis for projects that impact irrigation resources shall include detailed socio-economic impacts to irrigators, especially small farmers, water companies and municipalities. Provisions of the Regulatory Flexibility Act will serve as a model for such analysis.” RMP, p. 83.

22. With regard to noxious weeds, the Juab County RMP provides that “Undesirable vegetation and noxious weeds are eradicated from all of the County's public land rivers and streams and their

associated riparian zones.” The Plan further provides that “Land managers eradicate undesirable riparian species and noxious weeds in the County” and “additional encroachment by undesirable native species, invasive non-native vegetation, and noxious weeds is eliminated.” RMP, pp. 19 & 37.

23. With regard to water resources, Juab County’s RMP provides that “[w]ater is one of the most important if not the most important natural resource in the County.” And, “[i]rrigation was one of the first beneficial uses for water resources when Juab County was settled and has become more efficient over the years. Decline of ecosystem health during the last 50 years – especially on federal lands – is a result of failures to implement active management rather than a result of limited human influences associated with multiple use/sustained yield projects.” RMP, pp. 69 & 84.

24. Further, “[r]ainfall in Juab County is not adequate for the most commonly grown crops and is generally the limiting factor for vegetative cover on state and federal lands..” RMP, p. 84.

25. “Watersheds on public lands often supply water to communities in the County. Surface water is generally used for irrigation purposes, but watershed health and surface water quality and quantity can impact groundwater resources that are used for municipal domestic water supply. Actions on public lands in these watersheds are likely to affect such factors as water quality, water quantity, erosion rates, and groundwater recharge. There is currently a high degree of interest regarding surface water and other water resources..” RMP, p. 85.

26. The RMP states that, “Federal, state and local entities need to cooperate and coordinate surface water management to optimize water quantity, quality and beneficial use.” RMP, p. 85.

27. “Recreation/tourism has become one of the major resource uses within the region. The term recreation includes a variety of activities that affect and are affected by resources and other resource uses. Juab and its adjoining counties offer a wide variety of recreational opportunities,

especially for dispersed use, which rely on developed and undeveloped open space. These activities include wildlife viewing, hunting, hiking, backpacking, horseback riding, OHV use, fishing, bicycling, photography, camping, orienteering, river running, rock climbing, mountain biking, and sightseeing, among others.” RMP, p. 222.

28. Juab County offers many world-class outdoor recreation opportunities from the Wasatch Range and Mt. Nebo (11,928 feet) on the east to the Deep Creek Range and Ibapah Peak (12,087) on the west. In between, tourists can drive OHVs at the 60,000 acre Little Sahara Recreation Area; marvel at Paul Bunyan’s Woodpile; look for topaz at Topaz Mountain; soak in Baker Hot Springs; swim and fish at Burraston Ponds; swim, boat, fish, and camp at Yuba State Park; drive or bike the Pony Express National Historic Trail and the Mount Nebo National Scenic Byway; and view wildlife including quail, grouse, turkeys, deer, elk, bear, and even moose at places like Fish Springs National Wildlife Refuge, Mt. Nebo Wilderness Area and the Deep Creek Wilderness Study Area. *Welcome to Juab Visitor’s Guide*. <https://juab.is/visitors-guide/>.

29. Historically, residents of Juab County and visitors have enjoyed many forms of outdoor recreation in the non-WSA lands with wilderness character, such as hunting, fishing, hiking, family and group parties, family and group campouts and campfires, rock hounding, OHV travel, geological exploring, pioneering, parking their RV, or just plain touring in their personal vehicles. Such activities make up an important component of the custom, culture, and socioeconomic base of the County. RMP, p. 337.

30. Juab County made comments to the BLM during the scoping phase in opposition to the Pine Valley Water Supply Project.

31. Juab County’s injuries will be remedied by a decision to stay, set aside, and remand the BLM’s Record of Decision for the Pine Valley Water Supply Project.

Pursuant to 28 U.S.C. § 1746, I declare under penalty of perjury that the foregoing is true and correct.

DATED: 3/31/2026

Signed by:
Marvin Kenison
8C097420954D9AB
Marvin Kenison, Juab County Commissioner

EXHIBIT B-4

Declaration of White Pine County, Nevada
(Paula Carson, Commissioner Chair)

**DEPARTMENT OF THE INTERIOR
OFFICE OF HEARINGS AND APPEALS
INTERIOR BOARD OF LAND APPEALS**

**BEAVER COUNTY, UTAH; MILLARD
COUNTY, UTAH; JUAB COUNTY, UTAH;
WHITE PINE COUNTY, NEVADA; CITY
OF MILFORD, UTAH; CENTRAL NEVADA
REGIONAL WATER AUTHORITY;
NEVADA GRAZING BOARD OF DISTRICT
NO. 4; GREAT BASIN WATER NETWORK;
MARK WINTCH; WAH WAH RANCH,
WALLACE PEAK WATER COMPANY,
WINTCH & COMPANY LLC; BARBARA
WINTCH; JOHN CARTER; LYLE
CARTER; DEAN EYRE; DUSTIN KESLER;
BRANDON YARDLEY; AND GILBERT
("GIB") T. YARDLEY,**

Appellants,

v.

BUREAU OF LAND MANAGEMENT,

Respondent.

IBLA No. _____

RE: PINE VALLEY WATER SUPPLY
PROJECT
DOI-BLM-UT-C010-2020-0012-EIS
(2026)

DECLARATION OF PAULA CARSON

CHAIR, WHITE PINE COUNTY BOARD OF COMMISSIONERS, NEVADA

I, PAULA CARSON, White Pine County Commissioner, declare as follows:

1. I have personal knowledge of each of the facts set forth below and, if called upon to do so, could and would testify regarding the following. This declaration is filed in support of Beaver County, Utah, et al.'s *Notice of Appeal* and *Petition for Stay* in the above-captioned matter and in support of standing for White Pine County, Nevada.

2. I am currently the Chair of the White Pine County Board of County Commissioners, and I have been authorized to submit a declaration on behalf of White Pine County.
3. I have been a member of the White Pine County Board of County Commissioners since 2024.
4. My work includes remaining apprised and engaged in issues related to public and private lands in the County including public lands policy as well as water planning and policy.
5. White Pine County has a public trust interest in both public and private lands within the Snake Valley Hydrographic Basin. The County had adopted a Public Lands Policy Plan (2018) and Water Resources Plan (2019) that describe the values of public lands and critical natural resources, including water, to the County.
6. White Pine County has been involved in the BLM's environmental review process for the Pine Valley Water Supply Project ("Project") as a cooperating agency and its submission comments to the Bureau of Land Management at every stage of the process, including scoping, Administrative Draft EIS, Draft EIS, Administrative Final EIS, and Final EIS comments.
7. White Pine County includes portions of the following groundwater basins: Snake Valley Basin and Hamlin Valley Basin, which stand to be impacted by the Project's groundwater pumping according to USGS groundwater modeling and the Project proponent consultant's groundwater modeling.
8. White Pine County is home to the City of Ely and unincorporated town of Baker, whose economies rely on ranching, agriculture, and tourism.
9. White Pine County derives a portion of its revenue from agriculture, ranching, and recreation and tourism in Snake Valley and Hamlin Valley including the Great Basin National Park.

10. In 2021 White Pine County had \$330,499,956 in taxable sales from taxable goods and services for all the county's businesses. While some of these businesses operate within the Snake and Hamlin Valleys, many of them that are not located within one of these valleys but rely on business associated with recreation and tourism in the Great Basin National Park and other public lands in these basins. Impacts to natural or scenic resources in these valleys or the National Park could have a negative impact on this tax base.

11. In 2021 White Pine County had \$408.3 Million in assessed valuation (not including Net Proceeds from Mines) associated with Ad Valorem. Ad Valorem is a tax with an amount based on the value of a transaction or of property (commonly referred to as property taxes). Impacts to assessed valuation in Snake and Hamlin Valleys associated with groundwater drawdown could have a negative impact on this tax base.

12. Among the county's tax bases to be most likely impacted are: taxable sales tax if there were impacts to ranching/farming and recreation; ad valorem property tax if property values were decreased; and secondary taxes, including room tax or gaming tax if the impacts were linked to tourism.

13. Pursuant to the Nevada Department of Agriculture's 2017 Economic Analysis of the Food & Agricultural Sector, in 2015, White Pine County's food and agriculture sector: contributed \$47 million to the County's Economy; provided \$26 million of total exports; and accounted for 269 jobs. Top production agriculture industries area: beef cattle ranching/farming, hay farming and other animal production.

14. Pursuant to the National Park Service's 2024 National Park Visitor Spending Effects Science Report (NPS/SR – 2025/353), Great Basin National Park, which is located within the

Snake Valley and Hamlin Valley Hydrographic Basins, in 2024, contributed 152,068 total recreation visits, resulting in \$16,742,000 in total visitor spending, and supported 146 jobs.

15. This information is related to the Project and its impacts upon the county's ability to function or plan its budget, make management decisions, or engage in county activities regarding:

a. Economic Development. The following goals would be affected by the Project. The 2022 Annual Update to the Comprehensive Economic Development Strategy for White Pine County, Nevada, 2020-2025 (pp. 1-2):

- i. Existing Goal No. 5: Develop a comprehensive outdoor recreation/tourism plan to expand outdoor recreation accessibility and economic impact by developing outdoor businesses, services and events.
- ii. Existing Goal No. 9: Maintain and expand efforts related to securing water in White Pine County.

b. Water Resources. The following Statement of Purpose would be affected by the Project:

White Pine County's water resources are its most precious natural resource and are basic to all efforts to preserve the environment and to meet the needs of area citizens by providing for their economic wellbeing and improving their quality of life.

2019 White Pine County Water Resources Plan (2020 Update) p. 1.

c. Public Lands. The following would be affected by the Project (see source 2, page 41):

Water is fundamental to White Pine County's present and future. White Pine County's water is its most precious natural resource and a basic requirement to all efforts to preserve the environment and to meet the needs of area citizens by providing for their economic wellbeing and improving their quality of life. Water availability is essential for, and is the limit to, the economic future of White Pine County. Economic development goals of White Pine County include developing a comprehensive outdoor recreation and tourism plan that will expand outdoor recreation accessibility and economic impact by developing a robust plan to grow outdoor businesses, services, and events. The vegetation, wildlife, and landscapes of White Pine County are dependent on adequate

water. The connection between groundwater and springs, streams, lakes, and wetlands isare generally accepted by the scientific community.

Policy 19-1: Promote the intent and policies of the White Pine County Water Resources Plan.

2019 White Pine County Water Resource Plan (2020 Update) p. 41.

16. Cedar City's aquifer has been historically overdrawn, and this Project enables growth rather the implements aggressive water conservation measures. It could set a precedent for other export proposals targeting Great Basin or Greater Salt Lake groundwater. This is a dynamic that White Pine County has confronted before with the Southern Nevada Water Authority export and pipeline project that contemplated pumping groundwater from White Pine County for use in Clark County (Las Vegas). Organizationally, this pushes the County to strengthen basin-scale groundwater planning, monitoring and interstate coordination, formalize policy positions for future water export projects, and integrate this risk into long-range land use, economic development and climate resilience planning.

17. The Snake Valley and Hamlin Valley groundwater basins in White Pine County are characterized by largely undeveloped landscapes, including Great Basin National Park, valued for their pristine character, wildlife habitat, and intact rangeland. These landscapes support substantial economic activity in White Pine County through hunting, camping, and other outdoor recreation that generates tourism revenue. They also sustain ranching operations that depend on the valleys' groundwater and forage resources and that contribute materially to the County's agricultural economy and tax base.

18. White Pine County will be directly injured by the BLM's decision to grant a right-of-way for the Pine Valley Water Supply Project because the Project authorizes both surface disturbance and large-scale groundwater withdrawals in Pine Valley that will extend into neighboring hydrologically connected downgradient basins located within White Pine County.

19. Groundwater modeling prepared by the applicant's consultants for the BLM's EIS, as well as modeling conducted by the U.S. Geological Survey and White Pine County's consultants, demonstrates that Project pumping will draw down the Snake Valley and Hamlin Valley aquifers. Project Final Groundwater Resources Impact Assessment § 4.2.1.2.

20. With increasing numbers of years of drought, lesser mountain snowpack, and shorter wintertime temperatures, the proposed drawdowns of the Snake Valley and Hamlin Valley aquifers will effectively be permanent.

21. Depletion of groundwater in Snake Valley within White Pine County will impair the water availability that supports ranching operations within the County. Reduced groundwater availability will diminish the carrying capacity, productivity, and value of ranch properties, including ranches such as the Baker Ranch which contribute tax revenue to White Pine County as a direct result of income generated by ranching operations.

22. Through these impacts, the Project will directly injure White Pine County's proprietary and economic interests in Snake and Hamlin Valleys, including injury to the County's tax base and to land owned by ranchers, operating within the County who contribute taxes to White Pine County as a direct result of ranching revenue and groundwater and spring dependent property values.

23. Project groundwater modeling, as well as modeling conducted by the U.S. Geological Survey and White Pine County's consultants, confirms that the Project's groundwater withdrawals will directly impact land and water resources in White Pine County, which will diminish the value of property within the County.

24. Groundwater declines resulting from Project groundwater pumping are expected to increase pumping depths, reduce yield, degrade water quality, and require costly mitigation or replacement measures.

25. Project groundwater pumping is also expected to result in reduced land productivity, loss of vegetation, loss of wildlife habitat, introduction of invasive species and noxious weeds, subsidence risk, and diminished recreational value, which will result in reduced market value of land and water resources in White Pine County.

26. These groundwater declines and associated ecosystem impacts are expected to impair the scenic, recreational, ecological, and otherwise pristine character of Snake and Hamlin Valleys in White Pine County. These intact landscapes support tourism and related economic activity, including visitation, lodging, recreation spending, and other tourism-related income, from which White Pine County derives tax revenue.

27. The BLM's approval of the Project right-of-way in its Record of Decision is also inconsistent with White Pine County's Water Resources Plan (2019) and Public Lands Policy Plan (2018) objectives, policies, and guidelines described above and in White Pine County's scoping comments as well as its comments on the 2022 Draft EIS and the Administrative Final EIS, and more specifically frustrates White Pine County's implementation of that Plan and its objectives.

28. The Project's groundwater withdrawals will further impair White Pine County's ability to plan for future growth and development. Project pumping is expected to reduce groundwater availability within Snake and Hamlin Valleys that the County relies upon in planning for future residential, commercial, agricultural, ranching, and industrial development.

29. As a result, the Project threatens the County's institutional and proprietary interests in orderly land-use planning, infrastructure investment, and long-range economic development.

30. These concrete fiscal and proprietary harms to the County's revenues, interests, and planning authority constitute direct injuries to White Pine County itself.

31. White Pine County's injuries will be remedied by a decision to stay, set aside, and remand the BLM's Record of Decision for the Pine Valley Water Supply Project because the ground groundwater pumping activities authorized therein would not occur and therefore would not injure White Pine County's interests described herein.

Pursuant to 28 U.S.C. § 1746, I declare under penalty of perjury that the foregoing is true and correct.

DATED: 3/31/2026

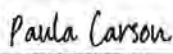
Signed by:

5504319E7315400
Paula Carson
Chair, White Pine County Commission

EXHIBIT B-5

Declaration of City of Milford, Utah
(Nolan Davis, Mayor)

**DEPARTMENT OF THE INTERIOR
OFFICE OF HEARINGS AND APPEALS
INTERIOR BOARD OF LAND APPEALS**

**BEAVER COUNTY, UTAH; MILLARD
COUNTY, UTAH; JUAB COUNTY, UTAH;
WHITE PINE COUNTY, NEVADA; CITY
OF MILFORD, UTAH; CENTRAL NEVADA
REGIONAL WATER AUTHORITY;
NEVADA GRAZING BOARD OF DISTRICT
NO. 4; GREAT BASIN WATER NETWORK;
MARK WINTCH; WAH WAH RANCH,
WALLACE PEAK WATER COMPANY,
WINTCH & COMPANY LLC; BARBARA
WINTCH; JOHN CARTER; LYLE
CARTER; DEAN EYRE; DUSTIN KESLER;
BRANDON YARDLEY; AND GILBERT
("GIB") T. YARDLEY,**

Appellants,

v.

BUREAU OF LAND MANAGEMENT,

Respondent.

IBLA No. _____

**RE: PINE VALLEY WATER SUPPLY
PROJECT
DOI-BLM-UT-C010-2020-0012-EIS
(2026)**

DECLARATION OF NOLAN DAVIS

MAYOR, CITY OF MILFORD, UTAH

I, NOLAN DAVIS, Mayor of the City of Milford, declare as follows:

1. I have personal knowledge of each of the facts set forth below and, if called upon to do so, could and would testify regarding the following. This declaration is filed in support of Beaver County, Utah, et al.'s *Notice of Appeal* and *Petition for Stay* in the above-captioned matter and in support of standing for the City of Milford, Utah.

2. I am the Mayor of the City of Milford, Utah (“the City”) and have served as Mayor since 2014. I also served on the city council and volunteered as Deputy Fire Chief of the Beaver County Fire District #2, totaling 33 years of elected service and 40 years of volunteer service.
3. I have been authorized to submit a declaration on behalf of the City. The City is in support of the appeal and the request for further review of the BLM’s Record of Decision.
4. The City supports a thorough and transparent evaluation of the Pine Valley Water Supply Project (the “Project”), ensuring that all environmental, hydrological, economic, and community impacts are fully considered prior to final authorization.
5. The City believes that careful stewardship of water resources is critical to the long-term viability of our beloved community and neighboring regions.
6. The City Council has reviewed the circumstances surrounding the BLM’s approval of the Pine Valley Water Supply Project and shares concerns regarding the potential impacts to regional water resources, long-term sustainability, and the precedent such approvals may set for the future water development in the region.
7. The City was established in 1873 and has operated for 153 years.
8. The City supplies water to 1,500 people in the Milford Valley.
9. The City owns 3434.64 acre-feet of water rights. The City owns and maintains four wells that are used by the City to pump water to our residents for residential and irrigation use. The City has one backup well.
10. The City has experienced water table declines, forcing the City to drill deeper for water to irrigate our golf course. I am concerned that if the water table continues to decline, the City will be forced to drop additional wells to continue to provide water to our residents.

11. The City is currently the state leader in renewable energy with a geothermal power plant that is completing its first phase of construction to provide 90 megawatts of power. The next construction phase will begin next month to generate another 410 megawatts of power. To date, we have 550 men and women working on the geothermal plant, in the mining industry, and on the Millard Solar facility, all providing labor towards our desired economic success.

12. The City intends to adopt its new General Plan next month, with a focus on addressing our goal of affordable housing for our many new workers and generating robust economic growth. The City is very concerned that the Pine Valley Water Supply Project could hinder or stop all growth in the western side of Beaver County.

13. The City of Milford filed a comment with the BLM during the 2022 public comment cycle.

14. The City's injuries will be remedied by the IBLA's decision to say, set aside, and remand the BLM's Record of Decision for the Pine Valley Water Supply Project.

Pursuant to 28 U.S.C. § 1746, I declare under penalty of perjury that the foregoing is true and correct.

DATED: 3/31/2026

DocuSigned by:

Nolan Davis

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Nolan Davis, Mayor, City of Milford

EXHIBIT B-6

Declaration of Central Nevada Regional Water Authority
(Jeffrey Fontaine, Executive Director)

**DEPARTMENT OF THE INTERIOR
OFFICE OF HEARINGS AND APPEALS
INTERIOR BOARD OF LAND APPEALS**

BEAVER COUNTY, UTAH; MILLARD COUNTY, UTAH; JUAB COUNTY, UTAH; WHITE PINE COUNTY, NEVADA; CITY OF MILFORD, UTAH; CENTRAL NEVADA REGIONAL WATER AUTHORITY; NEVADA GRAZING BOARD OF DISTRICT NO. 4; GREAT BASIN WATER NETWORK; MARK WINTCH; WAH WAH RANCH, WALLACE PEAK WATER COMPANY, WINTCH & COMPANY LLC; BARBARA WINTCH; JOHN CARTER; LYLE CARTER; DEAN EYRE; DUSTIN KESLER; BRANDON YARDLEY; AND GILBERT (“GIB”) T. YARDLEY,

Appellants,

v.

BUREAU OF LAND MANAGEMENT,

Respondent.

IBLA No. _____

RE: PINE VALLEY WATER SUPPLY
PROJECT
DOI-BLM-UT-C010-2020-0012-EIS
(2026)

DECLARATION OF JEFFREY FONTAINE

EXECUTIVE DIRECTOR

CENTRAL NEVADA REGIONAL WATER AUTHORITY

I, JEFFREY FONTAINE, declare as follows:

1. I have personal knowledge of each of the facts set forth below and, if called upon to do so, could and would testify regarding the following. This declaration is filed in support of

Beaver County, Utah, et al.'s *Notice of Appeal* and *Petition for Stay* in the above-captioned matter and in support of standing for Appellant Central Nevada Regional Water Authority.

2. I am the Executive Director of Appellant Central Nevada Regional Water Authority (“CNRWA”) and filed comments on the BLM’s Draft Environmental Impact Statement for the Pine Valley Water Supply Project on behalf of CNRWA in 2022.

3. The CNRWA is a ten-county unit of local government in the State of Nevada.

4. The CNRWA’s mission is to protect the water resources in member counties so these counties will not only have an economic future, but their valued quality of life and natural environment is maintained.

5. One of the main functions of CNRWA is to monitor, assess and respond to water projects that may adversely impact a member county.

6. White Pine County, Nevada, an Appellant in this appeal, is a member of the CNRWA.

7. The Central Region is Nevada’s largest hydrographic region and consists of 78 groundwater basins that are often interconnected by subsurface flow, deep bedrock aquifers, and some productive alluvial aquifers. Future pumping in Pine, Wah Wah, and Hamlin Valleys as part of the West Desert Water Supply Project, of which the Pine Valley Water Supply Project is the first phase, could have long term effects on at least three groundwater basins in the Central Region: Spring Valley, Dry Lake Valley, and Lake Valley. It also is projected to impact CNRWA member White Pine County’s interests in Snake Valley, in the Great Salt Lake Basin.

8. Pine Valley and the basins connected to it, including those extending into Nevada’s Central Region, are largely undeveloped landscapes that still retain their natural character. These areas are valued for their open rangeland, wildlife habitat, and overall intact condition. They also support real economic activity in CNRWA member White Pine County. People come to hunt,

camp, and recreate, which brings in tourism revenue. At the same time, these valleys support working ranches that depend on groundwater and forage, and those operations contribute directly to White Pine County's agricultural economy and tax base.

9. The BLM's decision to approve a right-of-way for the Pine Valley Water Supply Project puts those resources at risk. The Project authorizes large-scale groundwater pumping in Pine Valley, and the available information shows that those impacts will not stay contained there.

10. The modeling that has been done shows that pumping for the Project will cause major drawdown in the Pine Valley aquifer, on the order of 500 to 1,000 feet near the wellfield in the near term. Those effects are not isolated; they are expected to spread through connected groundwater systems. The projections show groundwater declines ranging from a few feet to several hundred feet across large parts of Pine and Wah Wah Valleys, including drops of about 50 to 100 feet within decades in the northern part of the already overappropriated Beryl Enterprises Area to the south of the well field. Over time, those impacts are expected to grow and spread even further. *See* Final Groundwater Resources Impact Assessment, Pine Valley Water Supply Project ("GRIA") § 4.2.1.2 (Dec. 2025); Brooks, L., U.S. Geological Survey, Groundwater Model of the Great Basin Carbonate and Alluvial Aquifer System Version 3.0, Fig. 33 (2017). These impacts are especially concerning because the Project is targeting deep aquifers that recharge very slowly, meaning the water that is removed may effectively be gone for good. *See* Pine Valley Water Supply Project Final EIS § 3.11.2.5 (2026).

11. Based on my review of the hydrologic work prepared by Central Iron County Water Conservancy District ("CICWCD") consultants for the Project's EIS, as well as materials from the U.S. Geological Survey and Beaver County's consultants, and conversations with Great Basin Water Network staff, there is a great deal of uncertainty about how far these impacts will

reach and how severe they will be. *See* Beaver County, et al. *Notice of Appeal and Petition for Stay*, Exhibit C (Brooks Technical Reports).

12. That uncertainty is made worse by how the modeling was done. For example, the EIS only looks at fifty years of pumping, even though the Project is based on permanent water rights that would likely be used for as long as water is available once the investment is made. It also evaluates less than half of the total pumping expected under the larger West Desert Pipeline Project. CICWCD's failure to model pumping under the full West Desert Project is particularly concerning for CNRWA because Hamlin Valley, the westernmost valley in the project area, shares a border with Lake Valley and lies closer to Spring and Dry Lake Valleys than Pine or Wah Wah Valleys, such that pumping there could have substantially greater impacts on groundwater basins within the Central Region. Each of these limitations narrows the scope of what the model can show, and taken together they obscure the likely extent of groundwater drawdown and interbasin impacts, particularly those that would extend into Nevada and are within the CNRWA.

13. Member White Pine County relies on groundwater resources in Spring and Lake Valleys for agriculture, ranching, municipal and domestic use, recreation, and their overall economic stability. Given the limitations in the modeling, there is real concern that pumping associated with this Project, including future pumping in Wah Wah and Hamlin Valleys, will cause broader and more severe impacts in Nevada than what the EIS describes. Those impacts would affect existing and future water uses, harm rural economies, and damage the groundwater-dependent ecosystems that these communities rely on.

14. For example, reduced groundwater in hydrologically connected Nevada basins would directly affect ranching operations. As water levels drop, ranches lose productivity, carrying

capacity declines, and property values are reduced. This includes operations like Baker Ranches, which contribute to White Pine County's tax base through ranching income. *See* Standing Declaration of Thomas Baker.

15. In this way, the Project threatens direct harm to member counties' economic and property interests, including their tax base and the value of lands owned by ranchers whose livelihoods depend on groundwater and spring systems.

16. Lower groundwater levels will also make wells more expensive to operate by increasing pumping depths, reducing yields, and potentially degrading water quality. In many cases, this will require costly mitigation or replacement measures across a wide area in Utah, with the potential for those impacts to extend into Nevada.

17. The effects are not limited to water supply. Project pumping is expected to reduce land productivity, degrade vegetation and wildlife habitat, increase the spread of invasive species and noxious weeds, raise the risk of subsidence, and reduce recreational value. These changes will lower the overall value of land and water resources in both Pine Valley and hydrologically connected basins.

18. As these groundwater and ecosystem impacts occur, they will also change the character of these landscapes. The scenic, ecological, and recreational qualities that make Pine Valley and surrounding areas unique could be diminished, including in connected valleys in Nevada's Central Region. Because these areas support tourism and related economic activity, those changes would reduce revenue that member White Pine County depends on.

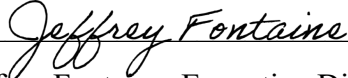
19. All of these impacts (economic, environmental, and related to planning and resource management) represent concrete harm to member counties, as well as to CNRWA's work and mission.

20. The Project would directly affect CNRWA itself, because it would require the organization to expand its efforts to respond to Project impacts and to protect member White Pine County.

21. These harms can be avoided. If the BLM's Record of Decision is stayed, set aside, or remanded, the Project's construction and groundwater pumping, including wellfield development, pipeline and road construction, solar infrastructure, and associated pumping, would not move forward, and the injuries described above would not occur.

Pursuant to 28 U.S.C. § 1746, I declare, under penalty of perjury, that the foregoing is true and correct.

DATED: March 31, 2026



Jeffrey Fontaine, Executive Director
Central Nevada Regional Water Authority

EXHIBIT B-7

Declaration of Nevada Grazing Board of District No. 4
(Kori Huber, Secretary)

**DEPARTMENT OF THE INTERIOR
OFFICE OF HEARINGS AND APPEALS
INTERIOR BOARD OF LAND APPEALS**

BEAVER COUNTY, UTAH; MILLARD COUNTY, UTAH; JUAB COUNTY, UTAH; WHITE PINE COUNTY, NEVADA; CITY OF MILFORD, UTAH; CENTRAL NEVADA REGIONAL WATER AUTHORITY; NEVADA GRAZING BOARD OF DISTRICT NO. 4; GREAT BASIN WATER NETWORK; MARK WINTCH; WAH WAH RANCH, WALLACE PEAK WATER COMPANY, WINTCH & COMPANY LLC; BARBARA WINTCH; JOHN CARTER; LYLE CARTER; DEAN EYRE; DUSTIN KESLER; BRANDON YARDLEY; AND GILBERT (“GIB”) T. YARDLEY,

Appellants,

v.

BUREAU OF LAND MANAGEMENT,

Respondent.

IBLA No. _____

RE: PINE VALLEY WATER SUPPLY
PROJECT
DOI-BLM-UT-C010-2020-0012-EIS
(2026)

DECLARATION OF KORI HUBER

NEVADA GRAZING BOARD OF DISTRICT NO. 4 SECRETARY

I, KORI HUBER, hereby declare as follows:

1. I have personal knowledge of the facts set forth in this declaration. If called as a witness, I could and would competently testify to these facts. As to matters that reflect an opinion, they reflect my personal opinion and judgment on the matter.

2. This declaration is filed in support of Beaver County, Utah, et al.'s *Notice of Appeal* and *Petition for Stay* in the above-captioned matter and in support of standing for Appellant Nevada Grazing Board of District No. 4 ("N-4 State Grazing Board").

3. Between 2020 and 2022, the N-4 State Grazing Board submitted comments and participated in the public environmental review process conducted pursuant to the National Environmental Policy Act by the Bureau of Land Management for the Pine Valley Water Supply Project.

4. I am secretary for the N-4 State Grazing Board, and my family's ranching operation is a member.

5. I live in Snake Valley, which is hydrologically connected to the Project.

6. I am a member of the Baker family, which owns Baker Ranches and has run a cattle ranching operation in the Baker area and in southern Snake Valley, on both the Nevada and Utah sides of the state line, since 1954. *See Declaration of Thomas Baker.*

7. The N-4 State Grazing Board is organized pursuant to Nevada Revised Statutes, Chapter 568. The N-4 State Grazing Board exists for the benefit of approximately 130 ranchers who hold grazing permits on Bureau of Land Management ("BLM") public grazing parcels in White Pine, Lincoln, and Nye Counties.

8. All grazing boards in Nevada exist to re-distribute a portion of grazing fees paid to the federal government that are returned to the state as Range Improvement Funds. The purpose of this redistribution is to benefit rangeland health for present and future generations. Vast swaths of N-4 State Grazing Board member territory are on the Nevada-Utah border in White Pine and Lincoln Counties. Many of those public land grazing operations rely on waters that have hydrologic connections to Pine Valley, and to Hamlin and Wah Wah Valleys via the Great Salt

Lake Desert Groundwater Flow System and the Carbonate Rock Aquifer Flow System in Eastern Nevada.

9. Ranching and farming operations rely on water in a variety of ways to ensure their operations can be financially successful. Springs, groundwater, and surface water flows all play a role in growing forage like alfalfa or ensuring the natural growth of vegetation on rangelands. These waters also serve domestic and recreational needs in our communities.

10. Our members are directly and indirectly tied to Pine Valley. But all ties are significant. Members of the N-4 Board have rights to waters in flow systems connected to Pine Valley and the contiguous lands that will be harmed by the excessive and unnecessary groundwater pumping that will be facilitated by the Record of Decision. N-4 State Grazing Board members spend lots of time driving through Pine Valley to ensure the successful operation of their businesses and will be traveling through Pine Valley often for the foreseeable future. N-4 State Grazing Board members in this region must drive through Pine Valley to access the I-15 Interstate, to procure goods for their businesses in larger towns, and to connect with other members of the agricultural community. The ties that N-4 State Grazing Board members have to this project are undeniable.

11. N-4 State Grazing Board members own many different types of property in the area that the Pine Valley Water Supply Project is predicted to impact. Data compiled from the U.S. Geological Survey (“USGS”) in the *Groundwater Model of the Great Basin Carbonate and Alluvial Aquifer System Version 3.0* (2017) show that the project will siphon water away from N-4 State Grazing Board members in White Pine County, Nevada. N-4 State Grazing Board members have permits to graze on federal lands and title to private lands, groundwater rights, and surface water rights in Snake Valley near Big Springs, Dearden, and the Burbank area as well as in Garrison, Baker, and north of Highway 50-6.

12. The Final Environmental Impact Statement and Record of Decision ignored significant flaws in the Groundwater Resources Impact Assessment related to modeling simulations in southern Snake Valley put forth by the Central Iron County Water Conservancy District and approved by the BLM. In addition to being subject to significant levels of uncertainty with regard to its predictions, the modeling from the project proponent grossly over-estimated the amount of discharge from the area in Snake Valley where N-4 State Grazing Board members have ranching and farming operations. The flawed and skewed modeling presented by the project proponents and approved by the BLM result in harm to N-4 State Grazing Board members' property rights. This is because the Pine Valley Water Supply Project depends on waters currently being put to use in places like Snake Valley, where N-4 State Grazing Board members have successful operations that currently have right and title to waters that Pine Valley Water Supply Project proponents want to take.

13. Data from the USGS also show that, over time, water will be siphoned away from our members in Lincoln County in Snake Valley and also in Hamlin Valley, Dry Valley, Rose Valley, Eagle Valley, Dry Lake Valley, Patterson Valley, Clover Valley, and others. The lack of analysis and narrow scope of the review excluded an opportunity for meaningful consideration of N-4 State Grazing Board members' rights and considerations in the greater region that will experience impacts over time.

14. N-4 State Grazing Board also is concerned about these areas, as it appears that the BLM analyzed the project in a way that obscures the potential true geographic scope and severity of project impacts on N-4 State Grazing Board members. The EIS only looks at impacts of fifty years of pumping, even though the project is based on permanent water rights that would likely be used for as long as water is available. It also looks at only a portion of the total pumping

planned under the larger West Desert Pipeline Project, which also includes pumping from Hamlin and Wah Wah Valleys. That is a concern for the N-4 State Grazing Board because pumping in Hamlin Valley, which sits to the west of Pine Valley, could more quickly and severely affect groundwater that supports grazing and water supplies in areas members of the N-4 State Grazing Board rely on. By limiting both how long and how much pumping is studied, the analysis leaves out a big part of what could actually happen. As a result, it likely understates how far groundwater levels could drop and how those effects could spread into connected basins, including into Nevada and areas important to the Board.

15. The N-4 State Grazing Board submitted comments in earnest on the Draft Environmental Impact Statement because of the threats posed by the Pine Valley Water Supply Project. But we were not reasonably afforded that opportunity during the Final Environmental Impact Statement review. The BLM released the FEIS on a Friday afternoon and approved a record of decision on a Monday morning. The document was well over 800 pages, with technical hydrologic considerations and limited analysis on likely impacts to our rights. There were significant changes to the hydrological modeling section that directly impact N-4 State Grazing Board members' private property rights. We have been robbed of our ability to meaningfully engage. The BLM significantly degraded the normal and expected standards for public participation and due process with its expedited Record of Decision.

16. N-4 State Grazing Board members have run agricultural operations in the project's area of short-term and long-term impacts for decades. These are families with generational ties to the region. These connections are among the reasons why N-4 State Grazing Board members work so closely and align with the mission of the Great Basin Water Network ("GBWN"). N-4 State

Grazing Board members are also individual members of GBWN. This relationship spans more than 15 years.

17. N-4 State Grazing Board members worked with GBWN during the fight to stop the Southern Nevada Water Authority from exporting billions of gallons of groundwater from Snake Valley and surrounding valleys when the BLM illegally approved a Record of Decision for the Right of Way for the *Clark, Lincoln and White Pine Groundwater Development Project* (N-78803). We view this project as a similarly problematic effort with the same legal deficiencies and harms to our members' private property rights. The BLM did not adequately consider our rights, our waters, and our futures in approving the Record of Decision for the project.

18. N-4 State Grazing Board has provided GBWN with financial support to help in the effort to improve rangeland health, promote public education, and defend agricultural communities for more than a decade. Our work will be significantly impacted by the BLM's decision to grant a Right of Way for the Pine Valley Water Supply Project as we will need to focus efforts and resources to protect our members from impacts to their water rights and uses, which work may include public development of technical materials, education, political advocacy, and litigation. Our standing in this matter is essential to ensure that the government upholds the rights of N-4 State Grazing Board and GBWN members.

19. Such injuries and harms would be prevented by a decision to stay or vacate BLM's authorization of the project and an abandonment of the decision.

Pursuant to 28 U.S.C. § 1746, I declare under penalty of perjury that the foregoing is true and correct.

DATED: March 31, 2026

/s Kori Huber

Kori Huber, Secretary
Nevada Grazing Board District No.4

EXHIBIT B-8

Declaration of Great Basin Water Network
(Thomas Baker, Member)

**DEPARTMENT OF THE INTERIOR
OFFICE OF HEARINGS AND APPEALS
INTERIOR BOARD OF LAND APPEALS**

BEAVER COUNTY, UTAH; MILLARD COUNTY, UTAH; JUAB COUNTY, UTAH; WHITE PINE COUNTY, NEVADA; CITY OF MILFORD, UTAH; CENTRAL NEVADA REGIONAL WATER AUTHORITY; NEVADA GRAZING BOARD OF DISTRICT NO. 4; GREAT BASIN WATER NETWORK; MARK WINTCH; WAH WAH RANCH, WALLACE PEAK WATER COMPANY, WINTCH & COMPANY LLC; BARBARA WINTCH; JOHN CARTER; LYLE CARTER; DEAN EYRE; DUSTIN KESLER; BRANDON YARDLEY; AND GILBERT (“GIB”) T. YARDLEY,

Appellants,

v.

BUREAU OF LAND MANAGEMENT,

Respondent.

IBLA No. _____

RE: PINE VALLEY WATER SUPPLY
PROJECT
DOI-BLM-UT-C010-2020-0012-EIS
(2026)

**DECLARATION OF THOMAS BAKER
GREAT BASIN WATER NETWORK MEMBER**

I, THOMAS BAKER, declare as follows:

1. I have personal knowledge of each of the facts set forth below and, if called upon to do so, could and would testify regarding the following. This declaration is filed in support of Beaver County, Utah, et al.’s (“County and Community Appellants”) *Notice of Appeal* and

Petition for Stay in the above-captioned matter and in support of standing for Appellant Great Basin Water Network.

2. I submitted comments in my own name on the Bureau of Land Management's 2022 Draft Environmental Impact Statement for the proposed Pine Valley Water Supply Project.

3. Great Basin Water Network also submitted extensive comments on the BLM's 2022 Draft EIS for the Proposed Project.

4. I live and own a home in Baker, Nevada, in Snake Valley, which is hydrologically connected to Pine Valley.

5. My family has run a cattle ranching operation in the Baker area and in southern Snake Valley, on both the Nevada and Utah sides of the state line, since 1954.

6. I am part owner of Baker Land and also of Baker Ranches, which hold the Ranch's property and water rights.

7. Baker Land and Baker Ranches are based and own property in Baker, Nevada, and also own several agricultural properties in Burbank, Garrison, and north of Highway 50 in Utah.

8. Baker Land and Baker Ranches also own water rights to surface flows, springs, and groundwater in Snake Valley, both in Utah and Nevada, that support Baker Ranches' ranching operations, domestic use, and recreation.

9. The springs on Baker Ranches' desert grazing allotments are critical to the use of those allotments.

10. My family's Baker, Nevada property is within the service boundary and is served by the Baker Water and Sewer General Improvement District ("GID"), which is supported by Snake Valley groundwater.

11. The GID presently serves roughly 100 residential and commercial hookups for water service including the downtown Great Basin National Park Visitors Center, employee housing, and local businesses.

12. Provision of water for domestic and commercial use is essential to the residents of Baker and to the many GBWN visitors and tourists who depend on the town of Baker's businesses for food and lodging.

13. Over many years, I have observed a decline in groundwater levels and spring flows in Snake Valley as a result of existing local groundwater pumping.

14. It is my understanding, based on my review of the conclusions contained in USGS groundwater modeling reports, groundwater modeling reports prepared by Beaver County, Utah's consultants, and discussions with GBWN members that pumping from the Project wells in Pine and Wah Wah Valleys as proposed by the Central Iron County Water Conservancy District will capture the interbasin flow between Pine Valley and Snake Valley, resulting in groundwater table drawdowns in Snake Valley. A. Zdon, Roux Associates, *Groundwater impacts of the proposed Pine Valley Water Supply Project, Utah on Nevada groundwater basins with a Focus on Snake Valley, Nevada & Utah*, Table 1 (Sept. 20, 2021).

15. Based on my experience living and working in Snake Valley, I have little doubt that pumping in Pine Valley will affect groundwater in our area. Snake Valley is hydrologically connected to Pine Valley where the Project plans to pump, which means that interbasin flows between the valleys will be captured by Project pumping. From what I have reviewed, I am concerned that the impacts to my water rights and those of my neighbors will be greater and spread farther than what has been presented. The Project analysis only looks at fifty years of pumping, but that does not make sense to me. The water rights for this Project are permanent,

and once that kind of investment is made, I would expect the water to be pumped as long as it is available. On my own ranch, our water rights have been used for far longer than fifty years and continue to be relied on today.

16. I am also concerned because the Project does not appear to account for the full amount of pumping that is planned. From what I understand, the larger West Desert Pipeline Project would involve much more pumping than what was analyzed, including pumping from Hamlin Valley, which is closely connected to Snake Valley. That additional pumping, especially so close to where my water is located, puts my water rights at even greater risk than what is shown in the maps and analysis.

17. I am particularly concerned about impacts to Big Springs, where Baker Ranches holds senior water rights under Nevada law. Based on my review of the Project materials and discussions reflected in those materials, there appears to be a significant mismatch between what the model predicts for spring flows and what actually exists on the ground. GRIA, App. D, at D3-6B. The model shows much more water flowing at Big Springs than is actually there. To me, that means the model may be underestimating how much those springs could be affected by pumping. Because my ranch depends on those spring flows, any reduction would directly harm my operations and my water rights.

18. What concerns me further is that the Project materials suggest this mismatch does not matter because Big Springs is considered outside the main impact area. From my perspective, that does not make sense. If the model is overstating how much water is already there, it could be hiding real impacts. In other words, the same problem in the model is being used to say there is no problem. That kind of reasoning puts my water rights at serious risk.

19. Taken together, these issues make me believe that the Project's analysis does not show the full extent of the impacts that will actually occur. Each of these choices limits what the model can show, and together they paint a picture that, in my view, understates the risks.

20. Because of this, I am concerned that impacts to springs and groundwater resources that my ranch depends on have not been fully considered. If those impacts occur, they would directly affect my ability to operate my ranch and maintain my property.

21. In plain terms, I believe the groundwater drawdowns from this Project will be more severe than what has been presented. Those drawdowns could reduce the overall water available in Snake Valley, interfere with the natural flow of water between basins, and reduce the groundwater supply both over time and in the near term on my property. That would directly impact my property value, my ranching operations, my water rights, and my ability to continue using and enjoying the land and water resources in Snake Valley.

22. Lowering the groundwater table will reduce the spring flows on which Baker Ranches depends for its ranching, farming, and domestic uses, and will interfere with our existing water rights in violation of Utah and Nevada law.

23. The anticipated drawdown will eventually similarly necessitate deepening existing Baker Ranches wells at significant cost to maintain access to groundwater, further interfering with our existing water rights.

24. Similarly, additional Project-related groundwater drawdown and spring impacts would eventually directly threaten the town of Baker's local economy, which is based on ranching and tourism associated with Great Basin National Park, would threaten the continued existence of businesses, and would threaten the character of Baker itself.

25. All of these impacts would eventually directly threaten my business and the way of life for the community of Baker.
26. In addition to living and working in Snake Valley, I also have visited Pine Valley, where the Project will be constructed and pumped, on numerous occasions.
27. I travel through Pine and Wah Wah Valleys on my way to the towns in southern Utah for doctor and dentist visits and on business.
28. I have used the water at the corrals along the road and have used the water at houses in both Pine and Wah Wah Valleys when I have had vehicle issues.
29. I have also picnicked at the spring on the south end of Pine Valley.
30. Our neighbor who summers his cows next to Baker Ranches' operation in Burbank runs his cows in Pine Valley during the winter.
31. I have experienced firsthand Pine Valley's wide-open, undeveloped landscape, whose pristine beauty and largely untouched character are increasingly rare and deeply valued in this region.
32. As a close neighbor, I will return to the area many times for these purposes.
33. In addition to being a life-long resident of Baker in Snake Valley, I am also a member of the board of directors of the Great Basin Water Network ("GBWN"), a 501(c)(3) non-profit organization based in Baker, Nevada, whose interests and work stand to be impacted by the Proposed Project.
34. My father, Dean Baker, was a founding member of Great Basin Water Network, and I have served on its board of directors for roughly fifteen (15) years.

35. The Great Basin Water Network was formed in 2005 to protect locally sustainable water uses, natural resources, and the public interest through communication, coordination, research, science, education, litigation, and advocacy affecting the extended Great Basin.
36. GBWN works to ensure that decisions regarding water-resource management are made in a transparent fashion, comply with applicable law, are in the public interest, and are grounded in the best available science.
37. In addition to pursuing legal challenges to unsound water-management decisions, GBWN engages in legislative advocacy in Nevada and Utah to promote water-management policies that are consistent with the public interest and the sustainable use of water resources.
38. The organization also works to build coalitions among diverse interests and across political lines, and provides support to individuals, businesses, and local governments that may be affected by proposed unsustainable water-development projects.
39. GBWN also works to inform, educate, and counsel the public regarding water use and management issues, policies, and laws in the Great Basin, conducting extensive public education and outreach regarding water management in Nevada and Utah.
40. As part of this work, the organization commissions hydrologic and economic research, analyzes water development proposals and proposed water management policies, obtains and analyzes public records related to water-management decision making, and disseminates that information to the public.
41. GBWN communicates regularly with its supporters through a printed newsletter and electronic updates. GBWN sends its regular newsletter to roughly 850 subscribers, which newsletter includes information on the proposed Pine Valley Water Supply Project, and GBWN regularly posts information it obtains on its website, Facebook page, and Twitter account.

42. GBWN has been substantially involved in the activities of numerous government agencies for over 20 years.

43. One of GBWN's central roles when it was founded in response to the Southern Nevada Water Authority's proposed groundwater development and export project was to obtain legal representation not only for the organization itself, but also for the coalition of hundreds of local residents, businesses, and governmental entities that had formally protested the water-rights applications filed with the Nevada State Engineer by the Southern Nevada Water Authority.

44. Baker Ranches, myself, and other Baker Family members were among those protestants.

45. GBWN also was a party to the federal NEPA lawsuit which successfully challenged the BLM's decision to grant the Right of Way for the Southern Nevada Water Authority's proposed groundwater water development and export project.

46. The Pine Valley Water Supply Project threatens the same groundwater-dependent ecosystems, water rights, ranching operations, and rural communities in Snake Valley, on both sides of the Utah-Nevada border, that GBWN was formed to protect, and will harm Baker Ranches as well as GBWN's members and supporters, many of whom rely on these groundwater resources for their homes, businesses, and livelihoods and share GBWN's interest in protecting the ecological and economic integrity of Snake Valley and surrounding basins.

47. In doing so, the Project jeopardizes the progress GBWN achieved in stopping the Southern Nevada Water Authority's similar, larger project and directly undermines GBWN's ongoing work, as the BLM's Record of Decision granting the Project's Right-of-Way places those protected resources and interests at risk.

48. GBWN's current opposition to the Pine Valley Water Supply Project is a vital component of GBWN's work to protect local uses of water and the way of life of communities that rely on that water.

49. BLM's approval of the Project's Right of Way directly undermines the work GBWN does to advocate for responsible groundwater management by permitting the interbasin transfer of substantial amounts of groundwater relied on by existing users.

50. Approval of the Project's Right of Way will result in a need for GBWN to engage in additional robust efforts to advocate for the protection of these local uses of water resources and groundwater that stand to be impacted by the Project in Pine Valley and in hydrologically connected basins through advocacy, analysis, and dissemination of information related ensuring that impacts are avoided or mitigated.

51. As a result of the additional work necessitated by BLM's grant of the Project's right-of-way, GBWN will suffer financial harm by being required to expend substantially increased resources to address and respond to those impacts.

52. GBWN is motivated to engage at all levels of review on the Pine Valley Water Supply Project to protect the progress that GBWN has made and to ensure that our constituency of supporters who look to GBWN for leadership and information on water matters that affect their daily lives, are represented fully.

53. My injuries and harms discussed herein, as well as similar harms to GBWN members, and harms to GBWN itself discussed herein will be remedied by a decision to stay, remand, and set-aside BLM's Pine Valley Water Supply Project Record of Decision because the surface disturbances and groundwater pumping activities authorized therein would not be able to occur.

Pursuant to 28 U.S.C. § 1746, I declare, under penalty of perjury, that the foregoing is true and correct.

DATED: 3/31/2026

Thomas Baker

Thomas Baker

A. Zdon, Roux Associates, *Groundwater impacts of the proposed Pine Valley Water Supply Project, Utah on Nevada groundwater basins with a Focus on Snake Valley, Nevada & Utah*, Table 1 (Sept. 20, 2021).

Table 1. Groundwater-level declines on Nevada and Utah groundwater basins due to future pumping in Pine and Wah Wah Valleys, Utah as predicted by USGS GBAACS Model (Brooks, 2017)

Basin/ Hydrographic Unit No.	Basin Name	County	Short-term Effects (1)	Long-term Effects (2)	Comments
181	Dry Lake Valley, Nevada	Lincoln	<1 ft of drawdown	Up to 4.9 ft of drawdown	Long-term effects along eastern margin of basin
183	Lake Valley, Nevada	Lincoln, White Pine	<1 ft of drawdown	1-49.9 ft of drawdown	Long-term effects - east/south third of basin with maximum drawdown along eastern margin of basin.
184	Spring Valley, Nevada	White Pine, Lincoln	<1 ft of drawdown	1-49.9 ft of drawdown	Long-term effects - southern portion of basin along margin with Snake Valley; maximum drawdown along eastern margin of basin.
198	Dry Valley, Nevada	Lincoln	<1 ft of drawdown	1 to 49.9 ft of drawdown	Up to 49.9 ft of drawdown most of basin, greater drawdown in northernmost corner of basin.
199	Rose Valley, Nevada	Lincoln	<1 ft of drawdown	5 to 49.9 ft of drawdown	Most of basin with greater drawdown to the north.
200	Eagle Valley, Nevada	Lincoln	<1 ft of drawdown	5 to 49.9 ft of drawdown	Throughout basin
201	Spring Valley, Nevada	Lincoln	<1 ft of drawdown	5 to 49.9 ft of drawdown	Throughout basin
202	Patterson Valley, Nevada	Lincoln	<1 ft of drawdown	1 to 49.9 ft of drawdown	Up to 5 ft of drawdown through most of basin with greater drawdown to the eastern margin with Basin 201.
203	Panaca Valley, Nevada	Lincoln	<1 ft of drawdown	Up to 4.9 ft of drawdown	Northern and southeastern portions of basin.
204	Clover Valley, Nevada	Lincoln	<1 ft of drawdown	Up to 4.9 ft of drawdown	Northeastern tip of basin.
254	Snake & Hamlin Valleys, Nevada-Utah	Lincoln, White Pine, Iron, Beaver, Millard, Juab, Tooele	1-49.9 ft of drawdown	1-100 ft of drawdown	Short-term effect along eastern margin of Snake Valley (boundary with Pine Valley); Long-term effects southern half of basin.
255	Pine Valley, Utah	Iron, Beaver, Millard	Up to 1,000 ft of drawdown	Up to greater than 1,000 ft of drawdown	Maximum drawdowns at pumping center, short-term drawdowns of 1 to 500 ft through most of basin; long-term drawdowns of 5 to 500 ft through most of valley.
256	Wah Wah Valley, Utah	Iron, Beaver, Millard	Up to 500 ft of drawdown	5 to 500 feet of drawdown	Throughout basin
257	Tule Valley, Utah	Beaver	Up to 49 ft of drawdown	Up to 49 ft of drawdown	Short-term effect along southeastern portion of basin with greater margin at southernmost tip of basin; long-term effects throughout basin with 5 to 49 ft of drawdown in southern half of basin.
258	Fish Springs Flat, Utah	Juab, Tooele	<1 ft of drawdown	Up to 4.9 ft of drawdown	Long-term effects on southern tip of basin.
280	Beryl-Enterprise Area, Utah	Iron	1 to 49.9 ft of drawdown	Up to 999 ft of drawdown	Short-term drawdown to the north, long-term drawdown throughout basin with maximums along northern border with Pine Valley (proximity to simulated pumping center) short-term drawdown from local pumping effects unrelated to Pine and Wah Wah Valley pumping; long-term drawdown stable as drawdown merges with drawdown from pumping in Pine and Wah Wah Valley.
281	Parowan Valley, Utah	Iron	5 to 49.9 ft of drawdown	5 to 49.9 ft of drawdown	Short-term drawdown from local pumping effects unrelated to Pine and Wah Wah Valley pumping; long-term drawdown deepens as drawdown merges with drawdown from pumping in Pine and Wah Wah Valley.
282	Cedar City Valley, Utah	Iron	Up to 49.9 ft of drawdown	Up to 49.9 ft of drawdown	Along southern margin of basin due to local pumping
283	Beaver Valley, Utah	Beaver	Up to 49.9 ft of drawdown	Up to 49.9 ft of drawdown	Short-term effects along northwestern border of basin; long-term effects across western third of basin with maximum drawdown along northwestern border.
284	Millard Area, Utah	Beaver	Up to 4.9 ft of drawdown	1 to 49.9 ft of drawdown	Short-term effects along western margin of basin with maximum drawdown along southwestern corner of basin; long-term effect across western third of basin.
287	Sixty Desert, Utah	Millard	1 to 49.9 ft of drawdown	1 to 49.9 ft of drawdown	

EXHIBIT B-9

Declaration of Great Basin Water Network
(Annette Garland, Board Member)

**DEPARTMENT OF THE INTERIOR
OFFICE OF HEARINGS AND APPEALS
INTERIOR BOARD OF LAND APPEALS**

**BEAVER COUNTY, UTAH; MILLARD
COUNTY, UTAH; JUAB COUNTY,
UTAH; WHITE PINE COUNTY,
NEVADA; CITY OF MILFORD, UTAH;
CENTRAL NEVADA REGIONAL
WATER AUTHORITY; NEVADA
GRAZING BOARD OF DISTRICT NO. 4;
GREAT BASIN WATER NETWORK;
MARK WINTCH; WAH WAH RANCH,
WALLACE PEAK WATER COMPANY,
WINTCH & COMPANY LLC; BARBARA
WINTCH; JOHN CARTER; LYLE
CARTER; DEAN EYRE; DUSTIN
KESLER; BRANDON YARDLEY; AND
GILBERT ("GIB") T. YARDLEY,**

Appellants,

v.

BUREAU OF LAND MANAGEMENT,

Respondent.

IBLA No. _____

**RE: PINE VALLEY WATER SUPPLY
PROJECT
DOI-BLM-UT-CO10-2020-0012-EIS
(2026)**

DECLARATION OF ANNETTE GARLAND

GREAT BASIN WATER NETWORK

BOARD OF DIRECTORS MEMBER

I, ANNETTE GARLAND, declare as follows:

1. I have personal knowledge of each of the facts set forth below and, if called upon to do so, could and would testify regarding the following. This declaration is filed in support of

Beaver County, Utah, et al.'s *Notice of Appeal and Petition for Stay* in the above-captioned matter and in support of standing for Great Basin Water Network.

2. I submitted comments on the BLM's 2022 Draft EIS for the Pine Valley Water Supply Project in my own name and also on behalf of my ranching operation and family members Bertha Garland-Keith, David Keith, and Connor Garland Norton and McKenzie Norton.

3. Our ranching operation, Rafter Lazy C Ranch in Callao, Utah is held in trust by the Annette H. Garland Trust.

4. I am the trustee.

5. The Ranch is located in both Juab and Tooele Counties in Snake Valley, Utah.

6. Our ranching operations generate tax revenue to both Juab and Tooele Counties.

7. My late husband Cecil and I bought Rafter Lazy C Ranch in 1975.

8. Since that time, three more generations have been added to our ranching family.

9. My daughter, grandchildren, and great-grandchildren were and are being raised here in Callao and currently reside and work on the ranch.

10. We own 550 acres in Callao in both Juab and Tooele Counties located in Snake Valley.

11. We own Utah water rights to 2 culinary wells and 3 irrigation wells.

12. We own 1/3 of another irrigation well and holding pond located in the foothills of Callao.

13. A pond and various springs in our meadows also supply some water to the ranch.

14. We also own water shares in the Callao Irrigation Company.

15. These shares give us access to surface water runoff from the Deep Creek Mountains to the west of our property.

16. This water is combined with the well water used for irrigation and cattle watering.

17. We currently irrigate our ranching/farmland with 3 center pivots, 6 lateral wheel-lines, and various handlines.

18. Since we bought our ranch in 1973, we have noticed a significant decrease in our natural springs, water table, and mountain runoff in all of Snake Valley due to the changing climate, drought conditions, and local groundwater pumping.

19. Our family has strived to use conscientious ranching and grazing methods that would protect the ecosystem and wildlife near and on our ranch.

20. I have also been to Pine Valley, where the Proposed Project would be constructed and where drawdown will be the most severe and am likely to return in the future as we travel through Pine Valley on our way to Millard, Minersville, and Cedar City for ranch-related business, as well as to purchase ranching equipment and supplies.

21. I have experienced firsthand Pine Valley's expansive, undeveloped landscape, remarkable scenic beauty, and intact natural character.

22. These qualities make the Valley an exceptional place for wildlife habitat, recreation, and quiet enjoyment of the natural environment.

23. These are also the very qualities that make Callao unique and are the reason that my family settled here so very long ago.

24. We want to do everything in our power to help defeat this grab of water from Pine Valley, and eventually Wah Wah and Hamlin Valleys, as well as from our interconnected water supply in Snake Valley in Millard, Juab, and Tooele Counties.

25. We believe based on review of USGS and other groundwater modeling developed in the context of the Project environmental review process, that the Pine Valley Pipeline Project would

have a devastating effect on the interconnected and highly sensitive groundwater systems in the Great Salt Lake Desert, of which Snake Valley is a part.

26. Project pumping in Pine Valley, and from Wah Wah and Hamlin Valleys once the full project is constructed, would draw subsurface flow from the connected Snake Valley aquifer, where Callao is located.

27. I am not a hydrologist, but I have reviewed some of the Project EIS materials, including parts of the Groundwater Resources Impact Assessment, and have spoken with members of GBWN to understand how this Project could affect my water and my ranch. Based on that review and those discussions, I am concerned that there is a lot of uncertainty about how far and how severely the groundwater impacts will spread. From what I understand, the analysis only looks at fifty years of pumping, even though the Project is based on permanent water rights that could be used much longer. It also looks at only part of the total pumping planned under the larger West Desert Pipeline Project, and it assumes pumping will occur in one general area, even though other well locations are possible. From my perspective as a rancher who depends on this water, those limitations make it hard to trust that the analysis shows the full picture of what could happen to the groundwater. See Andy Zdon and Josh Osborne, Roux Associates, Inc., Technical Memorandum, *Groundwater impacts of the proposed Pine Valley Water Supply Project, Utah on Nevada groundwater basins with a Focus on Snake Valley, Nevada & Utah* (Sept. 20, 2021); Andy Zdon, P.C., Roux Associates, Inc., Technical Memorandum, *Comments regarding the Pine Valley Water Project DEIS and associated documents* (Mar. 8, 2022) (attached hereto and also submitted to the BLM as Exhibits B and C to GBWN's March 11, 2022, Comments on the Project's Draft EIS).

28. I am also concerned because, as I understand it from reading the materials and from discussions related to those materials, even the model results themselves are uncertain. The Project relies on a broader U.S. Geological Survey groundwater model, and both that work and the CWCID consultant's work indicate there is a fair amount of uncertainty in predicting how groundwater and springs will respond. I understand that in some places the model results do not line up well between predicted groundwater levels and spring flows, which, to me, suggests the impacts could be understated. At the same time, some areas, including places like Callao, are shown as outside the main impact area based on those same uncertain results. Given all of this, I do not have confidence that the model accurately shows where the impacts will occur or how severe they will be, and that concerns me for my water rights and for the future of my family's ranch.

29. Because of these issues, I am concerned that the Project's impacts to the connected groundwater system, including in Snake Valley, could be much greater than what is disclosed in the EIS. If groundwater levels drop more than predicted, it could reduce the water available for our ranching operations, affect springs and other water sources we rely on, and harm the land and ecosystems that support our livelihood. Over time, that would directly affect the value of our property, the viability of Rafter Lazy C Ranch, and the water rights that we depend on and which I intend to pass on to my children and grandchildren. Once the groundwater is gone, it will not replenish and our livelihood and the economies of our counties will be devastated.

30. I am also currently serving on the Board of Directors of the Great Basin Water Network as secretary of the board.

31. Great Basin Water Network ("GBWN") is a nonprofit organization dedicated to protecting the water resources of the Great Basin for the benefit of the region's communities, wildlife, and groundwater-dependent ecosystems.

32. Since its formation, GBWN has worked to promote responsible and sustainable water management in Nevada and Utah and to ensure that large-scale water development proposals do not undermine the long-term viability of rural communities and landscapes that depend on limited groundwater supplies.

33. My late husband, Cecil, and I were a part of the original founders of the Great Basin Water Network and along with many others in GBWN, have devoted much of our lives to promoting sustainable water management and use and to protecting the livelihoods, lifestyles, and the environment in the Great Basin.

34. GBWN was originally formed in response to proposals to export large volumes of groundwater from eastern Nevada to support urban growth in Las Vegas.

35. In that effort, the organization played an active role in organizing affected residents, ranchers, businesses, and local governments, supporting individuals who filed protests to the water-rights applications, and participating in related administrative and federal proceedings concerning those proposals.

36. The organization engages in public education and outreach, analyzes water-development proposals and water-management policies, reviews and obtains public records relating to water decisions, and shares information with the public and policymakers through publications, community meetings, and electronic communications.

37. GBWN also advocates for improved water conservation and responsible municipal water use and management as an alternative to large groundwater extraction projects that can threaten rural economies, groundwater-dependent ecosystems, and community water supplies.

38. Specifically, GBWN has been working to identify responsible water management opportunities in the Cedar Valley and has advocated for sustainable water management in the Valley.

39. GBWN has also worked with local residents in Beaver County and surrounding counties to analyze the hydrologic impacts of the Pine Valley Water Supply Project to help ensure the best protection for their water rights and uses.

40. Through these efforts, GBWN works to ensure that decisions affecting the region's limited water resources are made transparently and in a manner consistent with the long-term public interest.

41. As a Utah rancher and water rights owner, a resident of Juab County, a land owner in Tooele County, and member of the Great Basin Water Network's board of directors, the lack of public participation provided by the BLM in its development of the Project's Final EIS and Record of Decision has significantly impacted our ability to protect our rights and interests as individuals, and to pursue our mission and work as an organization.

42. The failure to provide an adequate opportunity for public participation since the publication of the Project DEIS four years ago is also an egregious departure from previous NEPA practice.

43. The lack of adequate public participation is of critical importance here, because the Pine Valley Water Supply Project directly threatens the groundwater resources, rural communities,

and groundwater-dependent ecosystems that Great Basin Water Network works to protect, including my own.

44. It is critical that the public be provided with an opportunity to provide input on the environmental review process to ensure that BLM's decisions are made in a transparent manner and consistent with the best available science.

45. Such an approach is necessary to ensure adequate consideration of impacts to water rights and the environment in Pine Valley and in hydrologically connected groundwater basins such as Snake Valley.

46. The lack of opportunity for public involvement in the four years since the Draft EIS was issued undermines GBWN's mission of ensuring that decisions regarding water resources are made in a transparent manner and consistent with best available science.

47. In addition to undermining GBWN's work advocating for transparent decision making and science-based decision making, approval of the Project's right-of-way also undermines GBWN's ongoing efforts to promote responsible water management and improved municipal water conservation by enabling large-scale groundwater extraction that could degrade hydrologically connected basins and rural economies in the region and which removes incentives to manage the resource responsibly.

48. Approval of the Project's Right of Way will result in a need to engage in additional robust efforts to advocate for the protection of water resources and groundwater dependent resources that stand to be impacted by the Project in Pine Valley and in hydrologically connected basins through advocacy, analysis, and dissemination of information related ensuring that impacts are avoided or mitigated.

49. As a result of the additional work necessitated by BLM's grant of the Project's right-of-way, GBWN will suffer financial harm by being required to expend substantially increased resources to address and respond to those impacts.

50. For these reasons, the Project directly affects both the mission and work of GBWN itself, as well as the interests of the organization's constituents, stakeholders, and supporters, including myself and my family, who depend on GBWN to advocate for sustainable management of the Great Basin's limited water resources and who most importantly depend on the groundwater resources themselves for our livelihoods.

51. My injuries and harms as well as those to GBWN discussed herein will be remedied by a decision to stay, remand, and set-aside BLM's Pine Valley Water Supply Project Record of Decision because the surface disturbances and groundwater pumping activities authorized therein would not be able to occur.

Pursuant to 28 U.S.C. § 1746, I declare, under penalty of perjury, that the foregoing is true and correct.

DATED: 3-31-2026

Annette H. Garland - Rafter Lazy C Ranch
Annette Garland, Rafter Lazy C Ranch

Date: 20 September 2021

To: Kyle Roerink, Great Basin Water Network

From: Andy Zdon and Josh Osborne, Roux Associates, Inc.

Subject: **Groundwater impacts of the proposed Pine Valley Water Supply Project, Utah on Nevada groundwater basins with a Focus on Snake Valley, Nevada & Utah**

This technical memorandum related to the proposed Central Iron County Water Conservation District (CICWCD) Pine Valley Water Supply Project (Pine Valley Project) has been prepared by Roux, Inc. (Roux) on behalf of the Great Basin Water Network (GBWN). Although the proposed Pine Valley Project is in Utah, the effects of the project are likely to extend well into Nevada. Although the focus of this technical memorandum is related to the effects of the Pine Valley Project in Nevada, a discussion related to effects of the Pine Valley Project on groundwater flow in Utah is included to provide context for the review of anticipated groundwater-related impacts in Nevada. This memorandum is based on our review of existing literature, Roux's running scenarios on a groundwater flow model developed by the U.S. Geological Survey (USGS), and our field visit of the Pine and Wah Wah Valleys area during 2020. We did not conduct a field inspection of Snake Valley for the purposes of this memorandum.

The locations of eastern Nevada groundwater basins including Snake Valley, and the Pine Valley Project are presented on Figure 1. CICWCD's proposed Pine Valley Project in Utah proposes to export approximately 15,000 acre-feet per year (afy) of groundwater from the southern portion of Pine Valley, a part of the headwaters of the Great Salt Lake Desert groundwater flow system. The Pine Valley Project is not a stand-alone project, but is the first phase of the proposed, multi-basin West Desert Water Supply and Conservation Project (Figure 2). The West Desert Project area lies within the headwaters of the Great Salt Lake Desert Flow System (GSLDFS; for Pine and Snake/Hamlin Valleys), and in the case of Wah Wah Valley, in the Sevier Lake Flow System (Figure 3). CICWCD has obtained groundwater rights in Pine Valley (15,000 acre-feet per year) and Wah Wah Valley (11,000 acre-feet per year). CICWCD currently has groundwater right applications for Hamlin Valley (10,000 acre-feet per year).

Groundwater-dependent ecosystems in the area range from large springs such as Wah Wah Spring (in Wah Wah Valley, Utah) to small springs and wet meadows. Many springs in the region are relatively small springs that individually may not appear to be significant components of the overall area groundwater budget, but individually and collectively are important ecological resources and can be relied upon for human uses. Additionally, springs in Snake Valley provide habitat for the Least Chub. By 2007, a majority of the known natural populations extant in 1979 were extirpated and the known distribution of least chub consisted of 6 populations (United States Fish and Wildlife Service [USFWS] and Utah Division of Wildlife Resources [UDWR], 2014, p. 7); Gandy Marsh, Bishop Springs and Leland Harris Springs in Snake Valley in northwestern Utah, Mills Valley in the Sevier drainage below Yuba Reservoir, the Mona Springs Complex in the Utah Lake drainage, and Clear Lake within the Sevier River drainage (Bailey et al., 2005, p. 18-19). The status of the Mona Springs population in 2007 was functionally extirpated (USFWS, 2010, p. 35400).

The proximity of the proposed Pine Valley Project to Snake Valley is likely to result in lasting water-resource impacts in the area. A reduced groundwater budget in Snake Valley resulting from induced underflow from Snake Valley toward Pine Valley is likely. Additionally, the changes to the groundwater system from the proposed Pine Valley Project, would likely affect springs in Nevada potentially including

those in Great Basin National Park. Further, more distant springs such as those at Fish Springs National Wildlife Refuge (in Fish Springs Flat groundwater basin in Utah) also are likely to be affected over time by changes in hydraulic gradients and gradient-directions caused by the groundwater capture from the proposed Pine Valley Project.

Based on our review of investigations by other researchers including the U.S. Geological Survey, and work conducted by agencies prior to the development of the proposed Pine Valley Project as presented on the U.S. Bureau of Land Management's ePlanning website for this project (U.S. Bureau of Land Management, 2021), we are not convinced that the proposed project as currently designed can provide the volume of water for the period envisioned by CICWCD. This is demonstrated by existing groundwater modeling results (Brooks, 2017), wellfield design and other factors. These potential deficiencies will also be discussed in this report. In order to potentially capture the volume of water envisioned by the project, the project would likely require a well field that is more widely distributed, throughout Pine Valley but based on existing public data and analyses, has not been evaluated. However, if the project does proceed as designed and does produce those volumes of water (~15,000 afy), or even less, the effects of the Pine Valley Project on Snake Valley and surrounding groundwater basins in Nevada would likely be substantial and have not been reliably evaluated at this time, particularly because of substantial, wide-ranging data gaps related to aquifer and flow system characteristics, and the nature and extent of groundwater-dependent ecosystems.

What is a spring and what are they like in this area?

Springs are places where groundwater reaches the ground surface, discharging as surface flow. By nature of their character, springs are highly sensitive to changes in groundwater level. For some springs, the reduction of less than one foot of groundwater elevation can result in the difference between surface water flow being present or absent. Some springs are small, seasonal, locally perched, features where last year's rainfall that soaked into the ground has hit a barrier to its downhill flow path, forcing that water back to the ground surface. The discharge from these local springs is gravity driven. Other springs are tied to deeper and more distant groundwater flow paths that may extend well beyond the boundaries of the local watershed. Because these flow paths are deeper, they are generally not affected by seasonal rainfall or changes in air temperature, they usually have more consistent flow, and if the flow paths are sufficiently deep, they are characterized by warmer groundwater discharge temperatures that remain relatively consistent over time. These springs will commonly have discharges that are anomalously large for their limited watershed and local precipitation. These latter springs rise to the surface under pressure. Figure 4 depicts the relationships between these two different types of springs within a typical flow system context.

How Groundwater Capture Can Impact Springs

In the GSLDFS and surrounding area, the primary risk to springs is the potential impacts due to proposed regional pumping. As described earlier, the proximity of the proposed Pine Valley Project pumping to springs and neighboring basin-fill aquifers is likely to have a deleterious effect. In Snake Valley and Great Basin National Park, these effects may result in changes to hydraulic gradients and gradient-directions, and reductions in spring flow.

Barlow and Leake (2012) present four common misconceptions regarding surface water depletion (such as a reduction of spring flow) due to groundwater pumping:

- Total development of groundwater resources from an aquifer system is "safe" or "sustainable" at rates up to the average rate of recharge;

- Depletion of spring flow is dependent on the rate and direction of water movement in the aquifer (i.e., is the spring upgradient or downgradient);
- Depletion of spring flow will stop when pumping ceases; and,
- Pumping groundwater exclusively below a confining layer will eliminate the possibility of depletion of surface water connected to the overlying groundwater system.

Additionally, Bredehoeft (2002, 2007) and Alley, et.al. (1999) point out the invalidity of the myth that pumping at the estimated groundwater recharge results in practical, sustainable groundwater development. Indeed, the sustainability of pumping is based on the capture (induced inflows and decreased discharges including spring flow) that is a response to groundwater pumping.

Other risks to springs may well arise from the Pine Valley Project but are impossible to evaluate because many of the springs in the region have not been evaluated for their connectedness to basin-fill aquifers. Although a subset of key springs was analyzed in Snake Valley by Gardner (2014) and in the Pine Valley area (Gardner, et.al., 2020), the spring set is not comprehensive, and to our knowledge, there has been no comprehensive regional analysis of springs in this area comparable to the analysis of springs in the Mojave Desert that the U.S. Bureau of Land Management (BLM) commissioned several years ago. Such investigations are not without precedent as shown by that BLM-commissioned comprehensive spring survey for the Mojave (Andy Zdon & Associates, 2016).

Characteristics of Snake Valley and the Great Salt Lake Desert Flow System

The Snake Valley basin (including Hamlin Valley) and surrounding area is in the western parts of Iron, Beaver, Millard, Juab, and Tooele Counties, Utah, and in northeastern Lincoln and eastern White Pine Counties, Nevada, within the Basin and Range geomorphic province. Snake Valley is part of an approximately 135-mile long, continuous north-trending depression, the approximate southern one-third of which is also known as Hamlin Valley. The Basin and Range region (also referred to as the Great Basin) is characterized by basins of internal drainage with considerable topographic relief, alternating between narrow faulted mountain chains and flat arid valleys or basins. The ranges generally trend north-northwest parallel to the regional structural regime. The geology of the Snake Valley area consists primarily of a succession of late Precambrian to early Mesozoic sedimentary rocks up to 33,000 feet thick, along with metamorphic rocks of Jurassic, Cretaceous, and Tertiary age (Kirby and Hurlow, 2005). Carbonate rocks making up the middle and upper portions of the succession are part of a regionally extensive aquifer system covering much of the eastern and southern Great Basin. Within that broad regional aquifer system, Snake Valley is within the GSLDFS, extending from eastern Nevada and western Utah, northward toward the Great Salt Lake Desert (Figure 3).

The Snake Valley area, including surrounding groundwater basins in eastern Nevada, is covered by coalescing alluvial fans forming broad slopes between the surrounding mountains and the valley floor. Coarse-grained deposits (primarily sand and gravel) within the basin fill are responsible for transmitting the greatest quantities of groundwater in the Snake Valley drainage basin, although where present, carbonate rocks may also transmit substantial groundwater. The basin fill is generally unconsolidated, moderately to well-sorted sand, gravel, silt and clay. As the valley floor is reached, the sorting of the alluvial sediments will increase, serving to increase the permeability of the sediments at the base of the alluvial fans. On the other hand, with increased depth, groundwater production can be expected to decrease as deposits lithify and porosity decreases, ultimately reducing permeability as strata is buried and ages (Kirby and Hurlow, 2005). Within the basin fill, the fine-grained (clay and silt) deposits that largely comprise former lakebed deposits and that underly much of the alluvial deposits may serve as

aquitards. Aquitards are low permeability geologic units that inhibit groundwater flow and can serve as confining units.

The regional gradient of the groundwater flow system is toward the north (Brooks, 2017; and Kirby and Hurlow, 2005). As described earlier, Snake Valley is within the headwaters of the GSLDFS. The GSLDFS covers approximately 2,600 square miles of western Utah. No perennial streams originate in this area, and runoff only reaches valley floors during and immediately after intense storms or periods of rapid snowmelt (Gates and Kreuer, 1981).

Groundwater is present throughout the GSLDFS within the unconsolidated basin fill and consolidated rocks, and varies in quality from fresh water to brine. Much of the groundwater budget is poorly known, but the annual groundwater recharge from precipitation and underflow from other basins in Nevada to the southern portion of the GSLDFS in Utah has been estimated at a combined 84,000 acre-feet per year (Gates and Kreuer, 1981). As described earlier, CICWCD has been granted rights in Pine Valley and neighboring Wah Wah Valley to the east, and has applied for groundwater rights in Hamlin Valley (southern end of Snake Valley). The combined volume of water of those groundwater rights (in Pine and Wah Wah Valleys) account for approximately 30% of the total groundwater inflow to the southern GSLDFS in Utah and Nevada inclusive of Snake, Pine, Wah Wah Valleys along with other valleys in White Pine County, Nevada and Millard and Juab Counties in Utah.

Fish Springs, the largest spring complex in the GSLDFS is likely primarily derived from underflow from Tule Valley toward Fish Springs Flat. Groundwater in Tule Valley itself is derived from underflow from Pine Valley, Wah Wah Valley, and the Sevier Lake Desert (Gardner, 2014, Brooks, 2017). An isotopic investigation of groundwater movement from Snake Valley toward Fish Springs, identified that a relatively small portion (if any) of the discharge from Fish Springs was derived from Snake Valley (Gardner, 2014). The implications of that condition are that additional production in Snake Valley, or induced underflow from Snake Valley toward Pine Valley would result in reductions in other Snake Valley discharges such as spring flow and evapotranspiration and could induce underflow from surrounding valleys (such as Spring Valley and others) thereby impacting the groundwater budgets for those basins and likely impact groundwater flow to Fish Springs. Additionally, although groundwater from Snake Valley does not appear to be reaching Fish Springs, Fish Springs does receive groundwater from Pine Valley and therefore would likely be directly impacted by Pine Valley Project pumping.

As part of Roux's review of the proposed Pine Valley Project, we reviewed the Great Basin Carbonate and Alluvial Aquifer groundwater flow model (GBCAAM; Brooks, 2017). Figure 5 presents groundwater flow directions as estimated by the GBCAAM under non-pumping conditions and as can be seen, groundwater from Snake Valley generally moves north. Due to the interconnectedness of groundwater flow in the basins within the GSLDFS, changes in the groundwater budgets of upgradient basins, such as Pine and Wah Wah Valleys, will have a domino effect on the groundwater basins down- and cross-gradient, although the timing of those changes is unclear.

In the case of Snake Valley, the majority of discharge from the basin occurs via evapotranspiration (~80,000 afy; Kirby and Hurlow, 2005 and Gardner, 2014). Additionally, groundwater is discharged from agricultural pumping in the area (~14,500 afy). Induced underflow from Snake Valley to Pine Valley caused by the Pine Valley Project would serve as a new stress on the Snake Valley groundwater system and would come at the expense of spring discharge and evapotranspiration, or induced underflow from surrounding basins as described earlier.

Sustainability of Groundwater Systems

The volume of groundwater in storage is an important aspect of the groundwater system. Changes in storage are identified in the field by changes in groundwater levels. A fundamental groundwater equation and the basis for evaluations of groundwater budgets (inflow vs. outflow estimates) is:

$$\text{Inflow} - \text{Outflow} = \text{Change in Storage}$$

When outflow (groundwater discharge both directly in-basin or through underflow to surrounding basins) exceeds inflow (groundwater recharge in basin plus contributions from surrounding basins), there is a negative change in groundwater in storage and groundwater levels can be expected to decline. When inflow exceeds outflow, the reverse is true. When the system is in equilibrium, water levels will generally remain relatively constant despite short-term fluctuations. Where they occur, long-term groundwater level declines are a clear indication that outflow has been exceeding inflow for an extended period. It should also be noted that in many areas, the recovery of groundwater levels following groundwater being removed from storage can take much longer than the period it took to decline, depending on the volume removed from storage, groundwater recharge, precipitation trends, and the geology of the basin.

Furthermore, under predevelopment conditions, a groundwater system is in equilibrium where inflow equals outflow. Groundwater pumping such as that proposed by CICWCD causes a disruption in this equilibrium, and recharge amounts, and other biological and hydrologic conditions can change. More often, discharge amounts and patterns are impacted. This includes the loss of phreatophytic vegetation (vegetation whose water requirements are met by roots tapping groundwater such as in the area of springs) and reduction or elimination of spring flow. All pumped water must be supplied by one or more of the following:

- Decreases in groundwater storage (lowered groundwater levels);
- Increased or induced recharge or underflow from surrounding basins (e.g., from Snake Valley); and/or,
- Decreased discharge either in the form of reduced subsurface outflow or decreases in natural forms of discharge such as evapotranspiration, spring flow or river base flow (such as would occur at Tule Spring and elsewhere in Sevier Desert areas with shallow groundwater).

Regardless of the amount of groundwater pumped, there will always be groundwater drawdown (and the removal of water from storage) in the vicinity of pumping wells, a necessity to induce the flow of groundwater to said wells. This area of groundwater drawdown is referred to as a cone of depression. For most groundwater systems, the change in storage in response to pumping is a transient phenomenon that occurs as the system readjusts to the pumping stress. The relative contributions of changes in storage, increases in recharge, and decreases in natural discharge evolve over time. The timing of that evolution in natural discharge change can be difficult to predict.

If the system can come to a new equilibrium (i.e., a combination of increased recharge and/or decreased discharge), the storage decreases will stop, and inflow will again equal outflow with the changes to the inflow/outflow components (capture) described above. The amount of groundwater "available" for a future groundwater development project is therefore dependent on what these long-term changes are, and how these changes affect the water resources and groundwater-dependent environmental resources of the area.

Hydrologic Analysis

We reviewed numerous technical documents related to the proposed Pine Valley Project and the hydrogeology of the surrounding region including Snake Valley. Highlights from those studies are discussed below.

Use of the GBCAAS Model

As described earlier, the USGS' GBCAAS Model was used by Roux to estimate local and regional hydrological responses to the proposed pumping scheme in Pine and Wah Wah Valleys. The GBCAAS Model is a regional groundwater model that encompasses alluvial, carbonate, and volcanic aquifer systems across Utah and portions of Nevada, California, and Idaho (Brooks, 2017). The initial release of the model simulated only steady-state flow conditions. The current version of the model, GBCAASv3.0, includes transient groundwater flow capabilities (specific storage and specific yield parameterizations have been added), has been recalibrated, and only employs local grid refinement in a portion of the model domain that covers an area unrelated to Pine Valley. The model includes both a calibration version – used to represent historic data sets – and a projection version that included new pumping in Pine and Wah Wah Valleys and reduced pumping in Parowan Valley.

Pine Valley and surrounding groundwater budgets

Bredehoeft, in his landmark papers (Bredehoeft, 2002; Bredehoeft, 2007; and Bredehoeft and Durbin, 2009), described the myth that pumping at the estimated groundwater recharge rate for a basin results in a sustainable groundwater development scheme. Indeed, the sustainability of groundwater development will be the ability of the groundwater development to capture the discharge from the groundwater basin. In Pine Valley that would translate to the sustainability of the proposed Pine Valley Project being reliant on the ability for the project to reduce groundwater underflow to downgradient basins, capture groundwater underflow from surrounding basins (e.g., Snake Valley) and reductions in spring discharge (the two principal discharge components of the groundwater budget). With respect to timing of discharge capture, Bredehoeft and Durbin (2009) write, "Large ground water systems, where a new equilibrium can be reached and in which the pumping is a long distance from boundaries where capture can occur, take long times to reach a new equilibrium. Some systems are so large that the new equilibrium will take a millennium or more to reach a new steady-state condition. These large systems pose a challenge to the water manager, especially when the water manager is committed to attempting to reach a new equilibrium state in which water levels will stabilize and the system can be maintained indefinitely."

Ultimately, the groundwater developed from Pine Valley (and potentially Hamlin and Wah Wah Valleys) will be derived by reducing underflow to downgradient groundwater basins in Beaver, Millard, Juab, and Toole Counties in Utah and White Pine and Lincoln Counties in Nevada for the groundwater system to reach a new equilibrium condition. Additionally, beyond the impacts of the Pine Valley Project on Snake Valley in White Pine County, Nevada, if Hamlin Valley is developed by CICWCD, which is planned as part of CICWCD's broader West Desert Water Project, that would have direct, additive impacts to the downgradient portion of Snake Valley in Nevada. Ultimately, a reduction of underflow toward the downgradient portion of the Great Salt Lake Desert flow system could also affect the Great Salt Lake flow system as well, which could affect the Great Salt Lake itself. The timing of those likely irreversible changes could take a long time, but on the other hand they could come sooner.

The U.S. Geological Survey (Brooks, 2017) used the GBCAAS groundwater model to evaluate the effects of the proposed pumping in Pine Valley, along with pumping in Wah Wah Valley (in volumes similar to the water rights held by CICWCD), and reductions in pumping of more than 20,000 acre-feet per year in Parowan Valley, Utah (we have no knowledge of such reductions being proposed). The results of that analysis are reflected in the drawdown prediction presented in Figure 6. Table 1 summarizes the results

of that simulation for groundwater basins in Nevada. As described earlier, the timing of the growth of the cone of depression from project pumping is uncertain given the paucity of aquifer data in the vast area affected. Therefore, the 1,000-year scenario is used to estimate the long-term equilibrium condition of Nevada groundwater basins from project pumping. It is important to recognize that the 1,000-scenario results could be attained in a much shorter timeframe. As can be seen, the groundwater level changes predicted by the U.S. Geological Survey in Nevada groundwater basins is substantial in Snake Valley, Spring Valley and surrounding groundwater basins in White Pine and Lincoln Counties.

Supplemental to the U.S. Geological Survey's analyses above, as part of our review we looked at the changes in subsurface flow that would occur as a result of project pumping, predicted by the GBCAAS Model (Brooks, 2017). Roux also looked at drawdown that would continue after pumping ceases. CICWCD's water rights applications for the Pine Valley Project and the larger West Desert Project make it clear that these projects are intended to serve as a permanent water supply for CICWCD's service area, particularly with Iron County's growth projects, and therefore it is not realistic to assume, or limit analysis to only a 50-year pumping period. Further, there is substantial uncertainty related to the timing of the pumping effects, so considering what the groundwater system would look like when the GSLDFS reaches a new equilibrium is of importance.

The primary source of underflow toward Pine Valley as the cone of depression from the proposed well-field pumping grows over the course of the project's projected long-term pumping, and even as the cone of depression recovers if the project is eventually shut down, is from a marked increase in underflow from neighboring Snake Valley (Figure 7). That induced underflow from Snake Valley would no longer be available as underflow northward down Snake Valley. As Gardner (2014) posited that very little if any groundwater from Snake Valley exits the valley toward Fish Springs as that groundwater is largely consumed by downgradient spring flow, evapotranspiration, and human use within Snake Valley, it follows that the reduced down-valley underflow in Snake Valley due to capture from Pine Valley pumping would affect downgradient spring flow, groundwater-dependent vegetation, and existing groundwater users. Ultimately, the induced underflow from Snake Valley due to the Pine Valley Project must be made up from other sources for Snake Valley groundwater basin to adjust to this new stress. Figure 7 presents the results of that pumping scenario and before and after underflow estimates. Figure 8 presents the flow field associated with pumping in Pine Valley after the groundwater system stabilizes (1,000 years), minus the baseline flow field (without pumping), in other words the net flow changes to the system. One can see the impact of pumping on patterns of groundwater flow, extending north from Pine Valley toward Fish Springs Flat and west from Pine Valley toward Snake Valley and into the Great Basin National Park area. That stress on the Snake Valley groundwater system will then result in similar inducements of underflow from groundwater basins surrounding Snake Valley such as Spring Valley. The before and after Pine Valley Project pumping effects on the Snake Valley groundwater budget and how those changes affect surrounding Nevada groundwater basins are presented in Figure 9.

The full extent of the capture will likely occur long after the proposed 50-year pumping period that has been proposed for the Pine Valley Project. Even assuming the 50-year pumping period is not extended, the cone of depression from that pumping will continue to expand as more distant groundwater is captured to allow recovery of the pumping center. Even after groundwater pumping has ceased, no mechanism to stabilize the groundwater flow system from continued drawdown exists. Drawdown will continue to expand resulting in unabated impacts to springs and human use until the aquifer system can reach a new equilibrium and begin to recover. Realistically, it is unlikely that Pine Valley Project pumping would cease after 50 years, and more likely to be substantially supplemented by additional pumping from Wah Wah Valley and, potentially, Hamlin Valley, considerably adding to the stress on groundwater basins in White Pine County and Lincoln County.

The processes and timing of these changes are made more unclear by Pine Valley having not been subject to significant groundwater development and currently being in a state of equilibrium (Gardner, 2020). Therefore, how the basin reacts to long-term groundwater stresses is not known beyond modeling analyses with the inherent uncertainties described earlier. In the case of the proposed project, the stresses will be substantial based on the following:

- The proposed pumping volume (15,000 acre-feet per year) from the basin-fill aquifer exceeds the USGS estimated recharge to that aquifer (11,000 acre-feet unconsumed recharge that moves to basin-fill aquifer per Gardner, et.al., 2020) by more than 35%;
- The estimated subsurface underflow from Pine Valley to the north likely will decrease toward zero as subsurface underflow is the principal groundwater discharge from the Pine Valley basin-fill aquifer available for capture;
- Decreased subsurface underflow affects down-basin discharge points such as those in Tule Valley and the Fish Springs area;
- Underflow from cross gradient basin-fill aquifers, including Snake Valley, and basins contributing flow toward Snake Valley such as Spring Valley, will increase towards Pine Valley as the regional groundwater gradient is interrupted by the extraction of groundwater in Pine Valley potentially creating a groundwater budget deficit for ecological resources and human-users.

As described earlier, the groundwater budget of Snake Valley is threatened by the Pine Valley Project as the likely changes in groundwater gradient of Pine Valley will redirect the groundwater gradient of at least a portion of Snake Valley. The groundwater budget of Snake Valley consists predominantly of evapotranspiration with lesser amounts of spring flow and underflow toward Tule Valley and Deep Creek Valley (Figure 9). Recharge of the Snake Valley basin-fill is predominantly supplied by precipitation in the Snake Range (Gardner and Heilweil, 2014) along with groundwater underflow from Spring Valley to the west.

Our analysis using the USGS GBCAAS Model solely simulating proposed Pine Valley Project pumping indicates that extraction of groundwater and alteration of the groundwater gradient associated with the Pine Valley project will affect the underflow of groundwater from Snake Valley, and ultimately, Spring Valley to the west along with other surrounding valleys. Absent potential future pumping in Wah Wah and Hamlin Valleys, the change in underflow from the southern portion of Spring Valley into Snake Valley under Pine Valley Project pumping almost doubles from 612 afy to 1,054 afy and an increase of 223 afy from the northern portion of Spring Valley. As described before, considering the modeling uncertainties described earlier, the specific volumes could vary substantially. Ultimately, the Pine Valley Project is estimated to affect Spring Valley, Nevada, before a new groundwater system equilibrium is reached (Figure 9 and Table 1). We have not simulated the additional effects that pumping from the Hamlin Valley phase of the West Desert Water Project would have on the groundwater systems in Nevada. However, Brooks (2017) does simulate the additive effects of pumping in Wah Wah and Pine Valleys (see Table 1). Additionally, results of Roux's use of the GBCAAS model indicates that the underflow from Snake Valley to Pine Valley increases more than an order of magnitude as the basins reach a new equilibrium (Figure 7).

Drawdown

When evaluating the model-predicted drawdowns for a pumping program or wellfield, generally the estimated well field drawdown is not representative of drawdown that would be measured in individual wells. The estimated drawdown is the representative drawdown for the model cell. Therefore, drawdown

as measured in a specific pumping well would be considerably more than that modeled, irrespective of well efficiency issues.

As estimated by the U.S. Geological Survey (Brooks, 2017), the drawdown estimated from pumping in the Pine Valley and Wah Wah Valley areas is substantial (Figure 9, Table 1). Based on our simulation using the USGS-developed GBCAAS model of pumping solely in the Pine Valley wellfield area, the GBCAAS model predicts approximately 600 feet of drawdown in the wellfield area.

A review of the drawdown predicted in Brooks (2017) for pumping similar to that proposed under the Pine Valley Project in Pine Valley, and in Wah Wah Valley similar to the amount of the CICWCD water rights granted, (Table 1) indicates that it would take approximately 1,000 years of pumping at those rates and conditions for the groundwater system to begin to reach a new equilibrium. Again, the timing of those impacts is subject to modeling error and uncertainties due to the sparsity of data in the area of the model domain. Nonetheless, this is indicative of the magnitude of stress the proposed pumping would put on the aquifer system.

The partial review of groundwater-dependent ecosystems including springs in Pine Valley, Wah Wah Valley and basins that are downgradient from those valleys, along with consideration of springs in Snake Valley that could be affected by declining groundwater levels (see Elliott, et al., 2006), and the predicted drawdowns (Brooks, 2017) demonstrate that the Pine Valley Project will give rise to considerable risk to important ecological and human uses.

Uncertainty

Future impact analyses for the Pine Valley Project should recognize these uncertainties that are also inherent in the GBCAAS Model including:

- The estimated evapotranspiration assumed in the flow system to derive a recharge estimate has an estimated error bounds of plus or minus 35% (Brooks, 2017; Gardner, et al., 2020), and therefore recharge estimates are subject to similar error bounds;
- The estimates described above could underestimate the amount and extent of drawdown as the transmissivity (the measure of the ability of the aquifer to yield water) of the basin-fill aquifer is simulated to not decrease over time even though the parameter is dependent on the saturated thickness of the aquifer (Brooks, 2017) and the fact that groundwater recharge could be overestimated;
- Absence of hydraulic testing in this largely undeveloped region affects predicted timing of pumping effects;
- Aquifers are modeled as confined and transmissivity is not simulated to decrease with groundwater level decline (Brooks, 2017);
- Storage properties are considered uncalibrated outside of Parowan Valley (Brooks, 2017);
- Faults not simulated could act as barriers to groundwater flow providing greater uncertainty to model results;
- Over-generalizing the areas with similar hydraulic characteristics in the models resulting from limited data may affect the model simulations; and,
- Modeling based on an incomplete review of springs in the Great Salt Lake Desert Flow system including isotopic analyses.

Feasibility

Based on our review, it is likely that modifications to the well field design including expanding the well field area and number of wells will be needed. These likely changes to the ultimate well field are not evaluated by the U.S. Geological Survey modeling, nor was Roux able to simulate those changes as we have no information available as to what those changes would be. This is based on the following:

- Modeled drawdowns less than what would be measured in a specific pumping well as the drawdown is representative of conditions in the model cell containing the well and an area of approximately 25 acres;
- Drawdown in a specific pumping well would be expected to be greater than modeled because the model assumes aquifer transmissivity remains constant even though declining groundwater levels would cause transmissivity to decrease;
- The model does not consider the additional in-well drawdown that would result from well inefficiency.

When these three factors are considered together, given the projected drawdowns predicted for pumping in the Pine and Wah Wah Valleys in the GBCAAS Model, there is insufficient information or data to allow an informed determination to be made as to whether there is sufficient aquifer thickness to support the proposed project without substantial changes to project design. Changes to the well field area (e.g. if expanded to cover all of Pine Valley) would substantially alter the extent of groundwater impacts and cause additional impacts to groundwater resources in Nevada, not identified in the current analysis.

Conclusions

Based on the discussion provided above, the following is a summary of our conclusions relating to the proposed Pine Valley Project:

1. CICWCD proposes to pump up to 15,000 acre-feet per year of groundwater from Pine Valley, the first phase of CICWCD's larger planned West Desert Water Supply and Conservation Project.
2. The proximity of the proposed Pine Valley Project to existing groundwater dependent environmental resources and human uses in neighboring Snake Valley (and the surrounding valleys) could result in lasting water resource impacts to those areas including reductions in spring flow and reduced evapotranspiration.
3. Distant springs such as those in Snake Valley that support Least Chub and/or Fish Springs National Wildlife Refuge could be affected by changes in hydraulic gradients and gradient directions caused by Pine Valley Project pumping;
4. The proposed pumping of 15,000 acre-feet per year in Pine Valley exceeds the USGS estimated volume (11,000 acre-feet per year) of groundwater estimated to recharge the alluvial aquifer of Pine Valley and move northward as underflow.
6. Pumping more than the estimated groundwater recharge would result in continued groundwater decline long after project pumping ceases;
7. The spring analysis for the affected region (related to connectivity with basin fill aquifers) is incomplete;
8. The primary source of captured groundwater feeding groundwater recovery after pumping ceases in Pine Valley is induced underflow from Snake Valley, and subsequently other basins such as Spring Valley, with additional induced underflow from Escalante Desert as a secondary source.

9. As groundwater sourced in Snake Valley is generally discharged through spring flow, evapotranspiration and human usage, induced underflow toward Pine Valley would reduce the available water in Snake Valley which is already largely used in-valley.
10. As drawdown and groundwater capture will continue long after pumping ceases, groundwater management to avoid substantial impacts will be impracticable, as once pumping ceases it will not be possible to adjust groundwater management to ameliorate the expanding drawdown until the system reaches its own equilibrium.
11. Based on the uncertainties that remain foundational to the environmental analysis, it is likely that the Pine Valley Project will cause harmful impacts to ecological and human uses in Pine Valley and surrounding valleys in the Great Salt Lake Desert flow system.

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Attachments

Figure 1 – Site Location Map

Figure 2 – West Desert Water Project Site Plan

Figure 3 – Great Salt Lake Desert and Wah Wah Groundwater Flow Systems

Figure 4 – Typical Flow System with Local and Regional Springs

Figure 5 – Non-Pumping Flow Vectors of the Great Salt Lake Desert Flow System

Figure 6 – Snake, Pine and Wah Wah Valley Drawdown—GBCAAS Model

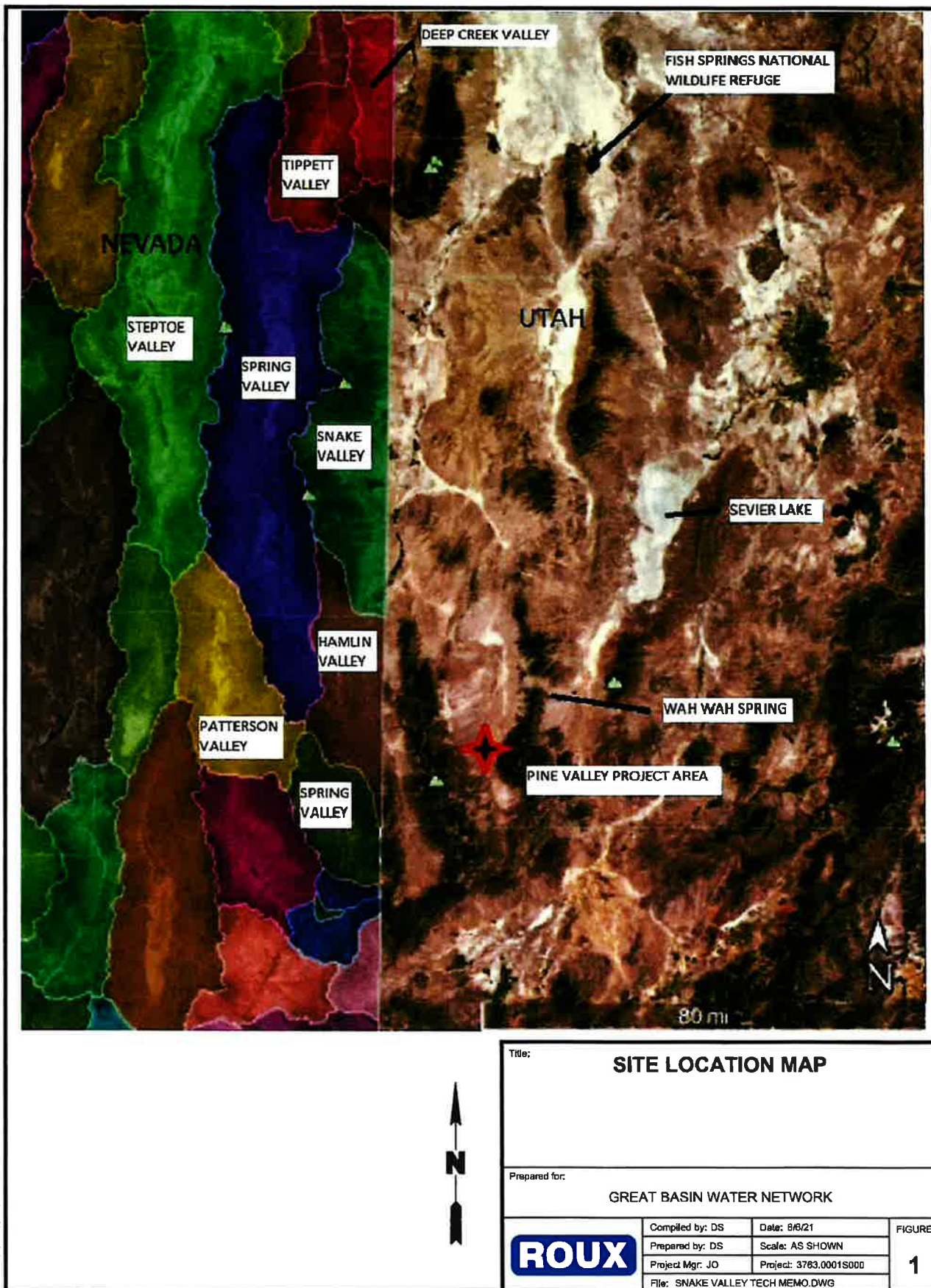
Figure 7 – Change in Subsurface Underflow—Pine Valley Pumping

Figure 8 – Flow Field

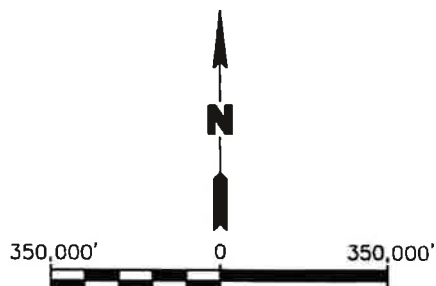
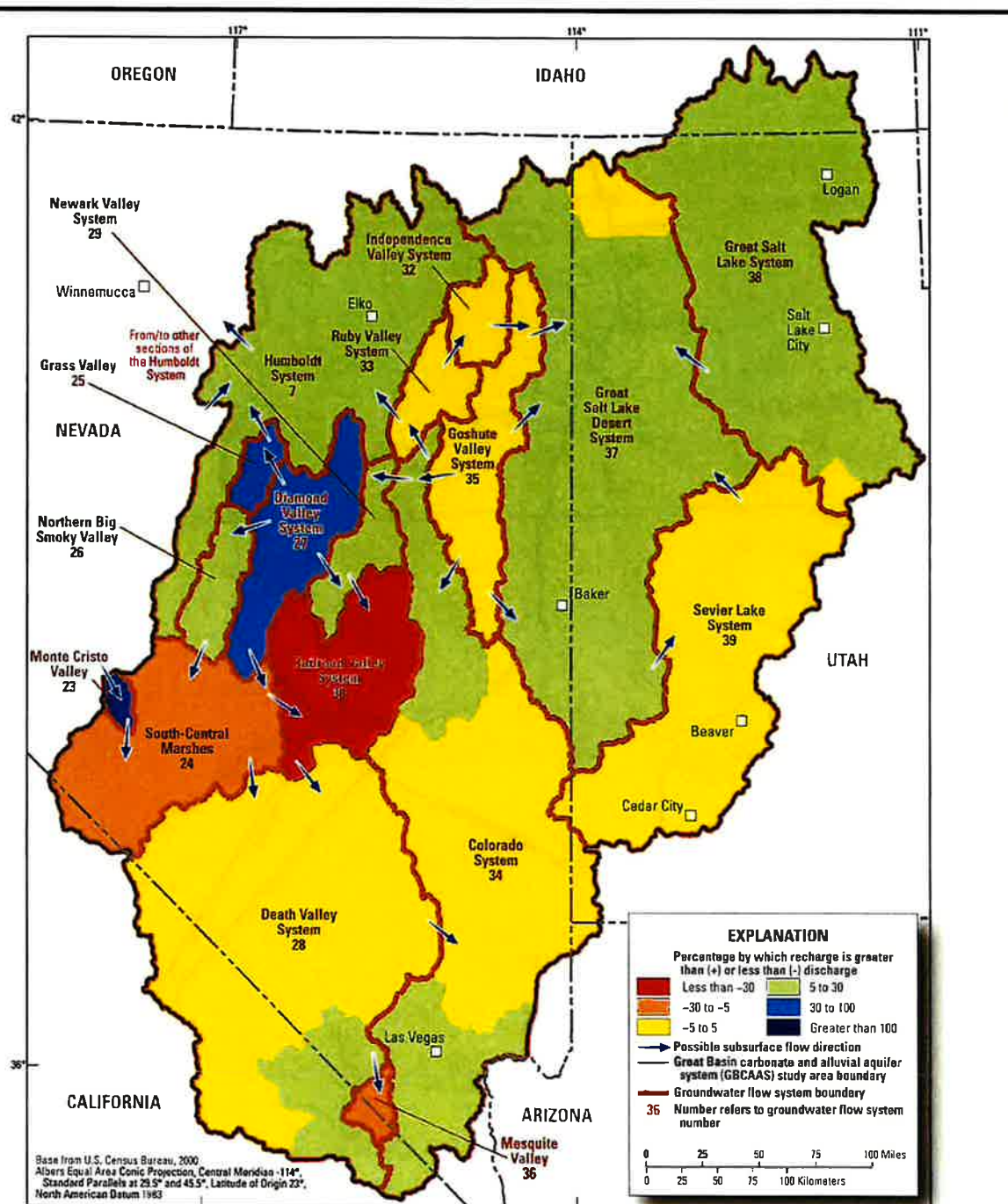
Figure 9 – Snake Valley Water Budget—With and Without Pine Valley Pumping

Table 1 – Groundwater-level declines on Nevada and Utah groundwater basins due to future pumping in Pine and Wah Wah Valleys, Utah as predicted by USGS GBAACS Model (Brooks, 2017)

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GREAT SALT LAKE DESERT AND WAH WAH GROUNDWATER FLOW SYSTEMS

FROM HEILWEIL AND BROOKS, 2011

Prepared for:

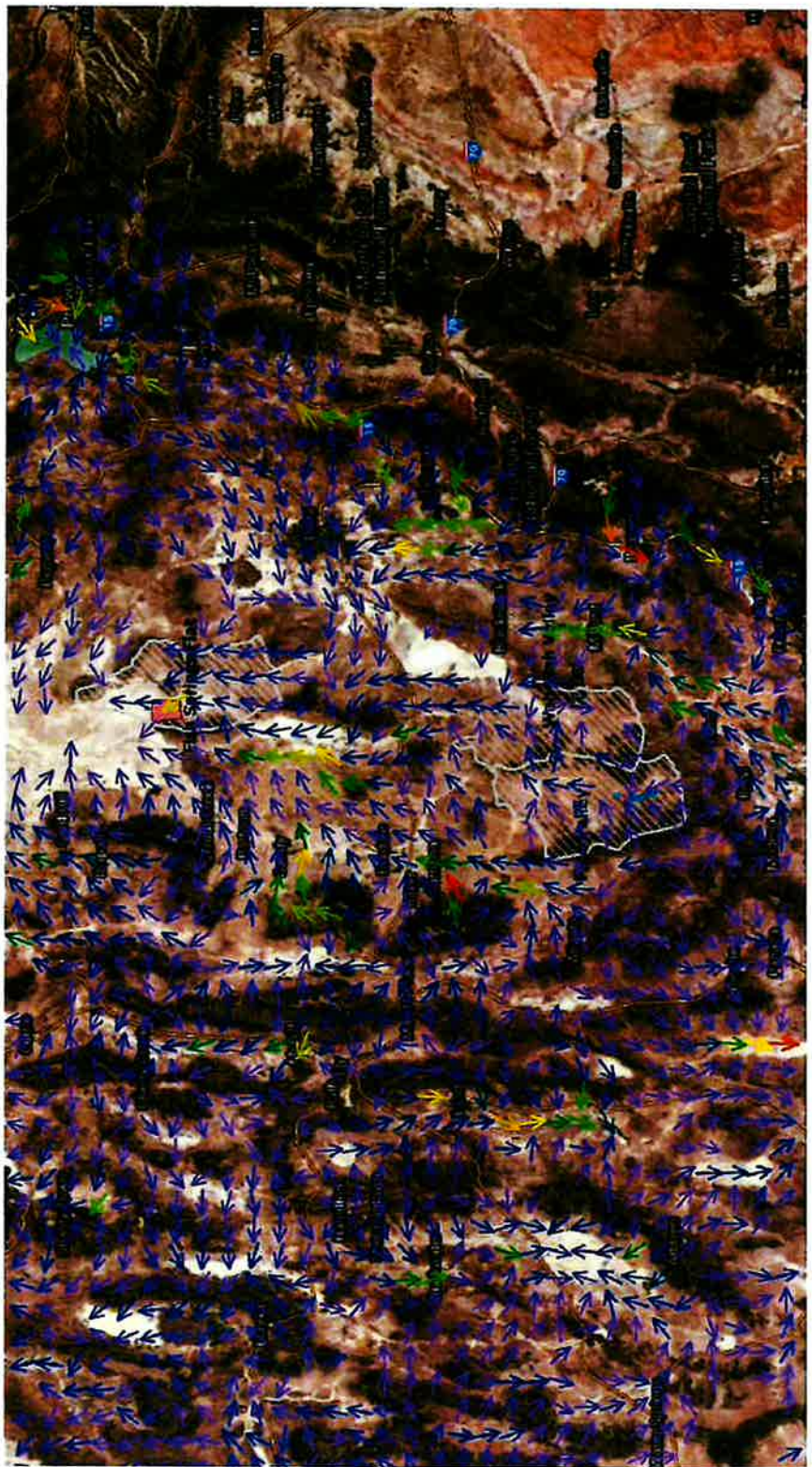
GREAT BASIN WATER NETWORK

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FIGURE

3



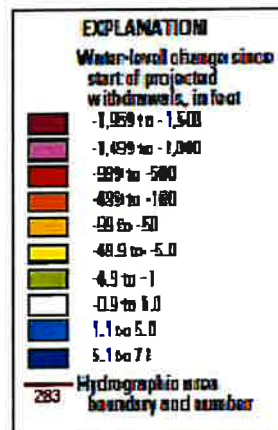
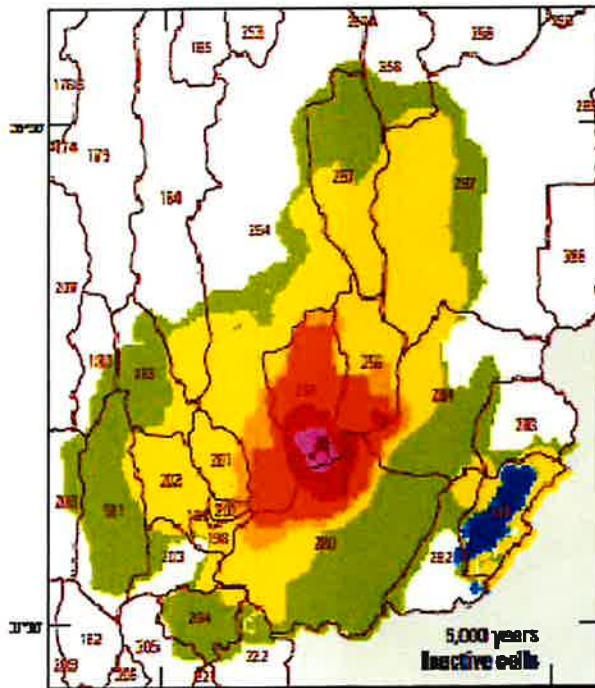
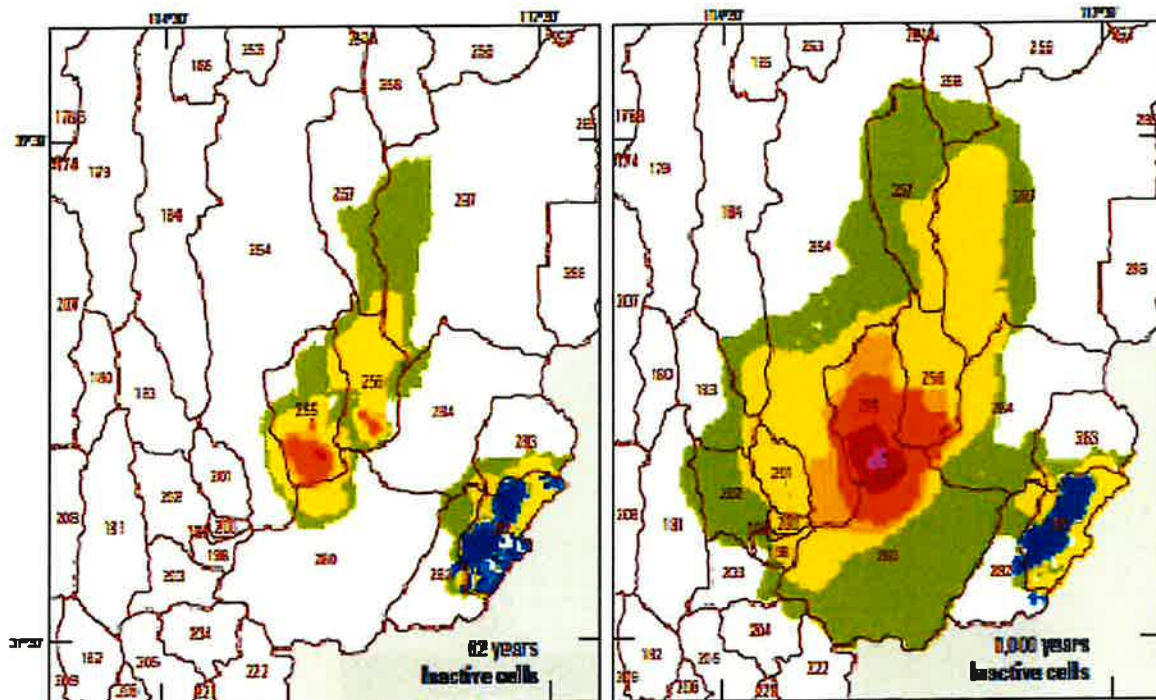
**NON-PUMPING FLOW VECTORS
OF THE GREAT SALT LAKE DESERT
FLOW SYSTEM**

FROM BROOKS, 2017

Prepared for:

GREAT BASIN WATER NETWORK

ROUX		Compiled by: DS		Date: 8/2/21	FIGURE 5
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Snake, Pine, and Wah Wah Valley Drawdown - GBCAAS Model

FROM BROOKS 2017

Prepared for:

GREAT BASIN WATER NETWORK

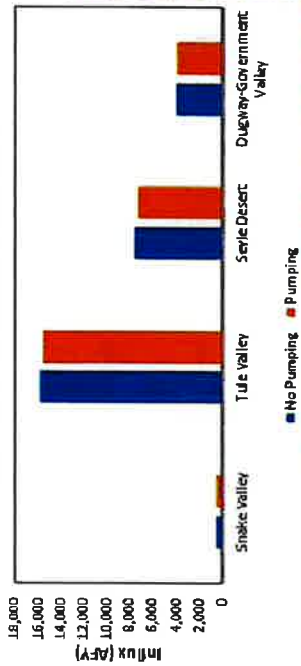
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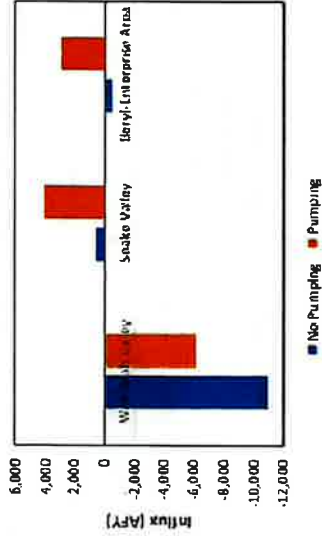
FIGURE

6

Fish Springs Flat Groundwater Underflows



Pine Valley Groundwater Underflows



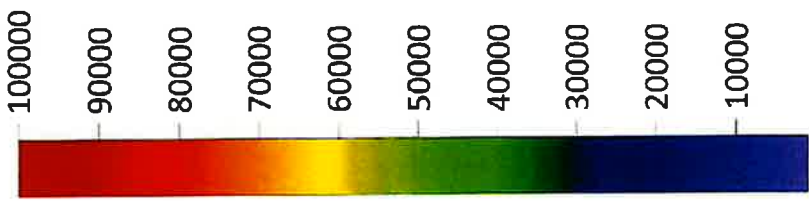
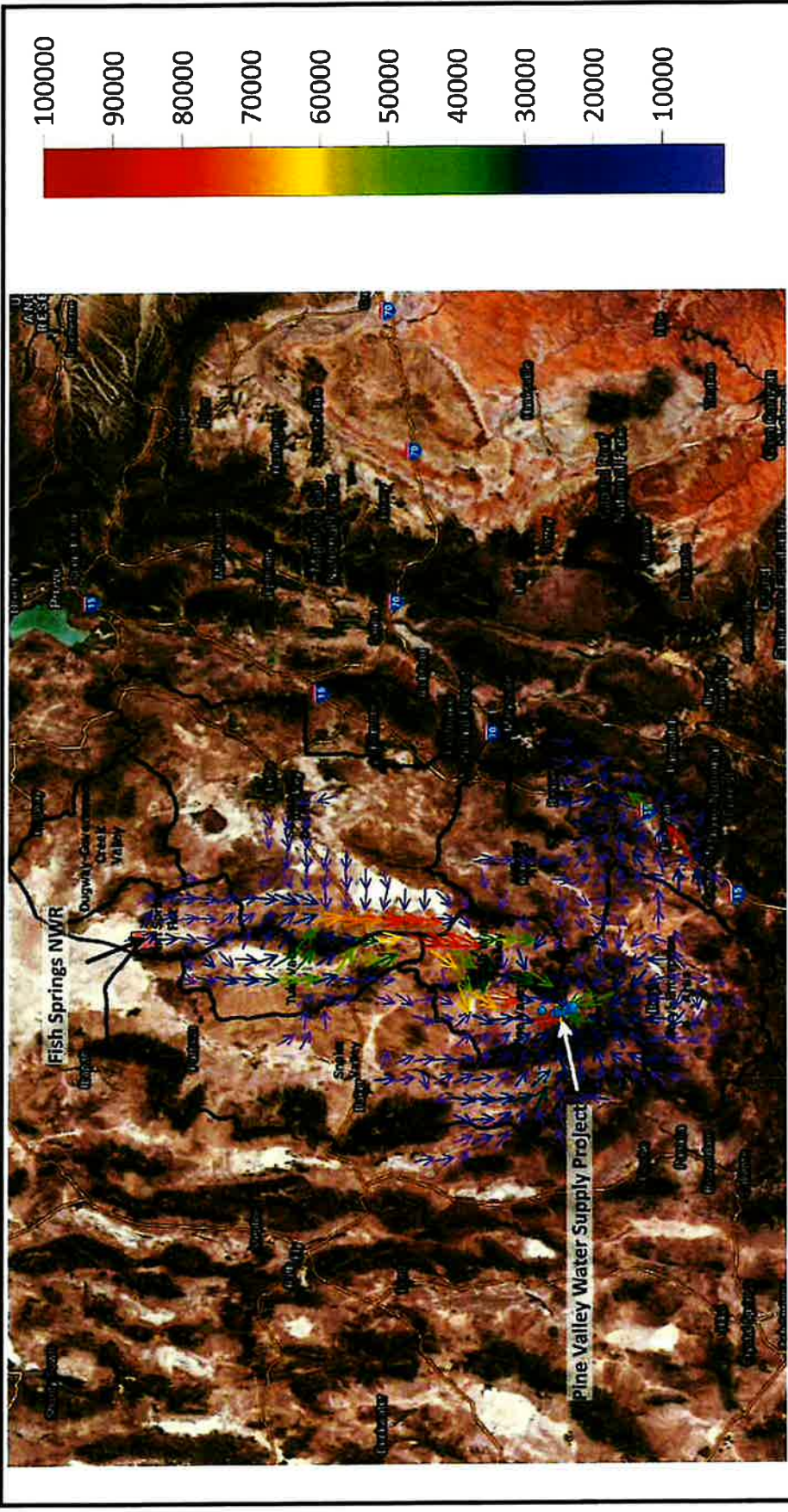
**CHANGE IN SUBSURFACE
UNDERFLOW - PINE VALLEY PUMPING**

Prepared for:

GREAT BASIN WATER NETWORK



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FLOW FIELD



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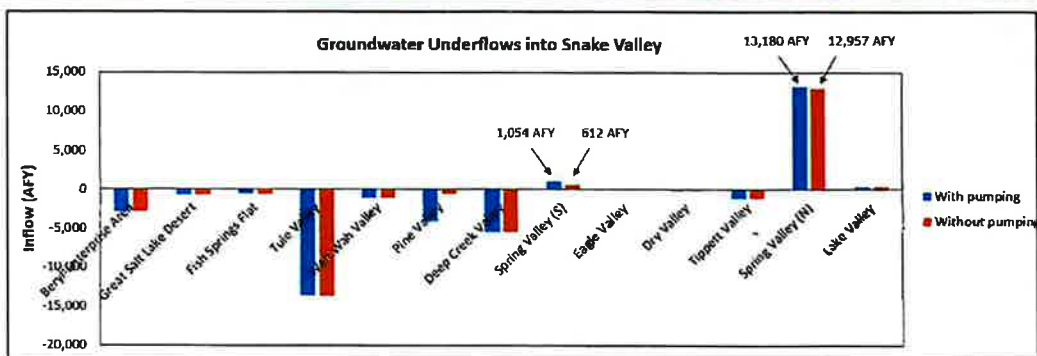
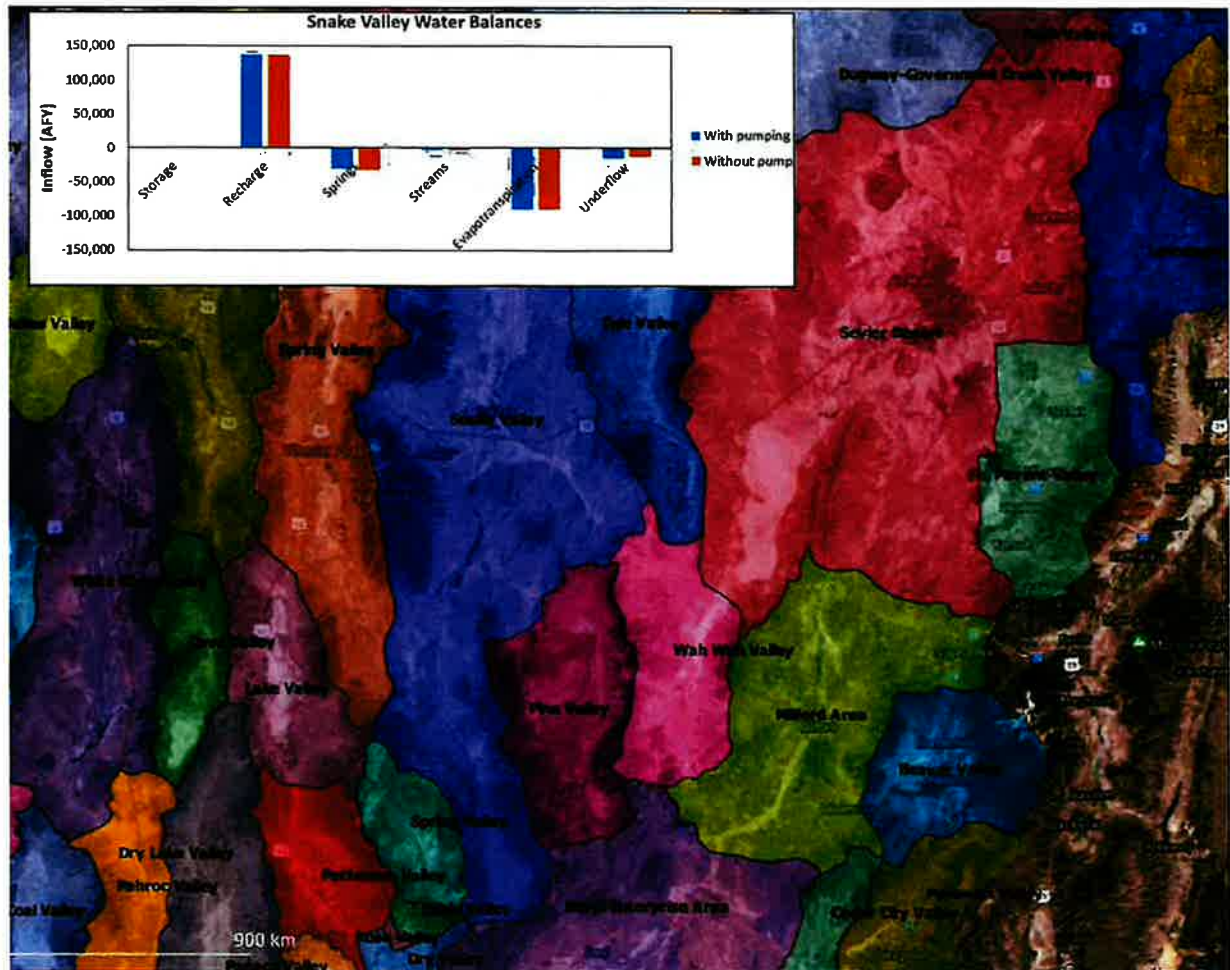
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FIGURE
8



Title:

SNAKE VALLEY WATER BUDGET - WITH AND WITHOUT PINE VALLEY PUMPING

Prepared for:

GREAT BASIN WATER NETWORK



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FIGURE

9

Table 1. Groundwater-level declines on Nevada and Utah groundwater basins due to future pumping in Pine and Wah Wah Valleys, Utah as predicted by USGS GBAACS Model (Brooks, 2017)

Basin/ Hydrographic Unit No.	Basin Name	County	Short-term Affects (1)	Long-term Effects (2)	Comments
181	Dry Lake Valley, Nevada	Lincoln	<1 ft of drawdown	Up to 4.9 ft of drawdown	Long-term effects along eastern margin of basin
183	Lake Valley, Nevada	Lincoln, White Pine	<1 ft of drawdown	1-49.9 ft of drawdown	Long-term effects - eastern third of basin with maximum drawdown along eastern margin of basin.
184	Spring Valley, Nevada	White Pine, Lincoln	<1 ft of drawdown	1-49.9 ft of drawdown	Long-term effects - southern portion of basin along margin with Snake Valley, maximum drawdown along eastern margin of basin.
188	Dry Valley, Nevada	Lincoln	<1 ft of drawdown	1 to 49.9 ft of drawdown	Up to 49.9 ft of drawdown most of basin, greater drawdown in northernmost corner of basin.
199	Rose Valley, Nevada	Lincoln	<1 ft of drawdown	5 to 49.9 ft of drawdown	Most of basin with greater drawdown to the north.
200	Eagle Valley, Nevada	Lincoln	<1 ft of drawdown	5 to 49.9 ft of drawdown	Throughout basin
201	Spring Valley, Nevada	Lincoln	<1 ft of drawdown	5 to 49.9 ft of drawdown	Up to 5 ft of drawdown through most of basin with greater drawdown to the eastern margin with Basin 201.
202	Patterson Valley, Nevada	Lincoln	<1 ft of drawdown	1 to 49.9 ft of drawdown	Northern and southeastern portions of basin.
203	Panaca Valley, Nevada	Lincoln	<1 ft of drawdown	Up to 4.9 ft of drawdown	Northeastern tip of basin.
204	Clover Valley, Nevada	Lincoln	<1 ft of drawdown	Up to 4.9 ft of drawdown	Short-term effect along eastern margin of Snake Valley (boundary with Pine Valley). Long-term effects southern half of basin.
254	Sinake & Hamlin Valleys, Nevada-Utah	Lincoln, White Pine, Iron, Beaver, Millard, Juab, Tooele	1-49.9 ft of drawdown	1-100 ft of drawdown	Maximum drawdowns at pumping center. Short-term drawdowns of 1 to 500 ft through most of basin; long-term drawdowns of 5 to 500 ft through most of valley.
255	Pine Valley, Utah	Iron, Beaver, Millard	Up to 1,000 ft of drawdown	Up to greater than 1,000 ft of drawdown	Throughout basin
256	Wah Wah Valley, Utah	Iron, Beaver, Millard	Up to 500 ft of drawdown	5 to 500 feet of drawdown	Short-term effect along southeastern portion of basin with greater margin at southernmost tip of basin, long-term effects throughout basin with 5 to 49 ft of drawdown in southern half of basin.
257	Tula Valley, Utah	Beaver	Up to 49 ft of drawdown	Up to 49 ft of drawdown	Long-term effects on southern tip of basin.
258	Fish Springs Flat, Utah	Juab, Tooele	<1 ft of drawdown	Up to 4.9 ft of drawdown	
280	Beryl-Enterprise Area, Utah	Iron	1 to 49.9 ft of drawdown	Up to 899 ft of drawdown	Short-term drawdown to the north, long-term drawdown throughout basin with maximums along northern border with Pine Valley (proximity to simulated pumping center)
281	Parowan Valley, Utah	Iron	5 to 49.9 ft of drawdown	5 to 49.9 ft of drawdown	Short-term drawdown from local pumping effects unrelated to Pine and Wah Wah Valley pumping, long-term drawdown stable as drawdown merges with drawdown from pumping in Pine and Wah Wah Valley.
282	Cedar City Valley, Utah	Iron	Up to 49.9 ft of drawdown	Up to 49.9 ft of drawdown	Short-term drawdown from local pumping, long-term drawdown deepens as drawdown merges with drawdown from pumping in Pine and Wah Wah Valley.
283	Beaver Valley, Utah	Beaver	Up to 49.9 ft of drawdown	Up to 49.9 ft of drawdown	Along southern margin of basin due to local pumping
284	Millford Area, Utah	Beaver	Up to 4.9 ft of drawdown	1 to 49.9 ft of drawdown	Short-term effects along northwestern border of basin; long-term effects across western third of basin with maximum drawdown along northwestern border.
287	Sawyer Desert, Utah	Millard	1 to 49.9 ft of drawdown	1 to 49.9 ft of drawdown	Short-term effects along western margin of basin with maximum drawdown along southwestern corner of basin; long-term effect across western third of basin.

TECHNICAL MEMORANDUM

To: Robert Pyles, Beaver County Board of Commissioners

From: Andy Zdon, P.G.; Roux Associates, Inc.

Date: March 8, 2022

Re: Comments regarding the Pine Valley Water Project DEIS and Associated Documents



This technical memorandum consisting of Draft Environmental Impact Statement (DEIS) comments related to the proposed Central Iron County Water Conservation District (CICWCD) Pine Valley Water Supply Project (Pine Valley Project) has been prepared by Roux Associates, Inc. (Roux) on behalf of the Beaver County Commissioners (Beaver County). In addition to the DEIS, the comments provided below are pertinent to the DEIS attachments that include the Groundwater Resources Impact Assessment (GRIA) and the Supplemental Analysis of Drawdown, Spring Flow Depletion and Wellfield Effects Assuming a Theoretical 200-Year Project Pumping Duration, Pine Valley Water Supply Project, Iron, Beaver and Millard Counties, Utah (SGRIA). During September 2021, Roux (2021) prepared a technical memorandum related to potential impacts of the proposed Pine Valley Project with a focus on Nevada. Due to the nature of the Pine Valley Project, the Roux technical memorandum from 2021 covered many of the issues also pertinent to the groundwater and ecological resources of Beaver County, Utah, and surrounding Utah counties. Therefore, for the purposes of these comments, a copy of that Roux, 2021 technical memorandum is attached for reference and serves as an addendum to these comments.

Roux's review has identified numerous technical issues that not only raise serious doubts concerning the reliability of the predicted effects of the project, but that also call into question the basic foundational soundness of the DEIS's analyses of the project's likely impacts – even leaving aside deficiencies in more granular technical details of the analysis of specific impacts. Therefore, the comments Roux is presenting herein, represent those issues foundational to the DEIS and its relied upon analyses, and that are recurring insufficiencies throughout those documents. The reviewer listed above is a Professional Geologist in the State of Utah and has more than 30 years of hydrogeological experience (C.V. attached). The following summarizes key insufficiencies related to the analyses presented in the DEIS:

1. Scope of the Analysis

The Central Iron County Water Conservation District (CICWCD) proposes to pump up to 15,000 acre-feet per year of groundwater from Pine Valley, the first phase of CICWCD's larger planned West Desert Water Supply and Conservation Project as presented on CICWCD's website and as shown in Figure 2 of the attached Roux technical memorandum. The Pine Valley Project is not a stand-alone project, but is the first phase of the proposed, multi-basin West Desert Water Supply and Conservation Project. This is confirmed on CICWCD's website. The West Desert Project area lies within the headwaters of the Great Salt Lake Desert Flow System (GSLDFS; for Pine and Snake/Hamlin Valleys), and in the case of Wah Valley, in the Sevier Lake Flow System. CICWCD has obtained groundwater rights in Pine Valley (15,000 acre-feet per year) and Wah Wah Valley (12,000 acre-feet per year). CICWCD currently has groundwater right applications for Hamlin

Valley (10,000 acre-feet per year), which it also intends to use as a component of the West Desert Project. Therefore, cumulatively, the West Desert Project would result in pumping of up to 37,000 acre-feet per year of groundwater withdrawals from the headwaters of the Great Salt Lake Desert flow system. (This accounts for approximately 18% of the total estimated annual groundwater recharge for the Great Salt Lake Desert flow system within Utah (based on Gates and Kruer, 1981) inclusive of Snake Valley in Utah.

However, the DEIS does not analyze the entirety of the envisaged West Desert project, only considering this first phase (Pine Valley Project) of a substantially larger groundwater-export project. The cumulative impact scenarios presented in the DEIS and associated SGRIA do not consider the effects of foreseeable future pumping in Wah Wah Valley (for which CICWCD holds groundwater rights) and in Hamlin Valley (for which CICWCD has applied for groundwater rights), leaving the only other source of additional groundwater impacts to be from the existing rural groundwater uses typical for this part of the basin and range (e.g., irrigation and domestic use). Additionally, based on our on-site visits, including to Snake Valley, much of the irrigation in the southern half of Snake Valley is captured spring discharge from such springs as Big Springs, Deardon Springs and others. Impacts to these springs, even slight, may result in the need for additional groundwater pumping to maintain land uses.

2. Lack of Access to Analytical Data

The foundation of groundwater impact analyses developed in the GRIA and the SGRIA, and relied upon in the DEIS, including not only the numerical modeling activities, but the justification for the new modeling activities, is the development of aquifer parameters resulting from the aquifer tests conducted in the Pine Valley and Wah Wah Valley proposed well fields. The lack of clarity as to how the additional pumping is simulated as described above, and confidence in the analysis, is largely the result of a lack of transparency regarding these aquifer data on which the analyses within the DEIS are derived. Despite a Freedom of Information Act request that was submitted for model files and aquifer test data related to the DEIS, none of those data and/or files has been provided by the BLM to date

The need to review the aquifer data including groundwater level and pumping rate data over time is a critical component of reviewing the technical analysis presented as part of the DEIS. For example, a presentation in Cedar City on April 25, 2019, by Barnett Intermountain Water Consulting (attached hereto) presented results of aquifer testing in Pine Valley on Slide 19 of the presentation. In that slide two graphs of aquifer data (aquifer test data were apparently made available to that consultant, but it is unclear whether they represent data from 2016-17 or more recent testing) indicated that there were issues related to maintaining constant discharge rates, and it appears that mid-way through the testing on Well #8, that pumping ceased for a time and then was restarted. Anomalous responses to pumping rates were present as well. There are no dates in on the graphs, so it is unclear if those data are from the test included in the Gardner, et.al. (2020) report or if they are the data from well tests presented in Appendix B of the GRIA. Of note is that the software printouts provided in Appendix B present values of storativity for data collected from pumping wells, although reliable estimates of storativity from drawdown data from the pumping well cannot be made. Deflections in drawdown (e.g., as seen in the output from pumping well CICWCD #7 in the GRIA) could be the result of a barrier or other condition. It could also be the effect of changing discharge rate. Absent the data, it is unclear which of these options could be at work, leaving substantial room for speculation as to the cause of these conditions and the meaning of the aquifer test results that have been the foundation for the groundwater

modeling and impact assessment. In other words, without this data, there is not adequate support in the record for the analyses presented in the GRIA and SGRIA.

In addition to the aquifer test data, a FOIA request for the groundwater flow model files was also filed with the U.S. Bureau of Land Management and the U.S. Geological Survey, but as of the date of this memorandum, those files also have not been received. The U.S. Geological Survey has published guidelines for the review of a groundwater flow model (Reilly and Harbaugh, 2004). It is our understanding that based on public comments, the U.S. Geological Survey has conducted a review of the modeling presented in the GRIA. However, to our knowledge the results of that review have not been released. Absent the model files, it is not possible to independently verify the characteristics of the model, its stability in running simulations, and to identify potential data input errors that can commonly occur.

The U.S. Geological Survey's Great Basin Carbonate and Alluvial Aquifer System (GBCAAS) model was used to run a scenario like the current Pine Valley Project scenario (Brooks, 2017). For this project, the refined Pine Valley model referred to as the GBCAAS-PV model (Formation, 2021a) results are substantially different in both results and presentation. Absent both the aquifer test data, and the groundwater flow model files, an independent review of that work is not publicly available currently.

3. Uncertainty

As described in the attached technical memorandum by Roux (2021), the broad expanse of the potentially affected geographic area that is represented by little or no hydrologic data collection and associated analyses leads to speculative conclusions regarding the extent of potential impacts and future management as described under the proposed adaptive management plan despite the numerical modeling conducted. Section 1.4.2 of the GRIA lists numerous bullets representative of areas of uncertainty and/or data gaps. Virtually all aspects of the conceptual flow model of the Pine Valley area qualifies as either a data gap or area of significant uncertainty. Despite this recognition of the need for additional data, and as presented in the recommendations for additional studies needed to develop an adaptive management plan, a more detailed groundwater flow model has been developed without adequate data, as reflected in the extensive uncertainties and unknowns acknowledged in the GRIA. When applied to the GRIA analyses, this leaves a large part of the analysis as speculative. It is our opinion that the additional studies needed to develop a more defined adaptive management strategy (i.e., monitoring, management, and mitigation) would also apply to the reliability of the GRIA and associated DEIS. The referenced necessity for greater understanding which would be gained from the additional recommended studies is indicative of the current lack of needed information that would be necessary to evaluate the anticipated groundwater/ecological impacts which the planned adaptive management is going to be developed to preclude.

4. Proximity to Springs

The proximity of the proposed Pine Valley Project to existing groundwater dependent environmental resources and human uses in neighboring Snake Valley (and the surrounding valleys) could result in lasting water resource impacts to those areas including reductions in spring flow and reduced evapotranspiration. However, the substantial uncertainties associated with these potential impact receptors represents a major data gap. Additionally, as presented in Formation's Groundwater Resource Impact Assessment (GRIA), many of those receptors fall out of the

arbitrarily defined limited project area, which does not include Fish Springs National Wildlife Refuge even though that refuge lies downgradient within the Great Salt Lake Desert flow system.

Gardner (2016) indicates that the Snake Valley groundwater system provides little groundwater contribution to discharge at Fish Springs. This leaves the Utah portion of the Great Salt Lake Desert Flow System as the ultimate source of discharge at these ecologically important springs in Fish Springs National Wildlife Refuge. As described earlier, the ultimate West Desert Project (of which Pine Valley Project is the first phase) would export a volume of water that represents a substantial portion of the estimated total Utah recharge to the Great Salt Lake Desert Flow System (as estimated by Gates and Kruer, 1981). Additionally, the last sentence of the second paragraph on Page 42 of the GRIA states that *"...the general groundwater flow direction in the vicinity of the Pine Valley HA is northward to discharge areas in the vicinity of Sevier Lake and Tule Valley, and from there (and surrounding valleys) northward to a discharge area near Fish Springs Flat."* The discharge area that goes unnamed is Fish Springs National Wildlife Refuge.

Given these connections and flow patterns, the removal of approximately one-third the total groundwater recharge of the contributing part of the Great Salt Lake Desert Flow System on an annual basis, by necessity, would result in a significant impact to the discharge from that system at Fish Springs National Wildlife Refuge. That inevitability illustrates the flaws in the cumulative impact analysis presented in the GRIA and the SGRIA and underscores the necessity of evaluating the hydrologic impacts of all three phases of the proposed West Desert Pipeline as part of one unified DEIS.

5. Scenario Timeframes

The GRIA and SGRIA make statements about impact scenario timeframes that are inaccurate and conflict with past reporting by the USGS and the Utah Department of Natural Resources. On Page 7 of the GRIA and Page 41 of the DEIS, the use of 200-year pumping scenarios is described as relying upon "assumptions and information that are unavailable or highly uncertain and therefore not essential to a reasoned choice among alternatives." Given the uncertainties described in Section 4 above, that statement would apply to the 50-year scenarios as well. Regardless, the USGS (Masbruch, Gardner, et.al., 2014) used up to 150-year pumping scenarios for describing long-term effects of pumping on springs in Snake Valley, Brooks (2017) presented scenarios that included 1,000 and 5,000-years (nearing steady-state conditions), and the Utah Department of Natural Resources, in their comments regarding potential pumping by the Southern Nevada Water Authority (Kirby and Hurlow, 2005) referenced steady-state model results by the USGS to describe potential impacts to water resources in Utah. In this case, the use of steady-state modeling results is akin to the use of the 5,000-year impact scenarios in Brooks (2017).

As shown, the GRIA (50-years of assumed pumping) and SGRIA (200 years of assumed pumping, primary alternative only) appear to avoid illustrating potential project impacts by including only arbitrarily limited scenario timeframes. Additionally, the uncertain information described in the bullets on Page 8 of the GRIA illustrating the uncertainties that make longer impact scenario timeframes uncertain apply to 50-year scenarios as well. Ultimately, a steady-state scenario that illustrates the state of the Great Salt Lake Desert Flow System when a new equilibrium condition is reached in the region as a response to pumping (both for the PVP and cumulatively for the entire West Desert Project in conjunction with other existing uses) would be by far the soundest basis for evaluating project effects.

6. Model Uncertainties

The Formation Model (2021a, b) inherits the uncertainties within the Great Basin Carbonate and Alluvial Aquifer System Model (Brooks, 2017) that include spatial variability of aquifer properties, presence of unsimulated faults, uncalibrated storage properties, and absence of data in large areas of the model. Further, refinements are based on limited new data in a small, specific area (only the proposed well fields). Adding to these deficiencies is the fact that the northern well field alternative is run based on updated aquifer data collected from the southern portion of Pine Valley (the proposed well field for the Primary Alternative). Therefore, the Northern Well Field Alternative is subject to additional uncertainty due to the general lack of aquifer information in that part of the valley.

7. Existing Uses in Beaver County and Neighboring Counties

The proposed Pine Valley Project and the groundwater rights that support it would limit, or eliminate, the potential for limited future water resource development within Beaver County which could otherwise benefit Beaver County's economy, and the economies surrounding Beaver County, particularly Millard and Juab Counties in Utah and White Pine County, Nevada.

Existing uses may be unaccounted for and likely would be impacted. For example, in Section 3.7.1, springs, ponds and lake descriptions and uses are described based on reporting by Stephens (1976). For a groundwater-export project of this magnitude, the failure to do the field work necessary to quantify existing uses in the potential area of impacts, not only in Pine Valley, but in valleys adjacent to Pine Valley, the other valleys targeted by the complete West Desert Project, and downgradient basins within the groundwater flow system, coupled with the reliance on nearly 50-year-old reporting of uses is insufficient. By way of comparison, as part of the Southern Nevada Water Authority proposal for groundwater exportation, detailed mapping of uses in each potentially impacted groundwater basin was conducted. In the context of the PVP and the West Desert Project, of which the PVP is only the first phase, it is necessary to employ the same level of diligence as was conducted by Southern Nevada Water Authority to properly understand current conditions and account for current uses and resources.

8. Data Deficiencies Related to Springs and other Groundwater- Dependent Ecosystems

Similarly, the spring analyses for the affected region (related to connectivity with basin fill aquifers) is incomplete and is limited to the Pine and Wah Wah Valley areas. Due to the limitations that have been arbitrarily placed on the study area as represented in Figure 3-7 of the GRIA, groundwater-dependent ecosystems in Sevier, Tule, and Fish Springs Flat basins (inclusive of Fish Springs National Wildlife Refuge) are not considered despite the statement of direct connectivity described in Section 3.8.4 of the GRIA. During 2015-16, the U.S. Bureau of Land Management funded a spring survey of the Mojave Desert region in response to increasing pressure on groundwater resources in that region, and the recognition that those pressures could only be expected to increase in the future, as described in Partner Engineering and Science, Inc., 2020 and Zdon and Love, 2020. In the West Desert of Utah, except for the limited subset of springs in the flow system evaluated by Gardner (2020), there is no evidence of a systematic field investigation of springs in the Great Salt Lake Desert flow system like those described in the references listed above. Absent such an effort and considering the substantial effect that the proposed Pine Valley Project, and to a larger extent the West Desert Water Project of which it is a part, would have on the Great Salt Lake Desert flow system, the BLM's analysis of potential spring impacts and impacts to groundwater dependent ecosystems is incomplete and inadequate.

9. Use of Adaptive Management to Address Pumping Impacts on Springs

Throughout the GRIA, and DEIS, a recurring theme is that given all the uncertainties, the only way to evaluate the connectivity of springs to PVP pumping is to move forward with the project and evaluate impacts when they occur through the adaptive management program. This approach is problematic, especially given that the adaptive management program currently is undefined, and due to the long time frames (potentially hundreds of years) between the time when a spring impact is observed, and the time when recovery may begin to take place due to a cessation of pumping. As a result of this lag in system response to cessation of pumping, impacts to groundwater-dependent ecosystems will be detected too late for mitigation to be protective of the ecosystem. See Bredehoeft, J.D., *Monitoring Regional Groundwater Extraction: The Problem, Ground Water* (2011). This also means that by the time monitoring detects drawdown, it may be too late to maintain existing irrigation practices in Snake Valley derived from springs (e.g., from Clay Spring, Big Springs, Deardon Springs). The absence of sufficient data collection and analyses to include a defined monitoring, management, and mitigation structure as part of the DEIS leaves groundwater-dependent ecosystems and their uses at substantial risk due to the PVP.

As an example, in the Amargosa River Basin of Nevada and California, impacts to springs as a response to regional groundwater pumping has been shown to occur slowly, sometimes not becoming apparent for tens of years, or more before an impact can be attributed to that pumping. For instance, at Chappo Spring (formerly known as Yeoman Spring), spring discharge has decreased from more than 100 gallons per minute during the 1920's (Thompson, 1929), to less than 10 gallons per minute (Partner Engineering and Science, Inc., 2020), and approaching one gallon per minute) under current conditions. Since there was not a formal monitoring program covering this spring, the year to year change in discharge was not noticeable. However, given a nearly 100-year period between the early U.S. Geological Survey work and later monitoring (e.g., in Partner Engineering & Science, 2020), the impacts to the spring are readily apparent.

As drawdown and groundwater capture will continue long after pumping ceases, groundwater management to avoid substantial impacts will be impracticable based on the existing analyses, as once pumping ceases it will not be possible to adjust groundwater management to ameliorate the expanding drawdown until the system reaches its own equilibrium. By the time impacts to a spring system are observed, either directly in reduced spring discharge as surface flow, or through stressed vegetation and a reduction in evapotranspiration, it will be too late to manage groundwater pumping in a manner that will be proactively beneficial to the spring, and the potential to eliminate surface flow in several springs in Snake Valley (such as those mentioned above) is real.

The effect of not identifying potential regional effects of proposed pumping could have other unintended consequences beyond specifically impacting the spring ecosystems. As depicted in Version 3.0 of the Great Basin Carbonate and Alluvial Aquifer Model (Brooks, 2017), the primary source of captured groundwater feeding groundwater recovery after pumping ceases in Pine Valley, is induced underflow from Snake Valley, and subsequently other basins such as Spring Valley, with additional induced underflow from Escalante Desert as a secondary source (Roux, 2021). As groundwater sourced in Snake Valley is discharged through spring flow, evapotranspiration, and human usage, induced underflow toward Pine Valley, or in other words, reversal of the current groundwater gradient, would reduce the available water in Snake Valley which currently is used in-valley by irrigators and groundwater-dependent environmental resources (Gardiner, 2016). Of greater concern is that much of the irrigated agriculture in Snake

Valley (particularly in southcentral parts of the valley) is fed by springs. Spring discharges are captured and stored in impoundments, then piped to many of the existing pivot irrigation systems. Slight changes to groundwater elevations could make this sustainable approach to irrigation (which has been in use for more than one hundred years) impossible, exacerbating the need for additional groundwater pumping in Snake Valley to maintain agricultural uses, causing a spiraling impact between groundwater conditions caused by both increased irrigation pumping and PVP pumping.

10. Environmental Impacts of Northern Wellfield

Roux is not convinced that the proposed Pine Valley Project will feasibly provide 15,000 acre-feet per year of groundwater for 50 years as the well field is currently designed, for the reasons described in the attached technical memorandum by Roux (2021). Beyond the feasibility question though, this raises the likelihood that the northern wellfield described in the DEIS would be needed to achieve the pumping volumes designated by CICWCD's groundwater rights in Pine Valley. Although the GRIA runs 50-year pumping and 200-year recovery scenarios relating to the potential impacts that would be caused by a northern wellfield, the greater uncertainties concerning aquifer conditions in the northern portion of Pine Valley lead to an even greater level of uncertainty than is associated with the primary alternative. In particular, the Northern Wellfield Alternative scenario is predicted to cause impacts to begin to occur at Wah Wah Springs within a few years of pumping being initiated (Page 115 of the GRIA).

Given the inherent uncertainties associated with the model in general, and the relatively rapid response to pumping at Wah Wah Spring, more detailed field investigation and numerical analyses would be needed in the northern portion of the valley to have confidence in evaluating the potential effects of this eventual likely scenario. A greater level of field investigations and analyses are needed to reduce the uncertainty currently inherent in the GBCAAS-PV model. Additionally, the scenario for the northern wellfield is not considered in the 200-year scenarios (SGRIA). Therefore, given that the Northern Wellfield Alternative did not receive a similar level of field investigation and analysis as was provided to the Primary Alternative, which is already been shown to be inadequately evaluated, it cannot be determined if the reliance upon a northern well field is viable, and the BLM cannot gain an understanding of the impacts that it would cause. Further, it is impossible to evaluate if the northern wellfield is a superior alternative (if it is an alternative or just a shift in management after project initiation) than the existing primary alternative which is the subject of the DEIS due to the substantially uncertainties described.

Finally, absent the data and files we have requested as described previously in this memorandum, the foundation of the analyses for the northern well field cannot be put to rigorous testing.

Recommendations for Reducing Uncertainty of the Analysis

To reduce the uncertainties associated with the underlying models, Roux recommends the following:

- Update and expand the area of springs, ponds, and lakes to be considered as part of this analysis inclusive of those areas in Snake Valley, Nevada that could be affected by the Pine Valley Project, and cumulatively, the West Desert Project;
- Update and expand the status of existing groundwater and spring-water uses in the area including those in Snake Valley, Nevada;

- Run steady-state scenarios using both Pine Valley Project and separately a cumulative West Desert Project scenario;
- Evaluate through expanded field investigation, testing and modeling, the hydrologic effects of a potential northern wellfield design;
- Reassess the study area boundary to evaluate changes to springs that now outside the existing model used in the GRIA;
- Assess the cumulative impacts of the West Desert Project;
- Re-evaluate the locations of monitoring wells to ensure that a sufficiently early warning will be provided to avoid impacts to groundwater-dependent ecosystems and other water rights holders inclusive of those in Nevada;
- Canvas the areas of both inside and beyond the existing study area boundaries to evaluate, and if feasible, execute, additional aquifer testing to reduce modeling uncertainties; and,
- Release existing and future aquifer test data and numerical modeling files to allow independent review and transparency of data quality and model performance.

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EXHIBIT B-10

Declaration of Great Basin Water Network
(Abigail C. Johnson, Board Member)

**DEPARTMENT OF THE INTERIOR
OFFICE OF HEARINGS AND APPEALS
INTERIOR BOARD OF LAND APPEALS**

**BEAVER COUNTY, UTAH; MILLARD
COUNTY, UTAH; JUAB COUNTY,
UTAH; WHITE PINE COUNTY,
NEVADA; CITY OF MILFORD, UTAH;
CENTRAL NEVADA REGIONAL
WATER AUTHORITY; NEVADA
GRAZING BOARD OF DISTRICT NO. 4;
GREAT BASIN WATER NETWORK;
MARK WINTCH; WAH WAH RANCH,
WALLACE PEAK WATER COMPANY,
WINTCH & COMPANY LLC; BARBARA
WINTCH; JOHN CARTER; LYLE
CARTER; DEAN EYRE; DUSTIN
KESLER; BRANDON YARDLEY; AND
GILBERT ("GIB") T. YARDLEY,**

Appellants,

v.

BUREAU OF LAND MANAGEMENT,

Respondent.

IBLA No. _____

**RE: PINE VALLEY WATER SUPPLY
PROJECT
DOI-BLM-UT-C010-2020-0012-EIS
(2026)**

DECLARATION OF ABIGAIL C. JOHNSON

GREAT BASIN WATER NETWORK

BOARD OF DIRECTORS MEMBER

I, ABIGAIL C. JOHNSON, declare as follows:

I. I have personal knowledge of each of the facts set forth below and, if called upon to do so, could and would testify regarding the following. This declaration is filed in support of

Beaver County, Utah, et al.'s *Notice of Appeal* and *Petition for Stay* in the above-captioned matter and in support of standing for Appellant Great Basin Water Network.

2. I submitted comments in my own name on the Bureau of Land Management's ("BLM's") 2022 Draft Environmental Impact Statement for the proposed Pine Valley Water Supply Project.

3. Great Basin Water Network also submitted extensive comments on the BLM's 2022 Draft EIS for the Proposed Project.

4. I own property and a home in Baker, Nevada, located in Snake Valley, which is hydrologically connected to Pine Valley, where Project wells will withdraw groundwater for the Pine Valley Water Supply Project. I have owned this property since 2004.

5. The landscape, including its groundwater dependent flora and fauna and the beauty of Great Basin National Park, is what drew me to purchase property and move part-time to Snake Valley.

6. As a part-time resident of Baker, Nevada, I have driven through southern Snake Valley and Pine Valley on numerous occasions and expect to continue doing so in the future. These valleys are characteristic of the Basin-and-Range region, defined by expansive alluvial basins, broad valley floors, and surrounding mountain ranges that create a striking, open landscape largely free from development. From the road, I regularly observe the valleys' wide, unobstructed views, native vegetation, and overall undeveloped and natural condition. The scale, openness, and intact character of these valleys are unique and remarkable.

7. My Baker property is within the service boundary and is served by the Baker Water and Sewer General Improvement District ("GID").

8. I also have owned two parcels of land at the west end of Winnemucca Street since 2005, which lots are eligible for hookup to the GID.

9. As a part-time resident of Baker since 2004, I have depended on, appreciated, and enjoyed the availability of domestic water for my residential needs provided by the Baker Water and Sewer General Improvement District.
10. The GID's water source is the aquifer beneath the Kious basin, located south and slightly west of the Baker Townsite where a water storage tank is erected.
11. The system presently serves approximately one hundred four (104) residential and commercial hookups for water service including the downtown Great Basin National Park Visitors Center, employee housing, and local businesses.
12. Provision of water for domestic and commercial use is essential to the residents of Baker and to the many GBWN visitors and tourists who depend on the town of Baker's businesses for food and lodging.
13. It is my understanding based on review of publicly-available data and materials and from conversations with Baker residents that groundwater levels and spring flows in Baker and in many parts of Snake Valley already are in decline as a result of current local groundwater pumping.
14. It is also my understanding based on review of the conclusions contained in available reports that USGS groundwater modeling and groundwater modeling prepared by Beaver County, Utah's consultants confirms that pumping from the Pine and Wah Wah Valleys as proposed by the Central Iron County Water Conservancy District will result in groundwater table drawdowns in Snake Valley, which groundwater drawdowns would impact southern Snake Valley in the near term and eventually would expand north, especially if the Pine Valley applications are pumped from the Northern Wellfield. *See A. Zdon, Roux Associates, Groundwater impacts of the proposed Pine Valley Water Supply Project, Utah on Nevada*

groundwater basins with a Focus on Snake Valley, Nevada & Utah, Table 1 (Sept. 20, 2021), appended hereto and submitted to the BLM as Exhibit B to GBWN's March 11, 2022, Pine Valley Water Supply Project DEIS comments. Water resources in Great Basin National Park, which extends to the south from Baker along the west edge of Snake Valley, also could be put at risk.

15. Based on my review of parts of the hydrology reports prepared by CICWCD for the EIS as well as those prepared by USGS and Great Basin Water Network hydrologists, and based on conversations with GBWN staff, there is substantial uncertainty regarding the geographic scope and severity of groundwater impacts from the Project, and that uncertainty is amplified by a series of limiting modeling choices made by CICWCD's consultants that collectively downplay potential effects. In particular, the EIS analysis models only fifty years of pumping, even though the Project relies on permanent water rights that would reasonably be expected to be exercised for as long as water is available. The EIS also evaluates only a portion of the total pumping contemplated under the larger West Desert Pipeline Project, some of which would be pumped from Hamlin Valley, which is essentially an extension of Snake Valley to the south. Finally, it relies on a southern wellfield configuration in Pine Valley that does not reflect other reasonably foreseeable pumping locations. Each of these assumptions independently constrains the modeled area and magnitude of impacts, and together they significantly limit the model's ability to capture the full extent of drawdown and interbasin effects.

16. In addition, the model predictions themselves are highly uncertain, as reflected in the 2017 USGS Great Basin Carbonate and Alluvial Aquifer System 3.0 parent model report, and that uncertainty is further compounded by internal inconsistencies in the modeling of groundwater and spring discharge described in Appendix D to the December 2025 Groundwater

Resources Impact Assessment prepared by CICWCD consultants for the EIS. These types of mismatches can mask or minimize the appearance of drawdown effects in the model. At the same time, areas near Baker, Nevada, including groundwater systems that support Great Basin National Park, are excluded from the predicted zone of impact based on those same model outputs. Given the constraints and assumptions built into the analysis, I do not have confidence that the model reliably identifies the full geographic extent of potential impacts.

17. As a part-time resident of Baker, Nevada, I care deeply about the water resources, springs, and groundwater-dependent ecosystems that support Great Basin National Park and the surrounding community. In light of the limitations described above, I am concerned that the Project's impacts to the connected groundwater system may be more extensive than disclosed and have not been fully or accurately evaluated. Any resulting groundwater drawdown would directly affect residential water supplies in the Baker area, diminish property values, and harm the ecosystems that sustain the Park's unique environment and visitor experience.

18. Such impacts would also threaten Baker's local economy, which depends on ranching and tourism associated with Great Basin National Park, as well as the continued viability of local businesses and the character of the community itself. All of these impacts would directly threaten the way of life in Baker and in surrounding Snake Valley communities.

19. However, the Project's Groundwater Resources Impact Assessment excludes Baker from the area of predicted impacts. Formation Environmental, Final Groundwater Resources Impact Assessment, at 81 (Dec. 2025). This failure to consider impacts is concerning to me and puts my property at risk. This is especially troubling considering that the full planned West Desert Pipeline Project would include more than twice the pumping modeled by Central Iron County Water Conservancy District consultants.

20. Any such groundwater drawdowns could eventually impact the residential water supply in Baker, my property value, and Snake Valley's groundwater-dependent ecosystems.
21. Similarly, additional Project-related groundwater drawdown and spring impacts could eventually threaten Baker's local economy, which is based on ranching and tourism associated with Great Basin National Park, could threaten the continued existence of businesses, and could threaten the character of Baker itself.
22. All of these impacts could also eventually threaten the way of life in Baker and the very existence of the town itself.
23. In addition to being a part-time resident of Snake Valley, I am also a board member of Great Basin Water Network ("GBWN"), a 501(c)(3) non-profit organization based in Baker, Nevada, whose interests and work stand to be impacted by the Proposed Project.
24. I am a founding member of Great Basin Water Network and have served on its board of directors since the organization's inception in 2005.
25. In 2012, I became president of the GBWN board of directors and coordinator of the all-volunteer group.
26. In 2019, GBWN hired a full-time executive director who assumed coordinating duties.
27. In or about 2023, I stepped down as president of the GBWN board of directors, but continued to serve on the board.
28. The Great Basin Water Network was formed to protect the water resources of the Great Basin for residents, animals and plants.
29. GBWN works to ensure that decisions regarding water-resource management are made in a transparent fashion, comply with applicable law, are in the public interest, and are grounded in the best available science.

30. As more people populate the Great Basin, water providers are expanding use of ground and surface water resources. This has created a climate for water exploitation threatening the balance between the human and natural environment.
31. GBWN was founded specifically in response to concerns about the Southern Nevada Water Authority's ("SNWA's") ambitious proposal to pump large quantities of groundwater from eastern Nevada, including Snake Valley where Baker, the home to Great Basin National Park, is located, with predicted impacts extending into Utah.
32. We correctly understood that SNWA's project would have devastating effects on the communities, ecology, and economy of the area including agriculture and tourism.
33. In addition to pursuing legal challenges to unsound water-management decisions, GBWN engages in legislative advocacy in Nevada and Utah to promote water-management policies that are consistent with the public interest and the sustainable use of water resources.
34. GBWN has been substantially involved in monitoring the activities of numerous government agencies for over 20 years,
35. The organization also works to build coalitions among diverse interests and across political lines, and provides support to individuals, businesses, and local governments that may be affected by proposed unsustainable water-development projects.
36. GBWN also works to inform, educate, and counsel the public regarding water use and management issues, policies, and laws in the Great Basin, conducting extensive public education and outreach regarding water management in Nevada and Utah.
37. As part of this work, the organization commissions hydrologic and economic research, analyzes water development proposals and proposed water management policies, obtains and

analyzes public records related to water-management decision making, and disseminates that information to the public.

38. GBWN communicates regularly with its supporters through a printed newsletter and electronic updates. GBWN sends its regular newsletter to roughly 850 subscribers, which newsletter includes information on the proposed Pine Valley Water Supply Project, and GBWN regularly posts information it obtains on its website, Facebook page, and X account.

39. GBWN also attends public forums to disseminate information and runs public information advertisements in local newspapers.

40. One of GBWN's central roles at its founding, in response to the Southern Nevada Water Authority's proposed groundwater export project, was to secure legal representation not only for the organization but also for the hundreds of local residents, businesses, and local governmental entities, "protestants," who formally opposed the SNWA's water-right applications before the Nevada State Engineer.

41. As founders and board members, we established GBWN as a nonprofit to represent and support these individuals and entities, particularly in the Nevada State Engineer proceedings and related litigation.

42. GBWN also was a party to the federal NEPA lawsuit which successfully challenged the BLM's decision to grant the Right of Way for the Southern Nevada Water Authority's proposed groundwater water development and export project.

43. Importantly, GBWN's work in connection with the Southern Nevada Water Authority's proposed project also contributed to significant advancements in water conservation in southern Nevada. As a result, the Las Vegas Valley, once cited as an example of water overuse, is now

widely recognized for its conservation efforts and comparatively low per-capita water consumption, leading similarly situated western cities.

44. GBWN's advocacy, including related state and federal litigation, played a meaningful role in driving these innovations.

45. Much of GBWN's work focuses on promoting effective water conservation programs, including using economic incentives to encourage water-smart practices. This approach avoids relying on costly, multi-million-dollar projects that would burden urban taxpayers and put rural communities at risk.

46. Like the Southern Nevada Water Authority's per capita water use at the time its groundwater mining and export project was proposed, Cedar City currently maintains per-capita water use levels that substantially exceed those of comparable western cities.

47. Consistent with its prior work, GBWN advocates for improved water conservation in Cedar City, and GBWN's opposition to the proposed Pine Valley Water Supply Project is intended, in part, to encourage advancements in water conservation.

48. As such GBWN's opposition to the Project is a vital component of GBWN's work to advocate for sustainable water-management practices and advancements in water conservation.

49. In other words, BLM's approval of the Project's Right of Way following a four year pause in the NEPA process during which the public was shut out, directly undermines the work GBWN does to advocate for transparent decision making, responsible water management, and improvements in municipal water conservation by removing any incentive on the part of the project proponent, the Central Iron County Water Conservancy District, to implement readily available measures designed to reduce its per capita water use and eliminate the purported need for its groundwater mining project.

50. Finally, approval of the Project's Right of Way will result in a need to engage in robust efforts to advocate for the protection of water resources and groundwater dependent resources that stand to be impacted by the Project in Pine Valley and in hydrologically connected basins through advocacy, analysis, and dissemination of information related to ensuring that impacts are avoided or mitigated.

51. Similarly, approval of the Project will result in the need to increase efforts to educate and advocate for advancements in water conservation in Cedar City, both locally and at the legislative level and will similarly result in the need to engage in litigation.

52. As a result of the additional work necessitated by BLM's grant of the Project's Right of Way, GBWN will suffer financial harm by being required to expend substantially increased resources to work with impacted water rights owners and communities to address and respond to those impacts and to increase efforts to advocate for responsible water management.

53. When the Southern Nevada Water Authority withdrew its applications and Right of Way requests for its groundwater development project in 2020, GBWN succeeded in fulfilling its mission of advocating for sustainable water management and improved conservation measures.

54. After 31 years, the water grab was finally defeated and the cloud over Snake Valley and neighboring hydrologically connected valleys lifted.

55. It was a prolonged and grueling effort substantially by our volunteer board, extended network, community leaders and residents, and supporters near and far.

56. And now, the Pine Valley Water Supply Project threatens the same resources in Snake Valley, on both sides of the Utah Nevada border, and thus threatens the progress that GBWN achieved on behalf of itself, and on behalf of its constituents, stakeholders, communities, and

businesses when SNWA announced in 2020 that it would withdraw its state-based project water right applications and federal Right of Way.

57. Because the Pine Valley Water Supply Project is a threat to those same groundwater dependent ecosystems, water rights, ranching operations, and essential parts of rural existence, the resources and interests GBWN works to protect and advocate for, and because the grant of the Project Right of Way by the BLM undermines GBWN's work advocating for sound water management and advancements in municipal conservation and per capita water use, the BLM's Record of Decision granting the Right of Way for the Project directly impacts and threatens GBWN's interests and work.

58. GBWN is motivated to engage at all levels of review on the Pine Valley Water Supply Project to protect the progress that GBWN has made and to ensure that our constituency of supporters who look to GBWN for leadership and information on water matters that affect their daily lives, are represented fully.

59. My injuries and harms as well as those to GBWN discussed herein will be remedied by a decision to stay, remand, and set-aside BLM's Pine Valley Water Supply Project Record of Decision because the surface disturbances and groundwater pumping activities authorized therein would not be able to occur.

Pursuant to 28 U.S.C. § 1746, I declare, under penalty of perjury, that the foregoing is true and correct.

DATED: 3/31/2026



Abigail C. Johnson

A. Zdon, Roux Associates, *Groundwater impacts of the proposed Pine Valley Water Supply Project, Utah on Nevada groundwater basins with a Focus on Snake Valley, Nevada & Utah*, Table 1 (Sept. 20, 2021).

Table 1. Groundwater-level declines on Nevada and Utah groundwater basins due to future pumping in Pine and Wah Wah Valleys, Utah as predicted by USGS GBAACS Model (Brooks, 2017).

Basin/ Hydrographic Unit No.	Basin Name	County	Short-term Affects (1)	Long-term Effects (2)	Comments
181	Dry Lake Valley, Nevada	Lincoln	<1 ft of drawdown	Up to 4.9 ft of drawdown	Long-term effects along eastern margin of basin.
183	Lake Valley, Nevada	Lincoln, White Pine	<1 ft of drawdown	1-43.9 ft of drawdown	Long-term effects - east/south end of basin with maximum drawdown along eastern margin of basin.
184	Spring Valley, Nevada	White Pine, Lincoln	<1 ft of drawdown	1-43.9 ft of drawdown	Long-term effects - southern portion of basin along margin with Snake Valley; maximum drawdown along eastern margin of basin.
188	Dry Valley, Nevada	Lincoln	<1 ft of drawdown	1 to 43.9 ft of drawdown	Up to 46.9 ft of drawdown most of basin; greater drawdown in northernmost corner of basin.
199	Rose Valley, Nevada	Lincoln	<1 ft of drawdown	5 to 43.9 ft of drawdown	Most of basin with greater drawdown to the north.
200	Eagle Valley, Nevada	Lincoln	<1 ft of drawdown	5 to 43.9 ft of drawdown	Throughout basin.
201	Spring Valley, Nevada	Lincoln	<1 ft of drawdown	5 to 43.9 ft of drawdown	Throughout basin.
202	Paderon Valley, Nevada	Lincoln	<1 ft of drawdown	1 to 43.9 ft of drawdown	Up to 5 ft of drawdown through most of basin with greater drawdown to the eastern margin with Basin 201.
203	Parasa Valley, Nevada	Lincoln	<1 ft of drawdown	Up to 4.9 ft of drawdown	Northern and southeastern portions of basin.
204	Claver Valley, Nevada	Lincoln	<1 ft of drawdown	Up to 4.9 ft of drawdown	Northeastern tip of basin.
254	SNAKE & HARTIN VALLEYS, Nevada-Utah	Lincoln, White Pine, Iron, Beaver, Milard, Juab, Tooele	1-43.9 ft of drawdown	1-100 ft of drawdown	Short-term effect along eastern margin of Snake Valley (boundary with Pine Valley); Long-term effects southern half of basin.
255	Pine Valley, Utah	Iron, Beaver, Milard	Up to 1,000 ft of drawdown	Up to greater than 1,000 ft of drawdown	Maximum drawdowns at pumping center; short-term drawdowns of 1 to 500 ft through most of basin; long-term drawdowns of 5 to 500 ft through most of valley.
256	Wah Wah Valley, Utah	Iron, Beaver, Milard	Up to 500 ft of drawdown	5 to 500 feet of drawdown	Throughout basin.
257	Tule Valley, Utah	Beaver	Up to 43 ft of drawdown	Up to 43 ft of drawdown	Short-term effect along southeastern portion of basin with greater margin at southernmost tip of basin; long-term effects throughout basin with 5 to 43 ft of drawdown in southern half of basin.
258	Fish Springs Flat, Utah	Juab, Tooele	<1 ft of drawdown	Up to 4.9 ft of drawdown	Long-term effects on southern tip of basin.
259	Beryl-Enterprise Area, Utah	Iron	1 to 43.9 ft of drawdown	Up to 500 ft of drawdown	Short-term drawdown to the north; long-term drawdown throughout basin with maximums along northern border with Pine Valley (proximity to simulated pumping center); short-term drawdown north side of pumping effects unrelated to Pine and Wah Wah Valley pumping; long-term drawdown stable as drawdown merges with drawdown from pumping in Pine and Wah Wah Valley.
261	Farwell Valley, Utah	Iron	5 to 43.9 ft of drawdown	5 to 43.9 ft of drawdown	Short-term drawdown north side of pumping effects unrelated to Pine and Wah Wah Valley pumping; long-term drawdown deepens as drawdown merges with drawdown from pumping in Pine and Wah Wah Valley.
262	Cedar City Valley, Utah	Iron	Up to 43.9 ft of drawdown	Up to 43.9 ft of drawdown	Short-term drawdown north side of pumping effects unrelated to Pine and Wah Wah Valley pumping; long-term drawdown deepens as drawdown merges with drawdown from pumping in Pine and Wah Wah Valley.
263	Beaver Valley, Utah	Beaver	Up to 43.9 ft of drawdown	Up to 43.9 ft of drawdown	Along southern margin of basin due to local pumping.
264	Milard Area, Utah	Beaver	Up to 4.9 ft of drawdown	1 to 43.9 ft of drawdown	Short-term effects along northwestern border of basin; long-term effects across western third of basin with maximum drawdown along northwestern border.
267	Sevier Desert, Utah	Milard	1 to 43.9 ft of drawdown	1 to 43.9 ft of drawdown	Short-term effects along western margin of basin with maximum drawdown along southwestern corner of basin; long-term effect across western third of basin.

EXHIBIT B-11

Declaration of Great Basin Water Network
(Kyle Roerink, Executive Director)

**DEPARTMENT OF THE INTERIOR
OFFICE OF HEARINGS AND APPEALS
INTERIOR BOARD OF LAND APPEALS**

BEAVER COUNTY, UTAH; MILLARD COUNTY, UTAH; JUAB COUNTY, UTAH; WHITE PINE COUNTY, NEVADA; CITY OF MILFORD, UTAH; CENTRAL NEVADA REGIONAL WATER AUTHORITY; NEVADA GRAZING BOARD OF DISTRICT NO. 4; GREAT BASIN WATER NETWORK; MARK WINTCH; WAH WAH RANCH, WALLACE PEAK WATER COMPANY, WINTCH & COMPANY LLC; BARBARA WINTCH; JOHN CARTER; LYLE CARTER; DEAN EYRE; DUSTIN KESLER; BRANDON YARDLEY; AND GILBERT (“GIB”) T. YARDLEY;

Appellants,

v.

BUREAU OF LAND MANAGEMENT,

Respondent.

IBLA No. _____

RE: PINE VALLEY WATER SUPPLY
PROJECT
DOI-BLM-UT-C010-2020-0012-EIS
(2026)

DECLARATION OF KYLE ROERINK

EXECUTIVE DIRECTOR

GREAT BASIN WATER NETWORK

I, KYLE ROERINK, hereby declare as follows:

1. I have personal knowledge of the facts set forth in this declaration. If called as a witness, I could and would competently testify to these facts. As to matters that reflect an opinion, they reflect my personal opinion and judgment on the matter.

2. This declaration is filed in support of Beaver County, et al.'s ("County and Community Appellants'") *Notice of Appeal* and *Petition for Stay* in the above-captioned matter and in support of standing for Appellant Great Basin Water Network.
3. I live in Reno, Nevada. I have been the Executive Director of the Great Basin Water Network ("GBWN") since 2018.
4. I submit this declaration based on my professional work and personal experience in the Great Basin, including Pine Valley, and to describe my connection to Pine Valley, GBWN's work in the Great Basin and on the Pine Valley Water Supply Project, and the concrete ways in which the Project would harm GBWN, its members, and the communities and resources we work to protect.
5. I drafted and submitted Great Basin Water Network's comments on the BLM's 2022 Draft Environmental Impact Statement for the Pine Valley Water Supply Project and also worked with our subcontractors who prepared the technical reports attached to those comments.
6. GBWN's mission is to promote responsible water management and protect locally sustainable water uses, natural resources, and the public interest throughout the Great Basin through research, education, advocacy, and litigation. In carrying out that mission, GBWN represents the values and rights of its members and supporters, including by advocating for ratepayer and taxpayer protections, water conservation policies, and the rights of native and non-native communities. We seek reasonable water conservation policies that respect existing water rights users and the overall public interest. Finally, we believe that decisions related to water management should occur in a transparent fashion, without undue developer influence, and consistent with law and science. Consistent with this mission, our coalition members have assembled and paid for hydrologic reviews, assessments, and analysis from licensed

professionals with decades of groundwater experience. We have reviewed relevant scientific literature. We have paid for legal experts who know the law.

7. As Executive Director of GBWN, I focus on groundwater and surface water policy issues across the Great Basin, including Utah's West Desert and, more specifically, Pine Valley, Snake Valley, Hamlin Valley, and Wah Wah Valley. In this role, I work closely with attorneys, hydrologists, policy professionals, government officials, private businesses, water users, and grassroots advocates to assess water scarcity, develop practical policy solutions, advocate for responsible water management, and support our members throughout the Great Basin and the Colorado River Basin.

8. GBWN's work is grounded in, and its effectiveness stems from, close collaboration with a broad coalition of stakeholders who care deeply about water. This coalition-building approach is the foundation of our work, bringing together local governmental entities, tribes, citizen groups, water users, local businesses, and individuals from all walks of life to advocate collectively for a sustainable water future in the Great Basin.

9. GBWN takes a unique approach among conservation organizations, believing that, for better or for worse, the doctrine of prior appropriation is the law of the land — not something that can just be thrown away because it is unfavorable in a given context. As an organization bound by laws, we believe the principles of Prior Appropriation should be upheld until lawmakers undo them. When powerful development interests want to change or ignore the rules of the game, we take umbrage.

10. For decades we have worked to understand regional impacts of unsustainable water development proposals over time, building relationships with those who are concerned about short, medium, and long-term water availability. GBWN is deeply engaged in issues of water

management across the Great Basin, including proposals such as the Pine Valley Water Supply Project.

11. As Executive Director of GBWN, I personally have been working on matters in Pine Valley since 2020. The groundwater resources of Utah's West Desert and Pine Valley are of particular interest to me and to GBWN, as they hold both present-day and historical significance and are critical resources for human communities that depend on them as well as the flora and fauna that exist and thrive there.

12. With this project, the Central Iron County Water Conservancy District ("CICWCD") seeks to develop and export "paper water" that does not exist, according to U.S. Geological Survey data. In practice, this is an effort to authorize irresponsible and unsustainable groundwater mining from a system that lacks sufficient recharge to sustain the proposed pumping, placing connected basins, ecosystems, and existing water users at serious risk of long-term depletion and damage. Reports prepared for GBWN and additional reports submitted to the BLM in response to the DEIS and FEIS, including but not limited to reports prepared by the former U.S. Geological Survey scientist who developed the original groundwater modeling for the area, which I have reviewed and submitted to the BLM's NEPA record for the Project, conclude that the modeling CICWCD paid its consultants to prepare in support of the Project's EIS lacks the scientific integrity necessary to reliably demonstrate the availability of the groundwater the Project would pump and further underpredict the Project's likely impacts in a manner that places the communities and groundwater-dependent ecosystems that rely on that water at risk. The substantial uncertainty, inconsistencies, and flawed assumptions that plague the Pine Valley hydrology work conducted by CICWCD's consultants, combined with the decision to limit the modeling effort to an unlikely 50-year pumping scenario undermines the

scientific integrity of the EIS and obscures the true impacts the project will have on the areas that GBWN works to protect. *See* Beaver County, Utah, et al. *Notice of Appeal and Petition for Stay*, Exhibit C (Brooks Technical Reports).

13. And perhaps most importantly, as confirmed by materials submitted to the BLM by GBWN and Beaver County during the NEPA process for the Project, the project CICWCD actually intends to construct and pump would involve more than twice the amount of water it has analyzed for the Pine Valley Water Supply Project EIS, which necessarily would involve substantially greater impacts, particularly to GBWN members in Snake Valley.

14. It is also my understanding based on review of materials submitted to the BLM during the EIS process and based on consultations with experts in the hydrology of the area, that the project, either in the form of the Pine Valley Water Supply Project or the larger planned West Desert Project, will likely cause impacts to the groundwater system that cannot be effectively mitigated, including impacts to the water table and to the human communities, as well as plant and wildlife habitat, that depend on it.

15. The EIS falls short of the level of careful, informed, science-based decisionmaking that GBWN is committed to promoting, thereby undermining GBWN's mission and work and causing significant harm to the organization. The BLM's decision to grant a right of way to CICWCD for the Project similarly will result in extreme harm to GBWN members, many of whom depend on senior water rights which will be impaired by the Project's groundwater pumping.

16. As the Executive Director of GBWN, I have partnered on developing hydrologic reports, economic reports, films, and other means of informing ourselves and members of the public

about the resources at stake and the threat the Pine Valley Water Supply Project poses to those resources.

17. Our organization has invested considerable sums of money to research the science, develop relationships, and educate the public about the direct and indirect costs of the Pine Valley Water Supply Project as well as its more sustainable responsible alternatives.

18. GBWN has also spent years working with local leaders and community members with connections to Pine Valley. I have traveled far and wide to make connections with County Commissions, City Councils, advisory committees, business owners, tribal governments, and concerned citizens in regard to Pine Valley. We have worked in all branches of government to do what we and our members believe will best preserve the integrity of the region's groundwater resources and best protect those who depend on them. We have spent considerable sums of money to do this work. And it is worth every penny. It takes time and effort to educate people about groundwater.

19. GBWN's leadership and membership include individuals and communities with longstanding ties to Pine Valley and a direct stake in the water resources that stand to be impacted by the project. *See* GBWN Declarations of Tom Baker, Mark Whitney, Abigail C. Johnson, and Annette Garland. GBWN's leadership includes the chairwoman of the Indian Peaks Band of the Paiute Tribe of Utah. We have done extensive research and analysis of the Band's rights and histories in Pine Valley. Our membership includes individuals with water-dependent businesses and deep ties to Pine Valley, Wah Wah Valley, and the Great Salt Lake Desert. My relationships with these folks are invaluable and are built on many years of engagement and mutual trust. I have a deep gratitude and respect for them. When I am in Pine Valley, I think of them often.

20. Since its inception, GBWN has also worked closely with counties and other local governmental entities that would be affected by projects such as the Pine Valley Water Supply Project. That collaboration has deep roots in the collective response to the Southern Nevada Water Authority's proposed groundwater export project, where White Pine, Millard, Juab, and other counties—along with Tribal communities—worked in concert with GBWN to protect shared water resources. GBWN partnered with White Pine County in that litigation, Millard and Juab Counties were directly involved in proceedings in Nevada state court, and Beaver County supported the efforts to stop that project.

21. I am intimately familiar with this area of the Great Basin. I know where the springs and small amounts of surface water exist. I have walked the land with ranchers and hydrologists. I have spent time with tribal leaders and elders on their traditional homelands. I have worked closely with county commissioners and other elected leaders. I have given tours to reporters and concerned citizens.

22. My relationship to Pine Valley includes my work, aesthetic and spiritual pleasures, and community-based connections. I have traveled through the valley countless times and plan to return for as long as I live. Pine Valley is not overtly in the public eye. Pine Valley is a place to find peace. The valley serves as an emblem of Great Basin topography, hydrology, geology, botany, biology, and history. From the floor of Pine Valley, the Mountain Home Range sits to the west. In the distance are Mt. Wheeler and the Snake Range, which encompass Great Basin National Park. To the North are Crystal Peak, the Tunnel Springs Mountains, the Burbank Hills, and, in the distance, the Confusion Range. To the East are the Wah Wah Mountains and to the South are the Indian Peaks Range and, ultimately, the Escalante Desert. The valley floor helps put places like Great Basin National Park and the Escalante Desert in perspective.

23. Water from those mountains and its connected aquifer systems makes its way into Pine Valley where, from there, it goes in many directions. The water might be snowpack and runoff, but it's also fossil waters from the Pleistocene and Holocene. Hydrologists call those waters "carbonate" because of the limestone and other geologic formations they pass through. Because of GBWN's history, the connectivity between Pine Valley and Snake Valley carbonate flows are especially impactful. Carbonate flows in Snake Valley were significant for our organizational genesis.

24. There are high levels of connectivity between these aquifer systems that give life to the flora and fauna. The connection gives me distinct pleasure and purpose. Pine Valley is a place of wonderment and contemplation that is distinct and irreplicable; not just because of the threats, but because of the people, springs, and histories I have come to know there. There are homes, businesses, and sacred sites that exist in Pine Valley and share irreplaceable connection to Pine Valley. For example, when I see the limestone in the Wah Wah Range from the floor of Pine Valley, I think about underground water traveling to Mark Wintch's operation in Wah Wah Spring. When I see the high point in the Indian Peaks Range, I think about Chairwoman Tamra Borchardt Slayton and her family who are members of the Indian Peaks Band. And when I see a small creek running at a trickle out of Pine Grove, I know the amount of water Iron County wants to pipe away to support its own uses is not available for the taking, and that this trickle and the life it is critical to sustaining is at great risk. When I look to the north, I think of the Baker family and folks like Abigail Johnson and Annette Garland.

25. I talk to folks who ranch in Pine Valley who say that some of their springs have recently gone dry or their wells need replacements. I feel this deeply. The valley is experiencing change. Runoff patterns, soil moisture contents, evaporation intensity, aquifer recharge rates, and many

other factors that were much steadier in the last century are shifting toward aridity at a rapid pace. Pine Valley will face these climate-related stresses regardless, but they leave no surplus water to support the pipeline, which would rapidly and devastatingly diminish the resources relied on and valued by those who live in, recreate in, and cherish the Valley and those hydrologically connected to it.

26. The biological wonders of Pine Valley inspire me to think about how connected we are as a society and species on earth. The ecosystems of Pine Valley are not isolated—it is all connected—and the health of the desert directly affects the people, wildlife, and communities that depend on it. It was in Pine Valley where I saw a large Golden Eagle clasp a critter on the road, grip it tightly, and fly off. I’ve seen tribal elders marvel at wild horses and question the aridifying nature of the landscape. I’ve watched pronghorn bounce into the horizon. I think about sage grouse and Utah Prairie Dogs’ uncanny ability to survive despite living on the verge of extinction. These things mean different things to me and my friends who have homes, histories and agricultural operations in the valley. But they also should mean something for future generations who have yet to experience these wonders. I do not want to see that disappear for anyone.

27. The folks who live and work in the Nevada-Utah borderlands understand the potential for these development schemes to destroy all that supports their way of life. They also understand first-hand how water works and understand the long-term importance of sustainability. They have deep respect for that which sustains us all. They’ve seen springs go dry. They’ve deepened wells. They’ve litigated. They’ve shared in the joys of watching a spring burble and a stream flow. Water is not simply an amenity to them. It is their lifeblood.

28. As the executive director of GBWN, the story of Pine Valley is the story of my life. Should the pipeline advance and the water table decline, the streams no longer sing, and the animals no longer come that would leave a hole in my existence that could never be filled, and it would cause real harm to the water and property rights of the friends and community members of the West Desert.

29. The irony of the West Desert Importation Project is that the BLM's review pursuant to the National Environmental Policy Act began a few months after the Great Basin Water Network and its coalition defeated the Southern Nevada Water Authority's attempt to export billions of gallons of groundwater from Snake Valley and other valleys that share hydrologic connectivity with Pine Valley. The SNWA — after GBWN and its coalition defeated the dangerous and costly pipeline project in a final court battle ending in March 2020 — vowed to focus on water conservation to augment their limited supplies that serve 2 million people. In other words, the SNWA recognized that the Las Vegas Pipeline was both unnecessary and unsupported by law. Since then, GBWN has worked on multiple water conservation proposals with the SNWA in the 2021, 2023, and 2025 legislative sessions in Nevada. It is one of the great success stories in the west.

30. I mention GBWN's collaboration with SNWA for an important reason. Instead of battling with water providers, we believe that the real work begins in the spirit of conservative ingenuity, a respect for private property rights, and a belief in the best available science.

31. In Utah, unfortunately, we are at a different juncture — spending our time and resources focusing on protecting the rights and interests of our members, supporters, and allies as well as advocating for sustainable water management. Our legislative work on this project has mostly focused on funding efforts sought by Iron County and a few other measures. In the administrative arena, we are well versed in Groundwater Management Plans in the region. And

we track every water right filing made in the state of Utah on a weekly basis. We protest specious water rights in the region that do not meet the standards of Utah Code § 73-3-8. The goings-on of Iron, Beaver, Millard, Juab, Tooele and White Pine Counties are inherently tied to our everyday work as we track and monitor all projects proposed on BLM land and in the jurisdiction of other federal agencies.

32. GBWN and its members know and understand the lands and waters of the region, particularly the importance of their interconnected nature. And we see this effort from Iron County water officials as a microcosm of the problems that will hinder the western United States for decades to come. Indeed, this is a battle about water in the Great Basin. But it is connected to something else. At GBWN, we like to say this: What happens on the Colorado River, doesn't stay on the Colorado River. For example, the Vegas Pipeline arose from a purported need to augment Lake Mead's supplies. Over time, and thanks to our litigation, Southern Nevada Water Authority officials found other mechanisms to augment without groundwater importation from the Great Basin.

33. Another example of this interconnection is Iron County's involvement in the proposed Lake Powell Pipeline. At one point, Iron County was considered as part of the arrangement to receive imported water from that project. But the costs ultimately proved too high, and Iron County was cut out of the deal. In response, CICWCD officials turned to Pine, Wah Wah, and Hamlin Valleys and applied for water there instead, seeking to develop their own West Desert Pipeline interbasin transfer project. The Lake Powell Pipeline itself has, so far, proven to be little more than a pipe dream. The NEPA process was paused in 2020, after both GBWN and SNWA submitted comments on the DEIS raising concerns about impacts to Lake Mead. These kinds of water development schemes, robbing Peter to pay Paul, are outdated, irresponsible, and

ultimately unsupported by the law. As GBWN's work helped SNWA recognize years ago, there are better alternatives.

34. I mention these anecdotes because GBWN recognizes the connectivity we all have to watersheds throughout the region. We also recognize the connected histories of water exportation efforts on the borderlands of Nevada and Utah.

35. Pine Valley is the headwaters of the Great Salt Lake Desert Groundwater Flow System. That flow system is a part of multiple counties and thousands of square miles. Much of the system is, in essence, the lakebed bottom of ancient Lake Bonneville. And that lakebed bottom has connections with places like Pine Valley. The connectivity of it all cannot be denied. And that is why communities throughout the region understand what is at stake.

36. People understand the significance of the Great Salt Lake itself. They understand the system better because they can see the water in the lake. But in the desert, things move differently – especially underground. What our coalition also understands is that impacts that will be occurring will be in places many members of the public cannot readily see. The subterranean nature of the initial impacts will cause them to manifest on the surface gradually, with visibility of surface impacts seen differently at different locations during different periods of time. The impacts may not show themselves as quickly as they would in a big surface water area. But we do know that project impacts will be devastating and will cascade over a substantial geographic area.

37. What our coalition understands is that desert water isn't just for us at this current place in time. It is for future generations of all living things. This project jeopardizes those future generations' ability to depend on the most critical of resources in the Great Basin: water.

38. This project is the antithesis of what the Great Basin Water Network stands for, and what I—as a member and part of the community—stand for. This project jeopardizes our members’ and supporters’ values and directly impacts the property rights of GBWN’s board members and members.

39. If this project moves forward, it will require GBWN to take on significant new work to ensure that the ecosystems and communities we advocate for are protected to the greatest extent possible. Monitoring, management, and mitigation plans can lead to many types of conflicts that would likely involve our members. The costs associated with representing those interests likely would be significant. The costs associated with representing those interests likely would be significant. Additionally, the work required would necessarily shift our communications, outreach, educational activities, and operational focus toward defending property rights in response to irresponsible decisionmaking, diverting resources from our work advocating for responsible and sustainable water management. As we have seen in other contexts, including Owens Valley, holding water managers accountable in the context of mitigation planning and implementation is effectively a full-time job requiring considerable staff time, legal resources, hydrologists, and field work.

40. From an administrative perspective, the burden would not be limited to Pine Valley. Monitoring groundwater would also extend to the whole Great Salt Lake Desert, the Escalante Desert, and Cedar Valley. This project will undermine existing groundwater management plans while also pumping water that flows into connected basins over time. Assessing these impacts would be expensive and time-consuming, requiring ongoing analysis of law, regulation, and oversight in an unpredictable way given the lack of a demonstrably effective monitoring, management, and mitigation plan in the FEIS.

41. If Owens Valley is any indicator, the costs of engaging in the civic, administrative, and legal elements of this project would be detrimental to GBWN's mission and work. The deficiencies in the FEIS underscore a grave level of uncertainty, and the implementation of the project would radically reshape what we have to do to demand accountability and to protect the interests of our members. Similarly, based on our experience with SNWA, instead of focusing on conservation priorities in legislative and administrative spaces, we would be forced into continued battles that take time away from the most important work we have—figuring out how communities can live within their means.

42. The Project also undermines GBWN's work throughout the Great Basin advocating for responsible water management and sends a troubling signal that one community can solve its problems by shifting them to its neighbors. More specifically, the approval of this project removes any incentive CICWCD might have to engage in responsible water management, directly undermining GBWN's work and forcing GBWN to adjust its focus and shift resources in order to remain effective in its mission to advocate for responsible and sustainable water management.

43. This project frustrates our efforts to advance meaningful conservation provisions in law and water management decision-making. For years, we have worked to support turf removal efforts, groundwater retirement programs, agricultural efficiencies, domestic-use efficiencies, Colorado River solutions, water pricing, and other elements related to western water policy in Nevada and Utah. This project stakes a dangerous claim by building infrastructure that could discourage future conservation efforts—not just for Iron County but for other communities too—by signaling that communities can rely on importing new, ultimately unsustainable water

supplies rather than implementing readily available demand-reduction measures or pursuing water-efficient land use and development patterns.

44. In short, this project undermines GBWN's work advocating for the type of management that the prior appropriation doctrine should, theoretically, address. Iron County water officials claim the pipeline is needed to implement groundwater management plans without harm to its communities. But instead of doing the hard work of curtailing junior users, incentivizing efficiency, and acquiring senior rights for changes of use, the County is choosing to obtain additional water to support its poorly conceived pursuit of unfettered growth and development, injuring its neighbors in the process and imposing a burden on its own rate payers and Utah taxpayers who will bear the burden of paying for the Project.

45. The proponents of this project claim to work for a "conservancy," but this pipeline flies in the face of what it means to be conservative. It increases the price of water, creates conflict, infringes on private property rights, harms tribal governments, degrades principles of due process, and rebuffs many other facets of good governance.

46. Finally, BLM's management of the EIS process undermines GBWN's work advocating for transparent, science-based decisionmaking. At CICWCD's request, BLM excluded the public from the NEPA process for approximately four years while CICWCD and its consultants continued developing key technical materials behind the scenes. The project is not in line with the expectations of due process, public participation, and overall good governance.

47. The four-year period during which CICWCD continued to develop the Project outside of public view, followed by the Bureau of Land Management's release of the Final Environmental Impact Statement and near-simultaneous approval of the Record of Decision, deprived the public, including GBWN and its members, of any meaningful opportunity to review the updated

materials. This process reflects a lack of transparency and is inconsistent with the kind of careful, thorough decisionmaking GBWN works to ensure is the foundation of water management decisions in the Great Basin.

48. Such injuries and harms would be prevented by a decision to stay or vacate BLM's authorization of the Project and an abandonment of the decision.

49. GBWN will do whatever it takes to ensure our values are left intact. That commitment is fully consistent with the reality that Cedar City can meet its water needs without a pipeline by engaging in responsible, science-based, transparent decisionmaking.

Pursuant to 28 U.S.C. § 1746, I declare under penalty of perjury that the foregoing is true and correct.

DATED: _____

3/31/2026



Kyle Roerink

EXHIBIT B-12

Declaration of Great Basin Water Network
(Mark Whitney, Member)

**DEPARTMENT OF THE INTERIOR
OFFICE OF HEARINGS AND APPEALS
INTERIOR BOARD OF LAND APPEALS**

**BEAVER COUNTY, UTAH; MILLARD
COUNTY, UTAH; JUAB COUNTY,
UTAH; WHITE PINE COUNTY,
NEVADA; CITY OF MILFORD, UTAH;
CENTRAL NEVADA REGIONAL
WATER AUTHORITY; NEVADA
GRAZING BOARD OF DISTRICT NO. 4;
GREAT BASIN WATER NETWORK;
MARK WINTCH; WAH WAH RANCH,
WALLACE PEAK WATER COMPANY,
WINTCH & COMPANY LLC; BARBARA
WINTCH; JOHN CARTER; LYLE
CARTER; DEAN EYRE; DUSTIN
KESLER; BRANDON YARDLEY; AND
GILBERT (“GIB”) T. YARDLEY,**

Appellants,

v.

BUREAU OF LAND MANAGEMENT,

Respondent.

IBLA No. _____

RE: PINE VALLEY WATER SUPPLY
PROJECT
DOI-BLM-UT-C010-2020-0012-EIS
(2026)

DECLARATION OF MARK WHITNEY

GREAT BASIN WATER NETWORK MEMBER

I, MARK WHITNEY, hereby declare as follows:

1. I have personal knowledge of the facts set forth in this declaration. If called as a witness, I could and would competently testify to these facts. As to matters that reflect an opinion, they

reflect my personal opinion and judgment on the matter. I submit this declaration based on my professional work and personal experience in Beaver County and in Pine Valley specifically.

2. This declaration is filed in support of Beaver County, Utah, et al.'s *Notice of Appeal* and *Petition for Stay* in the above-captioned matter and in support of standing for Appellant Great Basin Water Network.

3. I live in Beaver County, Utah, splitting time between my East Ranch, in Milford Valley, and West Ranch, in Pine Valley. The West Ranch is partially owned by my brother, Kerry Sherwood, as part of our family trust. My family's ownership of property and water rights in Pine Valley around the Cougar Spar area are listed at the three following parcel numbers:

- Parcel 07-0700-0093
- Parcel 02-0172-0001
- Parcel 02-0171-0004.

Our water rights include the following permits from the Utah Division of Water Rights:

- Water Right 14-133
- Water Right 14-134
- Water Right 14-137
- Water Right 14-138

4. The Final Environmental Impact Statement for the Pine Valley Water Supply Project predicts groundwater level drawdown in the area of my West Ranch of 10 to 50 feet after 50 years of pumping alone. Pine Valley Groundwater Resources Impact Assessment. *See Formation Environmental, Final Groundwater Resources Impact Assessment*, Pine Valley Water Supply Project Final Environmental Impact Statement. Pgs. 84 and 195. Dec. 2025.

5. I was a Beaver County Commissioner from January 1999 until January 2023 — with a one term absence between 2004 and 2008 — totaling 20 years in service.

6. I began working with the Great Basin Water Network ("GBWN") not long after BLM filed the Notice of Intent for the environmental review pursuant to the National Environmental

Policy Act on the Pine Valley Water Supply Project. I was working closely with GBWN in my role as a private property owner in Pine Valley and as a Beaver County Commissioner who represented constituents in Pine Valley as well as the County's own interests.

7. I was familiar with GBWN's work in stopping the Southern Nevada Water Authority's pipeline effort. I cannot recall exactly when we first met, but I immediately wanted to start partnering with GBWN in as many ways as I could. I sought their help and advice. And GBWN obliged.

8. I am glad my membership afforded me an opportunity to expand and be more effective in my opposition to the Pine Valley Water Supply Project and to advocate for local water users in Beaver County, including my own.

9. I personally align with GBWN's mission of promoting responsible water management and protecting locally sustainable water uses, natural resources, and the public interest with research, education, advocacy, and litigation. GBWN represents the values and rights of its members and supporters, as evidenced by their strong advocacy for sensible water management in Pine Valley. The organization seeks reasonable water conservation policies that respect water rights users and the overall public interest. GBWN has brought invaluable expertise and knowledge to communities in Beaver County for years. And they know that the harms in Pine Valley will have a cascading effect throughout the region.

10. I ended my service on the Beaver County Commission after the 2022 election. But my commitment to fighting the project did not cease. The West Desert water development efforts from Iron County have played a major role in my private and personal life. The battle over federal Pine Valley project permitting — as well as state-level permitting for Pine, Hamlin and

Wah Wah Valleys — was part of my duties as a Beaver County Commissioner. That fight exhausted considerable time and resources during my tenure as a commissioner.

11. One of the many reasons why I am opposed to the BLM's Record of Decision is that federal regulators did not consider data that confirms that the water granted to Iron County in a settlement agreement that Beaver County had with Iron County water officials, which grants project rights to Iron County, is likely to exceed Pine Valley's safe yield. *See* Brooks, USGS, Groundwater Model of the Great Basin Carbonate and Alluvial Aquifer AS V. 3.0, Table 8 (2017); Great Basin Water Network, Request for Selection of the No Action Alternative or, Alternatively, Withdrawal of the FEIS and Issuance of a DEIS; Submission of Significant New Information Supporting the Need for SEIS; and Request for a Minimum 60-Day FEIS Availability Period Before Any Record of Decision, Att. D, at 6-7 (Mar. 2, 2026).

12. Further, the monitoring, management and mitigation plans do not meaningfully protect people who use water in Pine Valley. Nowhere in the Final EIS is there any assurance that my water uses and rights will be protected from project pumping. In other words, Iron County is not living up to its obligations within the state of Utah — nor is the EIS for the project in compliance with the National Environmental Policy Act. That is all being ignored to the detriment of my rights.

13. Moreover, the project has also played a role in my life as a water user and landowner in the West Desert. It is worth noting that when my family began formalizing its water rights in Pine Valley, water that is critical for our operations, the Central Iron County Water Conservancy District protested our applications. The water district said water wasn't available, primarily because they had already taken it. That action is indicative of what water managers in Iron County think about those of us who have homes and agricultural operations in Pine Valley. Their

protest signals that life will rapidly change in Pine Valley. There will be no additional water in the Valley for local uses. All water will be piped out and away from the people who live here and who need it to sustain themselves and their businesses. By controlling the water resources in Pine Valley, Iron County will also control impacts to our groundwater dependent resources and resource management. And if the Cedar Valley and Escalante Desert are indicators, then we can expect Pine Valley to experience significant problems in the future.

14. Our family's 103-acre property in Pine Valley is a refuge and place of significant meaning. There are two cabins and two bunkhouses. We brought our children out there during their adolescence. Our friends come out to hunt and marvel at the wildlife that enjoy our water and natural resources. Our property is near the best deer and elk herds in the West Desert. In good years, we run 50 pair of cattle on our private ground. Children fish in our ponds. The water serves as an area to gather with loved ones. I am in recovery from a battle with leukemia. During my treatments, I yearned to be at our West Ranch. It is where I spent my time and found the energy necessary to beat cancer. And I will always use Pine Valley as my source of inspiration and rejuvenation. Pine Valley will always be a part of me.

15. Anyone who spends time in Pine Valley knows how dry it is. Our water system at the West Ranch depends on wells. But we have three natural springs on the property. This year, 2026, is the first time that all three springs have gone dry. Without our wells, we wouldn't be able to access water. It is hard to fathom the springs going dry in March. But we didn't have any snow in the mountains this winter. Recharge rates to the basin are not what Iron County says they are. And new reports from USGS underscore that. However, one doesn't have to be a hydrologist to see the change. As a part-time resident of Pine Valley, I see the changes in the landscape and the changes in the water cycle happening every day. The volume of water Iron County proposes

to pump does not sustainably exist for exportation. And what Iron County will take already belongs to someone else throughout the Great Salt Lake Desert Groundwater Flow System — an inter-connected aquifer system that moves throughout Beaver, Millard, Juab, Tooele, and Iron Counties in Utah and into White Pine and Lincoln Counties in Nevada. The unnecessary, unsustainable, and scientifically unsound taking of water from the region will substantially and irrevocably harm my interests and many others. That is why my membership with GBWN is important. It is a group that recognizes what is at stake and cares about my deep connections to the region.

16. Thanks to my work with GBWN and Beaver County, I am well aware of the likelihood of impacts. Reports, reviews, and analysis of the project demonstrate grave uncertainties and significant shortcomings associated with the project. BLM's analysis as published in the Final Environmental Impact Statement is not based on a fulsome or scientifically sound record. Moreover, as stated above, even these flawed reports reveal serious impacts to my water rights. The impacts disclosed in the project's EIS do not include what happens when the project proponents begin drilling wells in other valleys as Iron County water officials have long planned. I believe wholeheartedly that the Pine Valley project will harm my rights in Pine Valley.

17. Such injuries and harms would be prevented by a decision to stay or vacate BLM's authorization of the Project and an abandonment of the decision.

Pursuant to 28 U.S.C. § 1746, I declare under penalty of perjury that the foregoing is true and correct.

DATED: March 31, 2026

/s Mark Whitney

Mark Whitney

EXHIBIT B-13

Declaration of Mark Wintch
(Wah Wah Ranch, Wallace Peak Water Company, Wintch & Company)

**DEPARTMENT OF THE INTERIOR
OFFICE OF HEARINGS AND APPEALS
INTERIOR BOARD OF LAND APPEALS**

**BEAVER COUNTY, UTAH; MILLARD
COUNTY, UTAH; JUAB COUNTY, UTAH;
WHITE PINE COUNTY, NEVADA; CITY
OF MILFORD, UTAH; CENTRAL NEVADA
REGIONAL WATER AUTHORITY;
NEVADA GRAZING BOARD OF DISTRICT
NO. 4; GREAT BASIN WATER NETWORK;
MARK WINTCH; WAH WAH RANCH,
WALLACE PEAK WATER COMPANY,
WINTCH & COMPANY LLC; BARBARA
WINTCH; JOHN CARTER; LYLE
CARTER; DEAN EYRE; DUSTIN KESLER;
BRANDON YARDLEY; AND GILBERT
("GIB") T. YARDLEY,**

Appellants,

v.

BUREAU OF LAND MANAGEMENT,

Respondent.

IBLA No. _____

**RE: PINE VALLEY WATER SUPPLY
PROJECT
DOI-BLM-UT-C010-2020-0012-EIS
(2026)**

**DECLARATION OF MARK J. WINTCH
RANCHER AND LANDOWNER**

I, MARK J. WINTCH, Rancher and Landowner in Wah Wah Valley, declare as follows:

1. I have personal knowledge of each of the facts set forth below and, if called upon to do so, could and would testify regarding the following. This declaration is filed in support of Beaver County, Utah, et al.'s *Notice of Appeal* and *Petition for Stay* in the above-captioned matter and in my personal capacity as Mark J. Wintch, owner of Wallace Peak Water Company, Wintch Livestock, Wintch and Company Limited, Wah Wah Ranch, and the Wah Wah Spring complex.

2. I have lived on the Wah Wah Ranch, in Wah Wah Valley near Milford, Utah, for my lifetime. I have been a rancher for my entire life. The Wintch family has owned, farmed, and ranched the Wah Wah Ranch since 1934.
3. I filed my timely comments in February 2022 with the BLM regarding the Draft Environmental Impact Statement (DEIS) and opposing the Pine Valley Water Supply Project.
4. I am a general partner of Wintch and Company Limited, which owns the Wah Wah Ranch and the Wah Wah Spring complex located in Wah Wah Valley in western Beaver County.
5. The Wintch family and I own the private land and operate the Wallace Peak Water Company, Wintch Livestock, Wintch and Company Limited, Wah Wah Ranch, and the Wah Wah Spring complex.
6. I also own approximately 180 acres of my own personal land.
7. I ranch and farm in Wah Wah Valley. My wife, children, and I are the only residents in the entire valley. We rely on the spring to provide water for the livestock and our farm.
8. I own spring water rights in the Wah Wah Spring complex under Utah law that support these operations and which also supply our residential needs. The base water right is 69-19 with a priority date of July 12, 1937.
9. The water from Wah Wah Springs is the only consistent and live water for miles around.
10. We use the entire Wah Wah Valley to run our cattle operation. The Wah Wah Spring is our only source for domestic use and agricultural use.
11. We have over 100 miles of pipe that we use to water our cattle, and the wildlife uses the water also. This water runs through a small hydroelectric plant to provide our home with power and to power the pivots.

12. We have monitored the flow of our spring through power records. Springs do fluctuate in their flow, but we have witnessed a decline in the power output that has caused us to transition to a smaller impeller and change the design of the water flow to the power plant. These changes were made in 2015, and we still have not changed back to the larger impeller.

13. Wah Wah Ranch relies on spring resources and rights that support its operations, and any drawdown to the water table or drying of springs on my ranch would result in a direct impact to my ranching operations, property value, and generational livelihood.

14. Wallace Peak Water Company, Wintch Livestock, Wintch and Company Limited, Wah Wah Ranch, and the Wah Wah Spring complex and any related holdings will be directly injured by the BLM's decision to grant a right-of-way for the Pine Valley Water Supply Project because the Project authorizes both surface disturbance and large-scale groundwater withdrawals in Pine Valley that will extend into our neighboring hydrologically connected downgradient basin.

15. The Pine Valley Water Supply Project will destroy our business and our home. Cedar Valley Water Conservancy District, formerly known as Central Iron County Water Conservation District, admitted that there will be a direct impact on Wah Wah Spring. This is wholly unacceptable, because we will not have enough water to create power, causing us to either use diesel generators or move to town and abandon the farming operation. With those additional costs, my operation will no longer be economically viable. This pumping project will literally kill my business and destroy my home.

16. Groundwater modeling prepared by the applicant's consultants for the BLM's EIS, as well as modeling conducted by the U.S. Geological Survey, and Beaver County's hydrological consultant, demonstrates that the predicted effects of the proposed Project pumping will draw down the Pine Valley aquifer by hundreds of feet at the Project well field in the short term during

the initial 50-year pumping period. The pumping will also affect downgradient, hydrologically connected basins by drawing down the water table from approximately five to hundreds of feet across a large area of Beaver County in Pine and Wah Wah Valleys within 50 years of Project buildout, with far more severe impacts over a much broader geographic area the longer the wells are pumped. Project Final Groundwater Resources Impact Assessment § 4.2.1.2, p. 111.

17. These impacts will effectively be permanent.

18. Reduced groundwater availability will diminish the carrying capacity, productivity, and value of ranch properties, including my ranch and ranches such as T and D Ranch. *See Declaration of Dean Eyre.*

19. The injuries that I, my children, and the entire Wintch family will face will be remedied by a decision to stay, set aside, and remand the BLM's Record of Decision that approved the Pine Valley Water Supply Project.

Pursuant to 28 U.S.C. § 1746, I declare under penalty of perjury that the foregoing is true and correct.

DATED: 3/31/2026

DocuSigned by:

3FD7A4475EF547E
Mark J. Wintch

EXHIBIT B-14

Declaration of Barbara Wintch

**DEPARTMENT OF THE INTERIOR
OFFICE OF HEARINGS AND APPEALS
INTERIOR BOARD OF LAND APPEALS**

**BEAVER COUNTY, UTAH; MILLARD
COUNTY, UTAH; JUAB COUNTY, UTAH;
WHITE PINE COUNTY, NEVADA; CITY
OF MILFORD, UTAH; CENTRAL NEVADA
REGIONAL WATER AUTHORITY;
NEVADA GRAZING BOARD OF DISTRICT
NO. 4; GREAT BASIN WATER NETWORK;
MARK WINTCH; WAH WAH RANCH,
WALLACE PEAK WATER COMPANY,
WINTCH & COMPANY LLC; BARBARA
WINTCH; JOHN CARTER; LYLE
CARTER; DEAN EYRE; DUSTIN KESLER;
BRANDON YARDLEY; AND GILBERT
("GIB") T. YARDLEY,**

Appellants,

v.

BUREAU OF LAND MANAGEMENT,

Respondent.

IBLA No. _____

RE: PINE VALLEY WATER SUPPLY
PROJECT
DOI-BLM-UT-C010-2020-0012-EIS
(2026)

**DECLARATION OF BARBARA R. WINTCH
RANCHER AND LANDOWNER**

I, BARBARA R. WINTCH, Rancher and Landowner in Wah Wah Valley, declare as follows:

1. I have personal knowledge of each of the facts set forth below, and if called upon to do so, could and would testify regarding the following. This declaration is filed in support of Beaver County, Utah, et al.'s *Notice of Appeal* and *Petition for Stay* in the above-captioned matter and in support of the standing by Barbara R. Wintch.

2. I have lived on the Wah Wah Ranch, in Wah Wah Valley near Milford, Utah, for 55 years when I married my husband John Wintch whose family has been involved in Wah Wah Valley for more than 100 years. Livestock is the business that brought the Wintch family here in 1898. Through the years, there have been many improvements made to this business venture.
3. In July 1937, the farm was moved from the spring into the Wah Wah Valley.
4. We own water right 69-19 in the Wallace's Peak Water Company.
5. We own and run a ranching operation with 1280-head of cattle, a 900-head feed yard, and 220 acres of irrigated alfalfa and corn silage. The property also provides homes to two families.
6. As owners of Wintch Livestock Company, we have been actively engaged with the Beaver County Cattle Association and the Utah Cattlemen's Association.
7. I timely filed my comments in 2022 with the BLM regarding the Draft Environmental Impact Statement (DEIS) and opposing the Pine Valley Water Supply Project.
8. Water is the resource that is so important to this valley. We have appreciated it and have used it for good purposes: first, to water the livestock; second, to increase the size of our farm from 80 acres to more than 200 acres of alfalfa and corn; third, to produce the electricity that powers the homes and pivot irrigation sprinklers in the field; and last but not least, to provide water to the wildlife that live in this valley.
9. The Pine Valley Water Supply Project as proposed by the Central Iron County Water Conservation District stated that in their best analysis of the project, it will adversely impact our water source at Wah Wah Spring.
10. I am very concerned about the future of our ranch, our livelihood, and the ability of our two sons Mark and Paul Wintch and their continued use of this valley. Without water, this venture will dry up and disappear.

11. Groundwater modeling prepared by the applicant's consultants for the BLM's EIS, as well as modeling conducted by the U.S. Geological Survey, and Beaver County's hydrological consultant, demonstrates that the predicted effects of the proposed Project pumping will draw down the Pine Valley aquifer by hundreds of feet at the Project well field in the short term during the initial 50-year pumping period. The pumping will also affect downgradient, hydrologically connected basins by drawing down the water table from approximately five to hundreds of feet across a large area of Beaver County in Pine and Wah Wah Valleys within 50 years of Project buildout, with far more severe impacts over a much broader geographic area the longer the wells are pumped. Project Final Groundwater Resources Impact Assessment § 4.2.1.2, p. 111.

12. These impacts will effectively be permanent. Through these impacts, I feel that despite the many improvements we have made to the land and area, we will no longer be in business.

13. The Wah Wah Spring is our lifeblood. We need this water. We read the report that Beaver County had prepared in opposition to this project and we agree with their findings.

14. The injuries to Wah Wah Ranch and our related business interests with Wintch Livestock Company will be remedied by a decision to stay, set aside, and remand the BLM's Record of Decision that approved the Pine Valley Water Supply Project.

Pursuant to 28 U.S.C. § 1746, I declare under penalty of perjury that the foregoing is true and correct.

DATED: 4/1/2026

/s/ Barbara R. Wintch
Barbara R. Wintch, Rancher and Landowner

EXHIBIT B-15

Declaration of John Carter

**DEPARTMENT OF THE INTERIOR
OFFICE OF HEARINGS AND APPEALS
INTERIOR BOARD OF LAND APPEALS**

**BEAVER COUNTY, UTAH; MILLARD
COUNTY, UTAH; JUAB COUNTY, UTAH;
WHITE PINE COUNTY, NEVADA; CITY
OF MILFORD, UTAH; CENTRAL NEVADA
REGIONAL WATER AUTHORITY;
NEVADA GRAZING BOARD OF DISTRICT
NO. 4; GREAT BASIN WATER NETWORK;
MARK WINTCH; WAH WAH RANCH,
WALLACE PEAK WATER COMPANY,
WINTCH & COMPANY LLC; BARBARA
WINTCH; JOHN CARTER; LYLE
CARTER; DEAN EYRE; DUSTIN KESLER;
BRANDON YARDLEY; AND GILBERT
("GIB") T. YARDLEY,**

Appellants,

v.

BUREAU OF LAND MANAGEMENT,

Respondent.

IBLA No. _____

RE: PINE VALLEY WATER SUPPLY
PROJECT
DOI-BLM-UT-C010-2020-0012-EIS
(2026)

DECLARATION OF JOHN CARTER

I, JOHN CARTER, declare as follows:

1. I have personal knowledge of each of the facts set forth below and, if called upon to do so, could and would testify regarding the following. This declaration is filed in support of Beaver County, Utah, et al.'s *Notice of Appeal* and *Petition for Stay* in the above-captioned matter and in support of my personal standing.
2. I live in Milford, Utah, and I have spent my entire life in this area, engaged in hunting, recreation, wildlife projects, and conservation.

3. I own approximately 12 acres of private property with a small cabin and water rights in the Sheep Creek area of Pine Valley. I use the land for family recreation and hunting which I have owned for 36 years.
4. The water to our property is supplied by a domestic well and is used for personal use and watering plants.
5. I have watched over the years and observed that the natural springs in the area have slowed or completely stopped, due to poor weather patterns and low water accumulation. I have noticed the drastic impact that this decreased recharge causes on ranchers in the area but also the wildlife.
6. If the water is pumped from this area, the wells and natural springs will dry up. I have no doubt that taking the water from this area will not only destroy the ecosystem, but damage people's property value, including my equity in my property, and kill the cattle rancher lifestyle that exists in this area.
7. Groundwater modeling prepared by the applicant's consultants for the BLM's EIS, as well as modeling conducted by the U.S. Geological Survey, and Beaver County's hydrological consultant, demonstrates that the predicted effects of the proposed Project pumping will draw down the Pine Valley aquifer by hundreds of feet at the Project well field in the short term during the initial 50-year pumping period. The pumping will also affect downgradient, hydrologically connected basins by drawing down the water table from approximately five to hundreds of feet across a large area of Beaver County in Pine and Wah Wah Valleys within 50 years of Project buildout, with far more severe impacts over a much broader geographic area the longer the wells are pumped. Project Final Groundwater Resources Impact Assessment § 4.2.1.2, p. 111.
8. These impacts will effectively be permanent.

9. I filed my comments in 2022, along with my wife Vickie Carter, to the BLM regarding the Draft Environmental Impact Statement (DEIS) in opposition to the Pine Valley Water Supply Project.

10. The injuries that I and my wife Vickie Carter will face will be remedied by a decision to stay, set aside, and remand the BLM's Record of Decision for the Pine Valley Water Supply Project.

Pursuant to 28 U.S.C. § 1746, I declare under penalty of perjury that the foregoing is true and correct.

DATED: 4/1/2026

/s/ John Carter

John Carter

EXHIBIT B-16

Declaration of Lyle Carter

**DEPARTMENT OF THE INTERIOR
OFFICE OF HEARINGS AND APPEALS
INTERIOR BOARD OF LAND APPEALS**

**BEAVER COUNTY, UTAH; MILLARD
COUNTY, UTAH; JUAB COUNTY, UTAH;
WHITE PINE COUNTY, NEVADA; CITY
OF MILFORD, UTAH; CENTRAL NEVADA
REGIONAL WATER AUTHORITY;
NEVADA GRAZING BOARD OF DISTRICT
NO. 4; GREAT BASIN WATER NETWORK;
MARK WINTCH; WAH WAH RANCH,
WALLACE PEAK WATER COMPANY,
WINTCH & COMPANY LLC; BARBARA
WINTCH; JOHN CARTER; LYLE
CARTER; DEAN EYRE; DUSTIN KESLER;
BRANDON YARDLEY; AND GILBERT
("GIB") T. YARDLEY,**

Appellants,

v.

BUREAU OF LAND MANAGEMENT,

Respondent.

IBLA No. _____

**RE: PINE VALLEY WATER SUPPLY
PROJECT
DOI-BLM-UT-C010-2020-0012-EIS
(2026)**

DECLARATION OF LYLE CARTER

I, LYLE CARTER, declare as follows:

1. I have personal knowledge of each of the facts set forth below and, if called upon to do so, could and would testify regarding the following. This declaration is filed in support of Beaver County, Utah, et al.'s *Notice of Appeal* and *Petition for Stay* in the above-captioned matter and in support of my personal standing.

2. I live in Minersville, Utah, and I have owned the grazing rights to the Water Hollow Allotment since 2003 on BLM and State Trust Land in Pine Valley. I have lived and farmed in Beaver County for 71 years and own 1,900 acres of private property.
3. My grazing rights extend for more than 28,000 acres on BLM land and 3,000 acres on State Trust Lands. In 2024, the state sold 640 acres of state land to Central Iron County Water Conservancy District, reducing my grazing acreage by 640 acres.
4. I use my grazing rights for 272 pairs (cow/calf) from May 1 through November 30 each year. Additionally, the land provides forage for 60-100 wild horses, 100-300 elk, 100-300 antelope, seven sage grouse leks, and several prairie dog relocations.
5. I have invested heavily in my grazing operation over the years, but most recently in 2023, I redeveloped the Water Hollow Spring on BLM land and invested \$30,000 to dig up the pipes, starting over at the head. I laid 30 miles of pipeline and replaced half of my watering troughs. The BLM assisted in laying the pipes. I made the connections on my own.
6. The Pine Valley Water Supply Project will directly impact my grazing rights by its locating the main pumping station and solar site in the middle of my BLM allotment. My grazing allotment will be home to approximately nine test wells and several main wells, several miles of roads and pipeline, well sites, pumping sites, and solar sites. Additionally, the sites will be fenced and therefore further reduce access for my cattle to graze.
7. My main concern is the loss of water and loss of grazing rights. If there is no water, there will be no need for grazing.
8. Groundwater modeling prepared by the applicant's consultants for the BLM's EIS, as well as modeling conducted by the U.S. Geological Survey, and Beaver County's hydrological consultant, demonstrates that the predicted effects of the proposed Project pumping will draw

down the Pine Valley aquifer by hundreds of feet at the Project well field in the short term during the initial 50-year pumping period. The pumping will also affect downgradient, hydrologically connected basins by drawing down the water table from approximately five to hundreds of feet across a large area of Beaver County in Pine and Wah Wah Valleys within 50 years of Project buildout, with far more severe impacts over a much broader geographic area the longer the wells are pumped. Project Final Groundwater Resources Impact Assessment § 4.2.1.2, p. 111.

9. These impacts will effectively be permanent.

10. I filed my comments in 2022 to the BLM regarding the Draft Environmental Impact Statement (DEIS) in opposition to the Pine Valley Water Supply Project.

11. The injuries that I will suffer will be remedied by a decision to stay, set aside, and remand the BLM's Record of Decision for the Pine Valley Water Supply Project.

Pursuant to 28 U.S.C. § 1746, I declare under penalty of perjury that the foregoing is true and correct.

DATED: 3-31-26



Lyle Carter

EXHIBIT B-17

Declaration of Dean Eyre

**DEPARTMENT OF THE INTERIOR
OFFICE OF HEARINGS AND APPEALS
INTERIOR BOARD OF LAND APPEALS**

**BEAVER COUNTY, UTAH; MILLARD
COUNTY, UTAH; JUAB COUNTY, UTAH;
WHITE PINE COUNTY, NEVADA; CITY
OF MILFORD, UTAH; CENTRAL NEVADA
REGIONAL WATER AUTHORITY;
NEVADA GRAZING BOARD OF DISTRICT
NO. 4; GREAT BASIN WATER NETWORK;
MARK WINTCH; WAH WAH RANCH,
WALLACE PEAK WATER COMPANY,
WINTCH & COMPANY LLC; BARBARA
WINTCH; JOHN CARTER; LYLE
CARTER; DEAN EYRE; DUSTIN KESLER;
BRANDON YARDLEY; AND GILBERT
("GIB") T. YARDLEY,**

Appellants,

v.

BUREAU OF LAND MANAGEMENT,

Respondent.

IBLA No. _____

RE: PINE VALLEY WATER SUPPLY
PROJECT
DOI-BLM-UT-C010-2020-0012-EIS
(2026)

DECLARATION OF DEAN EYRE

RANCHER AND LANDOWNER

I, DEAN EYRE, Rancher and Landowner in Pine Valley, declare as follows:

1. I have personal knowledge of each of the facts set forth below and, if called upon to do so, could and would testify regarding the following. This declaration is filed in support of Beaver County, Utah, et al.'s *Notice of Appeal* and *Petition for Stay* in the above-captioned matter and in support of standing by Dean Eyre.

2. I live in Minersville, Utah, and I own the T and D Ranch. We run cattle in Pine Valley on BLM ground, state lands, and private ground. I own private property in Sheep Creek, Cottonwood, Indian Creek, and Pots-um-Paw in Pine Valley in Beaver County.
3. This land and cattle have been in our family for generations, and I have personally owned this property since 1996.
4. I also have water rights in Pine Valley that are used for stock water and personal use. We have multiple springs that help us water our cattle and help maintain the grass to feed our cattle and the wildlife.
5. We are personally in one of the worst droughts that I have ever seen. I have one pond that has never been without water, and as of last year, it has been dry.
6. I filed my comments in 2022 with the BLM regarding the Draft Environmental Impact Statement (DEIS) to oppose the Pine Valley Water Supply Project. I expressed my concerns then that Iron County is trying to take our water supply. I reiterate that the Central Iron County Water Conservancy District is going after more water than is there. There is no recharge to the aquifer. If this project goes through, we would be devastated. We would be out of our family business and our son and grandsons would lose their chance to live this way of life. We love to hunt and camp with our families. This project would also devastate the wildlife.
7. Groundwater modeling prepared by the applicant's consultants for the BLM's EIS, as well as modeling conducted by the U.S. Geological Survey, and Beaver County's consultant demonstrates that the predicted effects of the proposed Project pumping will draw down the Pine Valley aquifer by hundreds of feet at the Project well field in the short term during the initial 50-year pumping period. The pumping will also affect downgradient, hydrologically connected basins by drawing down the water table from approximately five to hundreds of feet across a large area

of Beaver County in Pine and Wah Wah Valleys within 50 years of Project buildout, with far more severe impacts over a much broader geographic area the longer the wells are pumped. Project Final Groundwater Resources Impact Assessment § 4.2.1.2l, p. 111.

8. These impacts will effectively be permanent.

9. Reduced groundwater availability will diminish the carrying capacity, productivity, and value of ranch properties, including my ranch and ranches such as the Wah Wah Ranch. *See* Declaration of Mark J. Wintch.

10. The injuries that I, my children and grandchildren, and the entire T and D Ranch operation will face will be remedied by a decision to stay, set aside, and remand the BLM's Record of Decision that approved the Pine Valley Water Supply Project.

Pursuant to 28 U.S.C. § 1746, I declare under penalty of perjury that the foregoing is true and correct.

DATED: 4/1/2026

/s/ Dean Eyre
Dean Eyre

EXHIBIT B-18

Declaration of Dustin Kesler

**DEPARTMENT OF THE INTERIOR
OFFICE OF HEARINGS AND APPEALS
INTERIOR BOARD OF LAND APPEALS**

**BEAVER COUNTY, UTAH; MILLARD
COUNTY, UTAH; JUAB COUNTY,
UTAH; WHITE PINE COUNTY,
NEVADA; CITY OF MILFORD, UTAH;
CENTRAL NEVADA REGIONAL
WATER AUTHORITY; NEVADA
GRAZING BOARD OF DISTRICT NO. 4;
GREAT BASIN WATER NETWORK;
MARK WINTCH; WAH WAH RANCH,
WALLACE PEAK WATER COMPANY,
WINTCH & COMPANY LLC; BARBARA
WINTCH; JOHN CARTER; LYLE
CARTER; DEAN EYRE; DUSTIN
KESLER; BRANDON YARDLEY; AND
GILBERT ("GIB") T. YARDLEY,**

Appellants,

v.

BUREAU OF LAND MANAGEMENT,

Respondent.

IBLA No. _____

**RE: PINE VALLEY WATER SUPPLY
PROJECT
DOI-BLM-UT-C010-2020-0012-EIS
(2026)**

DECLARATION OF DUSTIN KESLER

I, DUSTIN KESLER, declare as follows:

1. I have personal knowledge of each of the facts set forth below and, if called upon to do so, could and would testify regarding the following. This declaration is filed in support of Beaver County, Utah's *Notice of Appeal* and *Petition for Stay* in the above-captioned matter and in support of standing for this declarant Dustin Kesler.
2. I live in Milford, Utah, and I have lived in the Milford Valley since 2009.

3. I operate the Green Diamond Ranch located in Milford Valley which farms 1200 acres of irrigated farmland. The ranch is located in a downgradient basin of the proposed Pine Valley Water Supply Project ("the Project"). The ranch is a fourth-generation operation, primarily producing alfalfa hay for the dairy industry.
4. I personally own 159 acres of farm property in the Milford Valley.
5. I have owned irrigation water rights since 2014 that are in the vicinity of the Project. All of my water is provided from underground wells. I use the underground well water for farmland irrigation, residential use, and some stock watering. We sell some feed to the ranching community.
6. I serve on the Board of the Milford Pumpers Association. Based upon my knowledge and experience there, I understand that the historic underground water tables are in long term decline. No major recharge is available for groundwater in Milford Valley since the building of Minersville Reservoir in 1914 and the construction of the Rocky Ford dam, an embankment dam that impounds water from the Beaver River which heads in the Tushar Mountains for use in agriculture.
7. I am concerned that if the Milford Valley aquifer and the aquifers that Central Iron County Water Conservancy District is planning to pump from are connected, a project of this size, once put into motion, would not be shut down even if future impairments are found. Rather, once this new water is brought to Cedar City and new homes and families are established using it, the water will unlikely be taken away from them.
8. I know that Utah is the second driest state in the nation, and water is king. Without water, the ranching industry cannot survive, including Mark Wintch's operation which will be severely impacted by the Pine Valley Water Supply Project. *See Declaration of Mark Wintch.*
9. Groundwater modeling prepared by the applicant's consultants for the BLM's EIS, as well as modeling conducted by the U.S. Geological Survey, and Beaver County's hydrological

consultant, demonstrates that the predicted effects of the proposed Project pumping will draw down the Pine Valley aquifer by hundreds of feet at the Project well field in the short term during the initial 50-year pumping period. The pumping will also affect downgradient, hydrologically connected basins by drawing down the water table from approximately five to hundreds of feet across a large area of Beaver County in Pine and Wah Wah Valleys within 50 years of Project buildout, with far more severe impacts over a much broader geographic area the longer the wells are pumped. Project Final Groundwater Resources Impact Assessment § 4.2.1.2, p. 111.

10. These impacts will effectively be permanent.

11. I filed my comments in 2022 to the BLM regarding the Draft Environmental Impact Statement (DEIS) in opposition to the Pine Valley Water Supply Project.

12. The injuries that I will suffer will be remedied by a decision to stay, set aside, and remand the BLM's Record of Decision for the Pine Valley Water Supply Project.

Pursuant to 28 U.S.C. § 1746, I declare under penalty of perjury that the foregoing is true and correct.

DATED: 4/1/2026

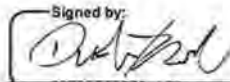
Signed by:

36F26C685F224F3
Dustin Kesler

EXHIBIT B-19

Declaration of Brandon Yardley

**DEPARTMENT OF THE INTERIOR
OFFICE OF HEARINGS AND APPEALS
INTERIOR BOARD OF LAND APPEALS**

**BEAVER COUNTY, UTAH; MILLARD
COUNTY, UTAH; JUAB COUNTY, UTAH;
WHITE PINE COUNTY, NEVADA; CITY
OF MILFORD, UTAH; CENTRAL NEVADA
REGIONAL WATER AUTHORITY;
NEVADA GRAZING BOARD OF DISTRICT
NO. 4; GREAT BASIN WATER NETWORK;
MARK WINTCH; WAH WAH RANCH,
WALLACE PEAK WATER COMPANY,
WINTCH & COMPANY LLC; BARBARA
WINTCH; JOHN CARTER; LYLE
CARTER; DEAN EYRE; DUSTIN KESLER;
BRANDON YARDLEY; AND GILBERT
("GIB") T. YARDLEY,**

Appellants,

v.

BUREAU OF LAND MANAGEMENT,

Respondent.

IBLA No. _____

**RE: PINE VALLEY WATER SUPPLY
PROJECT
DOI-BLM-UT-C010-2020-0012-EIS
(2026)**

DECLARATION OF BRANDON YARDLEY

BEAVER COUNTY COMMISSIONER

I, BRANDON YARDLEY, Rancher and Beaver County Commissioner, declare as follows:

1. I have personal knowledge of each of the facts set forth below and, if called upon to do so, could and would testify regarding the following. This declaration is filed in support of Beaver County, Utah, et al.'s *Notice of Appeal* and *Petition for Stay* in the above-captioned matter and in support of standing for Beaver County, Utah and in my personal capacity.

2. I have lived in Beaver County, Utah my entire life, and my family has been in the Milford Valley nearly 100 years or for four generations, and with our help, my kids could be the fifth generation.
3. Together with my family, I own approximately 7,000 acres of property along with approximately 6000 acre-feet of water per year of underground water rights in the Milford Valley. We use the water for farming and ranching. We also run around 600 mother cows on federal and state lands in our valley. The springs and wells in our valley and surrounding valleys are extremely important to our livelihood. The negative impact of the Pine Valley Water Supply Project on the ranchers who run cattle in Pine Valley and Wah Wah Valley will be irreversible.
4. I filed my individual comments in 2022 with the BLM regarding the Draft Environmental Impact Statement (DEIS) in opposition to the Pine Valley Water Supply Project.
5. I am currently serving in elected office as a Beaver County Commissioner.
6. I have been a member of the Beaver County Commission since 2024.
7. My work for Beaver County has included my role to protect the citizens of Beaver County. Water is a precious resource in our area, and throughout Southern Utah. Our underground aquifer has been declining for a number of years. As a county commission, we have taken steps to improve recharge and help the aquifer when the opportunity allows.
8. The water basins in southern Utah are tied together. I expect to see negative impacts in the Milford valley in a short period of time. We need to be very delicate with the limited resource that we rely upon. When water is moved 66 miles from its original source, that water is gone and it won't come back. The dry environment will not survive.
9. When the current springs and wells dry up, the ranchers, including me, will not be able to keep cattle in the area and may not be able to stay in business.

10. As a Beaver County Commissioner, I approved Beaver County's participation in the BLM's environmental review process for the Pine Valley Water Supply Project ("Project") as a cooperating agency and its submission comments to the Bureau of Land Management at every stage of the process, including scoping, Administrative Draft EIS, Draft EIS, Administrative Final EIS, and Final EIS comments.

11. Beaver County includes portions of the following groundwater Basins: Pine Valley, Wah Wah Valley, Snake Valley, Hamlin Valley, Beryl Enterprises Area, Milford Area, and Beaver Valley, most of which stand to be impacted by the Project's groundwater pumping according to USGS groundwater modeling and project proponent consultant groundwater modeling.

12. Beaver County is home to the cities of Milford, Minersville, and Beaver, whose economies rely on ranching, agriculture, and tourism, all of which are groundwater dependent.

13. Beaver County derives a substantial portion of its revenue from agriculture, ranching, and recreation and tourism in Pine Valley and in hydrologically connected downgradient valleys in Beaver County.

14. With regard to agriculture, Beaver County's Resource Management Plan provides that "[t]he 2012 Census of Agriculture indicates there are 277 farms or ranches in Beaver County occupying 190,000 acres of private land. The average farm size is 686 acres and the average land value is \$1,997 per acre. The average farm is valued at \$1,370,000. Of the county's 1,657,656 total acreage, agriculture activity occupies 11.5% of the land. The County had 37,000 acres of cropland, of which 32,000 acres were irrigated and harvested. Alfalfa is the dominant crop with 125,000 tons produced. Corn is the second leading crop with 284,400 bushels of grain and 35,000 tons of silage produced." Beaver County, Utah, Resource Management Plan, § 3.1 (Amended September 6,

2022), available at <https://rmp.utah.gov/documents/PLPCO::beaver-county-management-plan/>. (“Beaver County RMP” or “RMP”).

15. The RMP further provides that “Beaver County leads all counties in Utah in total market value of agricultural products at \$288.5 million as well as total livestock revenues valued at \$266.9 million. This is primarily attributable to the commercial hog production facilities in the County. In cattle production, there were over 21,000 head of cows in the county, of which 13,000 were raised for the beef market. The number of dairy cows has fallen to about 700 in 2012.” *Id.*

16. Beaver County’s objectives with regard to agriculture, as documented in its RMP are as follows: “1. To preserve and protect the agricultural lifestyle, heritage, culture and rural character of the County; 2. To actively coordinate with federal and state agencies to foster management goals and decisions that are favorable to the County’s agricultural industry; 3. To take action to encourage responsible stewardship of water and rangeland resources to foster a strong agriculture based economy; and 4. To adopt policies and principles that promote local agriculture to increase the state’s food security while decreasing its dependence on imported food and produce.” *Id.*

17. With regard to livestock and grazing, Beaver County’s Resource Management Plan provides that “grazing on public land is vital to the agricultural industry of the county.” RMP at § 3.2.

18. In particular, the Resource Management Plan notes that livestock grazing has a positive a positive impact on the County’s economy, accounting “for 93.7% of the total agricultural cash receipts in Beaver County, the highest in the state.” *Id.*

19. Consistent with the importance of livestock and grazing to the County’s revenue, economy, and cultural heritage, the Beaver County Resource Management Plan establishes the following objectives for livestock and grazing that are relevant here and that will be undermined by BLM’s

grant of the Project right-of-way and the associated groundwater pumping: to preserve livestock grazing on public lands as an important historic, cultural and economic activity; to maintain the AUM's at current levels and encourage increases as range conditions provide; to improve range conditions through vegetation treatments and proper management, all federal agency resource management planning on public lands within Beaver County, must involve active participation from the County and grazing permittees as contributing members; have all Federal policies and management plans acknowledge and consider the cultural, economic, and environmental importance of the livestock industry to the county and its citizens; protect AUM's from displacement by solar energy developments on public lands; and protect surface and groundwater resources for livestock use. *Id.*

20. With regard to water rights and irrigation, the Beaver County Resource Management Plan includes the following objective that would be directly harmed by Project pumping: to retain adequate water to meet its diverse current and future needs. Further, "[p]rivately held water rights shall be protected from federal and/or state encroachment or coerced acquisition. Beaver County opposes any movement toward nationalization or federal control of Utah water rights and water resources." RMP § 3.3.

21. Further, the Resource Management Plan provides that "NEPA analysis for projects that impact irrigation resources shall include detailed socio economic impacts to irrigators, especially small farmers, water companies and municipalities. Provisions of the Regulatory Flexibility Act will serve as a model for such analysis." *Id.*

22. With regard to noxious weeds, the Beaver County Resource Management Plan provides that it is Beaver County's objective: "[t]o fulfill its responsibility to its citizens to protect lands, crops and livestock from the harmful and costly invasion of noxious weeds by preventing their

introduction, establishment and spreading.” The Plan further provides that “Beaver County calls upon the federal agencies who administer lands within the county to: ... Maintain and enhance desired plant communities that benefit watersheds, water quality, wildlife, livestock, recreation, and are weed free [...and] Refrain from any planning decisions and management actions that will undermine, restrict or diminish the goals, purposes and policies of Beaver County as stated in this resolution.” RMP § 3.4.

23. With regard to water resources, Beaver County’s RMP provides that “[w]ater is one of the most important natural resources in Beaver County.” RMP § 4.

24. Further, “[t]he utility of all lands in the county, whether public or private, are fully dependent on water flows from watersheds or underground sources for their productivity.” RMP § 4.1.

25. “The rivers and streams flowing from watersheds on public lands supply important water for municipal, industrial, agricultural and recreational use.” *Id.*

26. The RMP provides that one of its objectives with regard to Beaver County’s hydrology is “[t]o demand that land managers coordinate programmatic agreements, best management practices, and prioritization schedules for improving hydrologic functions and conditions within Beaver County.” RMP § 4.1.

27. The RMP further refers to Section 63J-8-104 of the Utah Code, which “states that federal land management agencies shall manage the watershed on federal lands to achieve and maintain water resources at the highest reasonably sustainable levels...” *Id.*

28. Specifically, “[w]atersheds shall be managed to preserve the quality and quantity of water for current and future uses.” *Id.*

29. With regard to recreation and tourism, Beaver County's RMP provides that "[r]ecreation and tourism resulting from Beaver County's unique character, history, and culture plays a critical role in the local economy." RMP § 5.

30. "According to the Utah Department of Workforce Services, leisure and hospitality jobs had a 17.4% non-agricultural industry share in 2015, ranking 13th out of Utah's 29 counties. According to the Utah State Tax Commission, in 2015, travel-related tax revenues totaled approximately \$343,178." *Id.*

31. "Beaver County offers many world-class outdoor recreation opportunities. The majestic Tushar Mountain Range marks the eastern boundary of Beaver County. The range includes two of the highest mountains in the state, Delano Peak (12,173 feet) and Mount Belknap (12,139 feet). In addition to breathtaking hiking and backpacking trails, Beaver County has mountain biking opportunities, including a mountain traversing bike race each summer. Horse riding and packing trails and ATV trails are numerous and popular. The Tushar Mountains do not just offer summer activities, skiing, snowmobiling and ice fishing are very popular winter activities enjoyed by many locals and visitors. The large granite rock formations of the Mineral Mountains provides an adventurous wonderland for exploring as well as highly technical climbing and rappelling opportunities for more advanced climbers. Frisco Peak has been the destination for hang gliders who are bold enough to launch off the steep precipice into the rising desert thermals." *Id.*

32. "Beaver County is also known for its high-quality hunting and fishing opportunities. Beaver County is home to many huntable species including big game, waterfowl, and predators. The trophy-class elk and deer found in Beaver County are highly sought after and a prized resource. Minersville Reservoir is managed to produce trophy-sized trout, wipers and smallmouth bass. The

high mountain lakes and streams of the Tushar Mountains have Rainbow, Brown, Cutthroat, and Tiger trout varieties.” *Id.*

33. Beaver County’s RMP provides that “[i]t is the policy of Beaver County to support outdoor recreation on public lands as part of a balanced plan of economic growth and quality of life.” *Id.*

34. Pine Valley and downgradient hydrologically connected groundwater basins in Beaver County are characterized by largely undeveloped landscapes valued for their pristine character, wildlife habitat, and intact rangeland. These landscapes support substantial economic activity in Beaver County through hunting, camping, and other outdoor recreation that generate tourism revenue. They also sustain ranching operations that depend on the valleys’ groundwater and forage resources and that contribute materially to the County’s agricultural economy and tax base.

35. Beaver County will be directly injured by the BLM’s decision to grant a right-of-way for the Pine Valley Water Supply Project because the Project authorizes both surface disturbance and large-scale groundwater withdrawals in Pine Valley that will extend into neighboring hydrologically connected downgradient basins located within Beaver County.

36. Groundwater modeling prepared by the applicant’s consultants for the BLM’s EIS, as well as modeling conducted by the U.S. Geological Survey and Beaver County’s consultants, demonstrates that predicted effects of the proposed Project pumping will draw down the Pine Valley aquifer by hundreds of feet at the Project well field in the short term during the initial 50-year pumping period. The pumping will also affect downgradient, hydrologically connected basins by drawing down the water table from approximately five to hundreds of feet across a large area of Beaver County in Pine and Wah Wah Valleys within 50 years of Project buildout, with far more severe impacts over a much broader geographic area the longer the wells are pumped. Project Final Groundwater Resources Impact Assessment § 4.2.1.2, p. 111.

37. These impacts will effectively be permanent.
38. Depletion of groundwater in Pine Valley and in downgradient hydrologically connected basins within Beaver County will impair the water availability that supports ranching operations within the County. Reduced groundwater availability will diminish the carrying capacity, productivity, and value of ranch properties, including ranches such as the Wah Wah Ranch, which contribute tax revenue to Beaver County as a direct result of income generated by ranching operations. *See* Declarations of Mark Wintch and Barbara Wintch.
39. Through these impacts, the Project will directly injure Beaver County's proprietary and economic interests in Pine Valley and in hydrologically connected downgradient basins within the County, including injury to the County's tax base and to land owned by ranchers operating within the County who contribute taxes to Beaver County as a direct result of ranching revenue and groundwater and spring dependent property values.
40. Project groundwater modeling, as well as modeling conducted by the U.S. Geological Survey and Beaver County's consultants, confirms that the Project's groundwater withdrawals will directly impact land and water resources in Beaver County, which will diminish the value of property within the County.
41. Groundwater declines resulting from Project groundwater pumping are expected to increase pumping depths, reduce yield, degrade water quality, and require costly mitigation or replacement measures.
42. Project groundwater pumping is also expected to result in reduced land productivity, loss of vegetation, loss of wildlife habitat, introduction of invasive species and noxious weeds, subsidence risk, and diminished recreational value, which will result in reduced market value of land and water resources in Beaver County.

43. These groundwater declines and associated ecosystem, or environmental, impacts are expected to impair the scenic, recreational, ecological, and otherwise pristine character of Pine Valley and hydrologically connected downgradient valleys in Beaver County. These intact landscapes support tourism and related economic activity, including visitation, lodging, recreation spending, and other tourism-related income, from which Beaver County derives tax revenue.

44. The BLM's approval of the Project right-of-way in its Record of Decision is also inconsistent with Beaver County's Resource Management Plan objectives, policies, and guidelines described above and in Beaver County's comments on the 2022 Draft EIS and the Administrative Final EIS, and more specifically frustrates Beaver County's implementation of that Plan and its objectives.

45. Additionally, as noted in the Pine Valley Water Supply Project Final EIS, Beaver County's "RMP policies designate a 1,000-foot utility corridor, along State Route 21 and the TransWest Express powerline to the Millard County line (Beaver County 2019)." FEIS at § 1.5.1. The Project pipeline alignment chosen by the BLM and the applicant fails to make use of this existing utility corridor designated by Beaver County for such projects, frustrating Beaver County's ability to effectively engage in local land use planning and to plan for future growth and development.

46. Beyond the Project's frustration of Beaver County's designated utility corridor and land-use planning framework, its groundwater withdrawals will independently and substantially impair the County's ability to plan for future growth and development. Project pumping is expected to reduce groundwater availability within Pine Valley and hydrologically connected basins that the County reasonably relies upon in planning for future residential, commercial, agricultural, ranching, and industrial development.

47. Finally, there has been no demonstration by the Central Iron County Water Conservancy District or the BLM that the impact to water resources and groundwater dependent resources within Beaver County will be adequately mitigated, or that Beaver County will be made financially whole after withdrawal of groundwater causes the predicted environmental harm, and thus, Beaver County anticipates the need to expend significant financial resources to mitigate the loss of ecological and water resources that will be a direct result of Project groundwater pumping, including but not limited to the need to deepen wells, augment spring flow, manage transitions in vegetation, and mitigate increased fugitive dust.

48. As a result, the Project threatens the County's institutional and proprietary interests in orderly land-use planning, infrastructure investment, and long-range economic development.

49. These concrete fiscal and proprietary harms to the County's revenues, interests, and planning authority constitute direct injuries to Beaver County itself.

50. My injuries and Beaver County's injuries will be remedied by a decision to stay, set aside, and remand the BLM's Record of Decision for the Pine Valley Water Supply Project because the ground disturbance and groundwater pumping activities authorized therein, including pipeline and wellfield construction and operation, road construction, solar field construction, and groundwater pumping, would not occur and therefore would not injure Beaver County's interests and property rights described herein and my property described herein in my personal capacity.

Pursuant to 28 U.S.C. § 1746, I declare under penalty of perjury that the foregoing is true and correct.

DATED: 3/31/2026

DocuSigned by:
Brandon Yardley
07330830081A458
Brandon Yardley
Rancher and Beaver County Commissioner

EXHIBIT B-20

Declaration of Gilbert (“Gib”) T. Yardley

**DEPARTMENT OF THE INTERIOR
OFFICE OF HEARINGS AND APPEALS
INTERIOR BOARD OF LAND APPEALS**

BEAVER COUNTY, UTAH; MILLARD COUNTY, UTAH; JUAB COUNTY, UTAH; WHITE PINE COUNTY, NEVADA; CITY OF MILFORD, UTAH; CENTRAL NEVADA REGIONAL WATER AUTHORITY; NEVADA GRAZING BOARD OF DISTRICT NO. 4; GREAT BASIN WATER NETWORK; MARK WINTCH; WAH WAH RANCH, WALLACE PEAK WATER COMPANY, WINTCH & COMPANY LLC; BARBARA WINTCH; JOHN CARTER; LYLE CARTER; DEAN EYRE; DUSTIN KESLER; BRANDON YARDLEY; AND GILBERT (“GIB”) T. YARDLEY,

Appellants,

v.

BUREAU OF LAND MANAGEMENT,

Respondent.

IBLA No. _____

**RE: PINE VALLEY WATER SUPPLY
PROJECT
DOI-BLM-UT-C010-2020-0012-EIS
(2026)**

DECLARATION OF GILBERT (“GIB”) T. YARDLEY

I, GILBERT (“GIB”) T. YARDLEY, declare as follows:

1. I have personal knowledge of each of the facts set forth below and, if called upon to do so, could and would testify regarding the following. This declaration is filed in support of Beaver County, Utah, et al.’s *Notice of Appeal* and *Petition for Stay* in the above-captioned matter and in support of my personal standing.
2. I live in Beaver, Utah, and I own the Yardley Cattle Company.

3. I own property in the vicinity of the proposed Pine Valley Water Supply Project (the "Project") in a downgradient basin in Beaver Valley and the west desert. I purchased the desert land in 1985, so I have run cattle there for 41 years.
4. I own water rights in the vicinity of the Project and have owned them for at least 45 years.
5. I use the water in the vicinity of the Project for stock watering.
6. I have experienced and experience the water resources in the vicinity of the proposed Project. The water table is getting lower.
7. I also use the well water in the downgradient basins for my personal use.
8. Our cattle operation has eight wells and two springs used for stock water in the vicinity of this Project. I anticipate the impact of the Project to be an increasingly lower water table with wells and springs drying up.
9. I, along with the residents of Beaver County, am very alarmed and upset that the Central Iron County Water Conservancy District ("CICWCD") is trying to steal our water from Pine Valley and Wah Wah Valley. These areas are a desert, and in some dry years, only 2-3 inches of rainfall occurs. CICWCD and the State Water Engineer know this and know there is never enough rainfall to recharge these underground aquifers.
10. The cost of the Project will greatly increase everyone's costs for water.
11. In my opinion, Cedar City, Enoch, Hurricane, and St. George must stop issuing any more building permits. The increased demand of water needs to be addressed before permitting the continued growth. Wah Wah Valley and Pine Valley are not the solution.
12. In my opinion, people in eastern Iron County do a very wasteful job of managing water so they want to steal our Beaver County water.
13. The Project is completely uneconomical and very speculative.

14. Groundwater modeling prepared by the applicant's consultants for the BLM's EIS, as well as modeling conducted by the U.S. Geological Survey, and Beaver County's hydrological consultant, demonstrates that the predicted effects of the proposed Project pumping will draw down the Pine Valley aquifer by hundreds of feet at the Project well field in the short term during the initial 50-year pumping period. The pumping will also affect downgradient, hydrologically connected basins by drawing down the water table from approximately five to hundreds of feet across a large area of Beaver County in Pine and Wah Wah Valleys within 50 years of Project buildout, with far more severe impacts over a much broader geographic area the longer the wells are pumped. Project Final Groundwater Resources Impact Assessment § 4.2.1.2, p. 111.

15. These impacts will effectively be permanent.

16. I filed my comments in 2022 to the BLM regarding the Draft Environmental Impact Statement (DEIS) in opposition to the Pine Valley Water Supply Project.

17. The injuries that my cattle company and I will suffer will be remedied by a decision to stay, set aside, and remand the BLM's Record of Decision for the Pine Valley Water Supply Project.

Pursuant to 28 U.S.C. § 1746, I declare under penalty of perjury that the foregoing is true and correct.

DATED: 3/31/2026

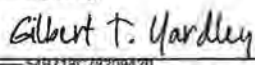
Signed by:

54B718C78209420
Gilbert ("Gib") T. Yardley

EXHIBIT C-1

Comment on the Draft Environmental Impact Statement
Pine Valley Water Supply Project
(DOI-BLM-UT-c010-2020-0012-EIS)

October 2, 2025

Comment on the Draft Environmental Impact Statement
Pine Valley Water Supply Project
(DOI-BLM-UT-C010-2020-0012-EIS)

With Emphasis on Groundwater Resources Impact Assessment and
GBCAAS-PV Model
Pine Valley Water Supply Project

Prepared by

Groundwater Model Analysis, LLC

Prepared For

Smith Hartvigsen, PLLC

October 2, 2025

To Whom It May Concern:

Groundwater Model Analysis, LLC respectfully submits the following comment on the Draft Environmental Impact Statement Pine Valley Water Supply Project (DOI-BLM-UT-C010-2020-0012-EIS), with specific reference to the Groundwater Resources Impact Assessment (GRIA) incorporated by reference in the DEIS. Because the DEIS depends on the adequacy of the GRIA, any deficiencies in the GRIA and GBCAAS-PV model described in the GRIA undermine the ability of the DEIS to adequately evaluate impacts as required by NEPA. A detailed technical review is attached to this letter as "Technical Review of the Draft Environmental Impact Statement." That technical review shows the DEIS, GRIA, and GBCAAS-PV model do not meet NEPA standards for high quality accurate scientific analysis (40 CFR 1500.1), evidence that the agency has made the necessary environmental analysis (40 CFR 1500.2), accurately describing the affected environment (40 CFR 1502.15), documentation of incomplete or unavailable information (40 CFR 1500.22), professional and scientific integrity (40 CFR 1502.24), accurate cumulative impact (40 CFR 1508.7), and accurate effects (40 CFR 1508.8).

Summary of Key Concerns

The GRIA describes conceptual and numerical models that were created to assess the potential groundwater resource impacts associated with the PVWS Project alternatives in support of the DEIS. Because of omissions, errors, and inconsistencies in the GRIA, improper model calibration techniques, and incomplete model analyses, the predictions of impacts have not been shown to be accurate.

1. The model predictions do not include prediction confidence intervals, prediction scaled sensitivities, or prediction correlation coefficients. Parameter uncertainty is not presented. These statistics are critical to understanding if the model can make precise predictions and the uncertainty in those predictions. Presenting prediction uncertainty is generally expected in the scientific community.
2. The model and report fail to acknowledge and simulate past pumping in the surrounding areas of Snake Valley, Beryl-Enterprise Area, and Milford Area. This past pumping has created large drawdown cones and depleted areas of evapotranspiration that existed during the pre-development period for which GBCAAS-PV was calibrated. The effects of decades of pumping and groundwater mining cannot be estimated by starting predictions with the steady-state no pumping model. Simulating capture of evapotranspiration that does not exist reduces the simulated amount and spread of the drawdown created by the project wells and underestimates recovery time.

3. Recharge was set as a known value in the groundwater model, despite uncertainty in recharge and despite the observations providing a lot of information about recharge parameters as indicated by large composite scaled sensitivities.
 - a. It is likely that simulated recharge could have been determined by regression.
 - b. Because recharge is set, this requires hydraulic properties to also be set (manually or by regression) to move this amount of water through the groundwater system.
4. The model has a lot of parameters that cover small areas and for which the observations provide little information as indicated by small composite scaled sensitivities.
 - a. The additional parameters may have been hand calibrated to fit specific water levels or spring discharge, but may not accurately represent the response of the system to pumping.
 - b. Having a lot of insensitive parameters increases prediction uncertainty. Of the 31 parameters added to the GBCAAS-PV model, only 7 of them have regressed values used in the final calibrated model.
5. The area of the proposed pumping has some of the highest water-level residuals in the calibrated model. The mismatch in this critical area could indicate a conceptual error in the model construction or parameterization, which could have a large impact on model predictions.
6. The pumping period of 50 years for the Pine Valley Water Supply Project and pumping in surrounding areas is unreasonably short. The DEIS and GRIA state that that a specific extraction rate beyond this time frame was considered speculative. The speculative and very specific extraction rate of zero is then used for the project pumping and pumping in surrounding areas after 50 years.

Recommendations

Several model processes should be changed and documented in the Final EIS.

1. Simulation of the affected environment must include past pumping in surrounding areas.
2. The final EIS should include calibration that allows recharge to be a calibration parameter and reduces the number of hydraulic conductivity zones.
3. Parameter uncertainty for all parameters should be determined and reported.
4. Prediction uncertainty should be determined and reported.

5. A longer pumping period should be analyzed.

Conclusions

The deficiencies in the GRIA and GBCAAS-PV model prevent accurate analysis of the range of impacts as required by NEPA. The attached Technical Review of the Draft EIS Groundwater Analysis provides detailed documentation of these concerns. The DEIS, as written, lacks sufficient scientific support to allow for informed decision-making as required by 40 CFR Parts 1500–1508.

Groundwater Model Analysis, LLC appreciates the opportunity to provide these comments and is available to provide clarification as needed.

Respectfully Submitted,

Lynette Brooks, owner
Groundwater Model Analysis, LLC

EXHIBIT C-2

Technical Review of the Draft Environmental Impact Statement
Pine Valley Water Supply Project
(DOI-BLM-UT-C010-2020-0012-EIS)

October 13, 2025

Technical Review of the Draft Environmental Impact Statement
Pine Valley Water Supply Project
(DOI-BLM-UT-C010-2020-0012-EIS)

With Emphasis on Groundwater Resources Impact Assessment and

GBCAAS-PV Model

Pine Valley Water Supply Project

Prepared by

Groundwater Model Analysis, LLC

Prepared For

Smith Hartvigsen, PLLC

October 13, 2025

Statement of Qualifications

This technical report has been prepared by Groundwater Model Analysis, LLC. The following summarizes the qualifications and relevant experience of Lynette Brooks, Owner and Principal Consultant. The review presented in this report is informed by extensive experience with U.S. Geological Survey models and reports.

Education and Licensing

Master of Science, Civil and Environmental Engineering, Utah State University, 1986.

Professional Engineer, Utah, July 1990 to March 2019 (Expired)

Professional Engineer, Hawaii, October 2017 to present (Active)

Professional Experience

Hydrologist, U.S. Geological Survey – over 29 years of professional experience in groundwater hydrology, groundwater modeling, and water resources analysis.

Areas of Expertise

- Groundwater flow modeling and parameter estimation (MODFLOW, UCODE)
- Hydrogeologic conceptual model development
- Peer review of USGS groundwater and modeling reports

Selected Projects and References (U.S. Geological Survey)

Brooks, L.E., 2017, Groundwater model of the Great Basin carbonate and alluvial aquifer system version 3.0: Incorporating revisions in southwestern Utah and east central Nevada: U.S. Geological Survey Scientific Investigations Report 2017-5072, 77 p., 2 appendixes, <https://doi.org/10.3133/sir20175072>.

Brooks, L.E., Masbruch, M.D., Sweetkind, D.S., and Buto, S.G., 2014, Steady-state numerical groundwater flow model of the Great Basin carbonate and alluvial aquifer system: U.S. Geological Survey Scientific Investigations Report 2014-5213, 124 p., 2 pl. <http://dx.doi.org/10.3133/sir20145213>.

Heilweil, V.M., and Brooks, L.E., eds., 2011, Conceptual model of the Great Basin carbonate and alluvial aquifer system: U.S. Geological Survey Scientific Investigations Report 2010-5193, 191 p. <https://doi.org/10.3133/sir20105193>.

Masbruch, M.D., Gardner, P.M., and Brooks, L.E., 2014, Hydrology and numerical simulation of groundwater movement and heat transport in Snake Valley and surrounding areas, Juab, Millard, and Beaver Counties, Utah, and White Pine and Lincoln Counties, Nevada: U.S. Geological Survey Scientific Investigations Report 2014-5103, 108 p. <http://dx.doi.org/10.3133/sir20145103>.

Stolp, B.J., Brooks, L.E., and Solder, J.E., 2017, Hydrology and numerical simulation of groundwater flow and streamflow depletion by well withdrawals in the Malad-Lower Bear River Area, Box Elder County, Utah: U.S. Geological Survey Scientific Investigations Report 2017-5011, 113 p., 6 appendixes, <https://doi.org/10.3133/sir20175011>.

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Abbreviations and Acronyms

CICWCD	Central Iron County Water Conservancy District
CFR	Code of Federal Regulations
DEIS	Draft Environmental Impact Statement (DOI-BLM-UT-C010-2020-0012-EIS) Pine Valley Water Supply Project (Bureau of Land Management, January 2022)
ETg	Evapotranspiration from groundwater
GRIA	Groundwater Resources Impact Assessment Pine Valley Water Supply Project Iron and Beaver Counties, Utah (Formation Environmental, December 2021).
GBCAAS	Great Basin Carbonate and Alluvial Aquifer System
GBCAAS-PV	Great Basin Carbonate and Alluvial Aquifer System groundwater model prepared by Formation Environmental and documented in Groundwater Resources Impact Assessment Pine Valley Water Supply Project Iron and Beaver Counties, Utah.
GBCAAS v. 1.0	Great Basin Carbonate and Alluvial Aquifer System groundwater model prepared by U.S. Geological Survey (Brooks and others, 2014).
GBCAAS v. 2.0	Great Basin Carbonate and Alluvial Aquifer System groundwater model prepared by U.S. Geological Survey (Stolp and others, 2017).
GBCAAS v. 3.0	Great Basin Carbonate and Alluvial Aquifer System groundwater model prepared by U.S. Geological Survey (Brooks, 2017).
PVWS	Pine Valley Water Supply Project
USGS	United States Geological Survey

Introduction

This report accompanies the comment prepared by Groundwater Model Analysis, LLC about the Draft Environmental Impact Statement (DOI-BLM-UT-C010-2020-0012-EIS, January 7, 2022) and Groundwater Resources Impact Assessment and for the Pine Valley Water Supply Project (December 2021, incorporated by reference in the DEIS) and provides further details and references about the problems that are briefly summarized in the comment. The emphasis of this report is a technical review of “Groundwater Resources Impact Assessment Pine Valley Water Supply Project Iron and Beaver Counties, Utah” (GRIA) prepared by Formation Environmental December 2021 and incorporated by reference in the DEIS. The purpose of this

report is to provide technical concerns with the GBCAAS-PV model presented in the GRIA, technical concerns with the conceptual budget that is simulated in the model, and technical concerns with reporting of the results of the GBCAAS-PV calibration and prediction simulations. This report also clarifies misconceptions about previous USGS reports and models if those misconceptions are used to make incorrect assumptions in the GRIA or GBCAAS-PV model. This technical review shows the DEIS, GRIA, and GBCAAS-PV model do not meet NEPA requirements for high quality accurate scientific analysis (40 CFR 1500.1), accurately describing the affected environment (40 CFR 1502.15), documentation of incomplete or unavailable information (40 CFR 1500.22), professional and scientific integrity (40 CFR 1502.24), accurate cumulative impact (40 CFR 1508.7), and accurate effects (40 CFR 1508.8).¹

Executive Summary

The GRIA describes conceptual and numerical models that were created to assess the potential groundwater resources-related impacts associated with the PVWS Project alternatives in support of the EIS (GRIA, p. A-1). This report shows little confidence can be placed on the predictions of impacts because of omissions, errors, and inconsistencies in the GRIA, improper model calibration techniques, and incomplete model analyses.

1. The model predictions do not include prediction confidence intervals, prediction scaled sensitivities, or prediction correlation coefficients. These statistics are critical to understanding if the model can make precise predictions and the uncertainty in those predictions. The lack of prediction uncertainty violates 40 CFR 1502.24 which requires scientific integrity of the discussions and analyses in environmental impact statements. Predictions are incomplete information and 40 CFR 1502.22 requires “the agency’s evaluation of such impacts based upon theoretical approaches or research methods generally accepted in the scientific community.” Not calculating or presenting prediction uncertainty is not generally accepted.
2. The model and report fail to acknowledge and simulate past pumping in the surrounding areas of Snake Valley, Beryl-Enterprise Area, and Milford Area. This past pumping has created large drawdown cones and depleted areas of evapotranspiration that existed during the pre-development period for which GBCAAS v. 3.0 and GBCAAS-PV were calibrated, and the effects of decades of pumping and groundwater mining cannot be estimated by starting with the steady-state no pumping model.

¹ The author has not reviewed the Administrative Final GRIA prepared by Formation Environmental, dated July 2025, due to BLM denials for document access under FOIA.

- a. The failure to account for this pumping violates 40 CFR 1502.15 to describe the affected environment.
 - b. During calibration and model predictions, discharge to evapotranspiration is simulated that does not currently exist and cannot be captured by future pumping.
 - c. Simulating capture of evapotranspiration that does not exist reduces the simulated amount and spread of the drawdown created by the project wells.
3. The omission of past pumping in surrounding valleys also violates 40 CFR 1508.7 requiring analysis of the cumulative effects of all past, present, and reasonably foreseeable future actions.
4. Recharge was set as a known value in the groundwater model, despite uncertainty in recharge and despite the observations providing a lot of information about recharge parameters as indicated by large composite scaled sensitivities.
 - a. It is likely that simulated recharge could have been determined by regression.
 - b. Because recharge is set, this requires hydraulic properties to also be set (manually or by regression) to move this amount of water through the groundwater system.
 - c. This violates scientific integrity (40 CFR 1502.24) by not following standard guidelines for model calibration.
 - d. Setting the recharge also impacted Snake Valley hydrographic area. Hydraulic conductivity values were adjusted to decrease water levels and possible decrease discharge to Clay Springs. These changes caused an ETg observation (et37Snake3) to be only about 18,000 acre-feet per year instead of the observed 37,400 acre-feet per year or the 27,600 acre-feet per year simulated in GBCAAS v. 3.0.
5. The model has a number of parameters that cover small areas and for which the observations provide little information as indicated by small composite scaled sensitivities.
 - a. The additional parameters may have been hand calibrated to fit specific water levels or spring discharge, but may not accurately represent the response of the system to pumping.
 - b. Having a lot of insensitive parameters increases prediction uncertainty. Of the 31 parameters added to the GBCAAS-PV model, only 7 of them have regressed values used in the final calibrated model.

6. The area of the proposed pumping has some of the highest water-level residuals in the calibrated model. The mismatch in this critical area could indicate a conceptual error in the model construction or parameterization, which could have a large impact on model predictions.

Scope and Organization of this Report

The body of this report mostly follows the organization of the GRIA, but does not comment on all sections of the GRIA. This report, however, changes the order of the presentation in the GRIA by inserting comments about Appendix A (Development of the GBCAAS-PV Groundwater Flow Model) between comments about Chapter 3 (Affected Environment) and Chapter 4 (Potential Project and Cumulative Effects).

Comments about GRIA Chapter 1: Introduction

This report presents two major concerns about topics highlighted in GRIA Chapter 1. The first concern is the discussion of “Management of Uncertainties and Risks”. As will be explained in “Model Predictions” section of this report, uncertainty in model parameters and model predictions is never acknowledged or discussed in the GRIA, despite the GRIA (2021, p. 5) stating that uncertainties must be sufficiently addressed in the GRIA. The omission of these data violates 40 CFR 1502.24 about scientific integrity because it is commonly recommended that prediction confidence intervals be calculated and presented. The omission of the data also violates 40 CFR 1502.22(a) which states:

“If the incomplete information relevant to reasonably foreseeable significant adverse impacts is essential to a reasoned choice among alternatives and the overall costs of obtaining it are not exorbitant, the agency shall include the information in the environmental impact statement.”

The second concern is the simulated pumping period as described in “Scoping Considerations” section of the GRIA, which is only 50 years despite the likelihood that the PVWS Project will be needed beyond 50 years. The DEIS (p. 1-2, 35-36) highlights the continuing water needs of Cedar City:

1. “The need for additional water arises from the lack of sufficient existing water resources within the overdrawn Cedar Valley basin to respond to growing population needs and the gradual implementation of the Cedar City Valley groundwater management plan (GMP), adopted in January 2021.”

2. “Based on an analysis of the Cedar Valley demand and projected savings from conservation efforts to meet or exceed these targets, conservation alone cannot overcome the current Cedar Valley deficit.”
3. “A temporary use alternative would essentially require two separate courses of action simultaneously: bringing in water from Pine Valley and purchasing existing Cedar City Valley water rights until the Project water is no longer needed (i.e., until the Cedar City Valley aquifer is in equilibrium). It would be economically infeasible for the CICWCD to both purchase many Cedar City Valley water rights and finance the PVWS Project, as the impact to Cedar City ratepayers and other customers served by the CICWCD would be extreme.”

The DEIS (p. 41) states that it is speculative to assume that pumping can continue at the same rate for more than fifty years. It is even more speculative to assume that over the next 50 years Cedar City could stop needing the 30,000 acre-ft/yr required reduction in the Groundwater Management Plan (Utah Department of Natural Resources, 2021, table 1) and the 15,000 acre-ft/yr PVWS project pumping.

The GRIA (p. 7) states:

“As discussed in Section 2, PVWS Project is subject to adaptive management, the DWRI water right order for the Project, and the Utah State Code. These would curtail pumping if the safe yield of the basin is exceeded, or prior water rights are impaired. Consequently, the assumption that pumping will automatically continue on the same pumping schedule and in the same geographic distribution was determined to be speculative.”

The definition of safe yield used by Utah Division of Water Rights equals recharge, which is an uncertain number (see “Groundwater Budgets” section in this report). The model also shows water rights in Wah Wah Springs will be impaired, but despite this, water rights were granted for the project and project reauthorization is already being considered. GRIA (p. 9) states:

“If, in 50 years at the time when project reauthorization is being considered, groundwater modeling utilizing updated assumptions and information indicates that continued pumping would have unacceptable impacts to the Pine Valley aquifer system or to other aquifers within the Great Salt Lake [Desert] Flow System, the authorized project pumping schedule would be adjusted to prevent these impacts.”

The simulated 50-year pumping period violates 40 CFR 1508(b) about possible effects later in time that are reasonably foreseeable. 40 CFR 1502.22(b)(4) describes “reasonably foreseeable” as:

“impacts which have catastrophic consequences, even if their probability of occurrence is low, provided that the analysis of the impacts is supported by credible scientific evidence, is not based on pure conjecture, and is within the rule of reason.”

Comments about GRIA Chapter 2: Project Description

Applicable Water Rights and Regulations

The GRIA (p. 12) states that Utah DWRI’s 2014 Order required that CICWCD “*shall develop a monitoring program to ensure that no prior rights are being impaired and that the aquifer system is not exceeding safe yield.*” The GBCAAS v. 3.0 model (Brooks, 2017) and the GBCAAS-PV model documented in the GRIA show that Wah Wah Springs will be affected by the project pumping and water rights will be impaired.

Safe Yield in Utah Law is Not Appropriate in Pine Valley

Utah Code §73-5-15(1(b)) defines "safe yield" as follows: “the amount of groundwater that can be withdrawn from a groundwater basin over a period of time without exceeding the long-term recharge of the basin or unreasonably affecting the basin's physical and chemical integrity.” In many basins in Utah, natural discharge before groundwater development approximately equaled recharge, so the definition of safe yield allowed for capture of all discharge. Water levels stabilize if pumping does not exceed previous natural discharge. In many valleys, therefore, safe yield could also be considered the amount of natural discharge. The amount of natural discharge from the regional groundwater flow system in Pine Valley is essentially zero. Pumping in Pine Valley will create a large drawdown cone extending to areas outside the valleys until natural discharge equal to the pumping rate is captured. The GBCAAS v. 3.0 model used a 5,000-year simulation because that is how long it took the simulated system to come to a new steady-state condition with water levels reaching stability and natural discharge being stopped by an amount equal to pumping (Brooks, 2017, figure 32).

Defining safe yield as equal to recharge does not make sense for Pine Valley, and the emphasis on recharge and not on capture of discharge violates 40 CFR 1502.15 by not properly describing the affected environment. The GRIA (p. 12) states that because uncertainty remains about the amount of recharge in Pine Valley, the precise safe yield can only be reliably established based on long-term groundwater level measurement in response to pumping. This premise reveals a lack of understanding of the source of water to wells (Theis, 1940; Konikow and Leake, 2014). Konikow and Leake (2014) state that the average predevelopment rate of **natural recharge itself is largely irrelevant to storage depletion and capture responses**, but that the natural recharge does serve as a constraint on capture—in the sense that it controls the natural predevelopment groundwater discharge, which is subject to capture by pumping wells. Measuring water-level

declines in response to pumping will reveal nothing about recharge, but will help define aquifer properties and may improve the groundwater flow model.

Safe yield for Pine Valley cannot be determined by the amount of recharge, and must be defined by alternative measures, such as:

1. How much decrease in flow to Wah Wah Springs is acceptable?
2. How much decrease in flow to Beryl-Enterprise Area is acceptable?
3. How much evapotranspiration loss in areas such as Tule Valley and Sevier Desert is acceptable?

Failure to consider these alternative definitions of safe yield violates 40 CFR 1502.22:

“If the incomplete information relevant to reasonably foreseeable significant adverse impacts is essential to a reasoned choice among alternatives and the overall costs of obtaining it are not exorbitant, the agency shall include the information in the environmental impact statement.”

Comments About GRIA Chapter 3: Affected Environment

This report details three major concerns about the description of the affected environment. First, models (Brooks, 2017; GBCAAS-PV described in the GRIA) indicate Wah Wah Springs will be affected by this project, but the DEIS does not present a summary of the use and importance of Wah Wah Springs. Second, the groundwater budgets defined in the GRIA for Pine Valley and Wah Wah Valley are questionable because of inconsistencies in the text and tables, and because of the method used to estimate precipitation. Third, the affected environment includes decades of pumping in Snake Valley, Beryl-Enterprise Area, and Milford Area that have caused large drawdown cones and reduction in natural discharge.

Wah Wah Springs

Rather than discuss Wah Wah Springs in a single paragraph or section, the GRIA scatters information in various places. To emphasize the importance of Wah Wah Springs to the water-rights holder, this report presents all information in one section. Wah Wah Springs is the sole source of water to Wah Wah Ranch and is used for irrigation, stock, and potable use (GRIA, p. 33). Power has been provided to Wah Wah Ranch since 1988 from a hydroelectric turbine placed in a water pipeline that runs from Wah Wah Springs to the ranch (GRIA, p. 23). A reservoir at Wah Wah Ranch, which has a surface area of about 60 acres and storage capacity of about 200 acre-feet, stores water diverted by pipeline from Wah Wah Springs (GRIA, p. 31).

Dutchman Reservoir and Newhouse Reservoir, two ponds located north of Wah Wah Ranch, also store water diverted from the springs.

Whether Wah Wah Springs is connected to the regional system is still unknown. It is much larger than other springs in the mountains, and is therefore more likely to be connected to the regional system. The regional system receives most of its recharge in the mountains and it is reasonable to assume that mounding occurs beneath the mountain ranges that raises the level of the regional system to the altitude of Wah Wah Springs. The GBCAAS-PV model in the GRIA simulates it as connected, as does GBCAAS v. 3.0 (Brooks, 2017).

GBCAAS v. 1.0 (Brooks and others, 2014) and GBCAAS v. 3.0 (Brooks, 2017, table 8) use an observed discharge of 720 acre-feet per year for Wah Wah Springs, which is similar to the discharge reported by Stephens (1974), but does not include the evapotranspiration around the spring that may not be discharging from the regional system. It is lower than the discharge reported by Gardner and others (2020). Long-term precipitation records from stations around the area (Cedar City, Enterprise, Black Rock; Smith and others, 2019) show that precipitation during the period before and during measurements reported by Stephens (1974) was below normal or normal. The records show that precipitation during the measurements reported by Gardner and others (2020) was above normal. Stephens (1974, table 8) measured discharge at 10 individual locations to estimate discharge from Wah Wah Springs. Gardner and others (2020, p. 40) report that discharge of Wah Wah Springs was measured through a rectangular weir in a collection box and is thought to represent nearly all the spring flow from the complex. Different precipitation and different development at the spring make it difficult to compare discharge from Wah Wah Springs between the two studies. The GBCAAS-PV model (GRIA, p. A-14) chose to use the higher number reported by Gardner and others (2020) as the model observation, and to include evapotranspiration around the springs as discharging from the regional system. In addition to using this large discharge, the GRIA typically refers to the percent reduction in flow to Wah Wah Springs, which appears small because of the large amount of assumed and simulated discharge. Scientific integrity (40 CFR 1502.24) requires the rate (and cumulative volume) of capture be described, so the direct effect on the water-rights holder is quantified. The amount of discharge and from the regional groundwater system to Wah Wah Springs, and the amount of capture, is incomplete or unavailable (40 CFR 1502.22).

40 CFR 1502.22(b) states:

“If the information relevant to reasonably foreseeable significant adverse impacts cannot be obtained because the overall costs of obtaining it are exorbitant or the **means to obtain it are not known**, the agency shall include within the environmental impact statement:

(1) A statement that such information is incomplete or unavailable; (2) a statement of the relevance of the incomplete or unavailable information to evaluating reasonably foreseeable significant adverse impacts on the human environment; (3) a summary of existing credible scientific evidence which is relevant to evaluating the reasonably foreseeable significant adverse impacts on the human environment, and (4) the agency's evaluation of such impacts based upon theoretical approaches or research methods generally accepted in the scientific community. For the purposes of this section, "reasonably foreseeable" includes impacts which have catastrophic consequences, even if their probability of occurrence is low, provided that the analysis of the impacts is supported by credible scientific evidence, is not based on pure conjecture, and is within the rule of reason."

The impacts to Wah Wah Springs could be catastrophic to the water-rights owner, and the uncertainty in the predictions presented in the GRIA needs to be quantified and presented.

Misrepresentation of USGS Reports

The DEIS and GRIA repeatedly misquote Stephens (1974) and Gardner and others (2020) when stating that Wah Wah Springs follows a structural contact of the carbonate and siliciclastic rocks and is perched on siliciclastic rocks. Stephens (1974) and Gardner and others (2020) report the following geologic conditions near Wah Wah Springs:

1. (Stephens, 1974, p. 1): "The springs issue from fractures and solution channels in Paleozoic carbonate rocks and from tufa deposits in an area where the land surface transects a structurally controlled fracture zone with relatively high permeability."
2. (Stephens, 1974, p. 21): "Wah Wah Springs discharge an estimated 800 acre-feet (0.987 hm³) of ground water annually from Paleozoic carbonate rocks; an additional estimated 600 acre-feet (0.740 hm³) is discharged by evapotranspiration in the spring area."
3. (Stephens, 1974, p. 22): "The springs appear to issue on the northeast-trending axis of a flexure in the Paleozoic carbonate rocks... Fracturing of the hard, brittle limestone along the crest of the fold is believed to have created a linear zone of relatively high permeability. The springs issue where the potentiometric surface of water in this zone intersects the land surface."
4. Gardner and others (2020, p. 5): "Wah Wah Springs is the most well-known spring in the valley. The Springs are actually a complex of springs on the west side of the valley just south of Utah State Highway 21 that discharge from carbonate lithology at the base of the Wah Wah Mountains."

The geologic framework used for GBCAAS v. 3.0 (Cederberg and others, 2011) and GBCAAS-PV have no siliciclastic rocks near Wah Wah Springs and has thickness of the Lower Carbonate Aquifer Unit of at least 17,000 ft. Unless the GRIA presents new geologic data, no evidence exists that Wah Wah Springs is perched on siliciclastic rocks.

The quotes from the DEIS and the GRIA as given below call into question the professional integrity and scientific integrity (40 CFR 1502.24) required in the DEIS, and appear to be written to emphasize the possibility that Wah Wah Springs could be disconnected from the regional groundwater flow system.

1. DEIS (p. 113): “The location of the springs and seeps is thought to follow a structural contact of the carbonate and siliciclastic rocks prevalent in the northern portion of the range (Stephens 1974). In this setting, spring flow depletion in the range of 9 to 14 percent, or similar values, would be most likely to manifest itself either as a flow depletion at spring and seep discharge areas at the fringes of the entire discharge area, away from the primary spring orifices. These discharge locations are in more vulnerable positions along the discharge structure and therefore, more vulnerable to groundwater level decline. Spring flow depletion could also occur as a decrease in overflow from the spring areas to the surrounding groundwater-dependent phreatophyte vegetation.”
2. DEIS (p. 113-114) and GRIA (p. 33): “Consistent with Stephens (1974), Wah Wah Springs is described by Gardner et al. (2020) as issuing from the base of the carbonate aquifer unit in the Wah Wah Mountains and draining a mountain aquifer unit perched on a siliciclastic unit; however, it is also acknowledged that water discharged at the springs includes a “thermal” component indicative of deeper circulation. The geochemical groundwater age dating information supports the presence of modern water; however, a fraction of pre-modern water is also interpreted to be present, and therefore, the discharge from Wah Wah Springs is interpreted as a mixture of modern and Late Holocene groundwater (Gardner et al. 2020). A principal uncertainty is the fraction of modern versus pre-modern water in the spring discharge, which would shed light on the amount of discharge derived from recent recharge to a perched mountain aquifer versus more deeply circulating groundwater from the regional aquifer system that could be affected by Project pumping.”
3. DEIS (table F1) and GRIA (table 6-1): “Spring complex located on a side slope near the contact between carbonate and underlying siliciclastic rock near the alluvial valley fill boundary”.

Groundwater Budgets

The groundwater budgets presented in the GRIA have inconsistencies in both calculations and concepts. Reported precipitation amounts can be used to calculate 4 different recharge amounts, but recharge is considered to be known. Evapotranspiration estimates have a large range, which is an accurate reflection of the uncertainties involved in water budget calculations. The GRIA acknowledges that ETg is uncertain, but does not acknowledge that unknown ETg implies unknown recharge.

Precipitation in Pine Valley and Wah Wah Valley

Tables and analyses in the GRIA are inconsistent about the amount of precipitation in Pine Valley and Wah Wah Valley, and by using the reported numbers four different precipitation amounts (**table 1** in this report) can be calculated. These inconsistencies, and the fact that the chosen number is the only one that exceeds the proposed project pumping, call into question the scientific integrity (40 CFR 1502.24) of the recharge analysis. The GRIA (p. 52) calculates simple spatial averages for precipitation, which would meet the definition of “generally accepted” (40 CFR 1502.22(b)(4) methods. The GRIA (p. 52) wrongly concludes that using the average of rain gage data in each valley provides similar results as using spatially-averaged rain gage data and uses the average, which violates scientific integrity. The difference between the average and the spatial average in Pine Valley is enough to either have excess precipitation become recharge, or is not enough to satisfy estimated evapotranspiration (**table 1**).

In addition to using an incorrect method, the precipitation reported for the Desert Experimental Station is reported as 6.22 inches in GRIA table 3-1, but 7.77 inches in GRIA table 3-11 for the same period. The precipitation at the Wah Wah Ranch gage is reported as 6.77 inches in GRIA table 3-2, but 6.61 inches in GRIA table 3-11 for the same period. I have been unable to find data for these stations other than that reported in the GRIA, so cannot verify which of these numbers are correct. The difference in precipitation between GRIA tables 3-1 or 3-2 and table 3-11 and between average or spatially-averaged precipitation produces significantly different results for precipitation and recharge in Pine Valley (**table 1**). As explained in the “Safe Yield in Utah Law is Not Appropriate in Pine Valley” section of this report, recharge does not affect the capture of discharge, but it does affect model calibration and parameters. Model parameters affect model predictions.

Table 1. Recharge calculations for different precipitation rates using precipitation gages in Pine Valley and Wah Wah Valley as reported in the GRIA.

[Recharge is calculated as difference between precipitation and evapotranspiration.]						
	Pine Valley			Wah Wah Valley		
Precipitation						
	Rate, inches	Area, acres	Amount, acre-feet/year	Rate, inches	Area, acres	Amount, acre-feet/year
Average of rain gages (GRIA, table 3-11)	¹ 9.86	472,200	387,991	¹ 7.62	386,971	245,727
Area-weighted average of rain gages (GRIA, table 3-11 and page 52)	9.28	472,200	365,168	7.69	386,971	247,984
Average of rain gages using GRIA tables 3-1 and 3-2	9.60	472,200	377,760	7.65	386,971	246,694
Area-weighted average of rain gages using GRIA tables 3-1 and 3-2 and page 52	8.91	472,200	350,609	7.72	386,972	248,952
Evapotranspiration						
Area-weighted ET (GRIA, p. 66)	9.41	472,200	370,284	7.46	386,971	240,567
Recharge						
Recharge in GRIA, which uses average from GRIA table 3-11	0.45	472,200	17,708	0.16	386,971	5,160
Recharge if using spatially-weighted average of gages from GRIA table 3-11	-0.13	472,200	-5,116	0.23	386,971	7,417
Recharge if using average from GRIA tables 3-1 and 3-2	0.19	472,200	7,476	0.19	386,971	6,126
Recharge if using spatially-weighted average of gages from GRIA tables 3-1 and 3-2	-0.5	472,200	-19,675	0.26	386,972	8,384

¹. The GRIA (p. 53) mistakenly states that the spatially weighted average annual precipitation data is 9.86 inches in Pine Valley and 7.62 inches in Wah Wah Valley. GRIA (table 11) shows those numbers to be the average of the precipitation gages.

Recharge in Pine Valley and Wah Wah Valley

The GRIA calculates recharge for Pine Valley and Wah Wah Valley as the difference between precipitation and evapotranspiration. Depending on the correct amount of precipitation at Desert Research Station and whether spatially averaged precipitation is used, Pine Valley has anywhere from a deficit of -19,700 acre-feet/year or recharge of 17,700 acre-feet/year (**table 1**). The range is given here to show the uncertainty inherent in any recharge estimate. The numbers for Wah Wah Valley have less variation and range from 5,100 to 8,400 acre-feet/year of recharge.

The GRIA repeatedly states that Gardner and others (2020) did not complete water budgets and imply that a budget using precipitation and evapotranspiration has never been done for Pine and Wah Wah Valleys by the USGS. That is incorrect. Values for recharge and runoff, calculated using PRISM from 1940-2006, evapotranspiration, snow accumulation and melt, and hydraulic conductivity of surface materials (Basin Characterization Model, Flint and others, 2011) was completed for each hydrographic area in the GBCAAS study area (Masbruch, 2011). Recharge values were 27,000 acre-ft/yr for Pine Valley and 6,000 acre-ft/yr for Wah Wah Valley, similar to values reported by Stephens (1974, 1976). An earlier version of the Basin Characterization Model (Flint and others, 2004, table 1) estimated recharge for Pine Valley of 13,619 acre-ft/yr and for Wah Wah Valley of 5,418 acre-ft/yr. The same method produced different results, possibly due to differences in climate between the two studies, recalibration for surface permeability, or other unknown reasons. The point of the comparison is to show that it is difficult to estimate recharge. The GBCAAS v. 1.0 (Brooks and others, 2014) and GBCAAS v. 3.0 (Brooks, 2017) groundwater models allowed recharge to be estimated by regression, which is a generally accepted method (40 CFR 1502.22(b)(4)). Regression reduced the amount of recharge in Pine Valley and Wah Wah Valley from the conceptual numbers to match water levels and discharge observations.

A later section of this report (“Model Sensitivities and Manual Adjustment”) documents that the assignment of a specific recharge number to the groundwater model violates “methods generally accepted in the scientific community.” Recharge needs to be evaluated and documented as required by 40 CFR 1502.22(b)(3) and 40 CFR 1502.22(b)(4) as stated:

“(3) a summary of existing credible scientific evidence which is relevant to evaluating the reasonably foreseeable significant adverse impacts on the human environment, and (4) the agency’s evaluation of such impacts based upon theoretical approaches or research methods generally accepted in the scientific community.”

Misconceptions About Recharge in GBCAAS v. 3.0

The GRIA (p. 54) wrongly claims the following:

“The USGS incorporated the water budget estimates developed by Stephens (1974, 1976) and adjusted the water budgets assuming, among other things, that discharge from springs which ring Pine Valley at the surrounding mountain fronts is completely consumed by ET (based on reconnaissance-level calculations by Stephens), that deep percolation from semi-perched mountain aquifers does not occur, and that 3,000 AFY of recharge from precipitation falling within the Pine Valley HA drains in the subsurface to the Wah Wah Valley HA due to an eastward dip in the carbonate aquifer system of the Wah Wah Mountains. The net result was a decrease in recharge by 13,000 AFY in the Pine Valley HA in GBCAAS v. 3.0 compared to the prior version of the model.”

In all USGS versions of the GBCAAS model, with the exception of the child grid for Lower Bear River, recharge is originally simulated as estimated by the Basin Characterization Model (Flint and others, 2011; Masbruch, 2011, table A4-1) and explained in Masbruch and others (2011). The simulated amount of recharge was changed during model calibration by using parameters and zonation. GBCAAS v. 3.0 did not change recharge to match recharge estimated by the concurrent USGS study in Pine and Wah Wah Valleys (Gardner and others, 2020) or to match old estimates of recharge by Stephens (1974, 1976). The zonation and parameter values around Pine Valley and Wah Wah Valley were changed during calibration of GBCAAS v. 3.0 to match water level, spring discharge, and evapotranspiration of groundwater observations including data collected by Gardner and others (2020). All flow between hydrographic areas (such as Pine Valley to Wah Wah Valley) was calculated after model calibration and was not used to construct or calibrate any of the USGS GBCAAS models.

GBCAAS v. 3.0 makes no assumption about spring discharge being consumed by ET. GBCAAS v. 3.0 simulates most recharge as occurring on the mountains surrounding Pine Valley and Wah Wah Valleys (Flint and others, 2011) and percolating to the regional groundwater system. GBCAAS v. 3.0 makes no assumption about dipping geology other than as defined by Cederberg and others (2011) and incorporated in the Hydrogeologic Unit Flow Package or how much precipitation that may fall on Pine Valley goes to Wah Wah Valley. The calibrated model was used to predict the amount of flow between all hydrographic areas (Brooks, 2017, table 9).

Data collected during USGS Pine and Wah Wah Valley study (Gardner and others, 2020) were used as observations in GBCAAS v. 3.0. That data included the estimates of groundwater discharge to evapotranspiration in Tule Valley and around Sevier Lake and groundwater levels in wells. Calibration to these new observations required less recharge and lower hydraulic conductivity in some areas than in GBCAAS v. 2.0 (Stolp and others, 2017). Recharge in Pine and Wah Wah was reduced to cause better match to new water levels on the west side of Sevier

Lake (Brooks, 2017, figures 15 and 20) and to better match the distribution of evapotranspiration in Sevier Desert (Brooks, 2017, figures 16 and 26). Gardner and others (2020) stated the following about GBCAAS v. 3.0: "These reductions in recharge resulted in (1) lower simulated water levels on the west side of Sevier Lake that more closely matched measured water levels and (2) accurate simulation of the revised conceptual model having no regional groundwater discharging as ET directly from the Sevier Lake playa."

Evapotranspiration of Groundwater in Tule Valley and Sevier Desert

The GRIA expresses several concerns relating to the previous estimates and simulation of groundwater discharge to evapotranspiration in and around the Sevier Lake playa. First, they express doubt about Gardner and others (2020) conclusion that the Sevier Lake playa is not a regional discharge zone. Second, the GRIA (p. 58) suggests that some of the ETg around the playa could be from local perched aquifers. Third, the GRIA (p. 58) expresses concern that the Evapotranspiration Package in MODFLOW does not simulate the ability of plants to adapt to declining water levels. Fourth, the GRIA (p. 59) expresses concern that all ET cells in the model around the playa have the same altitude on both the east and west sides.

Despite these concerns, and the acknowledgment that ETg around Sevier Lake playa represents a data gap and uncertainty (GRIA, p. 5), the GBCAAS-PV model does not change the representation of ETg. Even the relatively simple step of using the child model to refine the location and altitude of ETg around the playa was not done (GRIA, p. A-39 to A-40). 40 CFR 1502.22 requires more documentation about this incomplete and unavailable information and a "statement of the relevance of the incomplete or unavailable information to evaluating reasonably foreseeable significant adverse impacts."

In relation to the third concern, the extinction depth used in GBCAAS v. 3.0 around Sevier Lake playa is 40 feet. A drop of 4 feet (examples used in the GRIA) would only affect simulated ETg by 10 percent, well within the estimate error of ETg. The GRIA (p. 58) states that this inability to simulate the ability of plants to adapt "will tend to overpredict impacts." If ETg is not decreased by declining levels, then discharge has not been captured and drawdown will continue to deepen and spread until drawdown is captured. In that scenario, the model allowing capture of ETg would underestimate drawdown. Simulating a reduction in ETg reduces the spread of the drawdown cone and decreases the length of time required for the system to reach a new steady state condition.

Using a reasonable range of precipitation values, the GRIA reports ETg in Tule Valley and Sevier Desert to be between 35,300 to 67,300 acre-feet per year. The GBCAAS-PV model simulates 42,400 acre-feet per year (GRIA, p. 61). The conceptual and simulated totals in GBCAAS v. 3.0 were 45,400 and 38,200 acre-feet per year, respectively. All of these are within the error

associated with estimating annual ETg over large areas. The GRIA acknowledges that ETg is uncertain, but does not acknowledge that **unknown ETg implies unknown recharge**.

Previous Pumping in Surrounding Areas

40 CFR 1502.15 requires the description of the affected environment. The discussion of the affected environment in the DEIS, however, neglects the effect of past pumping on the regional groundwater system in the area. The past pumping will impact project and cumulative effects during project pumping and recovery. The DEIS (p. 39) states: “past and present projects and uses contribute to the current condition of each of the resources considered for analysis and are described as part of the affected environment throughout this chapter.” Neither the DEIS nor the GRIA, however, consider the effect pumping in Snake Valley, Beryl-Enterprise Area, and Milford Area have had on the groundwater system throughout the region.

Past and current pumping in Beryl-Enterprise Area and Milford Area have mostly eliminated evapotranspiration of groundwater in those valleys, and water levels continue to decline (Smith and others, 2019, p. 74-82). Because pumping in both of those valleys exceeds the estimated natural discharge before pumping, the cones of depression created by pumping in those valleys will continue to spread until they intercept other discharge locations. Brooks (2017, p. 56) states:

“Because the projection stress periods, outside of Parowan Valley, start with pre-development steady-state conditions, the projection simulates capture of groundwater discharge that, in the real system, has already been captured by withdrawals that are not simulated (especially in the Beryl-Enterprise Area, HA 280). As a result, the drawdown presented in this report may underestimate the amount and extent of drawdown possible from the withdrawals in Pine and Wah Wah Valleys.”

Since 1940, over 1,100,000 acre-feet per year of water has been withdrawn from Snake Valley (Masbruch and others, 2014, figure 7 and table 14) and drawdown has occurred (Smith and others, p. 95). Because past pumping in Snake Valley has not exceeded natural discharge, the drawdown cone is not likely to spread as far or take as long to recover as in Beryl-Enterprise Area and Milford Area, but past pumping still needs to be considered in describing the affected area.

Since 1937, about 5,900,000 acre-feet of water has been withdrawn from Beryl-Enterprise Area and drawdowns are large and steep (Smith and others, 2019, p. 79-82). Mower and Sandberg (1982, p. 34) stated that the reduction from 26,000 acre-ft/yr of ETg in 1927 to 6,000 acre-ft/yr in 1977 was caused by groundwater pumping and the evapotranspiration of groundwater will continue to decline as long as water levels continue to decline. Smith and others (2019, p. 79-81) show that levels continued their steep decline. Mower and Sandberg (1982) do not discuss

the simulated change in evapotranspiration as part of the groundwater model analysis presented in the report. It would be reasonable to assume that no ETg is currently occurring in Beryl-Enterprise and that none is available for capture. The drawdown cone created by this pumping will continue to spread until that much water has been stopped from natural discharge in other areas (Barlow and Leake, 2012, p. 43), especially if pumping remains above the estimated 26,000 acre-ft/yr ETg that occurred prior to pumping. The effects of this must be included in the description of the affected environment and in model simulations.

About 4,100,000 acre-feet of water has been withdrawn from Milford Area since 1931 (Smith and others, 2019, figure 29) and drawdown in many areas is large and steep (Smith and others, 2019, p. 74-77). Mason (1998, table 2) simulates ETg of 26,900 acre-ft/yr in 1927 in the steady-state calibration of a groundwater model. Mason assumed the system was in steady-state from 1927 to 1949, and started a transient simulation in 1950. Groundwater withdrawals varied from 31,000 to 60,100 acre-ft/yr in stress periods up to 1982, and simulated evapotranspiration had declined to 12,300 acre-ft/yr at the end of the transient simulation. Predictive simulations from 1983 to 2020 of pumping 46,000 and 69,100 acre-ft/yr caused simulated evapotranspiration to be 9,600 and 7,500 acre-ft/yr, respectively (Mason, 1998, table 4). Smith and others (2019, figure 29) show that average pumping from 1983 to 2018 of about 55,000 acre-ft/yr. It is possible that current ETg in Milford Area is about 8,000 acre-ft/yr, and that the drawdown cone created by pumping in Milford will continue to spread to farther discharge locations.

Comments About GRIA Appendix A: Development of the GBCAAS-PV Groundwater Flow Model

Modeling Objectives

The modeling objectives state:

1. “Discretization should be more refined/detailed within the area surrounding the Pine Valley HA” (GRIA, p. A-4). The purpose of this refined discretization is not well explained as new geologic data is not presented that justifies geologic refinement. One thing that could have been refined in the child grid but was not is the location of evapotranspiration of groundwater around Sevier Lake playa; it is still simulated over a much larger area than it occurs because the area defined by the 1 mile by 1 mile GBCAAS v. 3.0 cells is used. Changing the ETg boundary to better match the narrow location of ETg would also change the land-surface altitude in each cell, which is used to define the top of the ETg surface in the model. Evapotranspiration in Tule Valley could also have been adjusted for the smaller grid-cell size.

2. “Transient simulations of PVWS pumping should include a reasonably foreseeable pumping period and a long enough post-pumping period to assess latent effects and recovery trends” (GRIA, p. A-4). Fifty years of pumping is not long enough. As discussed in the “Comments About GRIA Chapter 1: Introduction” section of this report, the DEIS lists several reasons why Cedar City will continue to need water from Pine Valley for longer than 50 years.
 - a. Given the referenced statements about water needs in Cedar City Valley and potential reauthorization, it is unlikely that project pumping would be stopped even if it is affecting other resources or water rights. 40 CFR 1502.14(a) requires that the EIS “rigorously explore and objectively evaluate all reasonable alternatives.” A reasonable alternative would be 100 years, as many valleys in Utah have had pumping for over 75 years.
3. “In light of the uncertainty in existing aquifer conditions and groundwater levels, a superposition approach is appropriate to evaluate the impacts of the PVWS Project.” The GRIA states superposition “is widely used in impact assessment, and tends to reduce the effect of model uncertainty on model outputs.” It is widely used, but it does not necessarily reduce model uncertainty. Predictions may be sensitive to parameters that were not calibrated, including storage properties, hydraulic conductance, and conductance of horizontal-flow barriers. National Research Council (2007, p. 11) states uncertainties in parameters and using the model to extrapolate beyond conditions for which it was calibrated might yield large uncertainties in model outputs.
 - a. Chapter A5 of the GRIA indicates that superposition is not used in the prediction simulations as recharge is included in the prediction model runs. Barlow and Leake (2012, p. 65) states: “Unlike flow models, superposition groundwater models do not simulate natural movement of water through an aquifer. Instead of computing head and flow, these models directly compute *change* in head and *change* in flow from an added stress such as pumping.” By including recharge in the prediction simulations, the GBCAAS-PV model is simulating the movement of water through the aquifer. Reilly and others (1987) give several examples of superposition models and none of them include recharge unless the change in recharge is being investigated. Superposition was not used to determine the effects of the proposed plan or the ANWS simulation. The changes in water levels or groundwater discharge are presented, but they were not determined by using a superposition model.
 - b. The cumulative effects analyses also did not use a superposition model, but merely added drawdown that was calculated separately for each pumping

center. The GRIA (p. 124) indicates that different models were used for separate pumping areas, which violates the principal of superposition in simply adding the drawdown from each model to get cumulative drawdown. In addition, simulated discharge to evapotranspiration may not be linear, which also violates the principal of superposition.

Regulatory Context

The GRIA (p. 6) states “The water level and water quality data [collected during monitoring] will be used to help ensure that any exceedance of the impacts identified in this EIS is preemptively identified and avoided, and that long-term extraction remains within the safe yield of the basin.” This statement implies that the simulated effect of reducing discharge to Wah Wah Springs is okay if it does not exceed the model prediction. This contradicts the Utah Division of Water Rights Order dated May 13, 2014 that requires that CICWCD develop and implement a monitoring program that ensures **no prior water rights are impaired** and the aquifer system in the Pine Valley is not exceeding safe yield (DEIS, p. 5). Because effects of pumping continue after pumping stops, the worst impacts are likely to occur after being identified and will not be avoided.

Boundary Conditions

Recharge from Precipitation

Recharge in the GBCAAS-PV model is assumed to be equal to the recharge described in Chapter 3 of the GRIA and is not adjusted during model calibration. As this report already describes, using the average of all rain gages in Pine Valley is not spatially representative of precipitation in Pine Valley (**table 1** in this report). In addition to increasing recharge in Pine Valley and Wah Wah Valley above the GBCAAS v. 3.0 values, the recharge was also increased in areas outside of Pine Valley and Wah Wah Valley (GRIA, p. A-38). The increase in recharge in Snake Valley required changes in hydraulic properties in Snake Valley (GRIA, p. A-46). GRIA (p. A-34) states that any inconsistencies between the parent and child models would be evaluated in terms of their ability to affect the use of the model for the proposed Project and cumulative impact analysis, but provides no discussion of this later in the report.

The GRIA (p. A-31) states: “groundwater discharge by ET around Sevier Lake and in Tule Valley is subject to considerable uncertainty and is estimated to average between 18,000 AFY to 67,000 AFY.” By admitting the ETg has considerable uncertainty, the GRIA is also admitting the recharge has considerable uncertainty. The GRIA (p. 103) states: “Water budget numbers derived from the GBCAAS-PV model and discussed herein should be understood in this context and should not be taken as absolute predictions” and yet use an absolute value of recharge to calibrate the

groundwater model. This violates 40 CFR 1502.24 about scientific integrity because no reason or references are given to explain how this is an acceptable method of calibration.

Wells

GRIA (p. A-39) states that calibration of the GBCAAS-PV model was performed for steady-state, pre-development conditions and includes no pumping. This violates 40 CFR 1502.15 to describe the affected environment because the effects of pumping in Beryl-Enterprise Area, Milford Area, and Snake Valley are not included. The long-term overpumping, especially in Beryl-Enterprise Area and Milford Area, has captured most or all of the ETg in those valleys, which will increase the drawdown and effects of future pumping in those areas, and may cause recovery to be slower than is estimated in the cumulative effects section of the GRIA.

The “Previous Pumping in Surrounding Areas” section of this report discuss the problems with neglecting decades of pumping in Snake Valley, Beryl-Enterprise Area, and Milford Area in the description and simulation of the affected environment. Failure to include the surrounding pumping in the baseline (without project pumping) scenario violates 40 CFR §1502.15 that “the environmental impact statement shall succinctly describe the environment of the area(s) to be affected or created by the alternatives under consideration.”

Historical pumping in Snake Valley should be assumed to occur at the location of pumping wells found in Masbruch and others (2014) and Masbruch (2019). Estimates of yearly amounts of pumping can be found in Masbruch and others (2014) and Smith and others (2019). Since 1940, over 1,100,000 acre-feet per year of water has been withdrawn from Snake Valley (Masbruch and others, 2014, figure 7 and table 14) and drawdown has occurred (Smith and others, p. 95). The drawdown cone created by this pumping will continue to spread until that much water has been stopped from natural discharge (Barlow and Leake, 2012, p. 43) and the effects of this must be included in any predictions about cumulative effects.

Historical pumping in Beryl-Enterprise Area can be found from Utah Division of Water Rights and historic pumping can be found in Smith and others (2019). All Beryl-Enterprise pumping should be simulated, not just the small amount of pumping in the area that may also be impacted by the Pine Valley project. Since 1937, about 5,200,000 acre-feet of water has been withdrawn from Beryl-Enterprise Area and drawdowns are large and steep (Smith and others, 2019, p. 79-82). The drawdown cone created by this pumping will continue to spread until that much water has been stopped from natural discharge (Barlow and Leake, 2012, p. 43) and the effects of this must be included in any predictions about cumulative effects. The GRIA offers no explanation why all of Snake Valley pumping is included, but only a small amount of Beryl-Enterprise pumping is included.

The GRIA (table 4-5) implies that Brooks (2017) included pumping in Milford Area and showed that drawdown from pumping in Milford Area would not intersect with drawdown caused by project pumping. GBCAAS v. 3.0 (Brooks, 2017) did not simulate pumping in Milford Area or make any predictions about drawdown caused by pumping in Milford Area. Past, present, and future pumping in Milford Area needs to be added to GBCAAS-PV model. Historical pumping locations in Milford Area can be found from Utah Division of Water Rights and total historic pumping amounts can be found in Smith and others (2019). Locations and amounts may also be available from the USGS as simulated by Mason (1998).

Evapotranspiration of Groundwater

Evapotranspiration of groundwater occurs in a very narrow strip around the Sevier Lake playa (Gardner and others, 2020, figure 8; Buto and Gardner, 2020), but was simulated over a much larger area in GBCAAS v. 3.0 because of the large model cell size (Brooks, 2017, figure 10). GBCAAS-PV should have reduced the number of cells with ETg boundaries to more closely match the area where ETg occurs and adjusted the altitude of the land surface in the Evapotranspiration Package to better match the refined grid.

The GRIA (p. A-20) states: “The ETg discharge in [Tule Valley and Sevier Desert] will, therefore, be further evaluated and adjusted during calibration of the GBCAAS-PV model.” The ETg discharge in Tule Valley and around Sevier Lake should be considered model observations and should not be adjusted during calibration.

Hydraulic Properties

The adjustment of hydrogeologic flow units (GRIA, p. A-41) to adjust to the child grid changes the thickness of hydrogeologic flow units from the original thicknesses mapped by Cederberg and others (2011). This differs from the method used to refine the grid in GBCAAS v. 2.0 (Stolp and others, 2017), which maintained the thickness of each HGU and adjusted the top and bottom altitudes. The effect of the change of thicknesses is not known because the GRIA presents no figures showing the differences, but this method precludes a direct comparison of hydraulic conductivity of aquifer units and zones between GBCAAS-PV and GBCAAS v. 3.0. A figure should be prepared showing the ratio of transmissivity in GBCAAS-PV compared to GBCAAS v. 3.0.

The GRIA (figure A4-10 and table A6) shows a large reduction in hydraulic conductivity of LCAU (parameter LCAU5181hkc) near Wah Wah Springs compared to GBCAAS v. 3.0. This parameter was not estimated by regression and has small composite scaled sensitivity (GRIA, figure A4-7), so the reason for its separation and value are unknown. Wah Wah Springs observation has medium 1% sensitivity to the parameter (GRIA, figure A4-7), with a larger value yielding more flow to Wah Wah Springs. It is possible the increased recharge in GBCAAS-PV created too much

discharge at Wah Wah Springs without a reduction in hydraulic conductivity. Reducing the value of this parameter may also reduce the simulated impact of pumping in Pine Valley on Wah Wah Springs in comparison to the GBCAAS v. 3.0 model because it is between the proposed pumping area and Wah Wah Springs. By neglecting to perform and report prediction parameter sensitivity and prediction uncertainty, the importance of this parameter to predictions of the effects of the project on Wah Wah Springs cannot be determined. This violates the requirements of 40 CFR 1502.22 to document incomplete or unavailable information and to use research methods generally accepted in the scientific community.

Model Observations

Using only observations in the child model does not reflect changes in the parent model that may occur because of the changes in model parameters in and near the child model. GBCAAS v. 3.0 files are available with all the data for the observations and they should be used, at least in the final calibration and sensitivity run. Even though calibration outside of the child model is beyond the scope of the EIS and the GRIA, presenting the residuals for all observations in GBCAAS v. 3.0 shows whether changes in and near the child model affected areas outside of the child model. If major changes in model fit in the parent have occurred, they should be documented in a table or figure. The GRIA (p. A-34) states: “refinement of the child model could lead to cascading effects outside the child model domain, potentially revealing inconsistencies with the parent model and the need for further calibration in areas that are beyond the scope of the Project effects analysis.” It is also possible, but not discussed in the GRIA, that incorrect calibration in the child model (such as not allowing recharge to regress) is affecting the parent model in incorrect ways.

The remaining comments in this section are of an editorial nature, and have little effect on the analysis of effects of the project or alternative. The discrepancies and data omissions, however, reflect poor scientific accuracy and integrity (40 CFR 1502.24).

1. The text, figures, and tables have inconsistencies about the observations that make it difficult to discern which observations were used for calibration, and the statistics associated with those observations. GRIA Attachment A1 lists 127 water levels in the child model, which matches the number reported on page A-43 of the GRIA. Page A-50 and figure A4-13, however, state that 92 water levels were used.
2. The weight assigned to clustered observations seems incorrect based on the description in the GRIA (p. A-42 to A-43). The discussion to reduce the weight because of clustering is correct, but the equations on p. A-43 reduce the variance of clustered observations. This increases the weight of clustered observations. GRIA Attachment A1 seems to have the calculation the correct way, but the decluster weights do not match the text

description. Some other method appears to have been used, including increasing the weight (decreasing the variance) of all wells that are not clustered.

3. GRIA Attachment A1 needs more explanation. An explanation should be provided for why “Variance used in model files” is not listed for most of the water levels on the first page of the attachment. An explanation should be given for the “NAVD88 Well Elevation” because all those values appear to have been surveyed. But if that were the case, then “Accuracy of altitude” would be much lower.
4. Another table should be added to the report with the same observations as Attachment A1, but showing observed level, simulated level, residual, and weighted residual for each well.
5. The GRIA (p. A-43) states that groundwater discharge observations are consistent with GBCAAS v. 3.0 (Brooks, 2017), but a table should be provided showing the observations and the variance. The observations for ETg in GBCAAS-PV are split between the parent and the child model, and an explanation for how those are calculated and used in regression should be included.
6. The GRIA (p. A-20) states: “The ETg discharge in [Sevier playa and Tule Valley] will, therefore, be further evaluated and adjusted during calibration of the GBCAAS-PV model. An explanation should be provided about how they were adjusted.
7. Wah Wah Springs is changed from GBCAAS v. 3.0 and the observation and the variance need to be documented. Given the changes through time in discharge from Wah Wah Springs (Stephens, 1976; Gardner and others, 2020) and that part of the discharge is to ETg not direct spring discharge, the variance could be larger than for some other springs.

Calibration

The model calibration of GBCAAS-PV as described in the GRIA has several problems that affect its ability to accurately make predictions.

1. The calibration is to conditions in the affected environment that do not include decades of groundwater development in the surrounding valleys and violates 40 CFR 1502.15. This issue has been discussed in previous sections of this report.
2. Recharge is specified and not allowed to vary during regression. This violates 40 CFR 1502.24 about scientific integrity because no reason or references are given to explain how this is an acceptable method of calibration. The uncertainty in conceptual recharge has been discussed in a previous section of this report. The problems with not allowing recharge to be a calibration parameter are discussed below.

3. The GBCAAS-PV model defines many parameters with low composite scaled sensitivities and probably large uncertainty, which also violates acceptable methods of calibration and scientific integrity.
4. The GRIA provides no uncertainty analysis of parameter values, which violates 40 CFR 1502.22 requiring documentation of incomplete or unknown information and how that information could impact predictions. Omitting uncertainty analysis of parameter values also violates scientific integrity required by 40 CFR 1502.24.
5. It is not clear if the uncertainty in parameters in the parent model outside of the child model are accounted for in the statistics presented in the GRIA. Recharge and hydraulic conductivity in the parent model are not certain, and by not accounting for that uncertainty, UCODE may give artificially small confidence intervals of the parameters in the child model or of model predictions.

Recharge

The GRIA (p. A-44) reports that modifying the most sensitive parameters correctly generally improves model fit to observations, but they do not modify recharge other than a slight rearrangement of where it occurs. Model observations provide a lot of information about recharge parameters; composite scaled sensitivities (css) in the GBCAAS-PV model show the highest value to parameter rch2551c and the third highest value to rch2542c (GRIA, figure A4-7). These two recharge parameters cover all the area around Pine Valley and the west side of Wah Wah Valley. The effects of the proposed pumping do not rely on recharge, but do rely on the aquifer properties, which are calibrated to the assigned recharge. This is a severe limitation of this model and **will impact model predictions**. 40 CFR §1502.24 requires the following:

“Agencies shall insure the professional integrity, including scientific integrity, of the discussions and analyses in environmental impact statements. They shall identify any methodologies used and shall make explicit reference by footnote to the scientific and other sources relied upon for conclusions in the statement.”

The GRIA (p. A-45) provides no scientific justification or references for not adjusting recharge in the groundwater model, only stating:

“GBCAAS v. 3.0 estimated recharge parameters during model calibration. This approach, however, was not used during GBCAAS-PV calibration.”

Hill and Tiedeman (2007, p. 278) state: “Preconceived notions about various aspects of the system only can be quantitatively tested against the observations by defining parameters, calculating sensitivities, and attempting estimation by regression.” Because knowledge of recharge can be considered incomplete, ignoring standard calibration methods also violates 40

1502.22 requiring the EIS to include methods and statistics to “make clear than such information is lacking” and to document “the agency’s evaluation of such impacts based upon theoretical approaches or research methods generally accepted in the scientific community.”

Hydraulic Conductivity

The GBCAAS-PV child model has 59 parameters for values of hydraulic conductivity or vertical anisotropy (GRIA, table A6). Of these, the value of only 7 were determined by regression. All parameters have uncertainty, and 40 CFR 1502.22 requires statements about incomplete and unavailable information that are not provided in the GRIA or DEIS. Determining so few parameters by regression undermines the scientific integrity (40 CFR 1502.24) of the model calibration.

The GRIA (p. A-47) states that 10 parameters were determined by regression. Of those 10, three had their values manually changed (GRIA, table A5) and were not used as determined by regression. One was a very minor adjustment, but two of them were manually adjusted to be lower than the estimated 95% confidence interval (GRIA, p. A-47 and table A5). The value for LCAU5241hkc was reduced from a regressed value of 69.2 feet per day to an assigned value 34 feet per day. The GRIA (p. A-47) wrongly states the assigned values for LCAU5241hkc and LCAU6181 represent small adjustments from the original GBCAAS v. 3.0 parameters. LCAU5241hkc was 20.3 feet per day in GBCAAS v. 3.0 and 34 feet per day in GBCAAS-PV, an increase of 67%. LCAU6181 was 0.017 feet per day in GBCAAS v. 3.0 and 0.044 feet per day in GBCAAS-PV, an increase of about 160 percent. These are hardly small adjustments, and are outside the 95% confidence intervals for these parameters reported by Brooks (2017, table 2-4). The GRIA does not provide a reason or “explicit reference by footnote to the scientific and other sources relied upon” (40 CFR 1502.24) to change the value of LCAU5241, but the GRIA (p. A-45) states carbonate aquifer zones LCAU516hkc and LCAU5241hkc are the primary parameters affecting discharge at Wah Wah Springs. It is possible the assigned hydraulic conductivity of LCAU5241hkc was adjusted to get a good match to the observed discharge at Wah Wah Springs. The GRIA (p. A-45 to A-46) states the hydraulic conductivity of LCAU6181 was adjusted to prevent mounding of water levels above land surface.

The GBCAAS-PV model (GRIA, 2021, table A6) has 2 more recharge parameters and 30 more hydraulic conductivity parameters than does GBCAAS v. 3.0 (Brooks, 2017, tables 2-3, 2-4, and 2-5). From GRIA (figure A4-6) and Brooks (2017, figure 20), only seven new water-level observations are available for GBCAAS-PV. It is unlikely that seven new observations provide enough information to justify 32 new parameters. The GRIA (p. A-47) tries to minimize the differences with GBCAAS v. 3.0 by stating: “the final model has 218 adjustable parameters; this is a slight increase from GBCAAS v. 3.0 (208 parameters) because of the shared parameters that

crossed the parent/child boundary and sub-divided parameter zones.” Whether or not GBCAAS-PV considers a parameter adjustable, it still has uncertainties that need to be quantified and that affect prediction uncertainty. Confidence intervals should be shown on GRIA figure A4-11 for GBCAAS v. 3.0 and GBCAAS-PV parameters and a table should list the values and confidence intervals for all GBCAAS-PV parameters, not just the ones that were regressed. Parameters that could not be regressed may have the largest confidence intervals, and if those parameters are important to model predictions the prediction uncertainty may be larger. GRIA (table A6) shows 12 parameters for UBFAU in GBCAAS-PV with different values than in GBCAAS v. 3.0 and 13 parameters for LCAU in GBCAAS-PV with different values than in GBCAAS v. 3.0. Five additional parameter values are changed in VU, UCAU, NCCU, and vertical anisotropy parameters (GRIA, table A6). In most cases, the parameters in GBCAAS v. 3.0 are also in the model in other locations, so the change in value in the GBCAAS-PV child model represents a new parameter.

The GRIA (p. A-44) states parameters with low sensitivity can impact small areas and targeted manual calculation was used to fine-tune areas of importance. If parameters are being adjusted to match one or two water level or discharge measurements, this could lead to many insensitive parameters and higher prediction uncertainty. Hill and Tiedeman, (2007, p. 13) state:

“A precise parameter estimate results when the observations provide abundant information about the parameter, given the model construction. A precise prediction results when the parameters important to the prediction are precisely estimated.”

National Research Council (2007) states:

“Increasing the refinement of models introduces increasing model parameters with uncertain values while decreasing the model transparency to users and reviewers. Here, the problem is a model that accrues significant uncertainties when it contains more parameters than can be calibrated with observations available to the model evaluation process” (p. 112).

and

“Model use in the environmental regulatory process may involve using the model to extrapolate beyond conditions for which the model was constructed or calibrated or conditions for which the model outputs cannot be verified. In these circumstances, uncertainties about the form of a model and the parameters in the model might yield large uncertainties in model outputs...any extra parameters that need to be estimated could degrade the confidence in the estimates of all parameters” (p. 11).

The GRIA does not provide parameter uncertainty, but given the small composite scaled sensitivities for many parameters, parameter uncertainty is probably large. Not providing

parameter uncertainty violates 40 CFR 1502.22 about providing more information about incomplete or unavailable information and 40 CFR 1502.24 about scientific integrity. National Research Council (2007, p. 130) states:

“Formal uncertainty analysis provides model developers, decision makers, and others with an assessment of the degree of confidence associated with model results as well as the aspects of the model having the largest impacts on its results. As such, uncertainty analysis and related sensitivity analysis is a critical aspect of model evaluation during model development and model application stages.”

More detail about parameter concerns and detailed analysis can be found in Appendix 1 of this report. The appendix discusses problems with regression as detailed in the GRIA, the problem with too many parameters and how those parameters should be grouped to provide fewer parameters and possible smaller parameter uncertainty and smaller prediction confidence intervals, and other details. While these are important considerations, the comments and tables are more for the benefit of future modeling attempts than a direct comment on the DEIS.

Model Evaluation

Model evaluation in the GRIA is mostly limited to the child model. Evapotranspiration to groundwater is an exception because the child model does not include all model cells from which ETg occurs. For transparency and scientific integrity (40 CFR 1502.24) and to meet the requirements of 40 CFR 1500.1 for high quality information and accurate scientific analysis, a table comparing statistics for all observations in GBCAAS v. 3.0 and GBCAAS-PV should be prepared. Decision makers cannot determine indirect effects farther removed in distance (40 CFR 1508.8(b)) if changes caused at distance are not documented. In addition to reporting statistics for water-level and discharge observations in the parent model, an analysis of changes in flow across the child-parent model boundaries from GBCAAS v. 3.0 (Brooks, 2017) to GBCAAS-PV should be presented.

The model evaluation is missing any discussion of parameter uncertainty, implying that the parameters are absolute values with which to make predictions. This violates 40 CFR 1502.22 to provide “a summary of existing credible scientific evidence which is relevant to evaluating the reasonably foreseeable significant adverse impacts” based on “the agency’s evaluation of such impacts based upon theoretical approaches or research methods generally accepted in the scientific community.”

National Resource Council (2007, p. 26) states:

“The combination of model formulation and parameters that results in a good match between observations and results is never unique because another combination of model formulation and parameters could result in an equally good match.”

Doherty (2025, p. 78) states:

“Calibration must not be construed as implying certainty of parameters, nor of predictions made by a calibrated model. Nor should it diminish the fundamental truth embodied in Bayes equation that history-matching may reduce the uncertainties of some parameters but not others, and may reduce the uncertainties of some model predictions while leaving the uncertainties of other model predictions relatively unchanged.”

Water-level Observations

A major problem with the calibration is that the area of the proposed pumping has some of the highest residuals (GRIA, figures A4-14 and A4-16), and on a small scale those residuals are not areally distributed. The GBCAAS-PV model simulates a steeper gradient at the southern end of Pine Valley than exists in the observed data. The mismatch in this area could indicate a conceptual error in the model construction or parameterization. The water levels in the southern end of Pine Valley were not available during calibration of GBCAAS v. 3.0, but 4 levels in the middle of the valley were. From Brooks (2017, figure 20) and GRIA (figure A4-14) it appears the GBCAAS v. 3.0 model has smaller residuals in this area. This is concerning as this area of the GBCAAS-PV model may be the most critical for estimating the effects of the proposed pumping. This is also concerning because the GRIA (p. A-51) states the most fine-tuning of the model by manual adjustments to parameters was done in Pine and Wah Wah Valleys; parameters were added or split with little support from regression statistics, and the calibration still has problems in this area. It is possible the information is not of high enough quality (40 CFR 1500.1) in this area to support the model predictions.

The model fit to water-level observations statistics indicate the model meets standards for calibration. GRIA (figure A4-13), however, obscures data by including perched water levels and making longer axes than required to show calibrated data. A comparison of both unweighted and weighted statistics between GBCAAS v. 3.0 and GBCAAS-PV should be included on GRIA figure A4-13 and GRIA figure A4-15.

Discharge Observations

As stated in the GRIA (p. A-51 and figure A4-18), the largest error in discharge observations is to discharge to ETg in part of Snake Valley (et37snake3). The GRIA states additional calibration in

the parent model may fix this, but fails to mention that the fit is significantly worse in GBCAAS-PV than in GBCAAS v. 3.0 or that changes made in the child model or in Snake Valley in GBCAAS-PV (parameters LCAU4191hkp and UCAU11hkc) may have impacted this observation.

Although recharge was increased in GBCAAS-PV in comparison to GBCAAS v. 3.0, total discharge to the eight ETg areas shown on figure A4-18 was reduced. Recharge in GBCAAS-PV is at least 8,660 acre-feet per year greater than in GBCAAS v. 3.0, but discharge to ETg and springs is 5,500 acre-feet per year less in GBCAAS-PV than in GBCAAS v. 3.0 (**table 2** in this report). This means a net of over 14,200 acre-feet/year is unaccounted in the budget for the child model and surrounding study area. No analyses are presented in the GRIA about flows across the child-parent boundary or discharge to other areas not included in the ETg estimates, such as Big Springs and Dearden Springs in Snake Valley. Failure to examine and explain this difference and determine if it is relevant to model calibration or model predictions violates 40 CFR 1502.22 requirements to document incomplete or unavailable information and 40 CFR 1500.1 for accurate scientific analysis.

Table 2. Mismatch between recharge and discharge in GBCAAS-PV model.

	GBCAAS v. 3. 0 (Brooks, 2017, table 8 and table A1-6)	GBCAAS-PV (GRIA, table 3-18, p. A-51, figure A4- 18)
[All values in acre-feet per year]		
Recharge		
Pine Valley	11,000	17,700
Wah Wah Valley	3,200	5,160
Snake Valley	140,000	¹ >140,000
Total increased recharge in GBCAAS-PV		>8,660
Discharge to Etg		
et37snake2	43,200	
et37snake3	27,600	
et37snake4	7,550	
et37tule	33,900	
et39beryl	23,800	
et39milford	31,700	
et39sevier2	2,720	
et39sevier3	1,560	
Total discharge to Etg	² 172,030	165,494
Discharge to springs in the child model		
Wah Wah Springs (gha256_1)	748	1,800
Clay Springs	281	262
Total decreased discharge in GBCAAS-PV		5,503
Unaccounted change in GBCAAS-PV		>14,200
¹ . Recharge in Snake Valley is increased in GBCAAS-PV relative to GBCAAS v. 3.0 because the higher recharge conceptualized in Pine Valley extends into Snake Valley to avoid sharp transitions in recharge at HA boundaries (GRIA, p. A-38 and figure A4-4).		
² . Reported on GRIA figure A4-18 as 172,500 acre-feet per year.		

Model Predictions

The calculation and presentation of model predictions violate 40 CFR 1500, 40 CFR 1502, and 40 CFR 1508 for accurate scientific analysis, documentation of incomplete information and scientific integrity, and analysis of all past, present, and future actions. No prediction uncertainty is presented, the length of time Cedar City will need the water is unknown, and the affected environment is not correctly simulated. These omissions prevent the regulators from obtaining accurate descriptions of the effects of the PVWS Project pumping.

No Presentation of Prediction Uncertainty

The model predictions described in the GRIA are similar to the preliminary model projection simulated with GBCAAS v. 3.0 (Brooks, 2017) and model scenarios (Masbruch, 2019) used to show estimated effects and extent of drawdown from possible pumping. Those analyses were not intended to provide detailed information needed for environmental analysis and project approval. Part of the purpose of the GBCAAS v. 3.0 projection was met when it was used to help determine the size of the child model in GBCAAS-PV. A model being used for project design and approval needs to include robust predictions and statistics that can only be obtained using a true prediction simulation. Prediction simulations require the predictions be defined using the model and the regression software so that statistics about the predictions can be determined. The model simulation of the startup pumping (6 southern wells) should also have predictions defined and analyzed. Because predictions were not defined and analyzed (Hill and Tiedeman, 2007, Chapter 8), the “Model Prediction” and “Potential Project and Cumulative Effects” sections of the GRIA are missing essential information needed to better understand the effects of the project.

Uncertainty in model parameters and model predictions is never acknowledged or discussed in the GRIA, despite the GRIA (p. 5) stating there are still significant uncertainties in the amount and distribution of groundwater recharge and discharge, as well as the aquifer properties and the hydrogeologic conceptual model and that **these uncertainties must be sufficiently addressed in the GRIA**. The DEIS (p. 93) states the GBCAAS-PV numerical flow model was developed to evaluate the reasonable range of impacts that could occur from groundwater extraction related to the PVWS Project, but a range of impacts is not presented. The omission of these data violates 40 CFR 1502.22(a) which states:

“If the incomplete information relevant to reasonably foreseeable significant adverse impacts is essential to a reasoned choice among alternatives and the overall costs of obtaining it are not exorbitant, the agency shall include the information in the environmental impact statement.”

No explicit reference to scientific and other sources relied upon to justify omitting parameter and prediction uncertainty are given, violating 40 CFR 1502.24 about scientific integrity. Many references can be used to justify the inclusion of uncertainty analysis. Hill and Tiedeman (2007, p. 340) state that predictions tend to be less accurate as prediction conditions differ more from calibration conditions. Prediction conditions of pumping 15,000 acre-ft/yr are very different than the non-pumping conditions for which the model was calibrated.

Doherty (2025, p. 78) states:

“Calibration must not be construed as implying certainty of parameters, nor of predictions made by a calibrated model. Nor should it diminish the fundamental truth embodied in Bayes equation that history-matching may reduce the uncertainties of some parameters but not others, and may reduce the uncertainties of some model predictions while leaving the uncertainties of other model predictions relatively unchanged. Nor should any conclusions regarding the predictive integrity of a model be drawn from the fact that it has been calibrated. Ultimately, decision-makers should be made aware of the range of predictive possibilities that are compatible with all available data. **Some kind of predictive uncertainty analysis is required** to answer the most important question with which decision-makers are faced.”

The National Research Council (2007) states:

“Formal uncertainty analysis provides model developers, decision makers, and others with an assessment of the degree of confidence associated with model results as well as the aspects of the model having the largest impacts on its results. As such, **uncertainty analysis and related sensitivity analysis is a critical aspect of model evaluation** during model development and model application stages. The use of formal qualitative and quantitative uncertainty analysis in environmental regulatory modeling is growing in response to improvements in methods and computational abilities” (p. 130).

and:

“Realistic assessment of uncertainty in model outputs is central to the proper use of models in decision making. Probability provides a useful framework for summarizing uncertainties and **should be used as a matter of course** to quantify the uncertainty in model outputs used to support regulatory decisions” (p. 135).

PVWS Project Pumping

As explained in the “Comments about GRIA Chapter 1: Introduction” section of this report, the amount of pumping after 50 years is incomplete or unavailable information. 40 CFR 1502.22(a) requires:

“If the incomplete information relevant to reasonably foreseeable significant adverse impacts is essential to a reasoned choice among alternatives and the overall costs of obtaining it are not exorbitant, the agency shall include the information in the environmental impact statement.”

The short time frame also violates 40 CFR 1508(b) about possible effects later in time that are reasonably foreseeable. A time frame of 100 years should be considered as a compromise between the 50 years used for the prediction analysis and the 200-year simulation used in a supplement to the DEIS (Townsend and others, 2021). A recovery time of at least 450 years should also be simulated and reported for all effects instead of 200 years for some effects and 450 years for other effects (GRIA, Chapter 4).

Improper Description and Simulation of the Affected Environment

The “Previous Pumping in Surrounding Areas” and “Wells” sections of this report discuss the problems with neglecting decades of pumping in Snake Valley, Beryl-Enterprise Area, and Milford Area in the description and simulation of the affected environment and the violation of 49 CFR 1502.15. The surrounding pumping may have little effect on calibration and predictions during the 50 years of pumping. The surrounding pumping and associated decrease in natural discharge may have the most impact on the predictions during the recovery phase of the model. The cone of depression spreads from the PVWS pumping area to discharge locations until 750,000 acre-feet of cumulative discharge has been captured. In the process, it may intercept simulated discharge areas that do not exist in the physical system because past pumping has captured them. The effect on the prediction models would be to overestimate available capture, underestimate decline in storage and water levels, and simulate faster recovery time than may occur in the physical system. Failure to include the surrounding pumping in the baseline (without project pumping) scenario violates 40 CFR §1502.15 that “the environmental impact statement shall succinctly describe the environment of the area(s) to be affected or created by the alternatives under consideration.”

Model Limitations

The GRIA (Appendix A, Chapter 4) includes little discussion about model limitations when used for predictions. For example, Brooks (2017, p. 56) states:

“Because the projection stress periods, outside of Parowan Valley, start with pre-development steady-state conditions, the projection simulates capture of groundwater discharge that, in the real system, has already been captured by withdrawals that are not simulated (especially in the Beryl-Enterprise Area, HA 280). As a result, the drawdown presented in this report may underestimate the amount and extent of drawdown possible from the withdrawals in Pine and Wah Wah Valleys. Simulating all model layers as confined is another model limitation because transmissivity is not reduced with declining water levels; this could also result in the model underestimating the amount and extent of drawdown. Simulated effects (recovery, drawdown, and capture of natural discharge) also are dependent on aquifer transmissivity and storage properties. The simulated ultimate (long-term steady-state) drawdown and capture are based on simulated aquifer transmissivity, which is considered reasonably calibrated throughout the model. Simulated storage properties in Parowan Valley are considered adequately calibrated, and the simulated timing of the water-level recovery is likely a reasonable estimate of actual timing if withdrawals are reduced in Parowan Valley. Simulated storage properties outside of Parowan Valley are set the same as the Parowan Valley properties and are not considered calibrated. The timing of drawdown and capture outside of Parowan Valley are a representation of what would happen if those storage parameters are correct.”

Those same limitations exist in the GBCAAS-PV simulations, but are not addressed. This violates 40 CFR 1500.1 for high quality information to be available to public officials and citizens before decisions are made.

Cumulative Effects Analysis

Multiple problems with the analysis of cumulative effects call into question the scientific integrity (40 CFR 1502.24) of the analysis. First, it is highly speculative that all pumping will stop in all surrounding areas in 50 years. Second, pumping from the Milford Area is not included. Third, superposition cannot be used to add the results of two different models.

Future Pumping in Surrounding Areas

As with PVWS Project pumping, simulating pumping in surrounding areas for only 50 years and assuming all pumping will stop is highly speculative and violates 40 CFR 1508.7 that cumulative impact is the impact on the environment which results from the incremental impact of the action when added to other past, present, and **reasonably foreseeable** future actions. A 100-year pumping period would be more reasonable and have more scientific credibility (40 CFR 1502.24). The GRIA and DEIS repeatedly state assigning specific extraction rate beyond 50 years is speculative, but then use a model simulation that assigns the **very specific pumping rate of zero** in all areas. It is unlikely that three areas of agricultural development that have been

pumping about 150,000 acre-feet/year of water for the last 50 years would suddenly quit pumping water 50 years in the future. The Groundwater Management Plan for Beryl-Enterprise plans to gradually reduce pumping until reaching 34,000 acre-ft/yr in 2130 (GRIA, p. 65). If Utah Division of Water Rights assumes pumping is going to continue for over 100 years, the GRIA and DEIS should not assume pumping will end in Snake Valley, Beryl-Enterprise Area, and Milford Area in 50 years.

The GRIA (p. 124) states Masbruch (2019) showed that continuing pumping at currently approved rates in Snake Valley would result in “significant and irreversible” impacts. Masbruch (2019) simulated rates much higher than current rates of about 28,000 acre-ft/yr using a steady-state model, presenting results possibly thousands of years in the future. Masbruch (2019) never described the effects as irreversible. The GRIA suggests the states of Utah and Nevada would curtail pumping in Snake Valley to lessen impacts. The State of Utah defines safe yield as the amount of recharge available, not on whether natural groundwater discharge is affected. Unless the State of Utah has current plans to limit production in Snake Valley, it should not be assumed as a future occurrence. Masbruch and others (2014, p. 44) report water levels in 2009 in 27 wells with long-term records were similar to long-term average water levels. The steady-state model presented in Masbruch and others (2014) pumped 28,000 acre-ft/yr from Snake Valley (Masbruch and others, 2014, table 14), and discharge to major springs closely matched or exceeded observed rates (Masbruch and others, 2014, table 12). Simulated ET_g was 77 percent of estimated ET_g, including small springs. This could be caused by long-term (steady-state model) pumping, but is also within the range of error for ET_g estimates. This does not match the GRIA (p. 125) assumption that changes in pumping in the Snake Valley HA will occur within the next 50 years to avoid potentially significant impacts to spring resources of regional environmental significance. The 200-year simulation (Townsend and others, 2021) cannot be relied on as a predictor of future results because GBCAAS v. 3.0 and GBCAAS-PV are not calibrated transient models in Snake Valley.

The cumulative effect scenario described in the GRIA spread out the existing pumping in Snake Valley to new areas in Snake Valley and reduced the pumping at existing wells (GRIA, p. A-76). This will simulate different drawdown and capture than which has already occurred in the system. This is also speculative. Instead, existing pumping should be kept at the current locations (Masbruch, 2019 and Masbruch and others, 2014).

All pumping in Beryl-Enterprise Area must be simulated, not just the small amount of pumping in the area shown on GRIA figure A5-2. Ignoring most of the pumping in Beryl-Enterprise neglects the effects of long-term drawdown and capture of natural discharge. Pumping used for the cumulative effect prediction can be scaled or reduced at specific wells to account for future reductions under the Beryl-Enterprise Groundwater Management Plan through 2130.

Future pumping in Milford Area should be assumed to be equal to about 65,000 to 70,000 acre-ft/yr (Smith and others, 2019, figure 29) unless Utah Division of Water Rights has a plan to reduce pumping in this area.

Method

The principal of superposition to determine cumulative effects does not apply when using different models to simulate pumping as described in the GRIA. The GRIA (p. 124) states:

“Cumulative pumping was simulated using the GBCAAS-PV model for pumping in the Pine Valley HA and the southern Sevier Desert HA. To simulate cumulative pumping in the Snake Valley HA and the Beryl Enterprise HA, the recently updated version of GBCAAS with refinements focused on Snake Valley and Hamlin Valley (Masbruch 2019) was utilized and was thought to represent the most refined modeling tool available to evaluate the effects of cumulative pumping in that area and in the northern portion of the Beryl-Enterprise Area HA.”

Masbruch (2019a, p. 7) states that GBCAAS v. 3.0 was used for the simulations in that report, so it is not clear why GBCAAS-PV, which incorporates GBCAAS v. 3.0 for most of the parent model and includes the revisions deemed necessary for Pine Valley and Wah Wah Valley was not used to determine all cumulative effects. In addition, Masbruch (2019a, p. 7) used only the first steady-state period of the GBCAAS v. 3.0 model and used no storage properties. It is not possible to use Masbruch (2019b) for transient prediction simulations. The description of what model is used violates 40 CFR 1500.1 for high quality information and accurate scientific analysis.

GBCAAS v. 3.0 and GBCAAS-PV involve different recharge, different transmissivity, different model layers, and different definitions of hydrogeologic units (GRIA, p. A-41). An example of the differences in the models and why they cannot be used individually to determine cumulative effects is provided by model simulation of discharge to ETg in one area of Snake Valley. The observed discharge to et37Snake3 is 37,400 acre-ft/yr and GBCAAS v. 3.0 simulated discharge is 27,400 acre-ft/yr (Brooks, 2017, table 1-6). GBCAAS-PV simulated discharge is about 18,000 acre-ft/yr (GRIA, fig. A4-18). This difference indicates the two models will not predict linear responses and cannot be used to create superposition drawdown maps or to compare declines in discharge to springs and ETg. The GRIA provides no references to scientific or other sources about the validity of this unusual approach and therefore violates 40 CFR 1502.24.

Using two different models also complicates the determination of prediction confidence intervals which should to be presented. In addition, pumping in each valley has the potential to affect ETg in surrounding areas and because simulated ETg may not be a linear response, superposition cannot be used (Barlow and Leake, 2012, p. 65). The GRIA does not present a

valid scientific reason why GBCAAS-PV was not used to include all the pumping in one simulation.

Comments About Chapter 4: Potential Project and Cumulative Effects

Most of the technical problems with the predicted effects as estimated by the model are described in the “Model Predictions” section of this report. These problems are lack of presentation of prediction uncertainty; not simulating all past, present, and future pumping from the surrounding area for proper definition of the affected environment and cumulative effects analysis; the simulated pumping period of only 50 years; and using superposition of models incorrectly. Because the potential project and cumulative effects presented in GRIA Chapter 4 are invalid without prediction uncertainty, the importance of prediction uncertainty is repeated here.

Lack of Prediction Uncertainty Analyses

The DEIS (p. 93) states the GBCAAS-PV numerical flow model was developed to evaluate the **reasonable range** of impacts that could occur from groundwater extraction related to the PVWS Project. 40 CFR 1500.1 states NEPA procedures must insure environmental information be of high quality and that accurate scientific analysis is essential. 40 CFR 1502.1 states the EIS “shall provide full and fair discussion of significant environmental impacts.” The GRIA (p. 103) states: “Water budget numbers derived from the GBCAAS-PV model and discussed herein...should not be taken as absolute predictions.” The GRIA acknowledges that predictions are not absolute, but does nothing to analyze and present uncertainty, to provide a reasonable range of impacts, or to present full and fair discussion of significant environmental impacts.

Impact to Wah Wah Springs

The uncertainty in the change in discharge to Wah Wah Springs is not presented, so the reasonable range of impacts (DEIS, p. 93) cannot be determined. Wah Wah Springs is in an area of the model with a lot of zone boundaries in the model parameters. Because of this, it is likely that many of those parameters could have some influence on the simulated discharge to Wah Wah Springs and on the change in discharge caused by the Proposed Action and ANWS Alternative. The confidence interval for the prediction of change in flow at Wah Wah Springs is expected to be large because of the complicated geology and the lack of observations other than Wah Wah Springs to control the model parameters in the area.

In addition to the many parameter zones near Wah Wah Springs, a horizontal-flow barrier (HFB) is simulated on the east side of Pine Valley near the location of the ANWS Alternative wells

(Brooks, 2017, figure 12). The GRIA does not discuss why the ANWS Alternative impacts Wah Wah Springs only slightly more than the Proposed Action (in text, not in figures) despite being closer to Wah Wah Springs. It is possible that the HFB simulated on the east side of Pine Valley limits the effects of the pumping on Wah Wah Springs. The uncertainty in the conductance of that barrier, however, is large (Brooks, 2017, table 2-8). What is not known is the sensitivity of the change in discharge to Wah Wah Springs to the HFB conductivity parameter. This could be an important parameter for predictions and prediction uncertainties.

The GRIA (p. 115) states: “As discussed in Section 3.7.2.1, geochemical analyses performed by the USGS (Gardner et al. 2020) support the interpretation that only a portion of the discharge from Wah Wah Springs is derived from the regional aquifer system; therefore, the above depletion estimates may be considered conservative overestimates.” Discharge to Wah Wah Springs is incomplete information and the discussion required by 40 CFR 1502.22 must be included in the GRIA or DEIS. If only part of the discharge at and near the spring is connected to the regional system, it is likely that the part of the spring that has been developed for long-term use is the part that is best connected to the regional system. In that case, the change of 159 acre-feet per year in year 50 and 257 acre-feet per year in year 100, which is the change in the regional system, would all affect the use of the spring and could have catastrophic impacts. As explained in the “Wah Wah Springs” section of this report, the difference in spring measurements from Stephens (1976) to Gardner and others (2020) could be caused by precipitation trends. It is possible that the discharge measured by Stephens during a drier period is more representative of the regional part of the flow, and the reduction caused by pumping will be a much larger proportion of the regional spring discharge. Comparing the percent change to the largest possible regional discharge presents minimal effects and lacks scientific integrity (40 CFR 1502.24). Instead of talking about percent change, only change should be discussed, as would be the case in a true superposition model.

Effects that could impact Wah Wah Springs are not examined in the GRIA. For example, the GRIA (p. 105) discusses continued drawdown into Sevier Desert and Tule Valley with the ANWS alternative, but fails to discuss the expansion of 3 to 5 feet of drawdown into Wah Wah Valley for up to 150 years of recovery and the fact that drawdown of 3 to 5 feet exists near Wah Wah Springs after 200 years of recovery (GRIA, figure 4-2). Another example is the description of interbasin flows. The decrease in flow from Pine to Wah Wah Valleys appears to decrease levels in Wah Wah Valley enough that flow is also reduced from Wah Wah Valley to Sevier Desert and from Wah Wah Valley to Tule Valley. These effects are greater in the ANWS alternative, yet no mention is made that these changes could affect Wah Wah Springs or that the ANWS alternative may have more effect on Wah Wah Springs than the proposed project.

The GRIA (p. 135) states that Wah Wah Springs is outside the area predicted to be impacted by the cumulative drawdown changes. Figure 4-16, however, shows the drawdown cones from Pine Valley pumping and Sevier Playa pumping to merge during recovery, so given the information in the GRIA, it is not possible to determine that cumulative effects do not occur. Figure 4-20 graphs effects of each cumulative pumping scenario for Clay Spring, Dearden Spring Group, and Big Springs, but not for Wah Wah Springs.

The text and figures presented in the DEIS and chapter 4 of the GRIA have multiple discrepancies about Wah Wah Springs, violating 40 CFR 1500.1 and 40 CFR 1500.2 that information in the DEIS be high quality, have accurate scientific analysis, and be clear and concise.

1. The DEIS (p. 113) states: “The predicted depletion of Wah Wah Springs discharge under the Proposed Action is approximately 14 percent of the total estimated discharge, and the predicted depletion under the ANWS Alternative is approximately 9 percent.”
2. The DEIS (p. F-5) states: “...if Wah Wah Springs receives all of its discharge from the regional aquifer and operates as simulated in the GBCAAS-PV model, spring flow depletions of 14 to 15% may be anticipated as a result of implementing the Proposed Action and the ANWS Alternative, respectively.”
3. The GRIA (p. 116) gives a vague description of the changes to Wah Wah Springs caused by the ANWS Alternative, and merely states that depletion would be about 25 acre-feet per year greater than with the Proposed Action. It does not state when this depletion would occur.
4. Figures 4-4, 4-11, and 4-13 show less depletion with the ANWS Alternative.

Townsend and others (2021, p. 6) report that if pumping continued for 200 years, spring flow depletion in Wah Wah Springs is simulated as reaching a maximum of approximately 65%, approximately 50 years after pumping ceases. Because the amount of time the PVWS Project will pump is unknown, 40 CFR 1502.22(b) applies:

(b) If the information relevant to reasonably foreseeable significant adverse impacts cannot be obtained because the overall costs of obtaining it are exorbitant or the means to obtain it are not known, the agency shall include within the environmental impact statement: (1) A statement that such information is incomplete or unavailable; (2) a statement of the relevance of the incomplete or unavailable information to evaluating reasonably foreseeable significant adverse impacts on the human environment; (3) a summary of existing credible scientific evidence which is relevant to evaluating the reasonably foreseeable significant adverse impacts on the human environment, and (4) the agency’s evaluation of such impacts based upon theoretical

approaches or research methods generally accepted in the scientific community. For the purposes of this section, “reasonably fore seeable” includes impacts which have catastrophic consequences, even if their probability of occurrence is low, provided that the analysis of the impacts is supported by credible scientific evidence, is not based on pure conjecture, and is within the rule of reason.”

Presentation and Editorial Comments

This part of this report concentrates on the presentation of the predictions and how that presentation lacks clarity and consistency. The presentation makes it difficult to understand the effects of the proposed pumping, alternative pumping, and cumulative effects. The presentation violates 40 CFR 1502.1 which states the EIS “shall provide full and fair discussion of significant environmental impacts and shall inform decision makers and the public of the reasonable alternatives which would avoid or minimize adverse impacts.” Many parts of Chapter 4 in the GRIA violate 40 CFR 1500.1, which states NEPA procedures must ensure environmental information be of high quality and that accurate scientific analysis is essential.

Cumulative Depletion and Long Recovery

The GRIA and DEIS never clearly state the total reduction in natural discharge that will occur as a result of the proposed project. Pumping for only 50 years is going to affect the groundwater system for hundreds or thousands of years, but the GRIA present data only for 250 years or 500 years. Both alternatives have two things in common: 1) they produce drawdown, and 2) they reduce long-term cumulative discharge to springs and ETg by 750,000 acre-feet.

GRIA (p. 103) wrongly implies that recharge can be captured and limit the cone of depression caused by the project wells. This is not true in Pine Valley because only rejected recharge can be captured. (Theis, 1940, p. 2) states:

“Discharge by wells is thus a new discharge superimposed upon a previously stable system, and it must be balanced by an increase in the recharge of the aquifer, or by a decrease in the old natural discharge, or by loss of storage in the aquifer, or by a combination of these...On the other hand, no matter how great the normal recharge, if under natural conditions none of it was rejected by the aquifer, then there is no possibility of balancing the well discharge by increased recharge, except by the use of artificial processes such as water spreading.”

Konikow and Leake (2014, p. 1) state: “An important corollary to Theis’ (1940) principles is that the average predevelopment rate of natural recharge itself is largely irrelevant to storage depletion and capture responses.”

The GRIA completely omits providing any indication of how long recovery may take after pumping ceases. 40 CFR 1508.8(b) requires analysis of effects that are later in time or farther removed in distance, but are still reasonably foreseeable. From data presented in the GRIA (table 4-1), at the end of pumping, cumulative capture is only 0.5% of total pumped and after 200 years of recovery, cumulative capture is only 23 percent of total pumped. Two hundred years after pumping stops, 77 percent of the 750,000 acre-feet pumped still must be captured from natural discharge in the proposed alternative and 72 percent in the ANWS alternative. Barlow and Leake (2012, p. 43) report that over the time interval from when pumping starts until the water table recovers to original pre-pumping levels, the volume of depletion will equal the volume pumped. A longer recovery period must be simulated in the GBCAAS-PV model to make sure the farthest spread of drawdown is shown, and to show how long full capture of 750,000 acre-feet of discharge requires. The report should include a graph similar to Barlow and Leake (2012, figure B-2) showing cumulative capture as a percent of cumulative pumped.

Differing Prediction Times

The presentation of the effects is confusing because of the different time frames involved. The DEIS (p. 93) states: “recovery periods ranging from 200 to 450 years were simulated after the pumping period, depending on the effect being evaluated.” The GRIA (p. 102) states:

“The GBCAAS-PV consists of (1) a calibrated historical model that simulates groundwater and surface water conditions; (2) a baseline forecast model without project pumping; (3) 250-year forecast scenarios (including 50 years of project pumping and 200 years of recovery) to establish the aquifer response under the Proposed Action and the ANWS Alternative; and (4) 250-year to 500-year forecast scenarios (including 50 years of project pumping and 200 to 450 years of recovery) to establish the cumulative aquifer response under both project and existing and reasonably foreseeable pumping in the area that may be affected by the project.”

The GRIA fails to explain how the baseline forecast model differed from the steady-state model and whether predictions are compared to simulated values at the end of the baseline forecast model or to simulated values in the steady-state model. The GRIA also fails to explain why all effects were not reported for 500 years and why some figures and text describe 250 years and some describe 500 years. The presentation of the effects violates 40 CFR 1502.1 that the EIS provide a full and fair discussion of environmental effects and that statements shall be concise and clear.

Other Inconsistencies and Editorial Comments

Other parts of Chapter 4 indicate a lack of high quality information (40 CFR 1500.1), lack of clarity (40 CFR 1500.2), and lack of professional integrity (40 CFR 1502.24).

1. Without providing uncertainty analysis for the flows between hydrographic areas, the detailed discussions of the changes are ineffectual in examining the effects of the proposed pumping. The GRIA does not present uncertainty analysis, but GBCAAS v. 3.0 (Brooks, 2017, table 9) shows uncertainty in those flows of hundreds to thousands of acre-feet per year.
2. The GRIA (p. 114) reports that three regional springs outside the area of projected effects (APE) exist in Snake Valley. More than three regional springs, however, exist in Snake Valley (GRIA, figure 3-1; Masbruch and others, 2014, figure 6 and table 12; Brooks, 2017, figure 11 and table 1-6). The GBCAAS-PV model should include all the springs in calibration and predictions statistics.
3. Limiting change in discharge to areas with greater than one foot of drawdown is not capturing all the changes in discharge. An example is ETg in Tule Valley, which decreases even though drawdown is less than one foot.
4. Figure 4-4 should show the calibrated discharge to springs and ETg, not the observed or estimated discharge. The change being reported is from the value in the steady state or baseline model, not from the observed or estimated value.
5. Page 118 states the modeled ETg around Sevier Lake is about 1,500 acre-feet/year, which matches figures 4-14 and 4-15. Figure 4-4, however, shows estimated ETg of 4,231 acre-feet/year.
6. Page 118 states ETg in Milford Area for no pumping is about 32,000 acre-ft/yr. This is about the same as figures 4-14 and 4-15, which show about 32,400 acre-ft/yr. Figure A4-18, however, shows the calibrated discharge to ETg in Milford Area of about 27,000 acre-feet/year and observed value of about 32,000 acre-ft/yr. This makes it seem as if the calibrated model was not used as the starting point for the prediction scenarios, at least in the Milford Area.
7. Etg in Beryl-Enterprise is not discussed and no graph is shown.
8. The GRIA (p. 126) claims that groundwater levels in Snake Valley will recover rapidly because pumping centers are close to recharge and discharge areas. Recharge does not matter, and does not influence recovery. It is true that Snake Valley has a lot of discharge areas that can be captured and water levels will recover faster because of that.
9. The GRIA (p. 127) states that water levels in Beryl-Enterprise will recover to less than 10 ft of drawdown within 10 years after pumping stops. This is a case where because past pumping is not simulated, the model is probably incorrect. Water levels in Beryl-

Enterprise will probably not recover that quickly because the ETg that is being captured in the model does not exist in Beryl-Enterprise because of previous groundwater pumping.

Potential Cumulative Effects

Multiple problems with the analysis of cumulative effects call into question the scientific integrity (40 CFR 1502.24) of the analysis. These problems are discussed in detail in the “Cumulative Effects Analysis” section of this report, and are only listed here:

1. The analysis neglects past pumping in the areas surrounding Pine Valley.
2. The analysis completely ignores pumping in Milford Area.
3. Pumping that has been happening since the 1930s and 1940s and totals about 150,000 acre-ft/yr is assumed to end in 50 years.
4. Different models were used to analyze the effects of pumping in nearby areas and the effects of project pumping and the results cannot simply be added together. These results were then added together, but the principals of superposition may not apply to different models.

Comments About GRIA Chapter 6: Monitoring Plan

Monitoring Wells

The DEIS (p. 123-124) states: “Monitoring wells close to the hydrologic divide between the Beryl-Enterprise area and Pine Valley to the south, between the well field the ET discharge areas in Tule Valley HA and Sevier Desert HA, and between the wellfield and Snake Valley to the west and Wah Wah Valley to the east, would provide early warning of unexpected impacts to adjacent hydrologic basins as part of the adaptive management approach.” The DEIS (p. 17) states that the location of monitoring wells are shown on Figures 2-4, 2-5 and 2-6 of the Groundwater Resources Impact Assessment.

The locations of monitoring wells shown on those figures are insufficient to determine if aquifer properties and horizontal-flow barriers simulated between Pine Valley and Snake Valley and between Pine Valley and Wah Wah Valley are simulated correctly. Small changes in those parameters could have large consequences for drawdown propagation in east and west directions from the pumping wells, but most monitoring wells are aligned with the pumping wells in a north-south direction. Only in the extreme southern portion of Pine Valley are any monitoring wells east or west of the line of pumping wells; one well is to the east, and two wells are to the west of the proposed action pumping wells. The one well to the east is not in the correct location to determine if the simulated discontinuity in drawdown between Pine Valley

and Wah Wah Valley (GRIA, figure 4-1) accurately predicts future drawdown. Given the drawdown shown in the GRIA (figure 4-1), a monitoring well in southwestern Wah Wah Valley should be added to provide information about the accuracy of the groundwater model in predicting effects in Wah Wah Valley.

A technical memorandum describing the effects of a 200-yr pumping scenario (Townsend and others, 2021) details the need for additional monitoring wells between Pine Valley and Snake Valley as stated below:

“The monitoring approach contained in the GRIA proposes to assess the potential presence of impeding boundaries in the aquifer system by assessing the drawdown response in monitoring wells located near these boundaries. This approach attributes a downward deflection in the drawdown curve during pumping to the presence of a flow-impeding boundary. While this is a hydrologically-valid and commonly used approach to infer the existence of flow boundaries in an aquifer system, additional certainty could be derived from monitoring groundwater level responses in a transect across the impeding geologic boundaries from the Pine Valley HA into the Snake Valley HA.”

The same reasoning applies to the area between Pine Valley and Wah Wah Valley, but is not discussed in the GRIA or by Townsend and others (2021). The GRIA (figures 2-4, 2-5, and 2-6) does not show a transect between Pine Valley and Snake Valley as recommended by Townsend and others (2021, figure 12).

Monitoring Spring Discharge at Wah Wah Springs

The GRIA (p. 169) again misquotes Stephens (1974) and Gardner and others (2020) when stating that Wah Wah Springs follows a structural contact of the carbonate and siliclastic rocks (see “Misrepresentation of USGS reports” section of this report. The GRIA (p. 169) then uses this questionable geologic interpretation to state spring flow depletion at Wah Wah Springs would be most likely to manifest itself either as a depletion of outlying springs and seeps that are in more vulnerable positions along the discharge structure or as a decrease in overflow from the spring areas to the surrounding groundwater-dependent phreatophyte vegetation. Because it is not known if all the discharge in the area of Wah Wah Springs is connected to the regional system, it is possible that outlying springs and ET areas are not connected to the regional system. If they are not, they will not be affected by pumping, and monitoring that shows no change in those may not represent changes occurring in the developed part of Wah Wah Springs.

The GRIA (p. 170) states that the monitoring and mitigation measures for Wah Wah Springs includes direct monitoring of key spring resources as well as monitoring of sentinel wells located

between the PVWS wellfield and the springs and that potential adverse impacts to spring resources at Wah Wah Springs will be adequately mitigated. As stated in the “Monitoring Wells” section of this report, only one monitoring well is between the PVWS wellfield and Wah Wah Springs, and monitoring ET around the springs may not show regional effects that would occur to the developed spring system.

Conclusions

This technical review shows the DEIS, GRIA, and GBCAAS-PV model do not meet the standards for high quality accurate scientific analysis (40 CFR 1500.1), accurately describing the affected environment (40 CFR 1502.15), documentation of incomplete or unavailable information (40 CFR 1500.22), professional and scientific integrity (40 CFR 1502.24), accurate cumulative impact (40 CFR 1508.7), and accurate effects (40 CFR 1508.8). This report shows little confidence can be placed on the predictions of impacts because of omissions, errors, and inconsistencies in the GRIA, improper model calibration techniques, and incomplete model analyses.

The model analysis does not include parameter uncertainty. The model predictions do not include prediction confidence intervals, prediction scaled sensitivities, or prediction correlation coefficients. These statistics are critical to understanding if the model can make precise predictions and the uncertainty in those predictions. Not calculating or presenting prediction uncertainty is not generally accepted in the scientific community.

The model and report fail to acknowledge and simulate past pumping in the surrounding areas of Snake Valley, Beryl-Enterprise Area, and Milford Area. This past pumping has created large drawdown cones and depleted areas of evapotranspiration that existed during the pre-development period for which GBCAAS v. 3.0 and GBCAAS-PV were calibrated. The effects of decades of pumping and groundwater mining cannot be estimated by starting with the steady-state no pumping model.

Recharge was set as a known value in the groundwater model, despite uncertainty in recharge and despite the observations providing a lot of information about recharge parameters (high composite scaled sensitivities). The model has a number of hydraulic conductivity parameters that cover small areas and for which the observations provide little information (low composite scaled sensitivities). Having a lot of insensitive parameters increases prediction uncertainty. Of the 31 parameters added to the GBCAAS-PV model, only 7 of them have regressed values used in the final calibrated model.

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Appendix 1: Details about Model Parameters as Presented in the GRIA

The purpose of this appendix is to detail some of the problem with model parameters in the GBCAAS-PV model. Unless the changes recommended in this appendix are made, nothing in this appendix directly relates to model predictions of the effects of project pumping.

The GRIA (p. A-45) states that the regressed value of parameter BFAU_VNC tended to be about 300, which is unreasonable for basin-fill anisotropy and so it was kept at its original value. Hill and Tiedeman (2007, p. 290) report that unrealistic estimated parameter values may indicate problems with the model or fundamental model error. The GRIA (p. A-45) suggests the problem could be a steep gradient in southern Pine Valley, but provide no evidence this area is causing the problem or solutions to the problem. This should be examined using Cook's D or DFBETAS statistics.

The GRIA (p. A-45 and figure A4-7) show that discharge to Wah Wah Springs is most sensitive to recharge (increased recharge would cause increased spring discharge) and to parameters LCAU518hkc and LCAU5241hkc (increased hydraulic conductivity would cause decreased spring discharge). The GRIA (table A5) lists that regression wanted the value of LCAU5241hkc to be 84.8 feet per day, but the final value in the model was 34 feet per day. It is not stated, but it is possible that this value was adjusted to better match discharge to Wah Wah Springs. As with BFAU_VNC, more data concerning Cook's D or DFBETAS should be examined and provided to determine which observations were driving the large increase in regressed hydraulic conductivity and if model error is leading to that high value.

Parameter uncertainty should have been determined for all parameters and those parameters with overlapping uncertainty and low composite scaled sensitivities should have been combined. A complex model leads to more uncertainty in parameters and more uncertainty in predictions. Hill and Tiedeman (2007, p. 269) state that although more complex models generally fit the observations more closely than simpler models, they can have greater prediction error. National Research Council (2007, p. 103) states: "Models are always incomplete, and efforts to make them more complete can be problematic...Even more problematic are models that accrue substantial uncertainties because they contain more parameters than can be estimated or calibrated with available observations."

Composite scaled sensitivities (GRIA, figure A4-7) indicate that observations provide enough information about some parameters to justify changing the value of hydraulic conductivity from GBCAAS v. 3.0 and creating new zones. Observations, however, do not provide enough information for 21 parameters to be defined in the upper basin fill aquifer within the child model (UBFAU; GRIA, table A6). For many of those parameters, parameters should be combined

into one parameter (**table 1-1** in this report), generally into the parameter for which regression was possible. After combining, regression should be tried again and sensitivities, parameter uncertainties, and prediction uncertainties should be recalculated.

Based on composite scaled sensitivities (GRIA, figure A4-7), it is also hard to justify 21 zones for LCAU, 20 of these within the child model. As with UBFAU parameters, some of these parameters should be combined (**table 1-1**). After combining, regression should be tried again and sensitivities, parameter uncertainties, and prediction uncertainties should be recalculated.

The GRIA (table A6) has some errors in the GBCAAS v. 3.0 parameter listings (**table 1-1**). Of importance is LCAU5151, which GBCAAS-PV reduces by 47 percent. This LCAU zone covers mountains on the northwest and north parts of Pine Valley (GRIA, figure A4-10). The GRIA repeatedly discusses increasing hydraulic conductivity of UBFAU to match aquifer tests, but does not mention the decrease in carbonate conductance. Given that UBFAU is hundreds of feet to about 2,000 feet thick and LCAU is thousands of feet thick, the change in LCAU has more impact on total transmissivity than do changes in UBFAU.

The GRIA (p. A-45 and figure A4-7C) discusses leverage, but the discussion and the figure do not match leverage information provided by UCODE, which limits leverage to a maximum value of 1.0 (Poeter and others, 2014, table 6). Hill and Tiedeman (2007, p. 133-134) describe leverage as fit independent statistics that “identify observations that are sensitive in a way that causes the observed values to potentially have a profound effect on the regression results.” Because leverage statistics are fit independent, they cannot show “which observations most influence the weighted sum of square residuals” as stated in the GRIA (p. A-45). It is not possible to determine what statistics are shown on GRIA-2021 (figure A4-7C), but it is interesting that the text never discusses that Clay Springs has the highest statistic.

Table 1-1. Concerns about parameters in the GBCAAS-PV model presented in the GRIA.

[Information from GRIA, table A5, table A6, and figure A4-7. Composite scale sensitivity estimated from figure A4-7. Composite scaled sensitivity of <0.1 indicates bar cannot be seen on figure A4-7. Values of hydraulic conductivity in feet per day.]				
Parameter Name	Parameter Value	Regressed value	Composite scaled sensitivity	Comments
Observations do not provide enough data about these parameters to separate them. Provide justification if value of 36 is used instead of value of 38.8 estimated in GBCAAS v. 3.0.				
UBFAU35HKc	38.8	Not regressed	<0.1	
UBFAU351HKc	36	Not regressed	<0.1	
UBFAU352HKc	36	Not regressed	0.1	
UBFAU353HKc	38.8	Not regressed	0.1	
Observations do not provide enough data about these parameters to separate them.				
UBFAU41HKc	2.03	Not regressed	<0.1	
UBFAU411HKc	7.59	Not regressed	<0.1	
UBFAU4111HKc	4.5	4.5	1	
UBFAU4112HKc	7.59	Not regressed	<0.1	
Observations do not provide enough data about these parameters to separate them.				
UBFAU46HKc	17.1	Not regressed	<0.1	
UBFAU461HKc	16.4	16.4	0.7	
Table 1-1. Concerns about parameters in the GBCAAS-PV model presented in the GRIA—continued.				
Observations do not provide enough data about these parameters to separate them.				
UBFAU48HKc	0.229	Not regressed	<0.1	
UBFAU481HKc	1.73	Not regressed	0.1	
UBFAU4811HKc	2.2	Not regressed	0.1	
UBFAU4812HKc	1.14	1.14	1.6	
UBFAU4813HKc	0.5	Not regressed	0.3	

Table 1-1. Concerns about parameters in the GBCAAS-PV model presented in the GRIA–continued				
Parameter Name	Parameter Value	Regressed value	Composite scaled sensitivity	Comments
Observations do not provide enough data about these parameters to separate them and the parameters occur in a small area.				
LCAU511HKc	0.00265	0.00265	1.3	Increased from 0.0023 in GBCAAS v. 3.0 model
LCAU5111HKc	0.00339	Not regressed	0.2	
LCAU5112HKc	0.0067	Not regressed	0.3	Increased to reduce "mounding" in mountains (GRIA-2021, p. A-46).
Observations do not provide enough data about parameter LCAU5181HKc to separate it from LCAU518HKc . Setting the parameter for LCAU5181HKc may be based solely or mostly on discharge to Wah Wah Springs, and may have been reduced because recharge is increased. It may also control the impact pumping in Pine Valley may have on Wah Wah Springs and needs to be statistically or geologically justified.				
LCAU518HKc	19.1	19.1	0.7	
LCAU5181HKc	3.4	Not regressed	0.2	Value decreased from 20.3 in GBCAAS v. 3.0 model.
Observations do not provide enough information about parameter LCAU618HKc to separate these parameters. These two parameters are in Beryl-Enterprise and Milford hydrographic areas.				
LCAU618HKc	0.0285	Not regressed	<0.1	Increased from 0.017 GBCAAS v. 3.0 even though observations provide little data about it.
LCAU6181HKc	0.044	0.0562	1.8	Why wasn't regressed value used?
Other problems with parameter values in GBCAAS-PV				
UBFAU431HKc	45	Not regressed	4.8	Parameter with second highest composite scaled sensitivity but was not regressed. Was increased from 38.8 in GBCAAS v. 3.0. Only occurs in Snake Valley.

Table 1-1. Concerns about parameters in the GBCAAS-PV model presented in the GRIA– continued				
Parameter Name	Parameter Value	Regressed value	Composite scaled sensitivity	Comments
VU2_hkc zone 12	0.0202	Not regressed	0.1	Increased from 0.00337 in GBCAAS v. 3.0 to reduce "mounding" in mountains.
UCAU11HKc	0.0222	Not regressed	0.1	Decreased from 0.0419 in GBCAAS v. 3.0 even though observations provide little data about the parameter.
LCAU4111HKC	0.0023	Not regressed	0.2	Value equal same as value in GBCAAS v. 3.0. Table A6 erroneously reported incorrect value for GBCAAS v. 3.0 parameter.
LCAU4191HKp	5	Not regressed	Parameter not shown	This parameter is only in Snake Valley. Value increased from 1.24 in GBCAAS v. 3.0 because increased recharge caused water levels to be too high in Snake Valley (GRIA-2021, p. A-46). Water level observations, spring discharge, and discharge to evapotranspiration observations in Snake Valley need to be added to regression and model statistics.

Table 1-1. Concerns about parameters in the GBCAAS-PV model presented in the GRIA–continued

Parameter Name	Parameter Value	Regressed value	Composite scaled sensitivity	Comments
LCAU425HKc	0.103	0.103	1.1	This parameter is only in Snake Valley. Value decreased from 1.24 in GBCAAS v. 3.0, possibly to better match Clay Springs after increased recharge. How does this affect Big Springs and Dearden Springs in Snake Valley? Was it also changed in parent model because the parent-child boundary splits the GBCAAS v. 3.0 parameter zone?
LCAU5151HKc	0.00685	Not regressed	0.6	Value decreased from 0.013 in GBCAAS v. 3.0. Table A6 erroneously reports incorrect value for GBCAAS v. 3.0 parameter of 0.0023. This could cause some of the mounding issues that had to be dealt with by adjusting other parameters. Observations may have provided enough information for the value to be regressed, but it was not.
LCAU5241hkc	34	84.8	0.8	Provide explanation for not accepting the regressed value.

Table 1-1. Concerns about parameters in the GBCAAS-PV model presented in the GRIA–continued

Parameter Name	Parameter Value	Regressed value	Composite scaled sensitivity	Comments
NCCU17hkc	0.0138	Not regressed	1.5	The observations provide enough information that this parameter should have been regressed. The GRIA (p. A-45) states: "For example, testing of estimated values for NCCU17hkc did not benefit model calibration, so its initial value was not changed", but Table A6 shows it was increased from the GBCAAS v. 3.0 value of 0.00846.
NCCU36hkc	0.00613	Not regressed	0.2	The observations provide little information about the parameter, but it was decreased from 0.0109 in GBCAAS v. 3.0 with no explanation. This could cause some of the "mounding" issues that had to be dealt with.

Table 1-1. Concerns about parameters in the GBCAAS-PV model presented in the GRIA–continued

Parameter Name	Parameter Value	Regressed value	Composite scaled sensitivity	Comments
bfau_vnc	10.7	Not regressed	1.1	The GRIA (p. A-45) states: "Estimates of the basin fill vertical hydraulic conductivity anisotropy ratio, parameter BFAU_VNC, tended toward values of 300 or more, which was larger than the anisotropy ratio of playa units. Because this is a model-wide parameter, the estimated solution was not applied and its initial value was not changed." The parameter could have been separated from the parent model parameter and more statistics used to determine what was driving the high value in the attempted regression.
playa_vnc	100	Not regressed	0.1	Observations provide little information about the parameter, and no explanation is given why it was increased from 66.1 in GBCAAs v. 3.0.

EXHIBIT C-3

Comment on the Draft Environmental Impact Statement
Pine Valley Water Supply Project
(DOI-BLM-UT-C010-2020-0012-EIS)

October 23, 2025

Comment on the Draft Environmental Impact Statement
Pine Valley Water Supply Project
(DOI-BLM-UT-C010-2020-0012-EIS)

With Emphasis on Uncertainty of Model Predictions Calculated Using Modified
GBCAAS v. 3.0 Model

Prepared by

Groundwater Model Analysis, LLC

Prepared For

Smith Hartvigsen, PLLC

October 23, 2025

To Whom It May Concern:

Groundwater Model Analysis, LLC respectfully submits the following comment on the Draft Environmental Impact Statement Pine Valley Water Supply Project (DOI-BLM-UT-C010-2020-0012-EIS), with specific reference to the Groundwater Resources Impact Assessment (GRIA, dated December 2021) incorporated by reference in the DEIS. Because the DEIS depends on the adequacy of the GRIA, any deficiencies in the GRIA and GBCAAS-PV model described in the GRIA undermine the ability of the DEIS to adequately evaluate impacts as required by NEPA. A detailed technical review was previously submitted as “Technical Review of the Draft Environmental Impact Statement.” Part of that technical review shows that by not presenting prediction uncertainty the DEIS and GRIA do not meet NEPA standards for high quality accurate scientific analysis (40 CFR 1500.1), evidence that the agency has made the necessary environmental analysis (40 CFR 1500.2), documentation of incomplete or unavailable information (40 CFR 1500.22), professional and scientific integrity (40 CFR 1502.24), and accurate effects (40 CFR 1508.8).

Introduction

Chapter 4 of the GRIA (“Potential Project and Cumulative Effects”) and Section 3.11.3 of the DEIS (“Environmental Consequences”) describe the predicted effects of pumping on existing wells, springs, and evapotranspiration of groundwater, but provide no indication of model uncertainty in those predictions. The DEIS (p. 93) states, “the GBCAAS-PV numerical flow model was developed to evaluate the **reasonable range** of impacts that could occur from groundwater extraction related to the PVWS Project”, but ranges are not presented. Hill and Tiedeman (2007, p. 340) state the prediction uncertainty that can be quantified most readily is that produced by uncertainty in the defined parameters. Not only did the GRIA omit prediction uncertainty, it also failed to disclose parameter uncertainty, giving the impression the model parameters and model predictions are both accurate and precise (see Hill and Tiedeman, 2007, p. 14 for definitions).

Because the GBCAAS-PV model files have not been available to Groundwater Model Analysis, LLC, the U.S. Geological Survey (USGS) GBCAAS v. 3.0 model was downloaded from the USGS archive and modified to provide an example of prediction sensitivity and prediction uncertainty. UCODE (Poeter and others, 2005; Poeter and others, 2014) was used to define predictions and to calculate prediction sensitivity and prediction uncertainty. The process to modify GBCAAS v. 3.0 is presented as an Appendix to this comment. The predictions defined for UCODE analysis of sensitivity and uncertainty were the discharge to springs and evapotranspiration, and most importantly, the change in discharge with proposed and alternative (ANWS) pumping.

Predictions simulations were made assuming proposed or ANWS pumping occurs for 50 years and then stops, and include no pumping in nearby areas. Although 668 predictions are defined, only the change in discharge to Wah Wah Springs is presented and discussed in this comment. Similar analyses and discussion could be done for every discharge prediction.

Prediction Uncertainty Analysis

Prediction sensitivity was determined for 67 of the original 208 parameters in GBCAAS v. 3.0. Sensitivity to recharge was not calculated because the change in flow is not sensitive to recharge. Sensitivity to other parameters at distance from Pine Valley and surrounding areas was also not calculated because the change in flow in the current study area would have little sensitivity to them. Prediction sensitivity is necessary to perform linear uncertainty analysis using UCODE, and is discussed later in this comment. Linear uncertainty analysis calculates linear uncertainty around the prediction, and can lead to unrealistic results such as that pumping could increase discharge or pumping could reduce discharge by more than it was in the starting model. These numbers do not indicate an error, just a calculation made from the prediction and the standard deviation of the prediction.

Proposed Pumping

The results for Wah Wah Springs (D256_1 in the UCODE files) indicate a 25-percent possibility that proposed pumping could reduce spring discharge by more than 120 acre-feet/yr (acre-ft/yr) within one year of pumping and by more than 300 acre-ft/yr from year 39 to year 5,000 (figure 1). Another way of stating this, for example, is that at the end of 50 years of pumping, the model can predict with 75 percent certainty (truncated the physically unreasonable increases in discharge) that the decline in discharge to Wah Wah Springs caused by the proposed pumping will be between 0 and 371 acre-ft/yr. There is a 50% chance the decline in discharge will exceed the predicted amount of 113 acre-ft/yr. The results indicate 5-percent possibility that proposed pumping could reduce spring discharge by more than 360 acre-feet/yr (acre-ft/yr) within one year of pumping and completely capture all spring discharge from year 35 to 5,000 years (figure 2).

ANWS Pumping

The results for Wah Wah Springs indicate a 25-percent possibility that ANWS pumping could reduce spring discharge by more than 120 acre-feet/yr (acre-ft/yr) within one year of pumping and by more than 300 acre-ft/yr from year 50 to year 5,000 (figure 3). Another way of stating this, for example, is that at the end of 50 years of pumping, the model can predict with 75-percent certainty (truncated the physically unreasonable increases in discharge) that the decline in discharge to Wah Wah Springs caused by the ANWS pumping will be between 0 and 310 acre-

ft/yr. There is a 50% chance the decline in discharge will exceed the predicted amount of 63 acre-ft/yr. The results indicate 5-percent possibility that proposed pumping could reduce spring discharge by more than 360 acre-feet/yr (acre-ft/yr) within one year of pumping and completely capture all spring discharge from year 45 to 5,000 years (figure 4).

Discussion

Regardless of the exact prediction or the exact model parameters, uncertainty analysis will always show a 50-percent possibility that the decline will be more than predicted. This is also true for the GBCAAS-PV model and if the DEIS or GRIA had shown linear prediction uncertainty, it would show there is a 50-percent possibility that the decline in discharge to Wah Wah Springs with proposed pumping will be more than the 150 acre-ft/yr stated in the GRIA (p. 115). The length of the interval, and the 25-percent chance of a certain number being exceeded depend on the accuracy of the calibrated parameters and the sensitivity of the prediction to each parameter.

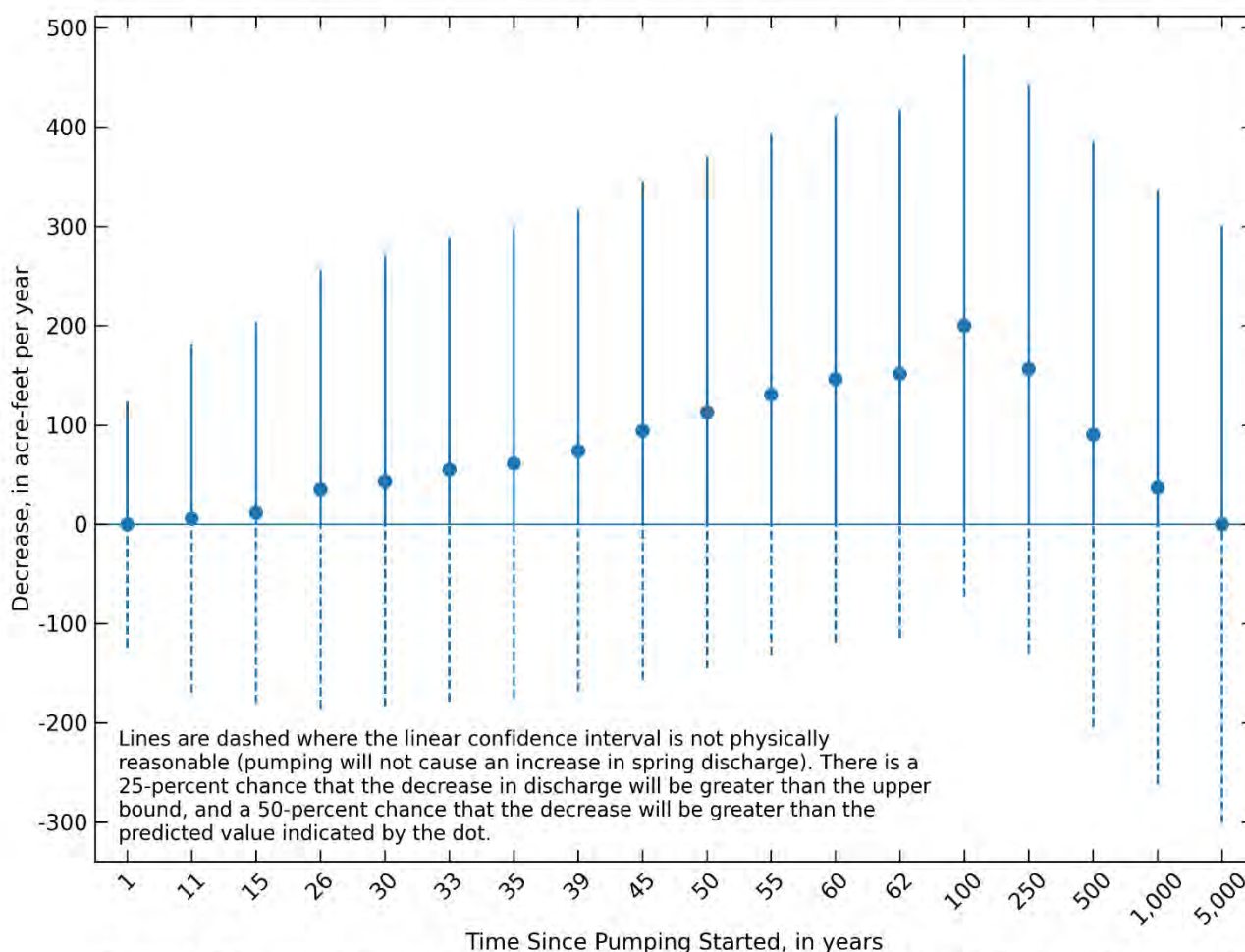


Figure 1. 50-percent Linear Confidence Interval for Decrease in Wah Wah Springs, Proposed Pumping

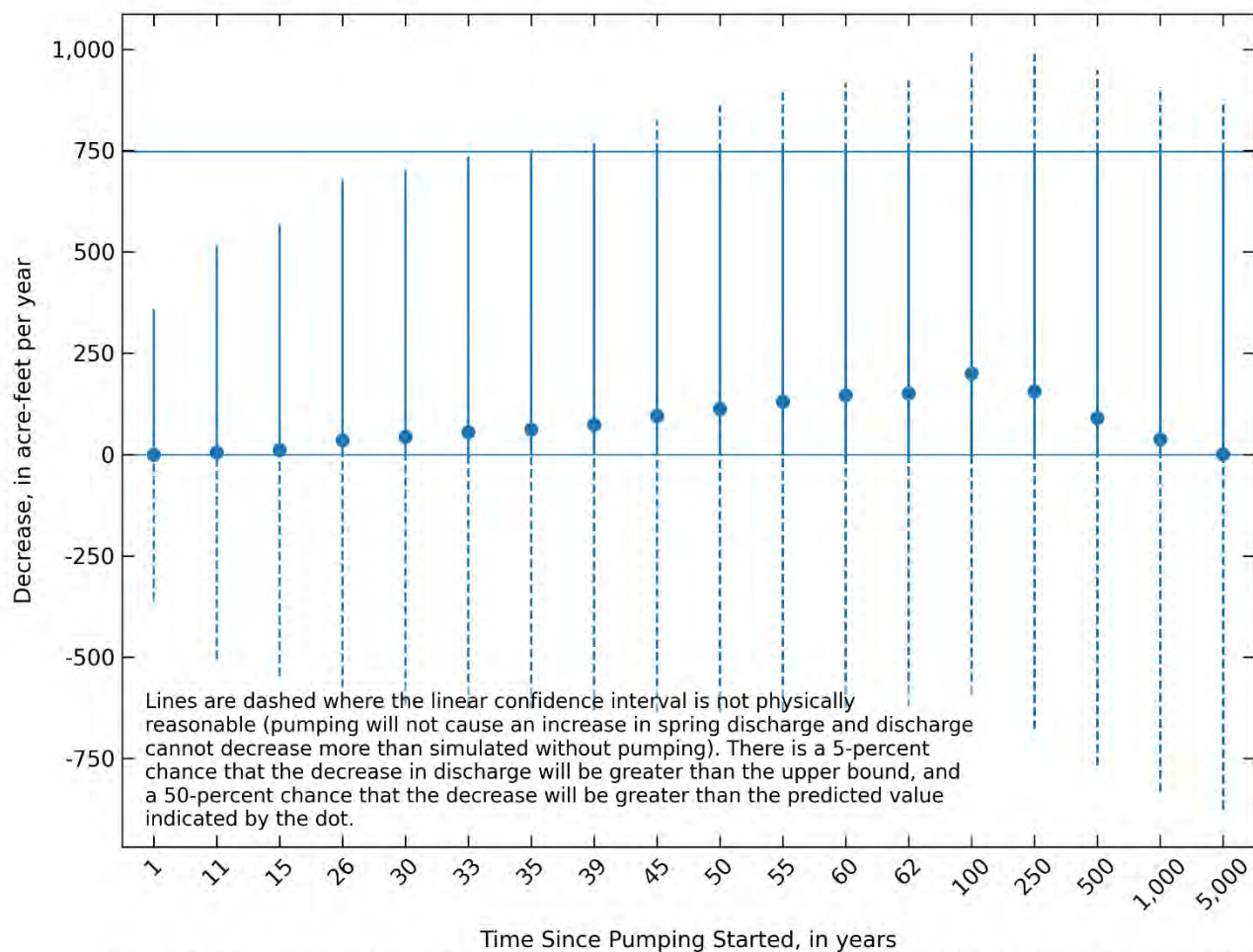


Figure 2. 95-percent Linear Confidence Interval for Decrease in Wah Wah Springs, Proposed Pumping

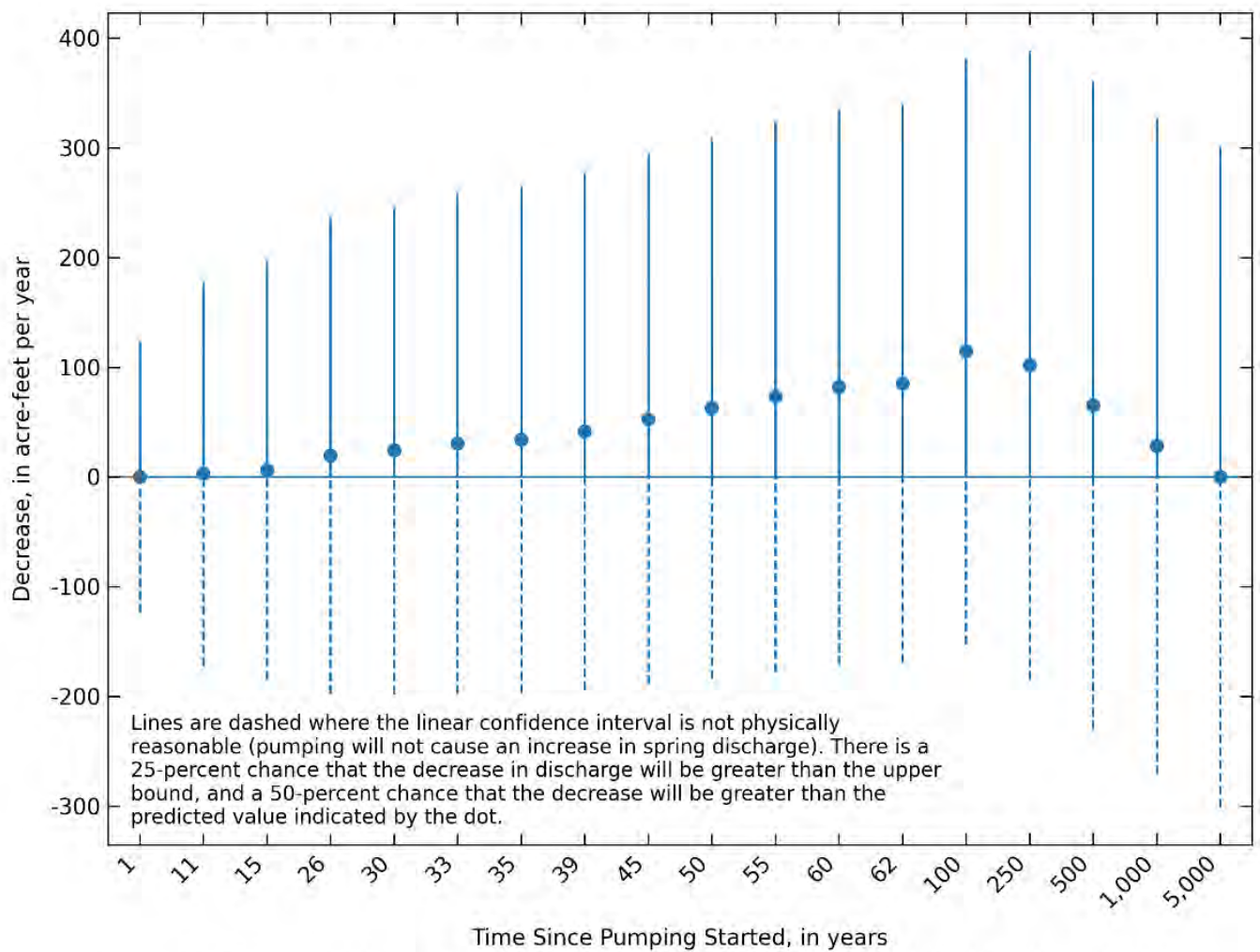


Figure 3. 50-percent Linear Confidence Interval for Decrease in Wah Wah Springs, ANWS

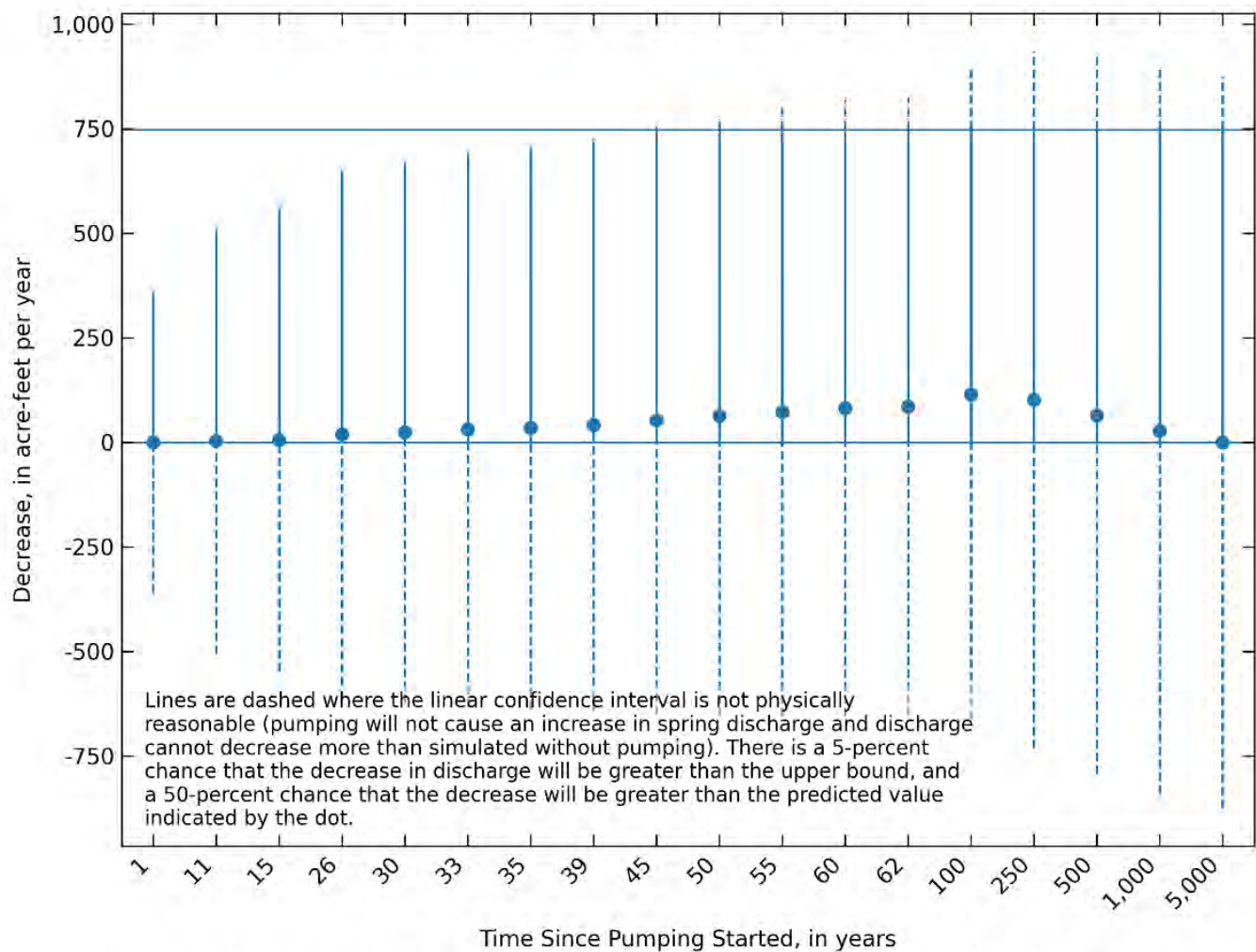


Figure 4. 95-percent Linear Confidence Interval for Decrease in Wah Wah Springs, ANWS

Prediction Sensitivity

Prediction sensitivity was calculated for 67 parameters in the modified model and recalculated for only those 67 parameters in the GBCAAS v. 3.0 model. The recalculation was necessary so the uncertainty in parameters that will have little affect on the change in discharge in the DEIS study area will not be included in sensitivity and uncertainty calculations. The decrease in discharge to Wah Wah Springs is most sensitive to three hydraulic-conductivity parameters with both the proposed pumping and the ANWS pumping (figures 5 and 6). These parameters are NCCU13, LCAU511, and UBFAU48.

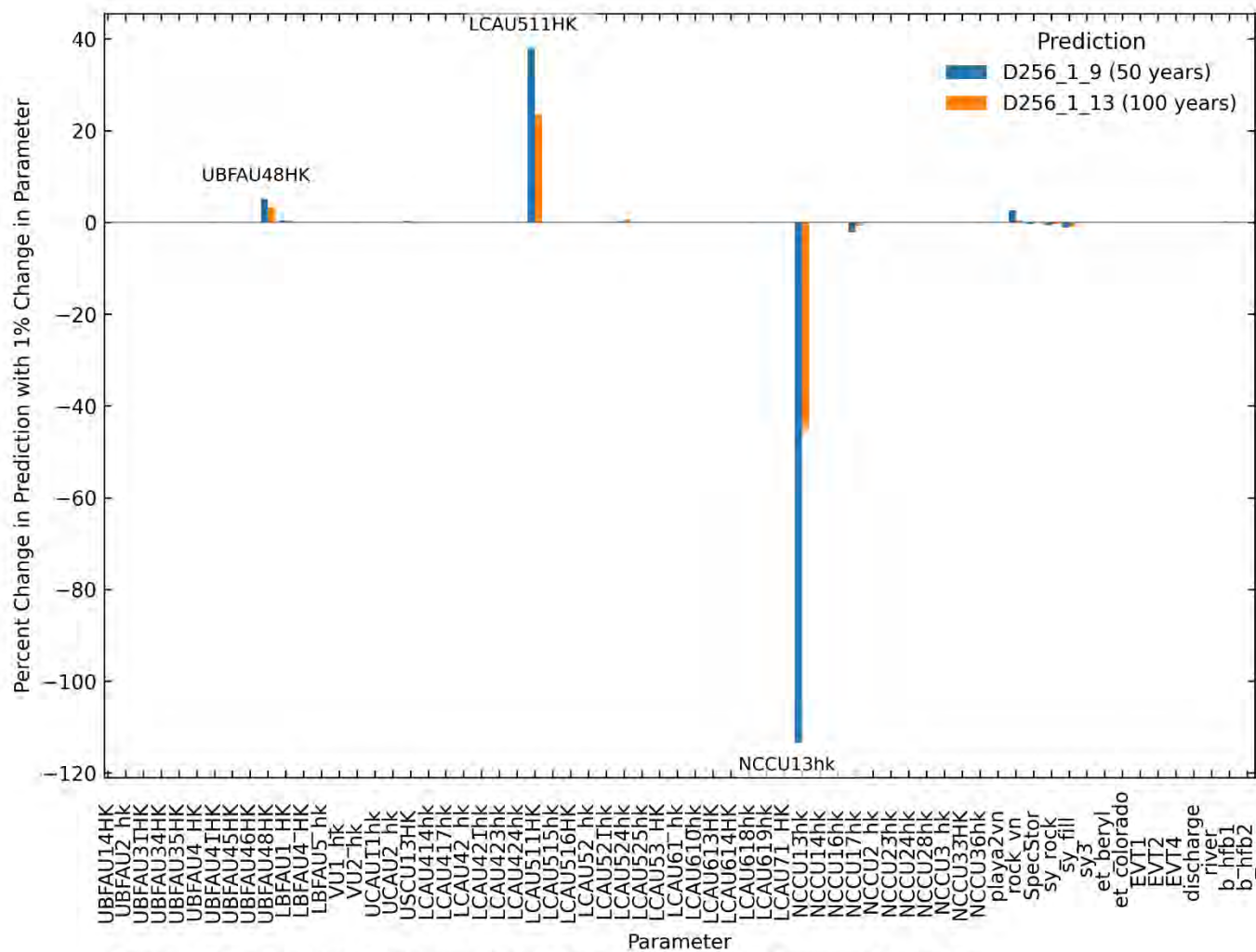


Figure 5. Sensitivity of Change in Wah Wah Springs to Proposed Pumping

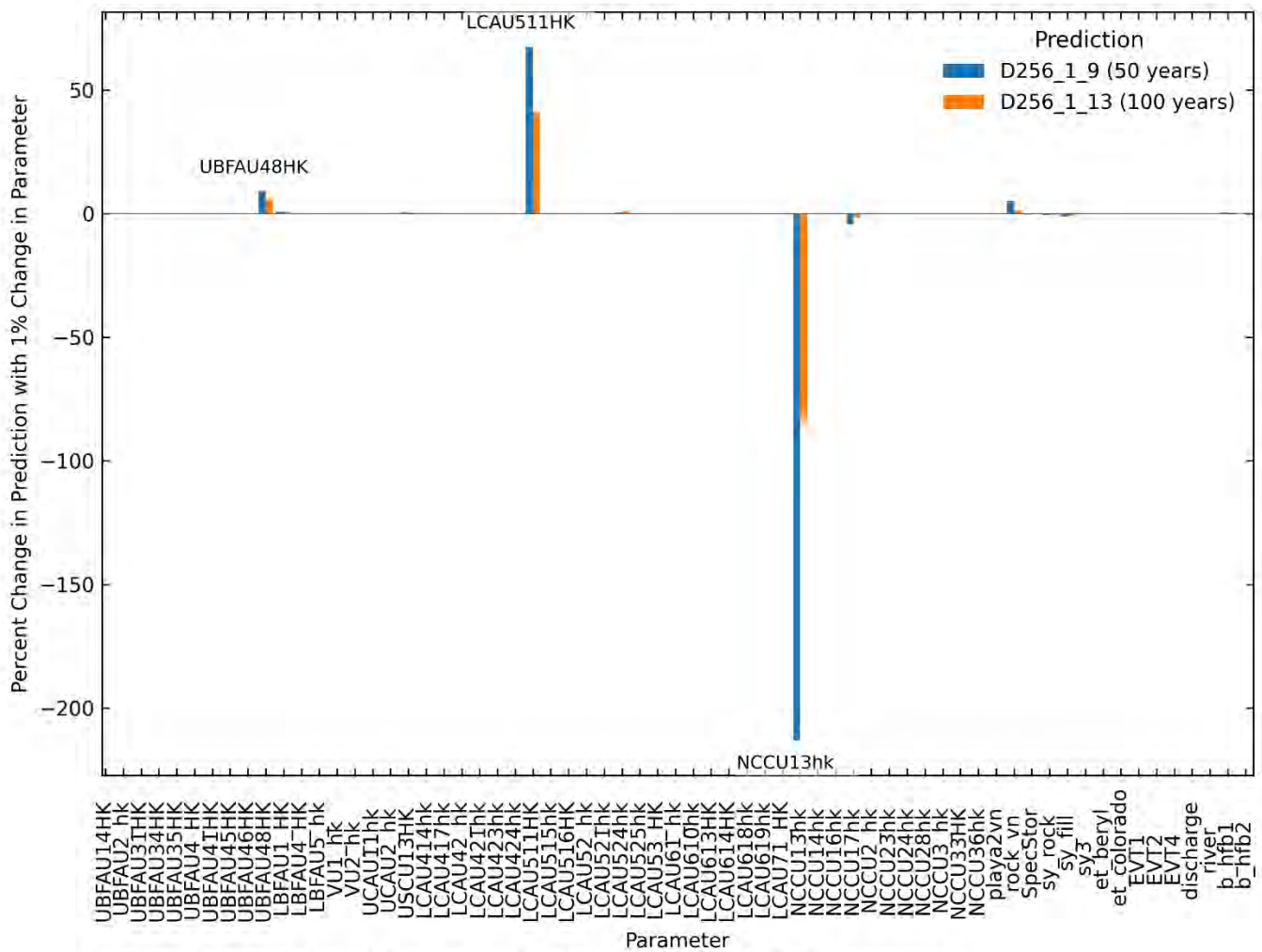


Figure 6. Sensitivity of Change in Wah Wah Springs to ANWS Pumping

Parameters in the non-carbonate confining unit are not discussed in detail in the GRIA so the location of NCCU13hk is shown on figure 7. GRIA figure A4-7 shows the observations provide little information about NCCU13hk (low composite scaled sensitivity) and GRIA tables A5 and A6 show that it was not regressed and was not changed from the value in GBCAAS v. 3.0. Brooks (2017, figure 17) shows that much of the information about NCCU13hk in the GBCAASv. 3.0 model is provided from observations outside of the DEIS study area, so the uncertainty in the value near Pine Valley and Wah Wah Springs may be more uncertain than indicated by Brooks (2017, figure 18). A greater parameter uncertainty would create a larger prediction uncertainty.

Given the location of NCCU13hk (figure 7) and the low composite scaled sensitivity to NCCU13hk in the calibrated models, it is likely that none of the proposed monitoring wells will provide early information about the effects of pumping on Wah Wah Springs. It is critical to gain a better understanding of NCCU13hk, which will probably include different monitoring wells than those proposed. The program OPR-PPR (Tonkin and others, 2007) is distributed with UCODE and can be used to guide selection of new monitoring locations.

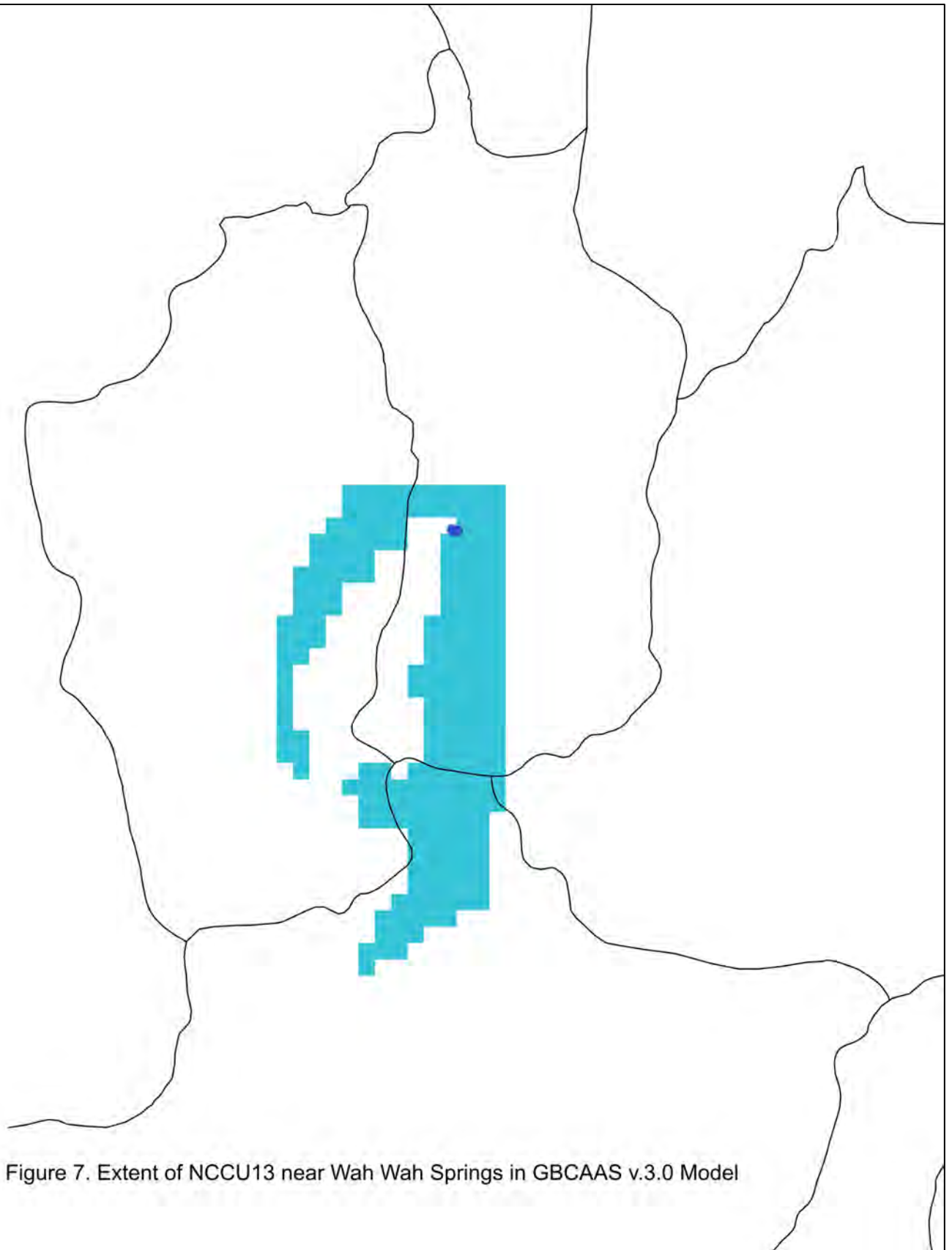


Figure 7. Extent of NCCU13 near Wah Wah Springs in GBCAAS v.3.0 Model

Parameter LCAU511HK in the GBCAAS v. 3.0 model was divided into three zones and parameters in the GBCAAS-PV model (GRIA, figure A4-10; LCAU511HKc, LCAU5111HKc, LCAU5112HKc). The value of LCAU511 was regressed in the GBCAAS-PV model, but the other two parameters have little sensitivity (GRIA, figure A4-7) and were apparently manually adjusted. Splitting one parameter into three parameters probably causes greater parameter uncertainty and greater prediction uncertainty than was estimated by using the GBCAAS v. 3.0 parameters as presented in this comment.

Parameter UBFAU48HK in the GBCAAS v. 3.0 model was divided into five parameters and zones in the GBCAAS-PV model (GRIA, figure A4-9; UBFAU48HKc, UBFAU481HKc, UBFAU4811HKc, UBFAU4812HKc, UBFAU4813HKc). Only one of these parameters was regressed in the GBCAAS-PV model; the others have little sensitivity (GRIA, figure A4-7) and were apparently manually adjusted. As with the LCAU parameters, splitting the parameters probably causes more parameter uncertainty and greater prediction uncertainty than was estimated by using the GBCAAS v. 3.0 parameters as presented in this comment.

Conclusions

The purpose of this comment is to stress that it violates scientific integrity (40 CFR 1502.24) to present only one number for the effect caused by pumping on discharge to springs, evapotranspiration, or water levels. The DEIS must consider and present uncertainty. For example, Wah Wah Springs is 50 percent likely to be affected greater and at an earlier time than presented in GRIA and DEIS (figures 1-4). WahWah Springs has a 25% chance of being reduced by more than 300 acre-ft/yr after year 39 and staying reduced by more than 300 acre-ft/yr for 5,000 years. Because of the high sensitivity of the change in Wah Wah Springs to parameter NCCU13hk, it is critical to obtain more information and more certainty about NCCU13hk; without that, the effect of pumping on Wah Wah Springs cannot be accurately estimated.

Groundwater Model Analysis, LLC appreciates the opportunity to provide these comments and is available to provide clarification as needed.

Respectfully Submitted,

Lynette Brooks, owner
Groundwater Model Analysis, LLC

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Appendix: Description of Changes to GBCAAS v. 3.0 Model

The purpose of this appendix is to describe the changes that were made to the GBCAAS v. 3.0 model to perform the analyses presented in this comment. Two flowpaths were followed: 1) Stress periods and pumping were redefined to match the GBCAAS-PV model described in the GRIA, predictions were defined, and prediction sensitivities and uncertainty were calculated. 2) Modifications to recalculate the sensitivities for the calibrated GBCAAS v. 3.0 model to include only 67 parameters to help define uncertainty for predictions.

- I. This item describes the first flowpath to modify the GBCAAS v. 3.0 models to include new stress periods and defined predictions.
 - A. Downloaded the GBCAAS v. 3.0 model from <https://www.sciencebase.gov/catalog/item/63140614d34e36012efa38e4>
 - B. Moved necessary files from Model and Output directories into modelfiles directory and delete Model and Output directories. This was done to speed up model processing.
 - C. Changed files that need to be changed to add stress periods and to have stress periods end at the same time as the GBCAAS-PV model to make comparison easier. At this point, some files for the parent model were renamed to GWMApv.* to indicate they were changed. File names were not changed if they required no changes, such as HUF, MLT, ZON, etc, and these names are still GBCAASv3parent.*. The names of the child model in Lower Bear River (HA273*.*) were not changed because the only changes were to change the stress periods.
 - D. The comparison of stress periods from GBCAAS v. 3.0 to GWMApv is shown in table A1.
 - E. Changed the location of pumping to more closely match the pumping in GBCAAS-PV as shown GRIA figures 2-1 and 2-1. The distribution in GWMApv is shown on figures A1 and A2 for the proposed pumping and ANWS pumping.
 - F. Made UCODE changes so that what were observations in the GBCAAS v. 3.0 projection model are predictions. Add derived predictions to calculated the difference in discharge from the end of the steady-state calibration to the end of each stress period in GWMApv.
 - G. Made two model directories: modelfiles and modelfilesANWS. The only difference is the location of pumping, but wanted to avoid renaming or overwriting output files.

- H. Ran UCODE with prediction and sensitivity mode in each of the model directories to get prediction scaled sensitivities.
 - I. Copied the prediction sensitivity output files to the LinUncFewer directory in each model directory. This put them in same directories as the calibration sensitivities calculated from the calibration model and kept the main model directories less cluttered.
 - J. Ran LINEAR_UNCERTAINTY in each model directory to get linear confidence intervals. UCODE automatically lists 95-percent confidence intervals. Used the standard deviation also listed to calculate 50-percent confidence intervals.
- II. This item describes the minor changes to the GBCAAS v. 3.0 calibration model to calculate sensitivity for only 67 of the 208 parameters.
- A. Downloaded the GBCAAS v. 3.0 model from <https://www.sciencebase.gov/catalog/item/63140614d34e36012efa38e4>
 - B. Moved necessary calibration files from Model and Output directories into modelfiles directory and delete Model and Output directories. This was done to speed up model processing.
 - C. Did not change any file names because the model was not changed.
 - D. Modified the ucode.par and GBCAASv3._paopt files so sensitivity was calculated for only 67 out of 208 parameters.
 - E. Ran the calibration model with UCODE in sensitivity mode without regression to keep calibrated parameters.
 - F. Copied all the UCODE output files to the linear uncertainty folders for the revised model so they could be used by LINEAR_UNCERTAINTY program provided with UCODE. Here the names of the output files were changed to GWMApv.* because UCODE requires all files to have the same root name.

Table A1. Definition of new stress periods for GWMApv model.

Archived Stress Periods					New Stress Periods				
SP	days	years	days, cumulative	years, cumulative	SP	days	years	days, cumulative	years, cumulative
1	4018	11.00	4018	11.00	1	4018	11.00	4018	11.00
2	1461	4.00	5479	15.00	2	1461	4.00	5479	15.00
3	4018	11.00	9497	26.00	3	4018	11.00	9497	26.00
4	1095	3.00	10592	29.00	4	1095	3.00	10592	29.00
5	1461	4.00	12053	33.00	5	1461	4.00	12053	33.00
6	731	2.00	12784	35.00	6	731	2.00	12784	35.00
7	1461	4.00	14245	39.00	7	1461	4.00	14245	39.00
8	2191	6.00	16436	45.00	8	2191	6.00	16436	45.00
9	1461	4.00	17897	49.00	9	1826	5.00	18262	50.00
10	2192	6.00	20089	55.00	10	1826	5.00	20088	55.00
11	1826	5.00	21915	60.00	11	1826	5.00	21914	60.00
12	731	2.00	22646	62.00	12	731	2.00	22645	62.00
13	342604	938.00	365250	1000.00	13	13879	38.00	36524	100.00
14	1461000	4000.00	1826250	5000.00	14	54787	150.00	91311	250.00
					15	91312	250.00	182623	499.99
					16	182625	500.00	365248	999.99
					17	1461000	4000.00	1826248	4999.99

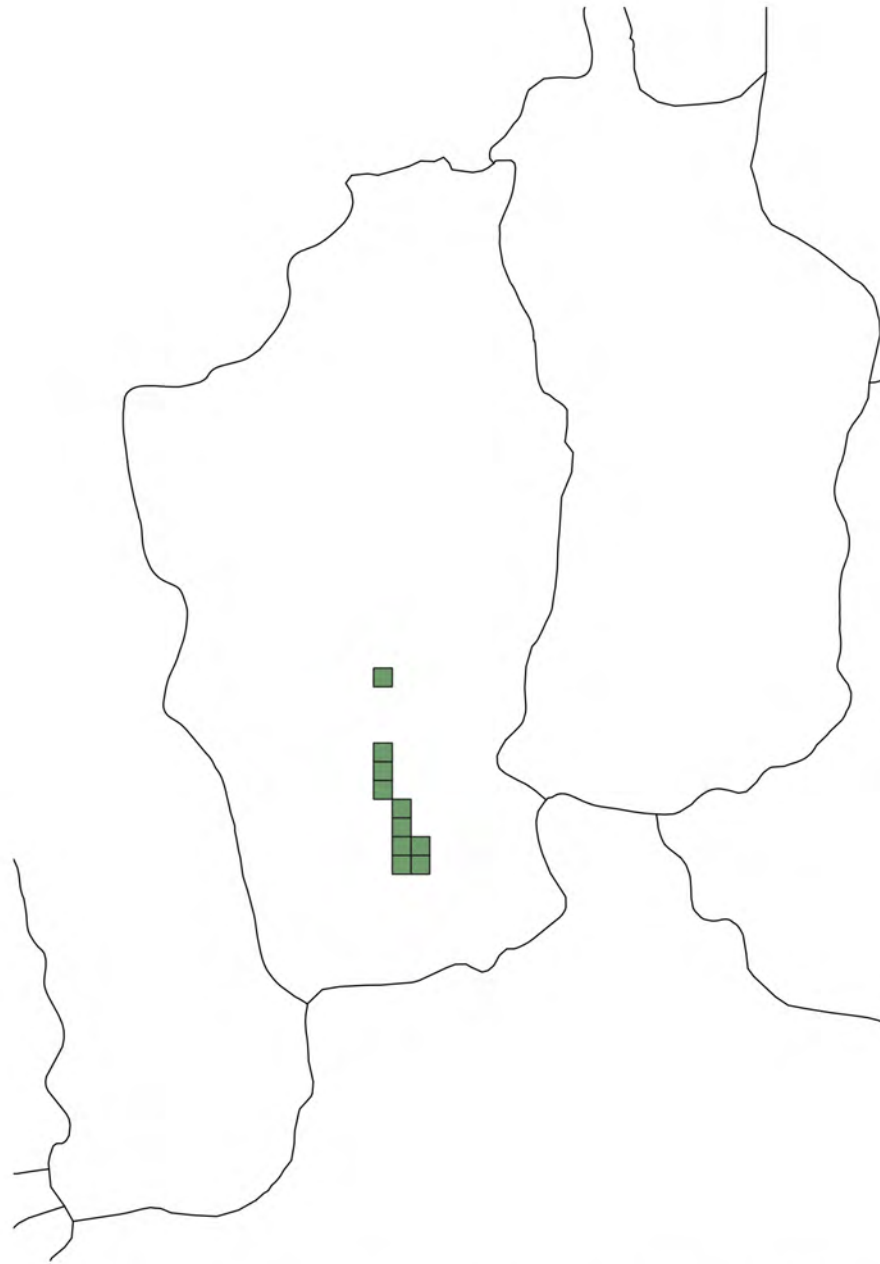


Figure A1. Location of pumping wells in GWMApv for the proposed pumping.

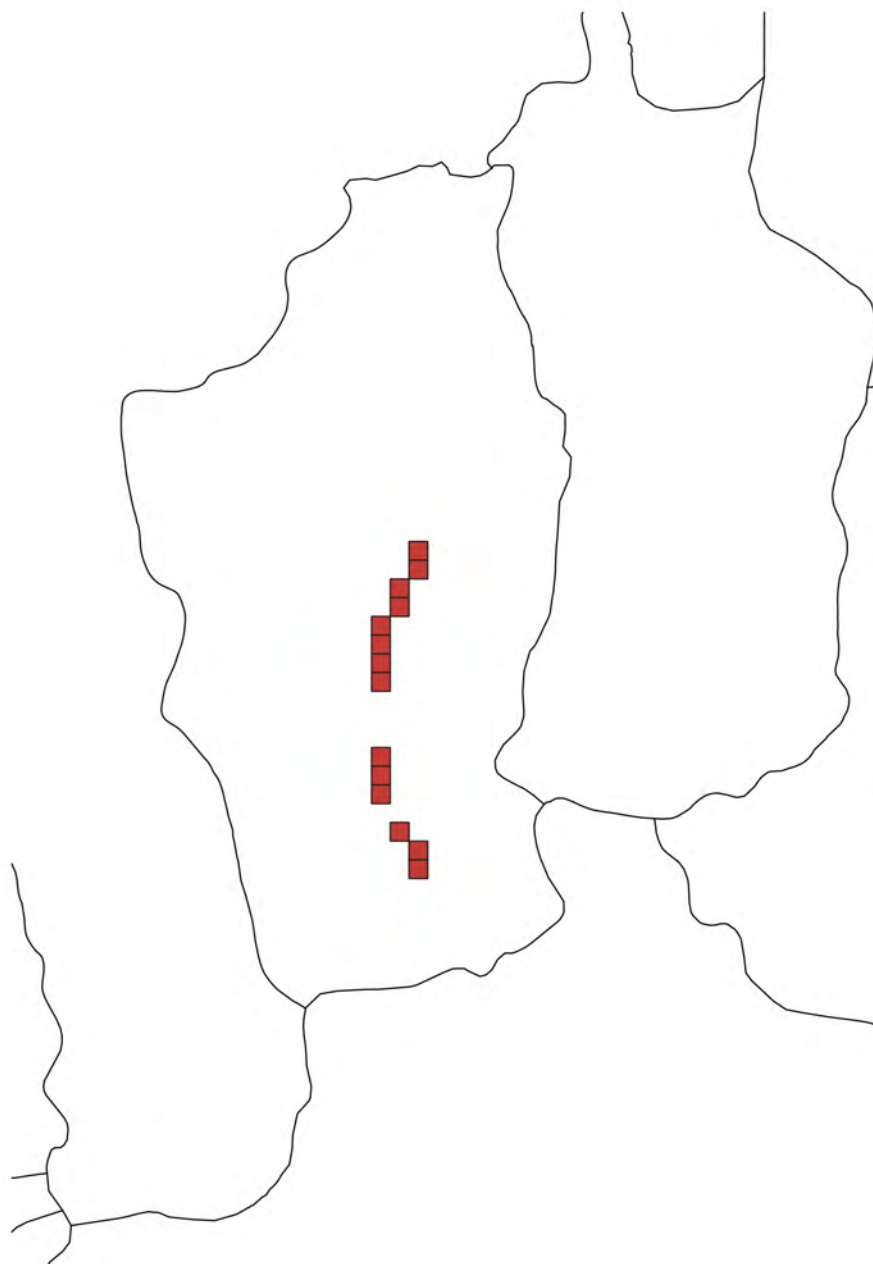


Figure A2. Location of pumping wells in GWMApv for ANWS pumping.

EXHIBIT D

Comments on the Final Environmental Impact Statement
Pine Valley Water Supply Project
(DOI-BLM-UT-C010-2020-0012-EIS)

March 1, 2026

Comments on the Final Environmental Impact Statement
Pine Valley Water Supply Project
(DOI-BLM-UT-C010-2020-0012-EIS)

With Emphasis on Final Groundwater Resources Impact Assessment and

GBCAAS-PV Model

Pine Valley Water Supply Project

Prepared by

Groundwater Model Analysis, LLC

Prepared For

Smith Hartvigsen, PLLC

March 1, 2026

To Whom It May Concern:

Groundwater Model Analysis, LLC respectfully submits the following comment on the Final Environmental Impact Statement Pine Valley Water Supply Project (DOI-BLM-UT-C010-2020-0012-EIS, February 27, 2026), with specific reference to the Final Groundwater Resources Impact Assessment (GRIA dated December 1, 2025; released February 27, 2026) incorporated by reference in the FEIS. Because the FEIS depends on the adequacy of the GRIA, any deficiencies in the GRIA and GBCAAS-PV model described in the GRIA undermine the ability of the FEIS to adequately evaluate impacts as required by NEPA.

Because of the limited time frame between release of the FEIS and possible Record of Decision, these comments focus only on major problems already documented in a comment prepared by Groundwater Model Analysis, LLC (dated October 2, 2025). Failing to remedy these errors in modelling and reporting shows the DEIS, GRIA, and GBCAAS-PV model do not meet NEPA requirements for high quality accurate scientific analysis (40 CFR 1500.1), accurately describing the affected environment (40 CFR 1502.15), documentation of incomplete or unavailable information (40 CFR 1500.22), professional and scientific integrity (40 CFR 1502.24), accurate cumulative impact (40 CFR 1508.7), and accurate effects (40 CFR 1508.8).

Six concerns were identified in the previous comment prepared by Groundwater Model Analysis, LLC that show little confidence can be placed on the predictions of impacts because of omissions, errors, and inconsistencies in the GRIA, improper model calibration techniques, and incomplete model analyses. These concerns are repeated here, and text is added that shows the concerns were not resolved in the Final GRIA and Final EIS. Four of the major technical problems with the model and report have not been remedied at all, two of them were partially remedied.

Concern #1. The model predictions do not include prediction confidence intervals, prediction scaled sensitivities, or prediction correlation coefficients. These statistics are critical to understanding if the model can make precise predictions and the uncertainty in those predictions. The lack of prediction uncertainty violates 40 CFR 1502.24 which requires scientific integrity of the discussions and analyses in environmental impact statements. Predictions are incomplete information and 40 CFR 1502.22 requires “the agency’s evaluation of such impacts based upon theoretical approaches or research methods generally accepted in the scientific community.” Not calculating or presenting prediction uncertainty is not generally accepted.

Uncertainty analysis **was not included** in the Final GRIA and Final EIS. Appendix A of the Final GRIA (p. A-1 to A-2) used the following reasoning why uncertainty analyses are not included:

“The most significant source of uncertainty in Great Basin Carbonate and Alluvial Aquifer System-Pine Valley (GBCAAS-PV) model prediction outputs derives from uncertainty in the underlying conceptual model. For example, data regarding local springs in the mountains surrounding Pine Valley supports an interpretation that they have no connection to the regional aquifer system and would not be affected by pumping for the PVWS Project; however, this cannot be conclusively demonstrated in the absence of sustained aquifer stress. Another example is uncertainty regarding the possible presence of stratigraphic and structural features associated with caldera deposits beneath southern Pine Valley, which could impede groundwater flow. Uncertainties of this nature cannot be practically assessed through numerical uncertainty evaluation analysis, and are addressed in the GRIA by assessing the implications and risks associated with data gaps, and addressing them through monitoring and mitigation strategies. As such, numerical uncertainty analysis was not thought to be warranted.”

Using lack of knowledge of some aspects of the system to justify not determining statistical uncertainty violates standards of scientific integrity. Systems always have unknowns, and yet many scientists have been involved in determining methods and programs to calculate and present uncertainty. In addition, statistical uncertainty accounts for some of those unknowns; for example, the uncertainty in hydraulic conductivity of some of the rock types accounts for not knowing exact locations of various rock types.

Concern #2. The model and report fail to acknowledge and simulate past pumping in the surrounding areas of Snake Valley, Beryl-Enterprise Area, and Milford Area. This past pumping has created large drawdown cones and depleted areas of evapotranspiration that existed during the pre-development period for which GBCAAS v. 3.0 and GBCAAS-PV were calibrated, and the effects of decades of pumping and groundwater mining cannot be estimated by starting with the steady-state no pumping model.

- a. The failure to account for this pumping violates 40 CFR 1502.15 to describe the affected environment.
- b. During calibration and model predictions, discharge to evapotranspiration is simulated that does not currently exist and cannot be captured by future pumping.
- c. Simulating capture of evapotranspiration that does not exist reduces the simulated amount and spread of the drawdown created by the project wells.

This **was addressed but is still incorrect** in the Final EIS and Final GRIA.

The simulated pumping in Beryl-Enterprise Area (GRIA Appendix A, p. A-85) represents only a small portion of the pumping in the area, and only for 30 years prior to starting the cumulative effects analyses. Pumping and drawdown started in 1945 in Beryl-Enterprise Area, and the large amount of pumping south of the PVWS area cannot be ignored. No justification is provided for the omission of about 72,000 acre-feet per year of groundwater withdrawals (Smith and others, 2019, figure 31).

Pumping in Milford Area of about 60,000 acre-feet per year (Smith and others, 2019, figure 29) is not included in the model. Omitting Milford Area pumping and most of Beryl-Enterprise Area pumping ignores the cumulative effects of 132,000 acre-feet per year of pumping that started in 1930. This is the equivalent of almost 9 times the amount of proposed pumping that is completely ignored.

The pumping in Snake Valley for 30 years (GRIA Appendix A, p. A-85) prior to starting analysis is fairly reasonable because Snake Valley has nearby discharge that can be captured and may be close to new steady-state conditions in 30 years. It would have been more scientifically accurate to go back to 1975 when pumping started to increase (Masbruch and others, 2014, figure 7).

Concern #3. The omission of past pumping in surrounding valleys also violates 40 CFR 1508.7 requiring analysis of the cumulative effects of all past, present, and reasonably foreseeable future actions.

See response to Concern #2.

Concern #4. Recharge was set as a known value in the groundwater model, despite uncertainty in recharge and despite the observations providing a lot of information about recharge parameters as indicated by large composite scaled sensitivities.

- a. It is likely that simulated recharge could have been determined by regression.
- b. Because recharge is set, this requires hydraulic properties to also be set (manually or by regression) to move this amount of water through the groundwater system.
- c. This violates scientific integrity (40 CFR 1502.24) by not following standard guidelines for model calibration.
- d. Setting the recharge also impacted Snake Valley hydrographic area. Hydraulic conductivity values were adjusted to decrease water levels and possible decrease discharge to Clay Springs. These changes caused an ETg observation (et37Snake3) to be only about 18,000 acre-feet per year instead of the observed 37,400 acre-feet per year or the 27,600 acre-feet per year simulated in GBCAAS v. 3.0.

This **was not changed** in the Final EIS and Final GRIA and represents one of the most critical limitations of the GBCAAS-PV model and Final GRIA.

Concern #5. The model has a number of parameters that cover small areas and for which the observations provide little information as indicated by small composite scaled sensitivities.

- a. The additional parameters may have been hand calibrated to fit specific water levels or spring discharge, but may not accurately represent the response of the system to pumping.
- b. Having a lot of insensitive parameters increases prediction uncertainty. Of the 31 parameters added to the GBCAAS-PV model, only 7 of them have regressed values used in the final calibrated model.

This **was not changed** in the Final EIS and Final GRIA.

Concern #6. The area of the proposed pumping has some of the highest water-level residuals in the calibrated model. The mismatch in this critical area could indicate a conceptual error in the model construction or parameterization, which could have a large impact on model predictions.

This **was not changed** in the Final EIS and Final GRIA.

Additional Comments

Two additional descriptions were added to the Final GRIA that are worth mentioning. First, the discharge from Wah Wah Springs used as calibration in the GBCAAS-PV model is about 2.5 times the discharge used in the USGS GBCAAS v. 3.0 model. This was clear in the draft GRIA. The draft GRIA, however, did not mention that variance of the observation was kept the same as in GBCAAS v. 3.0 (Final GRIA Appendix A, p. A-48). This means that during statistical regression and sensitivity analysis, Wah Wah Springs is given a much larger weight in the GBCAAS-PV model and the observation is assumed to be accurate within about 12 percent. This is unreasonable for spring discharge with sporadic measurements and may have influenced hydraulic conductivity parameters unreasonably.

Second, recharge from irrigation at Wah Wah Ranch is added to the GBCAAS-PV model. This was mentioned in the Draft GRIA, but the amount of recharge was not given in the Draft GRIA. The Final GRIA gives the amount as 750 acre-feet per year (Final GRIA, p. 39). This is about 47 percent of the spring discharge as used in the Final GRIA (p. 39), and 100 percent of the discharge used in GBCAAS v. 3.0. This amount of recharge implies that the 225 acres of irrigated cropland in Wah Wah Valley are being overwatered by at least 3 feet per year. This is highly unlikely in an area where water is scarce.

In contrast to this large amount of recharge, the Final GRIA (p. 70) reports:

“As discussed in Section 3.7.2.1, Stephens (1974) indicated that about 600 AFY of the spring discharge is diverted for irrigation use at the ranch. The diversion estimate is similar to the average annual ET estimate for the irrigated area at Wah Wah Ranch derived from our ET analysis (Section 3.9.3), which is 570 AFY for the period from 2005 to 2014.”

This calls into question the relatively large discharge reported in the GRIA and EIS for Wah Wah Springs. If that much water is available, the irrigated acreage would probably be larger.

In conclusion, the Final GRIA and Final EIS do not meet the standards required for NEPA analysis, and decisions should not be made using these documents. Groundwater Model Analysis, LLC appreciates the opportunity to provide these comments and is available to provide clarification as needed.

Respectfully Submitted,

Lynette Brooks, owner
Groundwater Model Analysis, LLC

REFERENCES

Masbruch, M.D., Gardner, P.M., and Brooks, L.E., 2014, Hydrology and numerical simulation of groundwater movement and heat transport in Snake Valley and surrounding areas, Juab, Millard, and Beaver Counties, Utah, and White Pine and Lincoln Counties, Nevada: U.S. Geological Survey Scientific Investigations Report 2014-5103, 108 p.
<http://dx.doi.org/10.3133/sir20145103>.

Smith, L.R. and others, 2019, Groundwater conditions in Utah, spring of 2018: Utah Department of Natural Resources Cooperative Investigations Report No. 59, 132 p.

Stephens, J.C., 1974, Hydrologic reconnaissance of the Wah Wah Valley drainage basin, Millard and Beaver Counties, Utah: Utah Department of Natural Resources Technical Publication 47, 53 p.

EXHIBIT E-1

Groundwater Impacts of the Proposed Pine Valley Water Supply
Project, Utah on Nevada Groundwater Basins with a Focus on Snake
Valley, Nevada & Utah

Andy Zdon and Josh Osborne, Roux Associates, Inc.

September 20, 2021

Date: 20 September 2021

To: Kyle Roerink, Great Basin Water Network

From: Andy Zdon and Josh Osborne, Roux Associates, Inc.

Subject: **Groundwater impacts of the proposed Pine Valley Water Supply Project, Utah on Nevada groundwater basins with a Focus on Snake Valley, Nevada & Utah**

This technical memorandum related to the proposed Central Iron County Water Conservation District (CICWCD) Pine Valley Water Supply Project (Pine Valley Project) has been prepared by Roux, Inc. (Roux) on behalf of the Great Basin Water Network (GBWN). Although the proposed Pine Valley Project is in Utah, the effects of the project are likely to extend well into Nevada. Although the focus of this technical memorandum is related to the effects of the Pine Valley Project in Nevada, a discussion related to effects of the Pine Valley Project on groundwater flow in Utah is included to provide context for the review of anticipated groundwater-related impacts in Nevada. This memorandum is based on our review of existing literature, Roux's running scenarios on a groundwater flow model developed by the U.S. Geological Survey (USGS), and our field visit of the Pine and Wah Wah Valleys area during 2020. We did not conduct a field inspection of Snake Valley for the purposes of this memorandum.

The locations of eastern Nevada groundwater basins including Snake Valley, and the Pine Valley Project are presented on Figure 1. CICWCD's proposed Pine Valley Project in Utah proposes to export approximately 15,000 acre-feet per year (afy) of groundwater from the southern portion of Pine Valley, a part of the headwaters of the Great Salt Lake Desert groundwater flow system. The Pine Valley Project is not a stand-alone project, but is the first phase of the proposed, multi-basin West Desert Water Supply and Conservation Project (Figure 2). The West Desert Project area lies within the headwaters of the Great Salt Lake Desert Flow System (GSLDFS; for Pine and Snake/Hamlin Valleys), and in the case of Wah Wah Valley, in the Sevier Lake Flow System (Figure 3). CICWCD has obtained groundwater rights in Pine Valley (15,000 acre-feet per year) and Wah Wah Valley (11,000 acre-feet per year). CICWCD currently has groundwater right applications for Hamlin Valley (10,000 acre-feet per year).

Groundwater-dependent ecosystems in the area range from large springs such as Wah Wah Spring (in Wah Wah Valley, Utah) to small springs and wet meadows. Many springs in the region are relatively small springs that individually may not appear to be significant components of the overall area groundwater budget, but individually and collectively are important ecological resources and can be relied upon for human uses. Additionally, springs in Snake Valley provide habitat for the Least Chub. By 2007, a majority of the known natural populations extant in 1979 were extirpated and the known distribution of least chub consisted of 6 populations (United States Fish and Wildlife Service [USFWS] and Utah Division of Wildlife Resources [UDWR], 2014, p. 7); Gandy Marsh, Bishop Springs and Leland Harris Springs in Snake Valley in northwestern Utah, Mills Valley in the Sevier drainage below Yuba Reservoir, the Mona Springs Complex in the Utah Lake drainage, and Clear Lake within the Sevier River drainage (Bailey et al., 2005, p. 18-19). The status of the Mona Springs population in 2007 was functionally extirpated (USFWS, 2010, p. 35400).

The proximity of the proposed Pine Valley Project to Snake Valley is likely to result in lasting water-resource impacts in the area. A reduced groundwater budget in Snake Valley resulting from induced underflow from Snake Valley toward Pine Valley is likely. Additionally, the changes to the groundwater system from the proposed Pine Valley Project, would likely affect springs in Nevada potentially including

those in Great Basin National Park. Further, more distant springs such as those at Fish Springs National Wildlife Refuge (in Fish Springs Flat groundwater basin in Utah) also are likely to be affected over time by changes in hydraulic gradients and gradient-directions caused by the groundwater capture from the proposed Pine Valley Project.

Based on our review of investigations by other researchers including the U.S. Geological Survey, and work conducted by agencies prior to the development of the proposed Pine Valley Project as presented on the U.S. Bureau of Land Management's ePlanning website for this project (U.S. Bureau of Land Management, 2021), we are not convinced that the proposed project as currently designed can provide the volume of water for the period envisioned by CICWCD. This is demonstrated by existing groundwater modeling results (Brooks, 2017), wellfield design and other factors. These potential deficiencies will also be discussed in this report. In order to potentially capture the volume of water envisioned by the project, the project would likely require a well field that is more widely distributed, throughout Pine Valley but based on existing public data and analyses, has not been evaluated. However, if the project does proceed as designed and does produce those volumes of water (~15,000 afy), or even less, the effects of the Pine Valley Project on Snake Valley and surrounding groundwater basins in Nevada would likely be substantial and have not been reliably evaluated at this time, particularly because of substantial, wide-ranging data gaps related to aquifer and flow system characteristics, and the nature and extent of groundwater-dependent ecosystems.

What is a spring and what are they like in this area?

Springs are places where groundwater reaches the ground surface, discharging as surface flow. By nature of their character, springs are highly sensitive to changes in groundwater level. For some springs, the reduction of less than one foot of groundwater elevation can result in the difference between surface water flow being present or absent. Some springs are small, seasonal, locally perched, features where last year's rainfall that soaked into the ground has hit a barrier to its downhill flow path, forcing that water back to the ground surface. The discharge from these local springs is gravity driven. Other springs are tied to deeper and more distant groundwater flow paths that may extend well beyond the boundaries of the local watershed. Because these flow paths are deeper, they are generally not affected by seasonal rainfall or changes in air temperature, they usually have more consistent flow, and if the flow paths are sufficiently deep, they are characterized by warmer groundwater discharge temperatures that remain relatively consistent over time. These springs will commonly have discharges that are anomalously large for their limited watershed and local precipitation. These latter springs rise to the surface under pressure. Figure 4 depicts the relationships between these two different types of springs within a typical flow system context.

How Groundwater Capture Can Impact Springs

In the GSLDFS and surrounding area, the primary risk to springs is the potential impacts due to proposed regional pumping. As described earlier, the proximity of the proposed Pine Valley Project pumping to springs and neighboring basin-fill aquifers is likely to have a deleterious effect. In Snake Valley and Great Basin National Park, these effects may result in changes to hydraulic gradients and gradient-directions, and reductions in spring flow.

Barlow and Leake (2012) present four common misconceptions regarding surface water depletion (such as a reduction of spring flow) due to groundwater pumping:

- Total development of groundwater resources from an aquifer system is "safe" or "sustainable" at rates up to the average rate of recharge;

- Depletion of spring flow is dependent on the rate and direction of water movement in the aquifer (i.e., is the spring upgradient or downgradient);
- Depletion of spring flow will stop when pumping ceases; and,
- Pumping groundwater exclusively below a confining layer will eliminate the possibility of depletion of surface water connected to the overlying groundwater system.

Additionally, Bredehoeft (2002, 2007) and Alley, et.al. (1999) point out the invalidity of the myth that pumping at the estimated groundwater recharge results in practical, sustainable groundwater development. Indeed, the sustainability of pumping is based on the capture (induced inflows and decreased discharges including spring flow) that is a response to groundwater pumping.

Other risks to springs may well arise from the Pine Valley Project but are impossible to evaluate because many of the springs in the region have not been evaluated for their connectedness to basin-fill aquifers. Although a subset of key springs was analyzed in Snake Valley by Gardner (2014) and in the Pine Valley area (Gardner, et.al., 2020), the spring set is not comprehensive, and to our knowledge, there has been no comprehensive regional analysis of springs in this area comparable to the analysis of springs in the Mojave Desert that the U.S. Bureau of Land Management (BLM) commissioned several years ago. Such investigations are not without precedent as shown by that BLM-commissioned comprehensive spring survey for the Mojave (Andy Zdon & Associates, 2016).

Characteristics of Snake Valley and the Great Salt Lake Desert Flow System

The Snake Valley basin (including Hamlin Valley) and surrounding area is in the western parts of Iron, Beaver, Millard, Juab, and Tooele Counties, Utah, and in northeastern Lincoln and eastern White Pine Counties, Nevada, within the Basin and Range geomorphic province. Snake Valley is part of an approximately 135-mile long, continuous north-trending depression, the approximate southern one-third of which is also known as Hamlin Valley. The Basin and Range region (also referred to as the Great Basin) is characterized by basins of internal drainage with considerable topographic relief, alternating between narrow faulted mountain chains and flat arid valleys or basins. The ranges generally trend north-northwest parallel to the regional structural regime. The geology of the Snake Valley area consists primarily of a succession of late Precambrian to early Mesozoic sedimentary rocks up to 33,000 feet thick, along with metamorphic rocks of Jurassic, Cretaceous, and Tertiary age (Kirby and Hurlow, 2005). Carbonate rocks making up the middle and upper portions of the succession are part of a regionally extensive aquifer system covering much of the eastern and southern Great Basin. Within that broad regional aquifer system, Snake Valley is within the GSLDFS, extending from eastern Nevada and western Utah, northward toward the Great Salt Lake Desert (Figure 3).

The Snake Valley area, including surrounding groundwater basins in eastern Nevada, is covered by coalescing alluvial fans forming broad slopes between the surrounding mountains and the valley floor. Coarse-grained deposits (primarily sand and gravel) within the basin fill are responsible for transmitting the greatest quantities of groundwater in the Snake Valley drainage basin, although where present, carbonate rocks may also transmit substantial groundwater. The basin fill is generally unconsolidated, moderately to well-sorted sand, gravel, silt and clay. As the valley floor is reached, the sorting of the alluvial sediments will increase, serving to increase the permeability of the sediments at the base of the alluvial fans. On the other hand, with increased depth, groundwater production can be expected to decrease as deposits lithify and porosity decreases, ultimately reducing permeability as strata is buried and ages (Kirby and Hurlow, 2005). Within the basin fill, the fine-grained (clay and silt) deposits that largely comprise former lakebed deposits and that underly much of the alluvial deposits may serve as

aquitards. Aquitards are low permeability geologic units that inhibit groundwater flow and can serve as confining units.

The regional gradient of the groundwater flow system is toward the north (Brooks, 2017; and Kirby and Hurlow, 2005). As described earlier, Snake Valley is within the headwaters of the GSLDFS. The GSLDFS covers approximately 2,600 square miles of western Utah. No perennial streams originate in this area, and runoff only reaches valley floors during and immediately after intense storms or periods of rapid snowmelt (Gates and Kreuer, 1981).

Groundwater is present throughout the GSLDFS within the unconsolidated basin fill and consolidated rocks, and varies in quality from fresh water to brine. Much of the groundwater budget is poorly known, but the annual groundwater recharge from precipitation and underflow from other basins in Nevada to the southern portion of the GSLDFS in Utah has been estimated at a combined 84,000 acre-feet per year (Gates and Kreuer, 1981). As described earlier, CICWCD has been granted rights in Pine Valley and neighboring Wah Wah Valley to the east, and has applied for groundwater rights in Hamlin Valley (southern end of Snake Valley). The combined volume of water of those groundwater rights (in Pine and Wah Wah Valleys) account for approximately 30% of the total groundwater inflow to the southern GSLDFS in Utah and Nevada inclusive of Snake, Pine, Wah Wah Valleys along with other valleys in White Pine County, Nevada and Millard and Juab Counties in Utah.

Fish Springs, the largest spring complex in the GSLDFS is likely primarily derived from underflow from Tule Valley toward Fish Springs Flat. Groundwater in Tule Valley itself is derived from underflow from Pine Valley, Wah Wah Valley, and the Sevier Lake Desert (Gardner, 2014, Brooks, 2017). An isotopic investigation of groundwater movement from Snake Valley toward Fish Springs, identified that a relatively small portion (if any) of the discharge from Fish Springs was derived from Snake Valley (Gardner, 2014). The implications of that condition are that additional production in Snake Valley, or induced underflow from Snake Valley toward Pine Valley would result in reductions in other Snake Valley discharges such as spring flow and evapotranspiration and could induce underflow from surrounding valleys (such as Spring Valley and others) thereby impacting the groundwater budgets for those basins and likely impact groundwater flow to Fish Springs. Additionally, although groundwater from Snake Valley does not appear to be reaching Fish Springs, Fish Springs does receive groundwater from Pine Valley and therefore would likely be directly impacted by Pine Valley Project pumping.

As part of Roux's review of the proposed Pine Valley Project, we reviewed the Great Basin Carbonate and Alluvial Aquifer groundwater flow model (GBCAAM; Brooks, 2017). Figure 5 presents groundwater flow directions as estimated by the GBCAAM under non-pumping conditions and as can be seen, groundwater from Snake Valley generally moves north. Due to the interconnectedness of groundwater flow in the basins within the GSLDFS, changes in the groundwater budgets of upgradient basins, such as Pine and Wah Wah Valleys, will have a domino effect on the groundwater basins down- and cross-gradient, although the timing of those changes is unclear.

In the case of Snake Valley, the majority of discharge from the basin occurs via evapotranspiration (~80,000 afy; Kirby and Hurlow, 2005 and Gardner, 2014). Additionally, groundwater is discharged from agricultural pumping in the area (~14,500 afy). Induced underflow from Snake Valley to Pine Valley caused by the Pine Valley Project would serve as a new stress on the Snake Valley groundwater system and would come at the expense of spring discharge and evapotranspiration, or induced underflow from surrounding basins as described earlier.

Sustainability of Groundwater Systems

The volume of groundwater in storage is an important aspect of the groundwater system. Changes in storage are identified in the field by changes in groundwater levels. A fundamental groundwater equation and the basis for evaluations of groundwater budgets (inflow vs. outflow estimates) is:

$$\text{Inflow} - \text{Outflow} = \text{Change in Storage}$$

When outflow (groundwater discharge both directly in-basin or through underflow to surrounding basins) exceeds inflow (groundwater recharge in basin plus contributions from surrounding basins), there is a negative change in groundwater in storage and groundwater levels can be expected to decline. When inflow exceeds outflow, the reverse is true. When the system is in equilibrium, water levels will generally remain relatively constant despite short-term fluctuations. Where they occur, long-term groundwater level declines are a clear indication that outflow has been exceeding inflow for an extended period. It should also be noted that in many areas, the recovery of groundwater levels following groundwater being removed from storage can take much longer than the period it took to decline, depending on the volume removed from storage, groundwater recharge, precipitation trends, and the geology of the basin.

Furthermore, under predevelopment conditions, a groundwater system is in equilibrium where inflow equals outflow. Groundwater pumping such as that proposed by CICWCD causes a disruption in this equilibrium, and recharge amounts, and other biological and hydrologic conditions can change. More often, discharge amounts and patterns are impacted. This includes the loss of phreatophytic vegetation (vegetation whose water requirements are met by roots tapping groundwater such as in the area of springs) and reduction or elimination of spring flow. All pumped water must be supplied by one or more of the following:

- Decreases in groundwater storage (lowered groundwater levels);
- Increased or induced recharge or underflow from surrounding basins (e.g., from Snake Valley); and/or,
- Decreased discharge either in the form of reduced subsurface outflow or decreases in natural forms of discharge such as evapotranspiration, spring flow or river base flow (such as would occur at Tule Spring and elsewhere in Sevier Desert areas with shallow groundwater).

Regardless of the amount of groundwater pumped, there will always be groundwater drawdown (and the removal of water from storage) in the vicinity of pumping wells, a necessity to induce the flow of groundwater to said wells. This area of groundwater drawdown is referred to as a cone of depression. For most groundwater systems, the change in storage in response to pumping is a transient phenomenon that occurs as the system readjusts to the pumping stress. The relative contributions of changes in storage, increases in recharge, and decreases in natural discharge evolve over time. The timing of that evolution in natural discharge change can be difficult to predict.

If the system can come to a new equilibrium (i.e., a combination of increased recharge and/or decreased discharge), the storage decreases will stop, and inflow will again equal outflow with the changes to the inflow/outflow components (capture) described above. The amount of groundwater "available" for a future groundwater development project is therefore dependent on what these long-term changes are, and how these changes affect the water resources and groundwater-dependent environmental resources of the area.

Hydrologic Analysis

We reviewed numerous technical documents related to the proposed Pine Valley Project and the hydrogeology of the surrounding region including Snake Valley. Highlights from those studies are discussed below.

Use of the GBCAAS Model

As described earlier, the USGS' GBCAAS Model was used by Roux to estimate local and regional hydrological responses to the proposed pumping scheme in Pine and Wah Wah Valleys. The GBCAAS Model is a regional groundwater model that encompasses alluvial, carbonate, and volcanic aquifer systems across Utah and portions of Nevada, California, and Idaho (Brooks, 2017). The initial release of the model simulated only steady-state flow conditions. The current version of the model, GBCAASv3.0, includes transient groundwater flow capabilities (specific storage and specific yield parameterizations have been added), has been recalibrated, and only employs local grid refinement in a portion of the model domain that covers an area unrelated to Pine Valley. The model includes both a calibration version – used to represent historic data sets – and a projection version that included new pumping in Pine and Wah Wah Valleys and reduced pumping in Parowan Valley.

Pine Valley and surrounding groundwater budgets

Bredehoeft, in his landmark papers (Bredehoeft, 2002; Bredehoeft, 2007; and Bredehoeft and Durbin, 2009), described the myth that pumping at the estimated groundwater recharge rate for a basin results in a sustainable groundwater development scheme. Indeed, the sustainability of groundwater development will be the ability of the groundwater development to capture the discharge from the groundwater basin. In Pine Valley that would translate to the sustainability of the proposed Pine Valley Project being reliant on the ability for the project to reduce groundwater underflow to downgradient basins, capture groundwater underflow from surrounding basins (e.g., Snake Valley) and reductions in spring discharge (the two principal discharge components of the groundwater budget). With respect to timing of discharge capture, Bredehoeft and Durbin (2009) write, "Large ground water systems, where a new equilibrium can be reached and in which the pumping is a long distance from boundaries where capture can occur, take long times to reach a new equilibrium. Some systems are so large that the new equilibrium will take a millennium or more to reach a new steady-state condition. These large systems pose a challenge to the water manager, especially when the water manager is committed to attempting to reach a new equilibrium state in which water levels will stabilize and the system can be maintained indefinitely."

Ultimately, the groundwater developed from Pine Valley (and potentially Hamlin and Wah Wah Valleys) will be derived by reducing underflow to downgradient groundwater basins in Beaver, Millard, Juab, and Toole Counties in Utah and White Pine and Lincoln Counties in Nevada for the groundwater system to reach a new equilibrium condition. Additionally, beyond the impacts of the Pine Valley Project on Snake Valley in White Pine County, Nevada, if Hamlin Valley is developed by CICWCD, which is planned as part of CICWCD's broader West Desert Water Project, that would have direct, additive impacts to the downgradient portion of Snake Valley in Nevada. Ultimately, a reduction of underflow toward the downgradient portion of the Great Salt Lake Desert flow system could also affect the Great Salt Lake flow system as well, which could affect the Great Salt Lake itself. The timing of those likely irreversible changes could take a long time, but on the other hand they could come sooner.

The U.S. Geological Survey (Brooks, 2017) used the GBCAAS groundwater model to evaluate the effects of the proposed pumping in Pine Valley, along with pumping in Wah Wah Valley (in volumes similar to the water rights held by CICWCD), and reductions in pumping of more than 20,000 acre-feet per year in Parowan Valley, Utah (we have no knowledge of such reductions being proposed). The results of that analysis are reflected in the drawdown prediction presented in Figure 6. Table 1 summarizes the results

of that simulation for groundwater basins in Nevada. As described earlier, the timing of the growth of the cone of depression from project pumping is uncertain given the paucity of aquifer data in the vast area affected. Therefore, the 1,000-year scenario is used to estimate the long-term equilibrium condition of Nevada groundwater basins from project pumping. It is important to recognize that the 1,000-scenario results could be attained in a much shorter timeframe. As can be seen, the groundwater level changes predicted by the U.S. Geological Survey in Nevada groundwater basins is substantial in Snake Valley, Spring Valley and surrounding groundwater basins in White Pine and Lincoln Counties.

Supplemental to the U.S. Geological Survey's analyses above, as part of our review we looked at the changes in subsurface flow that would occur as a result of project pumping, predicted by the GBCAAS Model (Brooks, 2017). Roux also looked at drawdown that would continue after pumping ceases. CICWCD's water rights applications for the Pine Valley Project and the larger West Desert Project make it clear that these projects are intended to serve as a permanent water supply for CICWCD's service area, particularly with Iron County's growth projects, and therefore it is not realistic to assume, or limit analysis to only a 50-year pumping period. Further, there is substantial uncertainty related to the timing of the pumping effects, so considering what the groundwater system would look like when the GSLDFS reaches a new equilibrium is of importance.

The primary source of underflow toward Pine Valley as the cone of depression from the proposed well-field pumping grows over the course of the project's projected long-term pumping, and even as the cone of depression recovers if the project is eventually shut down, is from a marked increase in underflow from neighboring Snake Valley (Figure 7). That induced underflow from Snake Valley would no longer be available as underflow northward down Snake Valley. As Gardner (2014) posited that very little if any groundwater from Snake Valley exits the valley toward Fish Springs as that groundwater is largely consumed by downgradient spring flow, evapotranspiration, and human use within Snake Valley, it follows that the reduced down-valley underflow in Snake Valley due to capture from Pine Valley pumping would affect downgradient spring flow, groundwater-dependent vegetation, and existing groundwater users. Ultimately, the induced underflow from Snake Valley due to the Pine Valley Project must be made up from other sources for Snake Valley groundwater basin to adjust to this new stress. Figure 7 presents the results of that pumping scenario and before and after underflow estimates. Figure 8 presents the flow field associated with pumping in Pine Valley after the groundwater system stabilizes (1,000 years), minus the baseline flow field (without pumping), in other words the net flow changes to the system. One can see the impact of pumping on patterns of groundwater flow, extending north from Pine Valley toward Fish Springs Flat and west from Pine Valley toward Snake Valley and into the Great Basin National Park area. That stress on the Snake Valley groundwater system will then result in similar inducements of underflow from groundwater basins surrounding Snake Valley such as Spring Valley. The before and after Pine Valley Project pumping effects on the Snake Valley groundwater budget and how those changes affect surrounding Nevada groundwater basins are presented in Figure 9.

The full extent of the capture will likely occur long after the proposed 50-year pumping period that has been proposed for the Pine Valley Project. Even assuming the 50-year pumping period is not extended, the cone of depression from that pumping will continue to expand as more distant groundwater is captured to allow recovery of the pumping center. Even after groundwater pumping has ceased, no mechanism to stabilize the groundwater flow system from continued drawdown exists. Drawdown will continue to expand resulting in unabated impacts to springs and human use until the aquifer system can reach a new equilibrium and begin to recover. Realistically, it is unlikely that Pine Valley Project pumping would cease after 50 years, and more likely to be substantially supplemented by additional pumping from Wah Wah Valley and, potentially, Hamlin Valley, considerably adding to the stress on groundwater basins in White Pine County and Lincoln County.

The processes and timing of these changes are made more unclear by Pine Valley having not been subject to significant groundwater development and currently being in a state of equilibrium (Gardner, 2020). Therefore, how the basin reacts to long-term groundwater stresses is not known beyond modeling analyses with the inherent uncertainties described earlier. In the case of the proposed project, the stresses will be substantial based on the following:

- The proposed pumping volume (15,000 acre-feet per year) from the basin-fill aquifer exceeds the USGS estimated recharge to that aquifer (11,000 acre-feet unconsumed recharge that moves to basin-fill aquifer per Gardner, et.al., 2020) by more than 35%;
- The estimated subsurface underflow from Pine Valley to the north likely will decrease toward zero as subsurface underflow is the principal groundwater discharge from the Pine Valley basin-fill aquifer available for capture;
- Decreased subsurface underflow affects down-basin discharge points such as those in Tule Valley and the Fish Springs area;
- Underflow from cross gradient basin-fill aquifers, including Snake Valley, and basins contributing flow toward Snake Valley such as Spring Valley, will increase towards Pine Valley as the regional groundwater gradient is interrupted by the extraction of groundwater in Pine Valley potentially creating a groundwater budget deficit for ecological resources and human-users.

As described earlier, the groundwater budget of Snake Valley is threatened by the Pine Valley Project as the likely changes in groundwater gradient of Pine Valley will redirect the groundwater gradient of at least a portion of Snake Valley. The groundwater budget of Snake Valley consists predominantly of evapotranspiration with lesser amounts of spring flow and underflow toward Tule Valley and Deep Creek Valley (Figure 9). Recharge of the Snake Valley basin-fill is predominantly supplied by precipitation in the Snake Range (Gardner and Heilweil, 2014) along with groundwater underflow from Spring Valley to the west.

Our analysis using the USGS GBCAAS Model solely simulating proposed Pine Valley Project pumping indicates that extraction of groundwater and alteration of the groundwater gradient associated with the Pine Valley project will affect the underflow of groundwater from Snake Valley, and ultimately, Spring Valley to the west along with other surrounding valleys. Absent potential future pumping in Wah Wah and Hamlin Valleys, the change in underflow from the southern portion of Spring Valley into Snake Valley under Pine Valley Project pumping almost doubles from 612 afy to 1,054 afy and an increase of 223 afy from the northern portion of Spring Valley. As described before, considering the modeling uncertainties described earlier, the specific volumes could vary substantially. Ultimately, the Pine Valley Project is estimated to affect Spring Valley, Nevada, before a new groundwater system equilibrium is reached (Figure 9 and Table 1). We have not simulated the additional effects that pumping from the Hamlin Valley phase of the West Desert Water Project would have on the groundwater systems in Nevada. However, Brooks (2017) does simulate the additive effects of pumping in Wah Wah and Pine Valleys (see Table 1). Additionally, results of Roux's use of the GBCAAS model indicates that the underflow from Snake Valley to Pine Valley increases more than an order of magnitude as the basins reach a new equilibrium (Figure 7).

Drawdown

When evaluating the model-predicted drawdowns for a pumping program or wellfield, generally the estimated well field drawdown is not representative of drawdown that would be measured in individual wells. The estimated drawdown is the representative drawdown for the model cell. Therefore, drawdown

as measured in a specific pumping well would be considerably more than that modeled, irrespective of well efficiency issues.

As estimated by the U.S. Geological Survey (Brooks, 2017), the drawdown estimated from pumping in the Pine Valley and Wah Wah Valley areas is substantial (Figure 9, Table 1). Based on our simulation using the USGS-developed GBCAAS model of pumping solely in the Pine Valley wellfield area, the GBCAAS model predicts approximately 600 feet of drawdown in the wellfield area.

A review of the drawdown predicted in Brooks (2017) for pumping similar to that proposed under the Pine Valley Project in Pine Valley, and in Wah Wah Valley similar to the amount of the CICWCD water rights granted, (Table 1) indicates that it would take approximately 1,000 years of pumping at those rates and conditions for the groundwater system to begin to reach a new equilibrium. Again, the timing of those impacts is subject to modeling error and uncertainties due to the sparsity of data in the area of the model domain. Nonetheless, this is indicative of the magnitude of stress the proposed pumping would put on the aquifer system.

The partial review of groundwater-dependent ecosystems including springs in Pine Valley, Wah Wah Valley and basins that are downgradient from those valleys, along with consideration of springs in Snake Valley that could be affected by declining groundwater levels (see Elliott, et al., 2006), and the predicted drawdowns (Brooks, 2017) demonstrate that the Pine Valley Project will give rise to considerable risk to important ecological and human uses.

Uncertainty

Future impact analyses for the Pine Valley Project should recognize these uncertainties that are also inherent in the GBCAAS Model including:

- The estimated evapotranspiration assumed in the flow system to derive a recharge estimate has an estimated error bounds of plus or minus 35% (Brooks, 2017; Gardner, et al., 2020), and therefore recharge estimates are subject to similar error bounds;
- The estimates described above could underestimate the amount and extent of drawdown as the transmissivity (the measure of the ability of the aquifer to yield water) of the basin-fill aquifer is simulated to not decrease over time even though the parameter is dependent on the saturated thickness of the aquifer (Brooks, 2017) and the fact that groundwater recharge could be overestimated;
- Absence of hydraulic testing in this largely undeveloped region affects predicted timing of pumping effects;
- Aquifers are modeled as confined and transmissivity is not simulated to decrease with groundwater level decline (Brooks, 2017);
- Storage properties are considered uncalibrated outside of Parowan Valley (Brooks, 2017);
- Faults not simulated could act as barriers to groundwater flow providing greater uncertainty to model results;
- Over-generalizing the areas with similar hydraulic characteristics in the models resulting from limited data may affect the model simulations; and,
- Modeling based on an incomplete review of springs in the Great Salt Lake Desert Flow system including isotopic analyses.

Feasibility

Based on our review, it is likely that modifications to the well field design including expanding the well field area and number of wells will be needed. These likely changes to the ultimate well field are not evaluated by the U.S. Geological Survey modeling, nor was Roux able to simulate those changes as we have no information available as to what those changes would be. This is based on the following:

- Modeled drawdowns less than what would be measured in a specific pumping well as the drawdown is representative of conditions in the model cell containing the well and an area of approximately 25 acres;
- Drawdown in a specific pumping well would be expected to be greater than modeled because the model assumes aquifer transmissivity remains constant even though declining groundwater levels would cause transmissivity to decrease;
- The model does not consider the additional in-well drawdown that would result from well inefficiency.

When these three factors are considered together, given the projected drawdowns predicted for pumping in the Pine and Wah Wah Valleys in the GBCAAS Model, there is insufficient information or data to allow an informed determination to be made as to whether there is sufficient aquifer thickness to support the proposed project without substantial changes to project design. Changes to the well field area (e.g. if expanded to cover all of Pine Valley) would substantially alter the extent of groundwater impacts and cause additional impacts to groundwater resources in Nevada, not identified in the current analysis.

Conclusions

Based on the discussion provided above, the following is a summary of our conclusions relating to the proposed Pine Valley Project:

1. CICWCD proposes to pump up to 15,000 acre-feet per year of groundwater from Pine Valley, the first phase of CICWCD's larger planned West Desert Water Supply and Conservation Project.
2. The proximity of the proposed Pine Valley Project to existing groundwater dependent environmental resources and human uses in neighboring Snake Valley (and the surrounding valleys) could result in lasting water resource impacts to those areas including reductions in spring flow and reduced evapotranspiration.
3. Distant springs such as those in Snake Valley that support Least Chub and/or Fish Springs National Wildlife Refuge could be affected by changes in hydraulic gradients and gradient directions caused by Pine Valley Project pumping;
4. The proposed pumping of 15,000 acre-feet per year in Pine Valley exceeds the USGS estimated volume (11,000 acre-feet per year) of groundwater estimated to recharge the alluvial aquifer of Pine Valley and move northward as underflow.
6. Pumping more than the estimated groundwater recharge would result in continued groundwater decline long after project pumping ceases;
7. The spring analysis for the affected region (related to connectivity with basin fill aquifers) is incomplete;
8. The primary source of captured groundwater feeding groundwater recovery after pumping ceases in Pine Valley is induced underflow from Snake Valley, and subsequently other basins such as Spring Valley, with additional induced underflow from Escalante Desert as a secondary source.

9. As groundwater sourced in Snake Valley is generally discharged through spring flow, evapotranspiration and human usage, induced underflow toward Pine Valley would reduce the available water in Snake Valley which is already largely used in-valley.
10. As drawdown and groundwater capture will continue long after pumping ceases, groundwater management to avoid substantial impacts will be impracticable, as once pumping ceases it will not be possible to adjust groundwater management to ameliorate the expanding drawdown until the system reaches its own equilibrium.
11. Based on the uncertainties that remain foundational to the environmental analysis, it is likely that the Pine Valley Project will cause harmful impacts to ecological and human uses in Pine Valley and surrounding valleys in the Great Salt Lake Desert flow system.

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Attachments

Figure 1 – Site Location Map

Figure 2 – West Desert Water Project Site Plan

Figure 3 – Great Salt Lake Desert and Wah Wah Groundwater Flow Systems

Figure 4 – Typical Flow System with Local and Regional Springs

Figure 5 – Non-Pumping Flow Vectors of the Great Salt Lake Desert Flow System

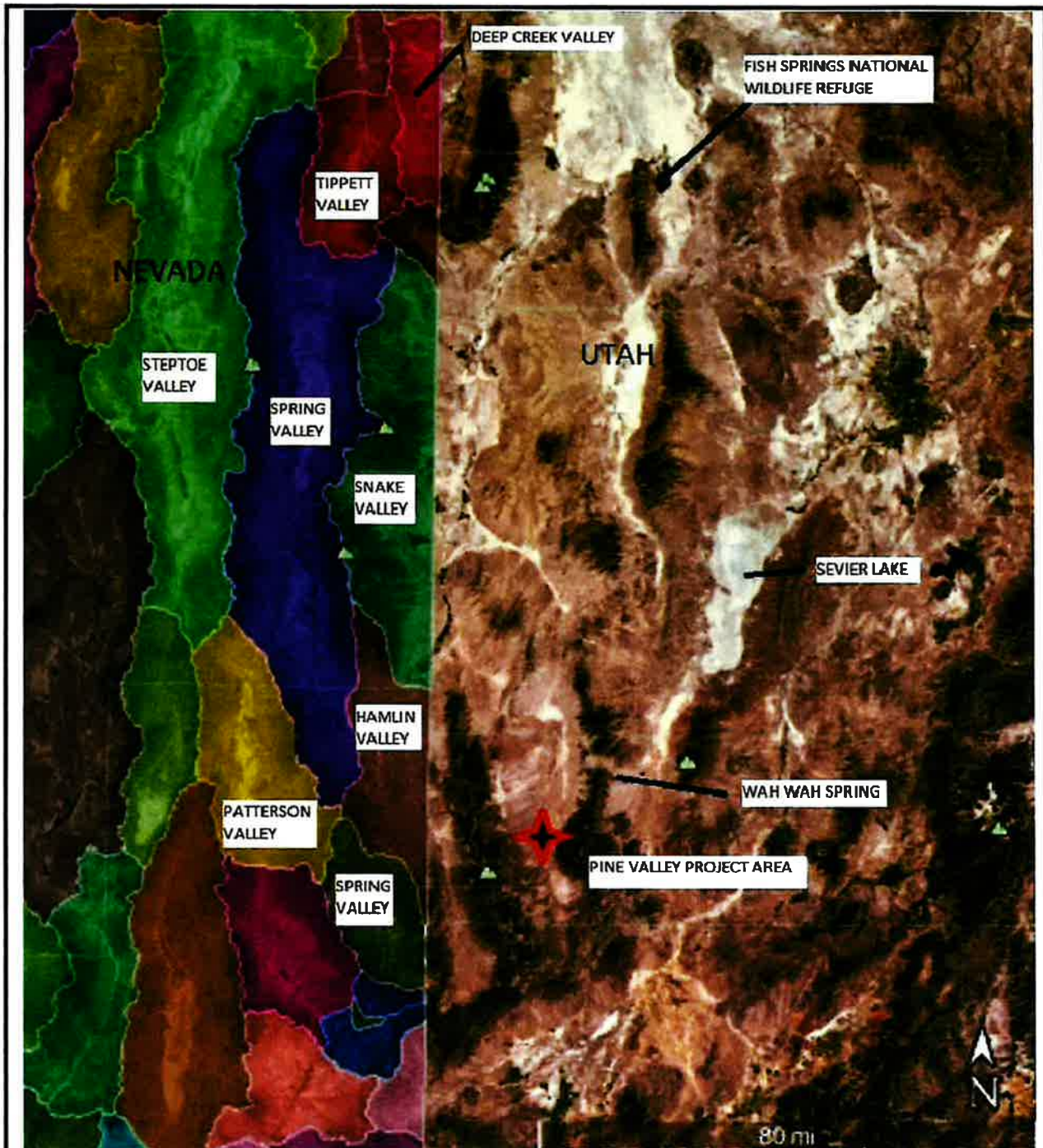
Figure 6 – Snake, Pine and Wah Wah Valley Drawdown—GBCAAS Model

Figure 7 – Change in Subsurface Underflow—Pine Valley Pumping

Figure 8 – Flow Field

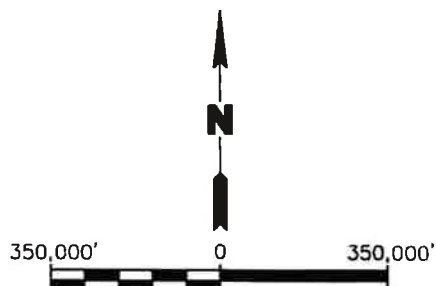
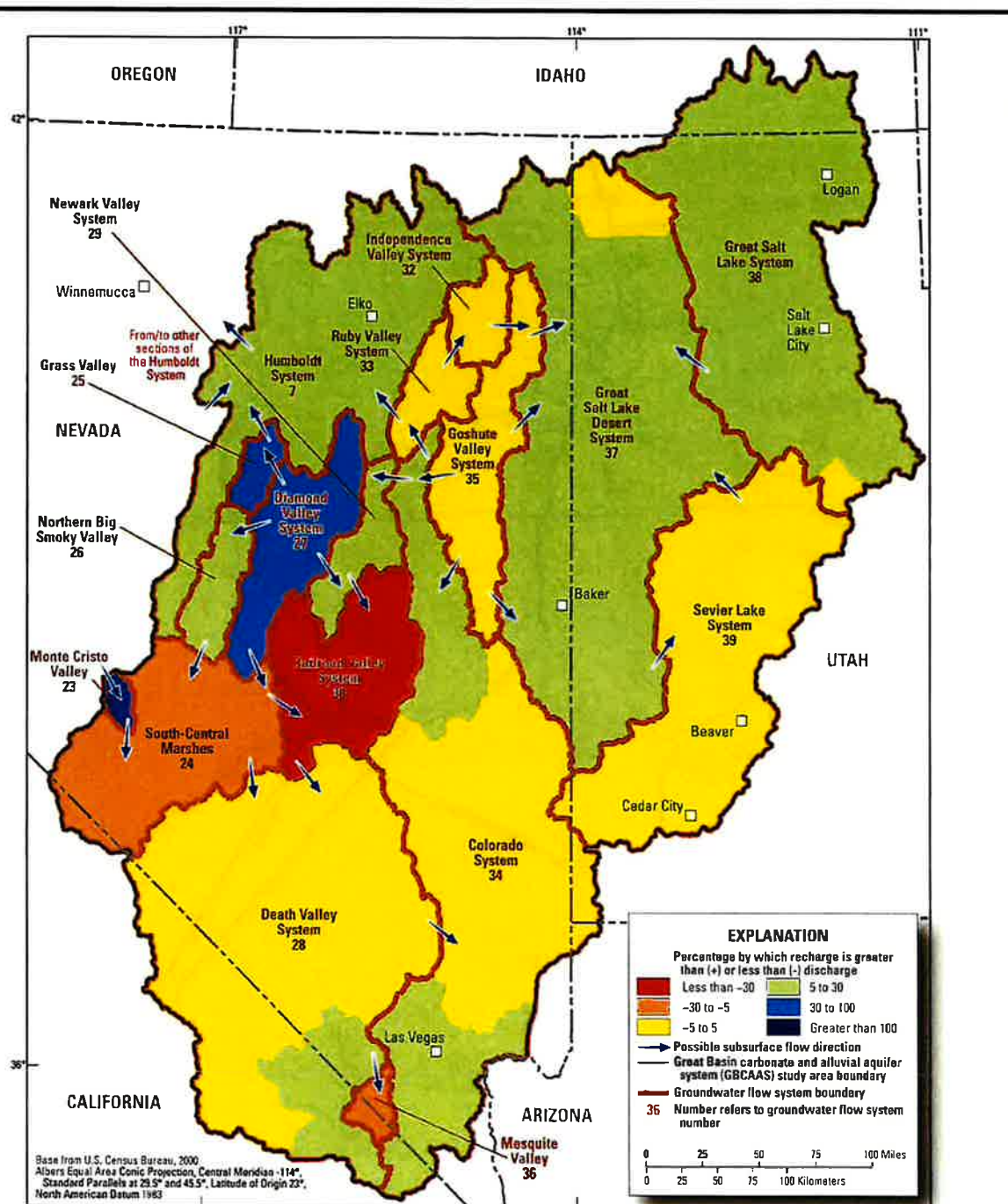
Figure 9 – Snake Valley Water Budget—With and Without Pine Valley Pumping

Table 1 – Groundwater-level declines on Nevada and Utah groundwater basins due to future pumping in Pine and Wah Wah Valleys, Utah as predicted by USGS GBAACS Model (Brooks, 2017)



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GREAT SALT LAKE DESERT AND WAH WAH GROUNDWATER FLOW SYSTEMS

FROM HEILWEIL AND BROOKS, 2011

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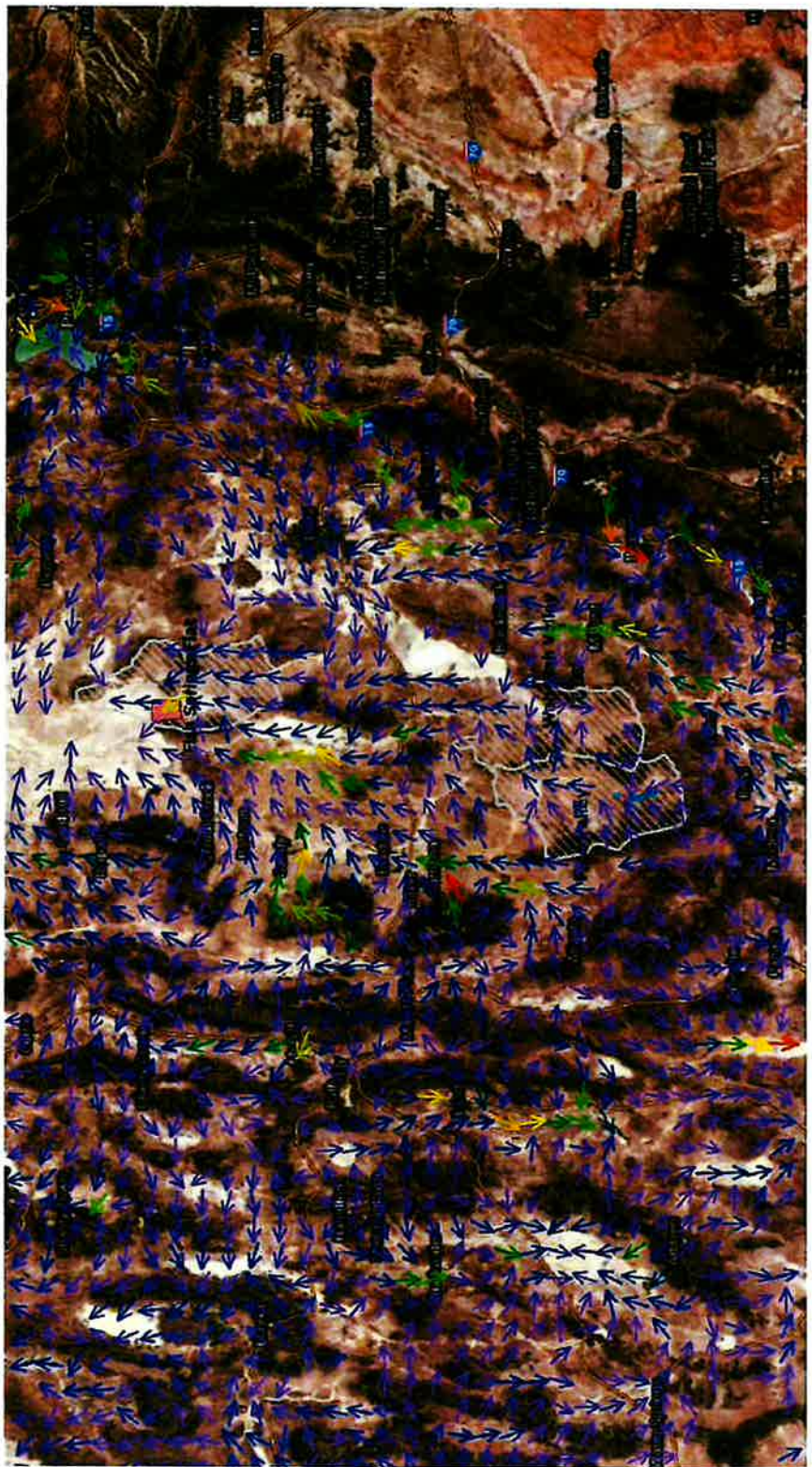
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FIGURE

3



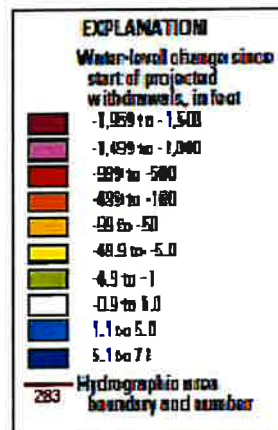
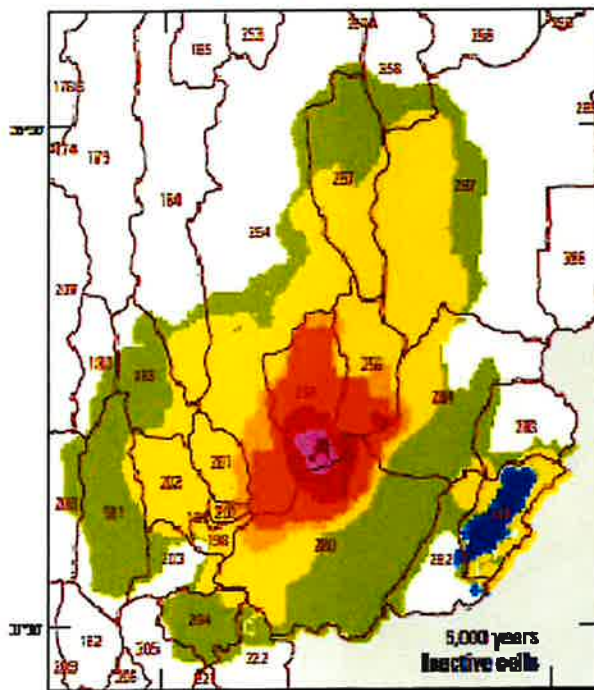
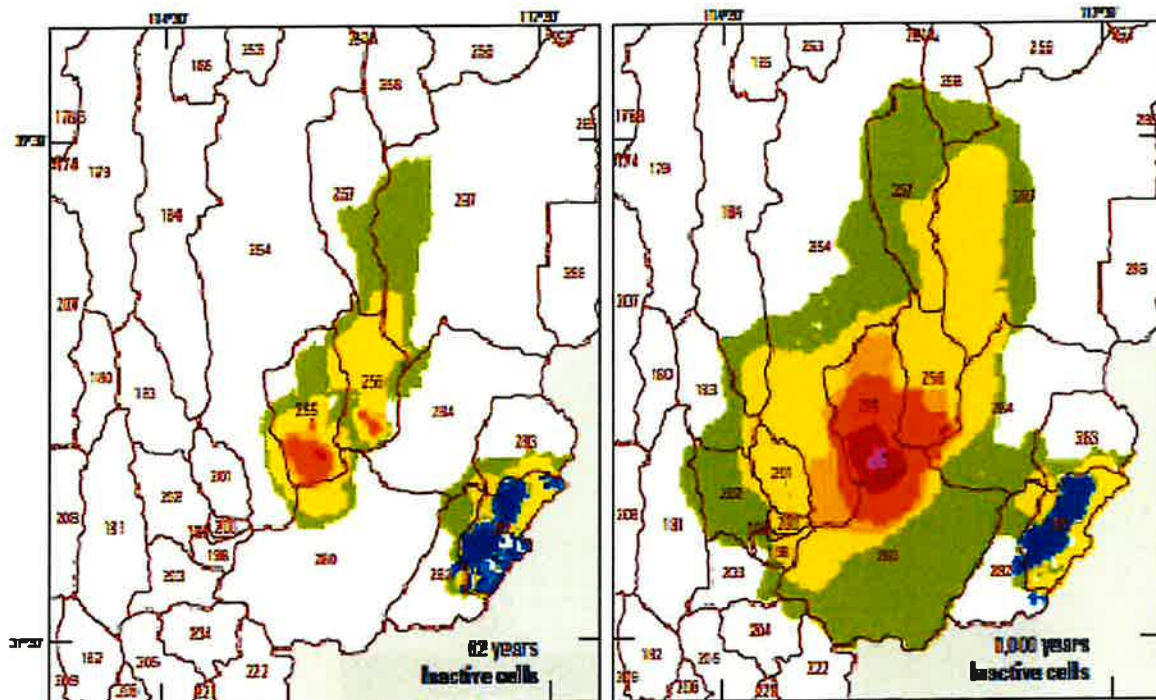
**NON-PUMPING FLOW VECTORS
OF THE GREAT SALT LAKE DESERT
FLOW SYSTEM**

FROM BROOKS, 2017

Prepared for:

GREAT BASIN WATER NETWORK

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SLAKE, PINE, AND WAH WAH VALLEY DRAWDOWN - GBCAAS MODEL

FROM BROOKS 2017

Prepared for:

GREAT BASIN WATER NETWORK

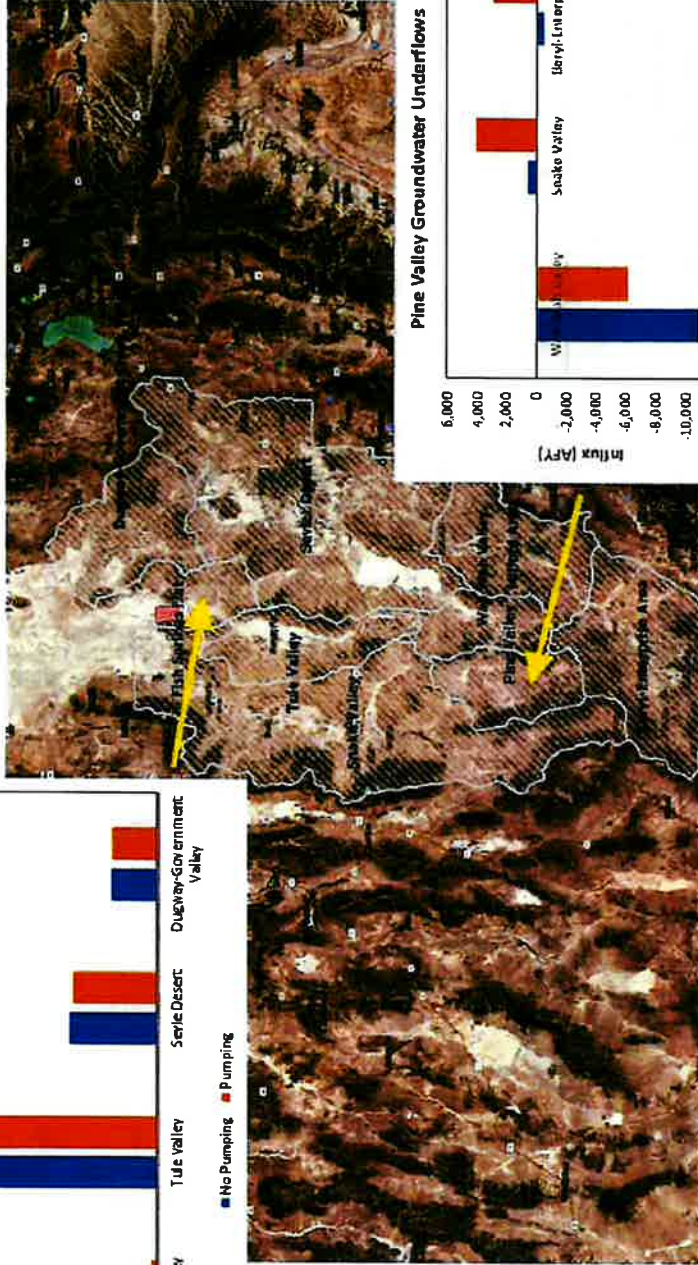
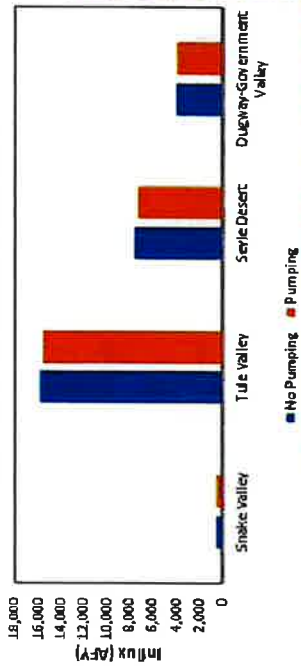
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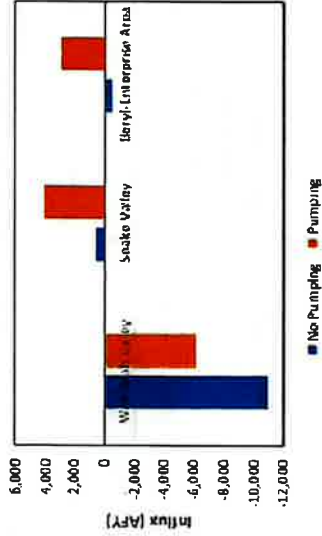
FIGURE

6

Fish Springs Flat Groundwater Underflows



Pine Valley Groundwater Underflows



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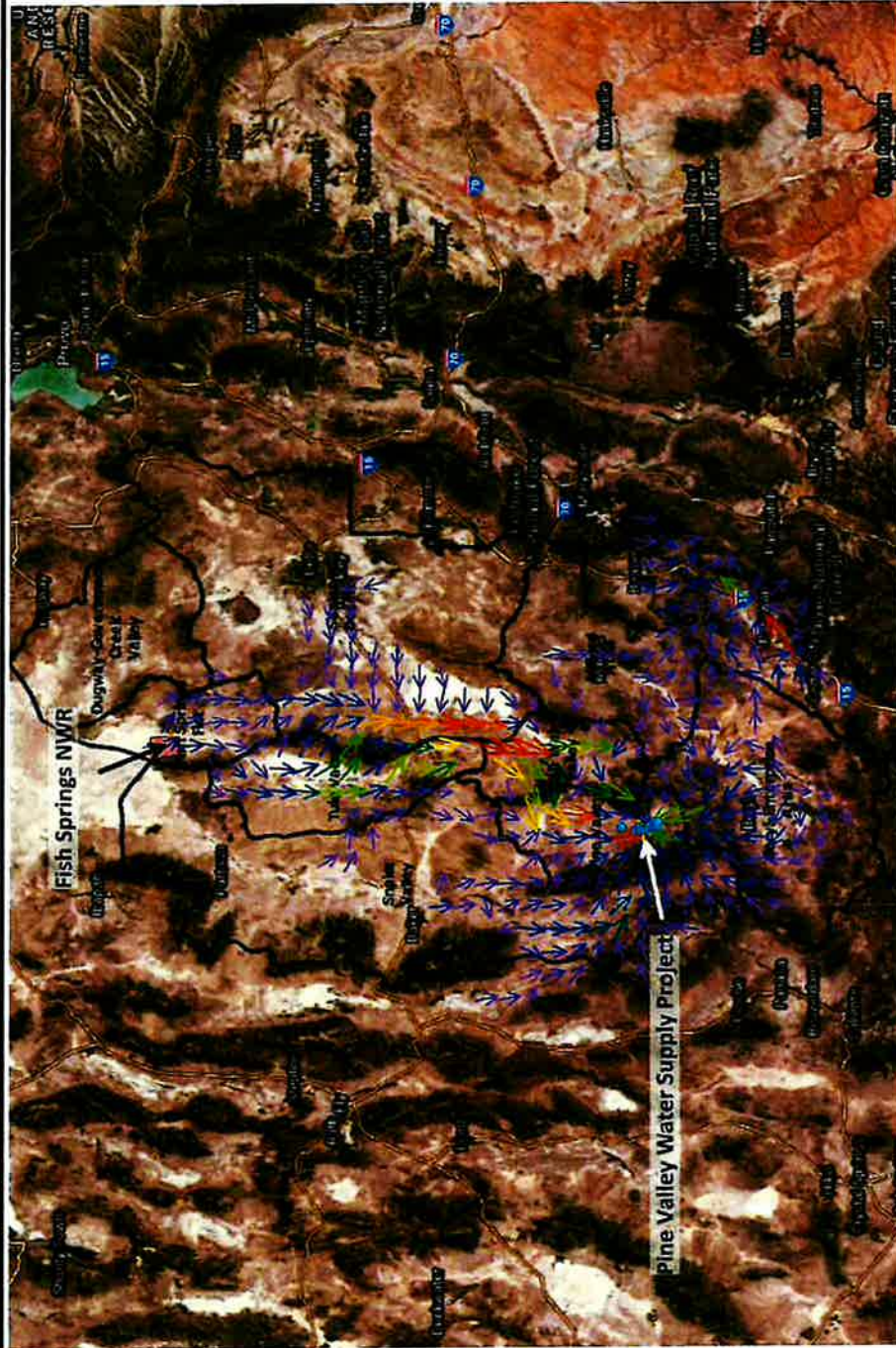
CHANGE IN SUBSURFACE UNDERFLOW - PINE VALLEY PUMPING

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GREAT BASIN WATER NETWORK

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FLOW FIELD

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GREAT BASIN WATER NETWORK



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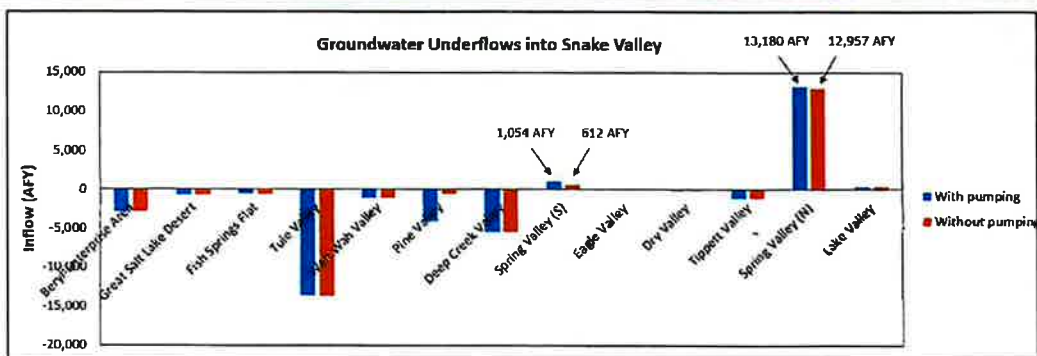
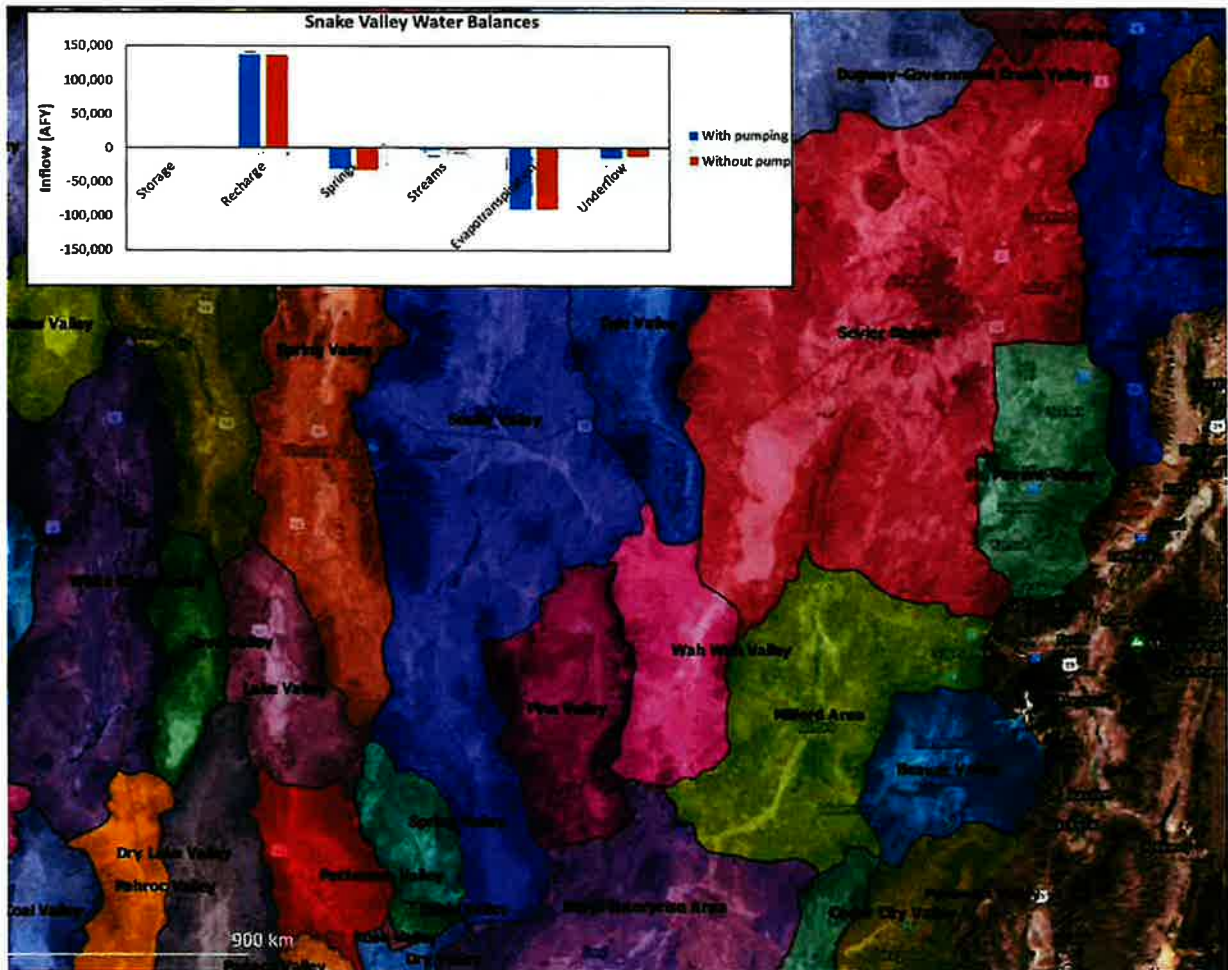
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FIGURE

8



Title:

SNAKE VALLEY WATER BUDGET - WITH AND WITHOUT PINE VALLEY PUMPING

Prepared for:

GREAT BASIN WATER NETWORK



Compiled by: DS	Date: 8/2/21
Prepared by: DS	Scale: NTS
Project Mgr. JO	Project: 3763.0001S000
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FIGURE

9

Table 1. Groundwater-level declines on Nevada and Utah groundwater basins due to future pumping in Pine and Wah Wah Valleys, Utah as predicted by USGS GBAACS Model (Brooks, 2017)

Basin/ Hydrographic Unit No.	Basin Name	County	Short-term Affects (1)	Long-term Effects (2)	Comments
181	Dry Lake Valley, Nevada	Lincoln	<1 ft of drawdown	Up to 4.9 ft of drawdown	Long-term effects along eastern margin of basin
183	Lake Valley, Nevada	Lincoln, White Pine	<1 ft of drawdown	1-49.9 ft of drawdown	Long-term effects - eastern third of basin with maximum drawdown along eastern margin of basin.
184	Spring Valley, Nevada	White Pine, Lincoln	<1 ft of drawdown	1-49.9 ft of drawdown	Long-term effects - southern portion of basin along margin with Snake Valley, maximum drawdown along eastern margin of basin.
188	Dry Valley, Nevada	Lincoln	<1 ft of drawdown	1 to 49.9 ft of drawdown	Up to 49.9 ft of drawdown most of basin, greater drawdown in northernmost corner of basin.
199	Rose Valley, Nevada	Lincoln	<1 ft of drawdown	5 to 49.9 ft of drawdown	Most of basin with greater drawdown to the north.
200	Eagle Valley, Nevada	Lincoln	<1 ft of drawdown	5 to 49.9 ft of drawdown	Throughout basin
201	Spring Valley, Nevada	Lincoln	<1 ft of drawdown	5 to 49.9 ft of drawdown	Up to 5 ft of drawdown through most of basin with greater drawdown to the eastern margin with Basin 201.
202	Patterson Valley, Nevada	Lincoln	<1 ft of drawdown	1 to 49.9 ft of drawdown	Northern and southeastern portions of basin.
203	Panaca Valley, Nevada	Lincoln	<1 ft of drawdown	Up to 4.9 ft of drawdown	Northeastern tip of basin.
204	Clover Valley, Nevada	Lincoln	<1 ft of drawdown	Up to 4.9 ft of drawdown	Short-term effect along eastern margin of Snake Valley (boundary with Pine Valley). Long-term effects southern half of basin.
254	Sinake & Hamlin Valleys, Nevada-Utah	Lincoln, White Pine, Iron, Beaver, Millard, Juab, Tooele	1-49.9 ft of drawdown	1-100 ft of drawdown	Maximum drawdowns at pumping center. Short-term drawdowns of 1 to 500 ft through most of basin; long-term drawdowns of 5 to 500 ft through most of valley.
255	Pine Valley, Utah	Iron, Beaver, Millard	Up to 1,000 ft of drawdown	Up to greater than 1,000 ft of drawdown	Throughout basin
256	Wah Wah Valley, Utah	Iron, Beaver, Millard	Up to 500 ft of drawdown	5 to 500 feet of drawdown	Short-term effect along southeastern portion of basin with greater margin at southernmost tip of basin, long-term effects throughout basin with 5 to 49 ft of drawdown in southern half of basin.
257	Tula Valley, Utah	Beaver	Up to 49 ft of drawdown	Up to 49 ft of drawdown	Long-term effects on southern tip of basin.
258	Fish Springs Flat, Utah	Juab, Tooele	<1 ft of drawdown	Up to 4.9 ft of drawdown	Short-term drawdown to the north, long-term drawdown throughout basin with maximums along northern border with Pine Valley (proximity to simulated pumping center)
280	Beryl-Enterprise Area, Utah	Iron	1 to 49.9 ft of drawdown	Up to 899 ft of drawdown	Short-term drawdown from local pumping effects unrelated to Pine and Wah Wah Valley pumping, long-term drawdown stable as drawdown merges with drawdown from pumping in Pine and Wah Wah Valley.
281	Parowan Valley, Utah	Iron	5 to 49.9 ft of drawdown	5 to 49.9 ft of drawdown	Short-term drawdown from local pumping effects unrelated to Pine and Wah Wah Valley pumping, long-term drawdown deepens as drawdown merges with drawdown from pumping in Pine and Wah Wah Valley.
282	Cedar City Valley, Utah	Iron	Up to 49.9 ft of drawdown	Up to 49.9 ft of drawdown	Along southern margin of basin due to local pumping
283	Beaver Valley, Utah	Beaver	Up to 49.9 ft of drawdown	Up to 49.9 ft of drawdown	Short-term effects along northwestern border of basin; long-term effects across western third of basin with maximum drawdown along northwestern border.
284	Millford Area, Utah	Beaver	Up to 4.9 ft of drawdown	1 to 49.9 ft of drawdown	Short-term effects along western margin of basin with maximum drawdown along southwestern corner of basin; long-term effect across western third of basin.
287	Sawyer Desert, Utah	Millard	1 to 49.9 ft of drawdown	1 to 49.9 ft of drawdown	

EXHIBIT E-2

Comments Regarding the Pine Valley Water Project DEIS and
Associated Documents

Andy Zdon, Roux Associates, Inc.

March 8, 2022

TECHNICAL MEMORANDUM

To: Robert Pyles, Beaver County Board of Commissioners

From: Andy Zdon, P.G.; Roux Associates, Inc.

Date: March 8, 2022

Re: Comments regarding the Pine Valley Water Project DEIS and Associated Documents



This technical memorandum consisting of Draft Environmental Impact Statement (DEIS) comments related to the proposed Central Iron County Water Conservation District (CICWCD) Pine Valley Water Supply Project (Pine Valley Project) has been prepared by Roux Associates, Inc. (Roux) on behalf of the Beaver County Commissioners (Beaver County). In addition to the DEIS, the comments provided below are pertinent to the DEIS attachments that include the Groundwater Resources Impact Assessment (GRIA) and the Supplemental Analysis of Drawdown, Spring Flow Depletion and Wellfield Effects Assuming a Theoretical 200-Year Project Pumping Duration, Pine Valley Water Supply Project, Iron, Beaver and Millard Counties, Utah (SGRIA). During September 2021, Roux (2021) prepared a technical memorandum related to potential impacts of the proposed Pine Valley Project with a focus on Nevada. Due to the nature of the Pine Valley Project, the Roux technical memorandum from 2021 covered many of the issues also pertinent to the groundwater and ecological resources of Beaver County, Utah, and surrounding Utah counties. Therefore, for the purposes of these comments, a copy of that Roux, 2021 technical memorandum is attached for reference and serves as an addendum to these comments.

Roux's review has identified numerous technical issues that not only raise serious doubts concerning the reliability of the predicted effects of the project, but that also call into question the basic foundational soundness of the DEIS's analyses of the project's likely impacts – even leaving aside deficiencies in more granular technical details of the analysis of specific impacts. Therefore, the comments Roux is presenting herein, represent those issues foundational to the DEIS and its relied upon analyses, and that are recurring insufficiencies throughout those documents. The reviewer listed above is a Professional Geologist in the State of Utah and has more than 30 years of hydrogeological experience (C.V. attached). The following summarizes key insufficiencies related to the analyses presented in the DEIS:

1. Scope of the Analysis

The Central Iron County Water Conservation District (CICWCD) proposes to pump up to 15,000 acre-feet per year of groundwater from Pine Valley, the first phase of CICWCD's larger planned West Desert Water Supply and Conservation Project as presented on CICWCD's website and as shown in Figure 2 of the attached Roux technical memorandum. The Pine Valley Project is not a stand-alone project, but is the first phase of the proposed, multi-basin West Desert Water Supply and Conservation Project. This is confirmed on CICWCD's website. The West Desert Project area lies within the headwaters of the Great Salt Lake Desert Flow System (GSLDFS; for Pine and Snake/Hamlin Valleys), and in the case of Wah Valley, in the Sevier Lake Flow System. CICWCD has obtained groundwater rights in Pine Valley (15,000 acre-feet per year) and Wah Wah Valley (12,000 acre-feet per year). CICWCD currently has groundwater right applications for Hamlin

Valley (10,000 acre-feet per year), which it also intends to use as a component of the West Desert Project. Therefore, cumulatively, the West Desert Project would result in pumping of up to 37,000 acre-feet per year of groundwater withdrawals from the headwaters of the Great Salt Lake Desert flow system. (This accounts for approximately 18% of the total estimated annual groundwater recharge for the Great Salt Lake Desert flow system within Utah (based on Gates and Kruer, 1981) inclusive of Snake Valley in Utah.

However, the DEIS does not analyze the entirety of the envisaged West Desert project, only considering this first phase (Pine Valley Project) of a substantially larger groundwater-export project. The cumulative impact scenarios presented in the DEIS and associated SGRIA do not consider the effects of foreseeable future pumping in Wah Wah Valley (for which CICWCD holds groundwater rights) and in Hamlin Valley (for which CICWCD has applied for groundwater rights), leaving the only other source of additional groundwater impacts to be from the existing rural groundwater uses typical for this part of the basin and range (e.g., irrigation and domestic use). Additionally, based on our on-site visits, including to Snake Valley, much of the irrigation in the southern half of Snake Valley is captured spring discharge from such springs as Big Springs, Deardon Springs and others. Impacts to these springs, even slight, may result in the need for additional groundwater pumping to maintain land uses.

2. Lack of Access to Analytical Data

The foundation of groundwater impact analyses developed in the GRIA and the SGRIA, and relied upon in the DEIS, including not only the numerical modeling activities, but the justification for the new modeling activities, is the development of aquifer parameters resulting from the aquifer tests conducted in the Pine Valley and Wah Wah Valley proposed well fields. The lack of clarity as to how the additional pumping is simulated as described above, and confidence in the analysis, is largely the result of a lack of transparency regarding these aquifer data on which the analyses within the DEIS are derived. Despite a Freedom of Information Act request that was submitted for model files and aquifer test data related to the DEIS, none of those data and/or files has been provided by the BLM to date

The need to review the aquifer data including groundwater level and pumping rate data over time is a critical component of reviewing the technical analysis presented as part of the DEIS. For example, a presentation in Cedar City on April 25, 2019, by Barnett Intermountain Water Consulting (attached hereto) presented results of aquifer testing in Pine Valley on Slide 19 of the presentation. In that slide two graphs of aquifer data (aquifer test data were apparently made available to that consultant, but it is unclear whether they represent data from 2016-17 or more recent testing) indicated that there were issues related to maintaining constant discharge rates, and it appears that mid-way through the testing on Well #8, that pumping ceased for a time and then was restarted. Anomalous responses to pumping rates were present as well. There are no dates in on the graphs, so it is unclear if those data are from the test included in the Gardner, et.al. (2020) report or if they are the data from well tests presented in Appendix B of the GRIA. Of note is that the software printouts provided in Appendix B present values of storativity for data collected from pumping wells, although reliable estimates of storativity from drawdown data from the pumping well cannot be made. Deflections in drawdown (e.g., as seen in the output from pumping well CICWCD #7 in the GRIA) could be the result of a barrier or other condition. It could also be the effect of changing discharge rate. Absent the data, it is unclear which of these options could be at work, leaving substantial room for speculation as to the cause of these conditions and the meaning of the aquifer test results that have been the foundation for the groundwater

modeling and impact assessment. In other words, without this data, there is not adequate support in the record for the analyses presented in the GRIA and SGRIA.

In addition to the aquifer test data, a FOIA request for the groundwater flow model files was also filed with the U.S. Bureau of Land Management and the U.S. Geological Survey, but as of the date of this memorandum, those files also have not been received. The U.S. Geological Survey has published guidelines for the review of a groundwater flow model (Reilly and Harbaugh, 2004). It is our understanding that based on public comments, the U.S. Geological Survey has conducted a review of the modeling presented in the GRIA. However, to our knowledge the results of that review have not been released. Absent the model files, it is not possible to independently verify the characteristics of the model, its stability in running simulations, and to identify potential data input errors that can commonly occur.

The U.S. Geological Survey's Great Basin Carbonate and Alluvial Aquifer System (GBCAAS) model was used to run a scenario like the current Pine Valley Project scenario (Brooks, 2017). For this project, the refined Pine Valley model referred to as the GBCAAS-PV model (Formation, 2021a) results are substantially different in both results and presentation. Absent both the aquifer test data, and the groundwater flow model files, an independent review of that work is not publicly available currently.

3. Uncertainty

As described in the attached technical memorandum by Roux (2021), the broad expanse of the potentially affected geographic area that is represented by little or no hydrologic data collection and associated analyses leads to speculative conclusions regarding the extent of potential impacts and future management as described under the proposed adaptive management plan despite the numerical modeling conducted. Section 1.4.2 of the GRIA lists numerous bullets representative of areas of uncertainty and/or data gaps. Virtually all aspects of the conceptual flow model of the Pine Valley area qualifies as either a data gap or area of significant uncertainty. Despite this recognition of the need for additional data, and as presented in the recommendations for additional studies needed to develop an adaptive management plan, a more detailed groundwater flow model has been developed without adequate data, as reflected in the extensive uncertainties and unknowns acknowledged in the GRIA. When applied to the GRIA analyses, this leaves a large part of the analysis as speculative. It is our opinion that the additional studies needed to develop a more defined adaptive management strategy (i.e., monitoring, management, and mitigation) would also apply to the reliability of the GRIA and associated DEIS. The referenced necessity for greater understanding which would be gained from the additional recommended studies is indicative of the current lack of needed information that would be necessary to evaluate the anticipated groundwater/ecological impacts which the planned adaptive management is going to be developed to preclude.

4. Proximity to Springs

The proximity of the proposed Pine Valley Project to existing groundwater dependent environmental resources and human uses in neighboring Snake Valley (and the surrounding valleys) could result in lasting water resource impacts to those areas including reductions in spring flow and reduced evapotranspiration. However, the substantial uncertainties associated with these potential impact receptors represents a major data gap. Additionally, as presented in Formation's Groundwater Resource Impact Assessment (GRIA), many of those receptors fall out of the

arbitrarily defined limited project area, which does not include Fish Springs National Wildlife Refuge even though that refuge lies downgradient within the Great Salt Lake Desert flow system.

Gardner (2016) indicates that the Snake Valley groundwater system provides little groundwater contribution to discharge at Fish Springs. This leaves the Utah portion of the Great Salt Lake Desert Flow System as the ultimate source of discharge at these ecologically important springs in Fish Springs National Wildlife Refuge. As described earlier, the ultimate West Desert Project (of which Pine Valley Project is the first phase) would export a volume of water that represents a substantial portion of the estimated total Utah recharge to the Great Salt Lake Desert Flow System (as estimated by Gates and Kruer, 1981). Additionally, the last sentence of the second paragraph on Page 42 of the GRIA states that *"...the general groundwater flow direction in the vicinity of the Pine Valley HA is northward to discharge areas in the vicinity of Sevier Lake and Tule Valley, and from there (and surrounding valleys) northward to a discharge area near Fish Springs Flat."* The discharge area that goes unnamed is Fish Springs National Wildlife Refuge.

Given these connections and flow patterns, the removal of approximately one-third the total groundwater recharge of the contributing part of the Great Salt Lake Desert Flow System on an annual basis, by necessity, would result in a significant impact to the discharge from that system at Fish Springs National Wildlife Refuge. That inevitability illustrates the flaws in the cumulative impact analysis presented in the GRIA and the SGRIA and underscores the necessity of evaluating the hydrologic impacts of all three phases of the proposed West Desert Pipeline as part of one unified DEIS.

5. Scenario Timeframes

The GRIA and SGRIA make statements about impact scenario timeframes that are inaccurate and conflict with past reporting by the USGS and the Utah Department of Natural Resources. On Page 7 of the GRIA and Page 41 of the DEIS, the use of 200-year pumping scenarios is described as relying upon "assumptions and information that are unavailable or highly uncertain and therefore not essential to a reasoned choice among alternatives." Given the uncertainties described in Section 4 above, that statement would apply to the 50-year scenarios as well. Regardless, the USGS (Masbruch, Gardner, et.al., 2014) used up to 150-year pumping scenarios for describing long-term effects of pumping on springs in Snake Valley, Brooks (2017) presented scenarios that included 1,000 and 5,000-years (nearing steady-state conditions), and the Utah Department of Natural Resources, in their comments regarding potential pumping by the Southern Nevada Water Authority (Kirby and Hurlow, 2005) referenced steady-state model results by the USGS to describe potential impacts to water resources in Utah. In this case, the use of steady-state modeling results is akin to the use of the 5,000-year impact scenarios in Brooks (2017).

As shown, the GRIA (50-years of assumed pumping) and SGRIA (200 years of assumed pumping, primary alternative only) appear to avoid illustrating potential project impacts by including only arbitrarily limited scenario timeframes. Additionally, the uncertain information described in the bullets on Page 8 of the GRIA illustrating the uncertainties that make longer impact scenario timeframes uncertain apply to 50-year scenarios as well. Ultimately, a steady-state scenario that illustrates the state of the Great Salt Lake Desert Flow System when a new equilibrium condition is reached in the region as a response to pumping (both for the PVP and cumulatively for the entire West Desert Project in conjunction with other existing uses) would be by far the soundest basis for evaluating project effects.

6. Model Uncertainties

The Formation Model (2021a, b) inherits the uncertainties within the Great Basin Carbonate and Alluvial Aquifer System Model (Brooks, 2017) that include spatial variability of aquifer properties, presence of unsimulated faults, uncalibrated storage properties, and absence of data in large areas of the model. Further, refinements are based on limited new data in a small, specific area (only the proposed well fields). Adding to these deficiencies is the fact that the northern well field alternative is run based on updated aquifer data collected from the southern portion of Pine Valley (the proposed well field for the Primary Alternative). Therefore, the Northern Well Field Alternative is subject to additional uncertainty due to the general lack of aquifer information in that part of the valley.

7. Existing Uses in Beaver County and Neighboring Counties

The proposed Pine Valley Project and the groundwater rights that support it would limit, or eliminate, the potential for limited future water resource development within Beaver County which could otherwise benefit Beaver County's economy, and the economies surrounding Beaver County, particularly Millard and Juab Counties in Utah and White Pine County, Nevada.

Existing uses may be unaccounted for and likely would be impacted. For example, in Section 3.7.1, springs, ponds and lake descriptions and uses are described based on reporting by Stephens (1976). For a groundwater-export project of this magnitude, the failure to do the field work necessary to quantify existing uses in the potential area of impacts, not only in Pine Valley, but in valleys adjacent to Pine Valley, the other valleys targeted by the complete West Desert Project, and downgradient basins within the groundwater flow system, coupled with the reliance on nearly 50-year-old reporting of uses is insufficient. By way of comparison, as part of the Southern Nevada Water Authority proposal for groundwater exportation, detailed mapping of uses in each potentially impacted groundwater basin was conducted. In the context of the PVP and the West Desert Project, of which the PVP is only the first phase, it is necessary to employ the same level of diligence as was conducted by Southern Nevada Water Authority to properly understand current conditions and account for current uses and resources.

8. Data Deficiencies Related to Springs and other Groundwater- Dependent Ecosystems

Similarly, the spring analyses for the affected region (related to connectivity with basin fill aquifers) is incomplete and is limited to the Pine and Wah Wah Valley areas. Due to the limitations that have been arbitrarily placed on the study area as represented in Figure 3-7 of the GRIA, groundwater-dependent ecosystems in Sevier, Tule, and Fish Springs Flat basins (inclusive of Fish Springs National Wildlife Refuge) are not considered despite the statement of direct connectivity described in Section 3.8.4 of the GRIA. During 2015-16, the U.S. Bureau of Land Management funded a spring survey of the Mojave Desert region in response to increasing pressure on groundwater resources in that region, and the recognition that those pressures could only be expected to increase in the future, as described in Partner Engineering and Science, Inc., 2020 and Zdon and Love, 2020. In the West Desert of Utah, except for the limited subset of springs in the flow system evaluated by Gardner (2020), there is no evidence of a systematic field investigation of springs in the Great Salt Lake Desert flow system like those described in the references listed above. Absent such an effort and considering the substantial effect that the proposed Pine Valley Project, and to a larger extent the West Desert Water Project of which it is a part, would have on the Great Salt Lake Desert flow system, the BLM's analysis of potential spring impacts and impacts to groundwater dependent ecosystems is incomplete and inadequate.

9. Use of Adaptive Management to Address Pumping Impacts on Springs

Throughout the GRIA, and DEIS, a recurring theme is that given all the uncertainties, the only way to evaluate the connectivity of springs to PVP pumping is to move forward with the project and evaluate impacts when they occur through the adaptive management program. This approach is problematic, especially given that the adaptive management program currently is undefined, and due to the long time frames (potentially hundreds of years) between the time when a spring impact is observed, and the time when recovery may begin to take place due to a cessation of pumping. As a result of this lag in system response to cessation of pumping, impacts to groundwater-dependent ecosystems will be detected too late for mitigation to be protective of the ecosystem. See Bredehoeft, J.D., *Monitoring Regional Groundwater Extraction: The Problem, Ground Water* (2011). This also means that by the time monitoring detects drawdown, it may be too late to maintain existing irrigation practices in Snake Valley derived from springs (e.g., from Clay Spring, Big Springs, Deardon Springs). The absence of sufficient data collection and analyses to include a defined monitoring, management, and mitigation structure as part of the DEIS leaves groundwater-dependent ecosystems and their uses at substantial risk due to the PVP.

As an example, in the Amargosa River Basin of Nevada and California, impacts to springs as a response to regional groundwater pumping has been shown to occur slowly, sometimes not becoming apparent for tens of years, or more before an impact can be attributed to that pumping. For instance, at Chappo Spring (formerly known as Yeoman Spring), spring discharge has decreased from more than 100 gallons per minute during the 1920's (Thompson, 1929), to less than 10 gallons per minute (Partner Engineering and Science, Inc., 2020), and approaching one gallon per minute) under current conditions. Since there was not a formal monitoring program covering this spring, the year to year change in discharge was not noticeable. However, given a nearly 100-year period between the early U.S. Geological Survey work and later monitoring (e.g., in Partner Engineering & Science, 2020), the impacts to the spring are readily apparent.

As drawdown and groundwater capture will continue long after pumping ceases, groundwater management to avoid substantial impacts will be impracticable based on the existing analyses, as once pumping ceases it will not be possible to adjust groundwater management to ameliorate the expanding drawdown until the system reaches its own equilibrium. By the time impacts to a spring system are observed, either directly in reduced spring discharge as surface flow, or through stressed vegetation and a reduction in evapotranspiration, it will be too late to manage groundwater pumping in a manner that will be proactively beneficial to the spring, and the potential to eliminate surface flow in several springs in Snake Valley (such as those mentioned above) is real.

The effect of not identifying potential regional effects of proposed pumping could have other unintended consequences beyond specifically impacting the spring ecosystems. As depicted in Version 3.0 of the Great Basin Carbonate and Alluvial Aquifer Model (Brooks, 2017), the primary source of captured groundwater feeding groundwater recovery after pumping ceases in Pine Valley, is induced underflow from Snake Valley, and subsequently other basins such as Spring Valley, with additional induced underflow from Escalante Desert as a secondary source (Roux, 2021). As groundwater sourced in Snake Valley is discharged through spring flow, evapotranspiration, and human usage, induced underflow toward Pine Valley, or in other words, reversal of the current groundwater gradient, would reduce the available water in Snake Valley which currently is used in-valley by irrigators and groundwater-dependent environmental resources (Gardiner, 2016). Of greater concern is that much of the irrigated agriculture in Snake

Valley (particularly in southcentral parts of the valley) is fed by springs. Spring discharges are captured and stored in impoundments, then piped to many of the existing pivot irrigation systems. Slight changes to groundwater elevations could make this sustainable approach to irrigation (which has been in use for more than one hundred years) impossible, exacerbating the need for additional groundwater pumping in Snake Valley to maintain agricultural uses, causing a spiraling impact between groundwater conditions caused by both increased irrigation pumping and PVP pumping.

10. Environmental Impacts of Northern Wellfield

Roux is not convinced that the proposed Pine Valley Project will feasibly provide 15,000 acre-feet per year of groundwater for 50 years as the well field is currently designed, for the reasons described in the attached technical memorandum by Roux (2021). Beyond the feasibility question though, this raises the likelihood that the northern wellfield described in the DEIS would be needed to achieve the pumping volumes designated by CICWCD's groundwater rights in Pine Valley. Although the GRIA runs 50-year pumping and 200-year recovery scenarios relating to the potential impacts that would be caused by a northern wellfield, the greater uncertainties concerning aquifer conditions in the northern portion of Pine Valley lead to an even greater level of uncertainty than is associated with the primary alternative. In particular, the Northern Wellfield Alternative scenario is predicted to cause impacts to begin to occur at Wah Wah Springs within a few years of pumping being initiated (Page 115 of the GRIA).

Given the inherent uncertainties associated with the model in general, and the relatively rapid response to pumping at Wah Wah Spring, more detailed field investigation and numerical analyses would be needed in the northern portion of the valley to have confidence in evaluating the potential effects of this eventual likely scenario. A greater level of field investigations and analyses are needed to reduce the uncertainty currently inherent in the GBCAAS-PV model. Additionally, the scenario for the northern wellfield is not considered in the 200-year scenarios (SGRIA). Therefore, given that the Northern Wellfield Alternative did not receive a similar level of field investigation and analysis as was provided to the Primary Alternative, which is already been shown to be inadequately evaluated, it cannot be determined if the reliance upon a northern well field is viable, and the BLM cannot gain an understanding of the impacts that it would cause. Further, it is impossible to evaluate if the northern wellfield is a superior alternative (if it is an alternative or just a shift in management after project initiation) than the existing primary alternative which is the subject of the DEIS due to the substantially uncertainties described.

Finally, absent the data and files we have requested as described previously in this memorandum, the foundation of the analyses for the northern well field cannot be put to rigorous testing.

Recommendations for Reducing Uncertainty of the Analysis

To reduce the uncertainties associated with the underlying models, Roux recommends the following:

- Update and expand the area of springs, ponds, and lakes to be considered as part of this analysis inclusive of those areas in Snake Valley, Nevada that could be affected by the Pine Valley Project, and cumulatively, the West Desert Project;
- Update and expand the status of existing groundwater and spring-water uses in the area including those in Snake Valley, Nevada;

- Run steady-state scenarios using both Pine Valley Project and separately a cumulative West Desert Project scenario;
- Evaluate through expanded field investigation, testing and modeling, the hydrologic effects of a potential northern wellfield design;
- Reassess the study area boundary to evaluate changes to springs that now outside the existing model used in the GRIA;
- Assess the cumulative impacts of the West Desert Project;
- Re-evaluate the locations of monitoring wells to ensure that a sufficiently early warning will be provided to avoid impacts to groundwater-dependent ecosystems and other water rights holders inclusive of those in Nevada;
- Canvas the areas of both inside and beyond the existing study area boundaries to evaluate, and if feasible, execute, additional aquifer testing to reduce modeling uncertainties; and,
- Release existing and future aquifer test data and numerical modeling files to allow independent review and transparency of data quality and model performance.

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EXHIBIT F

Pine Valley Water Supply and Conservation Project
Financial Business Plan and Water Needs Assessment

June 2023



Pine Valley Water Supply and Conservation Project

FINANCIAL BUSINESS PLAN AND WATER NEEDS ASSESSMENT

FINAL | June 2023

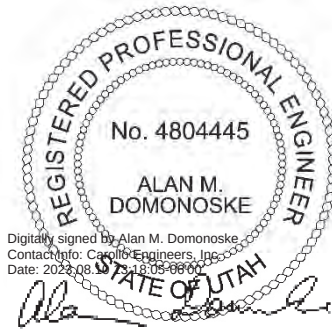




Pine Valley Water Supply and Conservation Project

FINANCIAL BUSINESS PLAN AND WATER NEEDS ASSESSMENT

FINAL | June 2023



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Abbreviations

AFY	acre-feet per year
BPA	Bonneville Power Authority
Carollo	Carollo Engineers, Inc.
Cedar City	Cedar City Corporation
cfs	cubic feet per second
CICWCD	Central Iron County Water Conservancy District
District	Central Iron County Water Conservancy District
DNR	Department of Natural Resources
DWR	Division of Water Rights
FBPWNA	Financial Business Plan and Water Needs Assessment
GMP	Groundwater Management Plan
GOMB	Governor's Office of Management and Budget
gpcd	gallons per capita per day
GPI	Kem C. Gardner Policy Institute
gpm	gallons per minute
Kgals	thousands of gallons
LEPA	Low Energy Precision Application
LESA	Low Elevation Sprinkler Application
N/A	Not Applicable
O&M	operation and maintenance
PVWS	Pine Valley Water Supply
SRF	State Revolving Fund
WIFIA	Water Infrastructure Finance and Innovation Act

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Chapter 1

INTRODUCTION

1.1 Study Goals

Monitoring of the Cedar Valley Aquifer has shown that water table levels have dropped anywhere from 10 feet to over 100 feet in some areas over the past 80 years. While agricultural demands drive much of the area's groundwater use, communities in Iron County are continuing to grow and drive a portion of the demands on this local resource. Because water is currently withdrawn from the aquifer at a rate that exceeds recharge, the Utah Division of Water Rights (DWR) developed a Groundwater Management Plan (GMP) for the Cedar City Valley (DWR 2021). The GMP calls for a series of significant cutbacks in water rights for users throughout the basin, with a goal of reducing net depletion use of local groundwater to sustainable levels. This will directly impact the ability of public water supply providers in Iron County to meet projected demands.

The Central Iron County Water Conservancy District (CICWCD) is proactively taking action to address the anticipated water supply shortfall. Agricultural irrigation is by far the largest use of water from the Cedar Valley Aquifer. The CICWCD has undertaken steps to support agricultural efficiency, including upgrading agricultural irrigation equipment in the valley to Low Energy Precision Application (LEPA) and Low Elevation Sprinkler Application (LESA) technologies as detailed in Chapter 2 – Integrated Water Resource Plan. The CICWCD has also invested in construction of facilities to increase the amount of water recharged to the aquifer from local surface water sources.

The CICWCD has implemented aquifer storage and conservation projects, as well as acquired water rights outside of the Cedar Valley Basin from basins in western Iron County and western Beaver County. These water rights will support groundwater development projects that will import water into the Cedar Valley and help provide a more resilient water future. The Pine Valley Water Supply and Conservation (PVWS) project includes development of wells and design and construction of a new pipeline from the Pine Valley wellfield to delivery points in the Cedar City Valley.

An economic and fiscal analysis study commissioned by the CICWCD in 2019 (Applied Analysis 2019) documented the financial benefits of the PVWS project, including estimates of employment generated by the project. Modeling conducted in the 2019 study found that constructing the PVWS (estimated at \$254 million at the time of the analysis) would generate over \$366 million in economic output and more than 3,100 person-years of employment, considering direct, indirect, and induced employment. Excerpts from the Applied Analysis economic report are included as Appendix A, and a link to the full report is provided in Chapter 5 – References.

This Financial Business Plan and Water Needs Assessment (FBPWNA) is an element toward making the CICWCD's vision a reality. First written in 2020, this updated edition of the FBPWNA report updates factors that have evolved since the initial analyses were completed. Most

notably, this includes analysis of a range of potential future population projections in Iron County and updated calculations that reflect rapidly escalating costs for purchasing in-basin groundwater rights that are being experienced in the Cedar Valley. Additionally, the District had Zions Public Finance conduct a finance study to evaluate bonding capacity and water rates.

The PVWS is envisioned as a regional project that can supply water to the vast majority of Iron County, consistent with the CICWCD's service area that covers more than 90 percent of the County's population. It is anticipated that with the PVWS in place, the CICWCD would serve a portion of the demands through direct retail service. The remainder of PVWS supply would be made available via wholesale deliveries to Cedar City, Enoch City, and Kanarraville. These communities are conducting ongoing evaluations in support of their potential participation in the project. This report provides information to support informed decision-making by the CICWCD and each of these key stakeholders.

This report outlines analyses conducted to assess the amount and timing of water needed to avoid a future supply gap (Water Needs Assessment) and the financial implications of implementing the project via cost sharing and outside funding opportunities (Business Plan). The Business Plan demonstrates how the project could be financed and funded, in light of incurring debt for the project, the revenues needed to cover that debt, and the associated changes to customers' water rates to provide the needed revenue.

1.2 Key Stakeholders

The CICWCD is leading efforts to plan the PVWS project. Key stakeholders that participated in the development of this FBPWNA are the same entities that could be future wholesale customers of CICWCD. The key stakeholders referenced throughout this report include:

- Cedar City Corporation (Cedar City).
- Enoch City.
- Town of Kanarraville.

Implementation of the project would include development of interlocal agreements between the CICWCD and participating key stakeholders.

Ensign Engineering has supported PVWS planning, including development of preliminary layouts of Pine Valley well field facilities, routing of the pipeline from Pine Valley to the Cedar City Valley, estimating capital costs for the PVWS infrastructure, and supporting permitting efforts initiated by the CICWCD.

1.3 Basis of Planning

Implementation of the PVWS project will require significant capital investment over the course of several years. For purposes of FBPWNA analyses, it was originally assumed that the CICWCD would issue and carry all debt to fund the project, and revenue for debt service would be a result of PVWS project water sales, primarily received from Cedar City and Enoch City. Revenue will include a combination of direct water sales to CICWCD's retail customers in addition to wholesale water sales to key stakeholders. It is important to note, a reputable local economist, Dr. David Tufte, reviewed the financial model for accuracy and reasonableness including underlying assumptions, financial factors, and methods used to conduct financial analyses in development of the initial 2020 report.

The updated study assumes that the CICWCD and key stakeholders would each start paying their proportionate share of the debt service (from 2025 through 2029) based on their respective projected future water demands (most importantly during construction of the project, as necessary), until they begin receiving water (i.e., purchasing water from CICWCD through the PVWS project) in 2030. Beginning in 2030 and beyond, the respective cities would pay for their proportionate debt service and all other wholesale related costs through their monthly fixed and volumetric rates charged to them by CICWCD. Variations on the project financing framework were not assessed in this study. Sources of outside funding (e.g., from state or federal-level grants or financing programs) were considered for their applicability and ability to moderate end-user rates.

Projections of water needs and future shortages are based on the methods and assumptions detailed in Chapter 2 of this report. Sources of information include information and studies published by state of Utah agencies, past studies and documents developed by the CICWCD and key stakeholders. A range of potential water supply strategies was evaluated, including options with and without construction of the PVWS project. It was generally assumed that new wells would be added as needed to meet demands until either the PVWS project comes on line or water rights constraints preclude further expansion of local groundwater use.

1.4 Related Studies

Planning for the PVWS project, including details of the wells and conveyance infrastructure needed to deliver water to the Cedar City Valley, is documented in the CICWCD's "Pine Valley Groundwater Development and Transmission Pipeline Project – Conceptual Plan of Development" (draft, Ensign Engineering September 2017). The CICWCD has also conducted previous studies to evaluate regional water needs and financial aspects of the project, such as the CICWCD's Water Master Plan (Ensign Engineering 2020) and the CICWCD's Water Resource Economic and Fiscal Analysis (working draft, Applied Analysis June 2019).

A fundamental basis for this FBPWNA study is an assumption that DWR will implement water rights cutbacks in the Cedar City Valley Aquifer on the schedule and in the amounts described in the GMP. Water use reports from CICWCD and key stakeholders demonstrate the historical demand trends, which were used as an initial basis of estimating future water demands in the study area. Conservation plans developed by Cedar City and Enoch City provide insights into future water use trends and conservation strategies. The amount and timing of water shortages identified in this FBPWNA report could be affected by any variations in the GMP quantity or timing, or by changes in the rate of water use in the CICWCD or key stakeholders' service areas.

A list of project reference materials is provided in Chapter 5 of this report.

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Chapter 2

INTEGRATED WATER RESOURCE PLAN

2.1 Water Needs Assessment Overview

The CICWCD and key stakeholders face challenges in meeting future municipal water demands. Water demands are forecasted to increase due to population growth in the Cedar City Valley, even after achieving the regional conservation goals established by the state of Utah. Combined with agricultural water use in the valley, this will apply further pressure to limited local water resources. The CICWCD and key stakeholders rely primarily on groundwater from the Cedar Valley Aquifer and have implemented several projects to recharge the aquifer with available Coal Creek surface water when it is physically and legally available. Figure 2.1 provides a summary of Cedar City Valley aquifer use by sector (adapted from Utah DWR 2016).

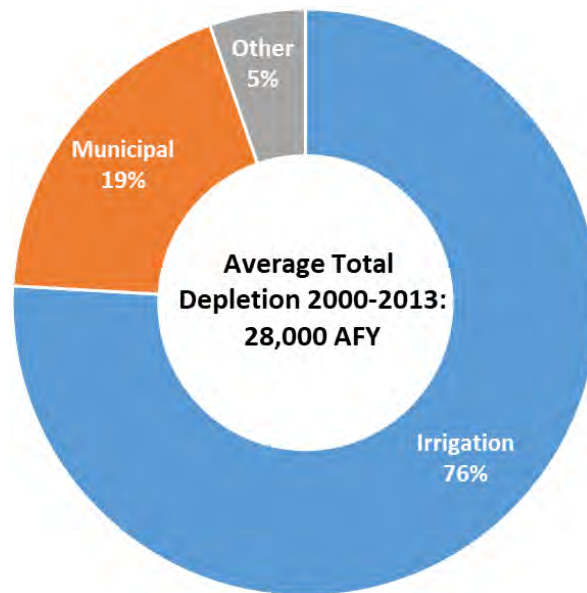


Figure 2.1 Cedar City Valley Aquifer Use by Sector

Despite these recharge efforts and ongoing conservation initiatives, data show that the combination of agricultural and municipal use of the Cedar Valley Aquifer has led to a declining water table for many years. Some areas in the valley have been reported to exhibit land subsidence as a result. A Utah Geological Survey 2014 study found that, "Lowering the potentiometric surface by groundwater pumping in excess of annual aquifer recharge has caused permanent compaction of fine-grained sediments of the Cedar Valley Aquifer. In response to the land subsidence, a minimum of 8.3 miles of earth fissures have formed in the south-western and northeastern parts of Cedar Valley."

The Utah DWR has developed a GMP for the Cedar City Valley. The GMP calls for a series of cutbacks in water rights for users throughout the basin, with a goal of reducing net depletion use of local groundwater to sustainable levels.

The combination of growing service area demands for the CICWCD and key stakeholders, combined with planned cutbacks in water rights, results in an anticipated future scenario where legally available supplies from the local aquifer will fall short of demands. The PVWS project will resolve this predicted shortage by providing a new water supply to the CICWCD and key stakeholders (Cedar City, Enoch City, and Kanarraville).

This chapter describes the forecasted demands and anticipated shortages identified through a water needs assessment for the CICWCD and key stakeholders. The analysis includes a depiction of water shortages that would be anticipated under a "no action" alternative, then it explores six different scenarios that could be used to avoid such shortages. This information was used to evaluate financial aspects of PVWS implementation in the FBPWNA, documented in Chapter 3 – Business Case Evaluation of this report.

2.2 Population Projections

Recognizing the uncertainty inherent in population projections, a range of historical and projected growth scenarios for Iron County, Utah are provided in Figure 2.2 and Table 2.1. The historical rate of population growth for Iron County in the 25 years from 1995 to 2020 was approximately 3 percent per year on average. Extrapolating that forward, the Iron County population would grow fivefold from 2020 to 2075.

Since 2015, the Kem C. Gardner Policy Institute (GPI) has produced long-term planning projections for the state of Utah and its counties. The recent 2022 Utah Long-Term Planning Projections include a baseline scenario considered the most likely, as well as high and low scenarios. Under both the baseline and low scenarios, growth rates are projected to moderate over the coming decades, resulting in a county population that nearly doubles between 2020 and 2075.

The 2012 Baseline Projection for the Utah Governor's Office of Management and Budget (GOMB) forecasts a county population that is expected to roughly triple from 2020 to 2075. In June 2022, the GPI looked at the accuracy of past population projections and found that this forecast most accurately projected the statewide as well as Iron County totals of 57,289 from the 2020 Census. Under this projection, a rate of growth similar to what occurred from 2010 and 2020 would continue in the long term. This projection is also the only one that includes city level figures, which are needed for calculating each entity's future water demands. For these reasons, the GOMB 2012 projections are the foundation of analyses in this FBPWNA. A comparison of the implications of different growth rates is provided in Section 2.6.

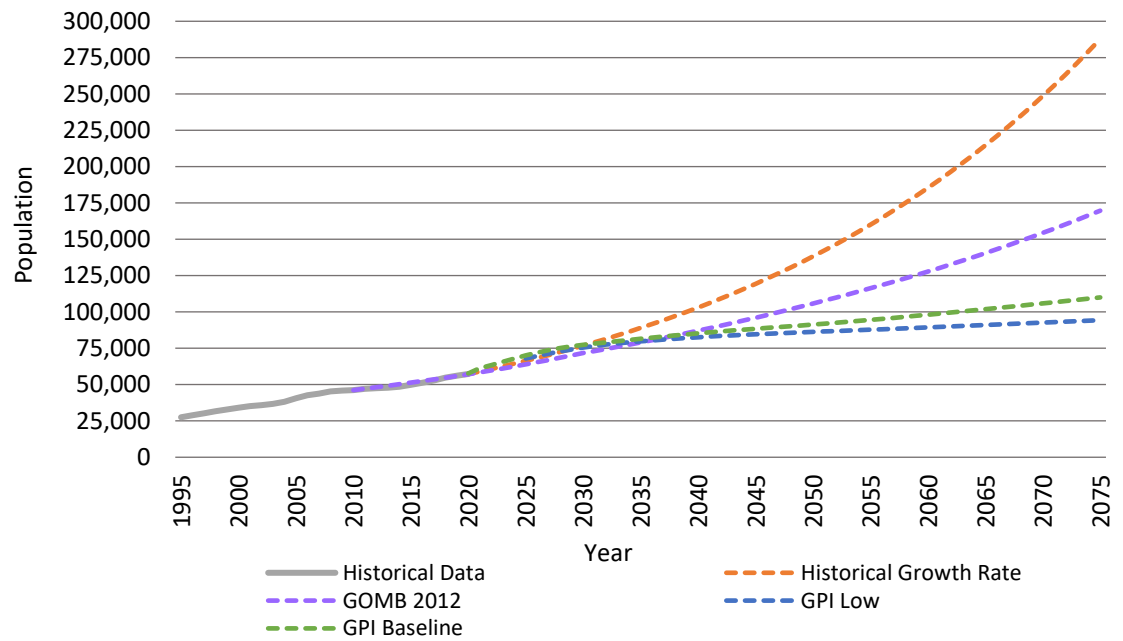


Figure 2.2 Historical and Projected Population in Iron County, Utah

Table 2.1 Population Growth Scenarios Iron County

	2025	2035	2045	2055	2065	2075
Historical Growth Rate ⁽¹⁾	66,344	88,973	119,320	160,019	214,600	287,798
GOMB 2012 ⁽²⁾	63,954	79,019	95,995	116,277	140,454	169,658
GPI 2022 Baseline ⁽³⁾	70,028	81,511	88,403	94,492	101,904	109,965
GPI 2022 Low ⁽³⁾	67,963	79,743	84,624	87,761	90,956	94,290

Notes:

(1) Growth extrapolated using average annual rate of population change from Census figures for 1995-2020.

(2) Iron County population projections per GOMB 2012.

(3) GPI State and County Projections Scenarios 2025-2060 (2022). 2065 and 2075 populations extrapolated from 2050-2060 growth percent.

Municipal (public water supply) water use is directly correlated to service area population. Historical and projections of population for the CICWCD and key stakeholders are presented in Tables 2.2 and 2.3, respectively. Projections were made through 2075 using GOMB 2012, consistent with statutory direction for a 50-year planning horizon.

Table 2.2 Historical Service Area Population

	2017	2018	2019	2020	2021
CICWCD Retail ⁽¹⁾	2,128	2,376	2,545	2,982	3,827
Cedar City ⁽²⁾	31,655	32,994	34,764	35,254	37,206
Enoch City ⁽²⁾	6,731	7,024	7,180	7,544	8,016
Kanarrville ⁽²⁾	395	400	407	449	461
Total Service Area⁽³⁾	40,909	42,794	44,896	46,229	49,510

Notes:

(1) Source: CICWCD annual water reports.

(2) Source: 2020 United States Census Bureau estimate.

(3) Sum of rows may not equal total shown due to rounding of decimals.

Table 2.3 Projected Service Area Population (GOMB 2012)

	2025	2035	2045	2055	2065	2075
CICWCD Total County Service Area ⁽¹⁾	58,822	72,551	88,136	106,728	128,347	155,034
CICWCD % of Service Area Connected ⁽²⁾	65%	75%	85%	95%	100%	100%
CICWCD Retail ⁽³⁾	6,356	8,189	10,104	11,822	9,913	12,078
Cedar City ⁽⁴⁾	40,239	49,630	60,292	73,010	87,799	106,055
Enoch City ⁽⁵⁾	8,309	11,502	15,457	20,773	30,135	36,401
Kanarraville ⁽⁶⁾	495	500	500	500	500	500
Total Service Area⁽⁷⁾	55,400	69,821	86,353	106,106	128,347	155,034

Notes:

- (1) Estimated as 91.4 percent of total Iron County population, based on CICWCD estimates of potential future service area (including retail and wholesale supply). Iron County population projections per GOMB 2012.
- (2) Percent of total CICWCD potential retail service area that will be connected to the CICWCD system in the year indicated. Estimates provided by CICWCD and Ensign Engineering staff, October 2019.
- (3) CICWCD total county service area at estimated percent connected, minus the population of the CICWCD's potential wholesale customers (Cedar City, Enoch City, and Kanarraville).
- (4) Projections through 2060 per GOMB 2012; 2050-2060 growth percent used to estimate 2075 population.
- (5) Projections through 2055 per Enoch City 2018 Impact Fee Plan; 2065 and 2075 populations extrapolated from 2050-2060 growth percent for Iron County per GOMB 2012.
- (6) Projections through 2025 per GOMB 2012. Population in 2035 and beyond was assumed constant at 500 per Kanarraville policy of ceasing further annexations.
- (7) Total population that could potentially be served by the PVWS, including CICWCD direct retail customers and wholesale deliveries to Cedar City, Enoch City, and Kanarraville. Sum of rows may not equal total shown due to rounding of decimals.

Future population projections show that the CICWCD's retail service area will grow substantially over the coming decades through a combination of organic growth and new customers via adding connections to residential areas not currently supplied by the municipalities. Not all subscribers of the PVWS are known at this time, and there is a potential that agriculture or another industrial user could subscribe to the project. However, based on today's economics, it is unlikely that current crop farmland could afford the cost of imported water.

The forecasted population of the CICWCD's retail customer base was estimated by taking the total Iron County population, multiplied by 91.4 percent of the county population that CICWCD anticipates being able to ultimately serve, and subtracting the population of Cedar City, Enoch City, and Kanarraville that could be served via wholesale connections to the CICWCD's system. The population of the total service area that could be supported by the PVWS project is the sum of the CICWCD's retail population and the key stakeholders' population that could be supplied water through a wholesale connection to the CICWCD's system.

2.3 Demand Forecast

The forecasted demands for the potential PVWS service area were based on a per-capita approach using data unique to the CICWCD and each of the key stakeholders.

2.3.1 Total and per Capita Historical Water Use

Historical water demands were used as an initial foundation for projecting future use in the service area. Historical total water use is shown in Table 2.4 in terms of total "diversion" use, not accounting for net returns of water to the aquifer (which would reflect total "depletion" use). These demands reflect the water use of all customers.

Table 2.4 Historical Diversion Water Use

Entity	Total Diversion Use (acre-feet per year [AFY])				
	2017	2018	2019	2020	2021
CICWCD Retail ⁽¹⁾	467	535	579	745	681
Cedar City	7,345	7,751	7,472	8,377	7,869
Enoch City	1,337	1,498	1,584	1,547	1,417
Kanarraville	177	175	182	187	142
Total	9,327	9,959	9,817	10,857	10,110

Notes:

(1) Based on DWR Annual Reports for the CICWCD Main, Chekshani, Cedar High, and Sunset service areas.

Trends in recent years' per capita water use for each entity are depicted in Figure 2.3. Variability in per capita demands from one community to another are expected because of the unique characteristics of each community's customer base and service area. The highest per capita diversion water use from 2017 through 2021 for each entity is highlighted in Figure 2.3. Per capita demands typically vary from year to year based on climatic conditions and use patterns in the service area. Data limitations on annual population for Kanarraville may affect the accuracy of Kanarraville per capita values, but the overall planning impact is minor because Kanarraville's population (and thus, projected future demand) is projected to remain a small fraction of the total area considered in this study.

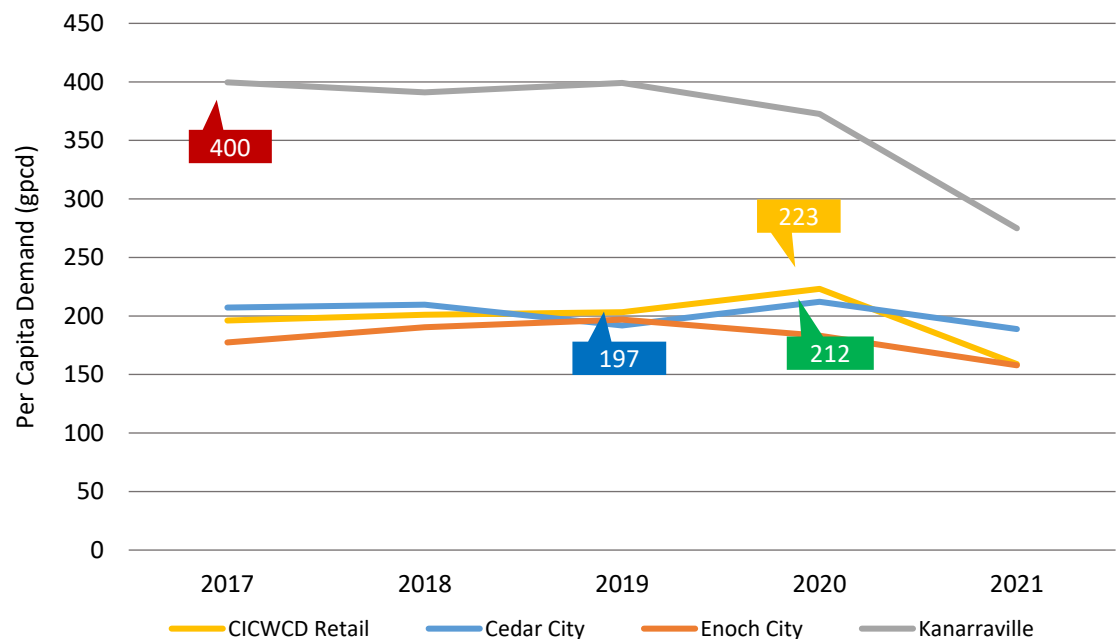


Figure 2.3 Trends and Maximum Values in Recent per Capita Water Use

The highest per capita value from 2017 to 2021 for each entity was used as the initial basis for future demands to reflect this variability. Doing so provides a level of conservatism in demand planning, essentially planning for a future scenario that may be similar to the peak in recent per capita demands. Ongoing enhancements to the CICWCD and key stakeholders' water conservation programs and State-issued conservation goals were subsequently used to adjust these values, as discussed later in this chapter.

2.3.2 Diversion and Consumptive Demands

Total diversion demands were forecasted for the CICWCD and each key stakeholder by multiplying the forecasted population by the recent maximum per capita demand for each entity. The resulting demand forecast, by decade through 2075, is provided in Figure 2.4. The CICWCD and key stakeholders' total water diversions would grow from 13,205 AFY in 2025 to 36,472 AFY in 2075 if no further water conservation enhancements were achieved. Alternative approaches for meeting the projected demands are outlined later in this chapter.

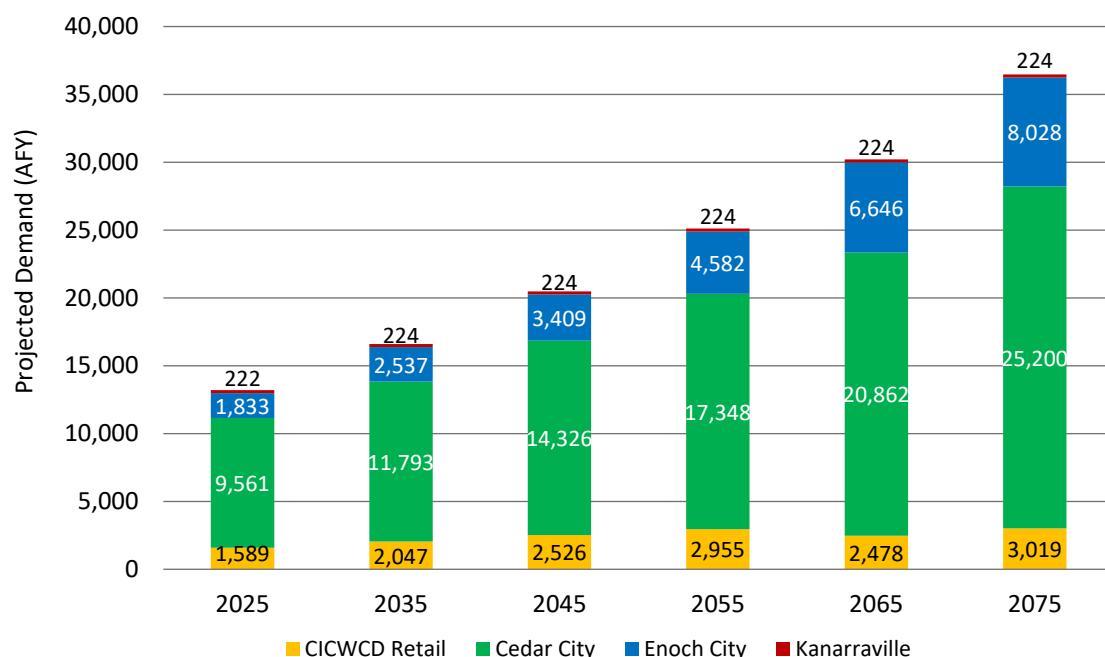


Figure 2.4 Forecasted Diversion Water Use without Additional Future Conservation

2.3.2.1 Municipal Water Conservation

The CICWCD and key stakeholders' planning reflects that additional water conservation will be an important component of meeting future demands. It is also recognized that the projected demands are most useful when expressed as a depletion value instead of a total diversion value, since the DWR GMP is expressed in terms of aquifer depletion values.

The following steps were taken to reflect those planning considerations:

- Per capita demand values were reduced to reflect future water conservation targets.
- Diversion water use forecasts were converted to depletion water use.

Future water conservation targets were assumed to be consistent with per-capita reductions proposed in the Utah Department of Natural Resources (DNR) document titled, "Utah's Regional

M&I Water Conservation Goals" (November 2019). Specifically, per capita water use reductions were assumed to match the reduction targets established by DNR in 2030, 2040, and 2065 relative to 2015 per capita demands for the "Lower Colorado River North" region of Utah, which includes all of Iron County.

For purposes of the current study, the reduction percentages shown in Table 2.5 were assumed to apply to the highest 2017 to 2021 per capita water use rate for each entity because per capita demands vary by year, often driven largely by annual and seasonal weather, though affected by many factors. The Utah DNR projections indicate conservation targets that some may consider being relatively aggressive. DNR does not provide clear guidance for how to meet those targets, but the CICWCD and most of the key stakeholders are already below the average unit water use value for the region. The resulting net projected diversion demand after additional future water conservation is summarized in Figure 2.5. The CICWCD and key stakeholders' water diversions will total about 26,260 AFY in 2075 if the conservation targets are achieved.

Table 2.5 Additional Future Conservation Targets and Revised per Capita Use

	Per Capita Demand Goals Relative to Baseline Plan (percent or gpcd)					
	2025	2035	2045	2055	2065	2075
Reduction ⁽¹⁾	0%	19%	24%	24%	28%	28%
CICWCD Retail	223	181	170	170	161	161
Cedar City	212	172	161	161	153	153
Enoch City	197	159	150	150	142	142
Kanarraville	400	324	304	304	288	288

Notes:

(1) Per Utah DNR conservation goals for the Lower Colorado River North, November 2019. Applied to highest per capita demands from 2017-2021 for each entity (shown here as 2025 per capita demands).

gpcd gallons per capita per day

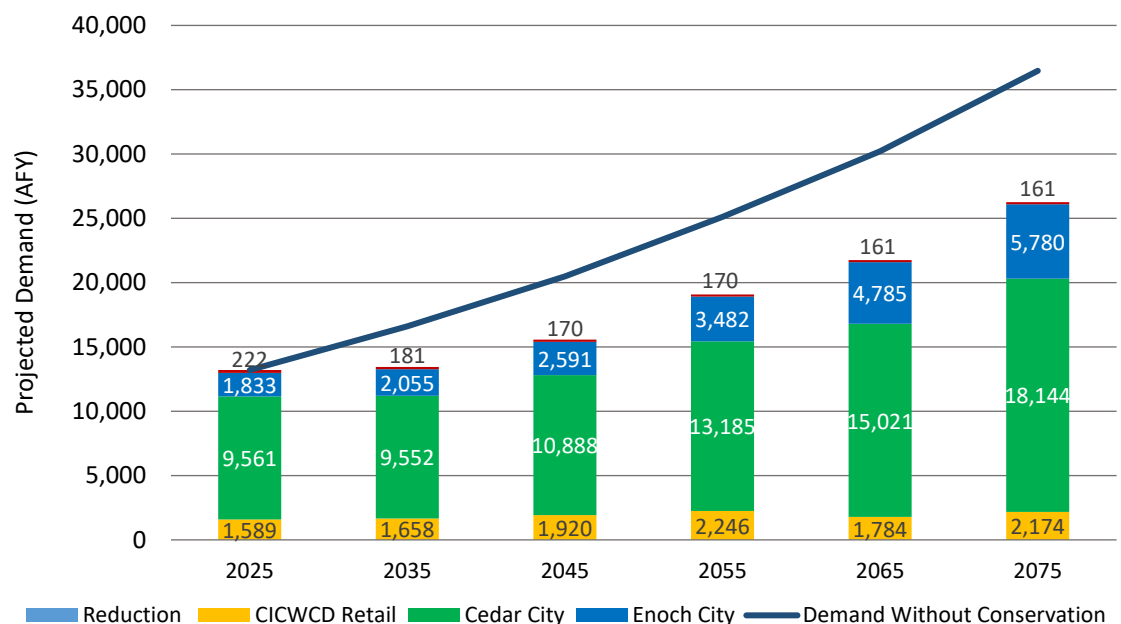


Figure 2.5 Forecasted Diversion Water Use with and without Additional Future Conservation

Water consumption in Cedar City Valley has reduced by 18 percent since 1995. Iron County ranked as the 4th county in the state for low water usage according to the State's 2019 Regional Conservation Goals Report. However, the CICWCD continues to emphasize conservation in the spirit of continuous improvement. Current efforts of the District to achieve residential conservation include:

- The CICWCD urges the community to "Water Less" and promotes many water wise programs for residents, including providing Localscapes waterwise landscaping classes, partnering with the State to provide water wise rebates for smart sprinkler controllers and toilets, and partnering with Utah State University Extension to provide free home water checks.
- The CICWCD holds annual community events to help educate the community about water conservation and local water issues. These events include the 5th Grade Water Fair field trip for Iron County School District and the annual community Water Festival.
- The CICWCD promotes conservation in development through the use of the District's Water Right Exchange Policy which restricts lawn size in new development.
- The CICWCD promotes cash incentives for conservation by replacing fixtures such as old toilets or sprinkler control systems, and lawn replacement with drought-tolerant landscaping.

For reference, Figure 2.6 shows an example of a residential property with water-efficient landscaping, including limited turf grass (limited to 2,300 square feet of the half-acre lot in this example). This type of landscaping would be an important component in meeting the water conservation goals summarized in Figure 2.3.



Figure 2.6 Example Residential Property with Water-Efficient Landscaping

2.3.2.2 Diversion versus Depletion

Forecasted water demands were converted from total diversion values to depletion values in order to provide a direct comparison to GMP water rights requirements. The DWR online database of water rights (https://waterrights.utah.gov/researchDB/Cedar_WRListing.asp) was used to estimate a ratio of depletion to diversion for each entity. DWR tracks each water right in Utah in terms of both a diversion right and a depletion right. The overall ratio for each entity was estimated by summing all diversion water rights (in AFY) for the entity and dividing it by the sum of the depletion rights (in AFY) for the entity. The resulting ratios were used to convert forecasted diversion water use to forecasted depletion water use (Figure 2.7). Total depletion water use by the CICWCD and key stakeholders will reach about 21,600 AFY in 2075 with additional conservation savings.

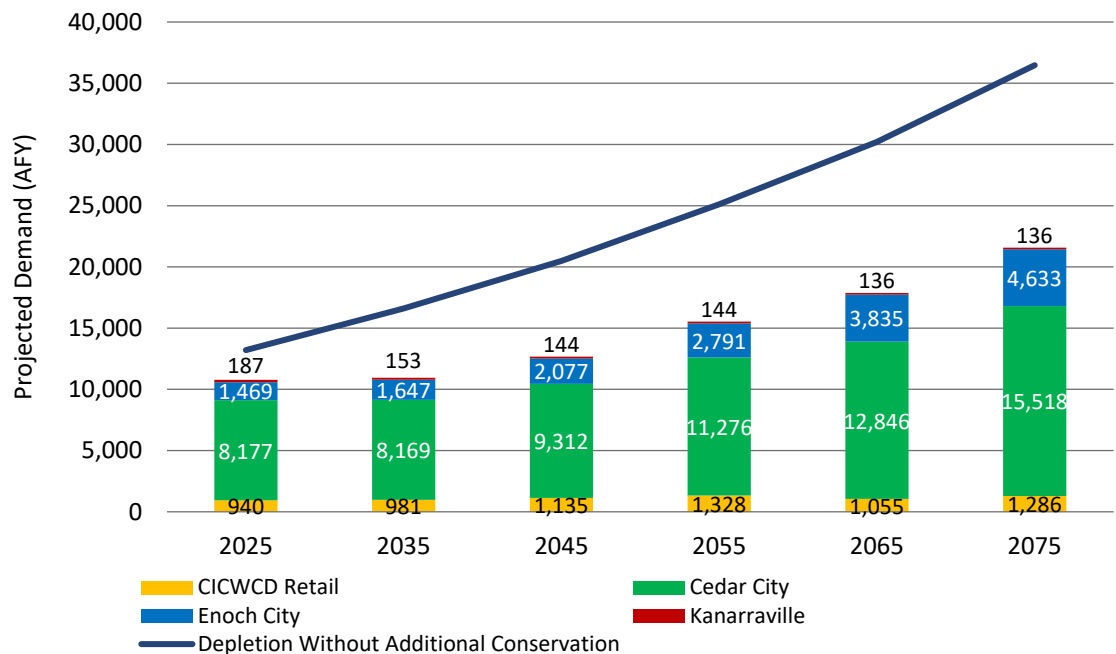


Figure 2.7 Forecasted Depletion Water Use with and without Additional Future Conservation

2.3.2.3 Agricultural Water Conservation

As the largest water use sector in the Cedar Valley, agricultural conservation can yield a significant benefit to regional water supplies. CICWCD estimates indicate that there are currently about 8,000 acres of farmland served by center pivots in Cedar Valley, irrigating 2 to 2.5 AFY per acre for a total use of 16,000 to 20,000 AFY. CICWCD also estimates that there are 1,560 acres of farmland in wheel-lines or flood irrigation, irrigating 3 to 4 AFY per acre for a total of 4,680 to 6,240 AFY. It is unclear how much of the wheel-line and flood irrigation is supplied by surface water versus groundwater. All told, agricultural irrigation is estimated to use upwards of 20,000 AFY in the valley, consistent with Utah DWR estimates of 21,400 AFY of agricultural depletion use of the local aquifer (Utah DWR 2016).

The CICWCD has undertaken steps to support agricultural efficiency. In 2019, it upgraded nearly 2,000 acres of center pivot irrigation equipment (approximately 25 percent of agricultural irrigation land in the valley) to LEPA and LESA technologies and since then an additional 500 acres have been converted to the water saving technology.

The Bonneville Power Authority ([BPA] 2020) describes LEPA and LESA technologies as follows:

"LEPA places the emitter type sprinkler on or just above the soil surface. LESA has the sprinklers located three feet or less above the soil surface and uses spray type sprinklers. LEPA and LESA both double the number of sprinklers on a center pivot.

Both technologies improve the sprinkler system application efficiency, reduce the direct evaporation from the sprinkler, reduce moisture loss from wet leaves, and require less pressure to operate; thus reducing the pump power consumption per acre-foot delivered. Although the technology is primarily used on pivots, it can also be used with lateral move irrigation systems. Washington State University and the University of Illinois found water savings of 5 to 15 percent. WSU and the U of I found that LESA's system may also reduce fertilizer requirements and has the potential to improve crop quality and yield."

Measurement of the increased efficiency and associated water savings from CICWCD's 2019 LEPA/LESA retrofit program is ongoing. It is anticipated that LEPA/LESA conversion of center pivots could reduce irrigation water use from the traditional 2 to 2.5 AFY per acre to around 1.7 to 2.1 AFY per acre. The state of Utah approved the Agricultural Optimization Bill in 2018 to study these impacts. The study is currently underway in partnership with Southern Utah University, Utah State University, and the CICWCD; 2022 was the 4th year of data collection. The research will determine if there is an equal or increased yield while diverting less water. New evapotranspiration equipment has been used to determine the amount of water that is used by the plant and lost to evaporation. Yield analysis of crops and a water diversion/depletion analysis is ongoing as well.

By comparison, CICWCD estimates that the rate of agricultural water use is similar on a per-acre basis to municipal water use. CICWCD estimates that existing residential customers of CICWCD, Cedar City, and Enoch City use about 0.75 AFY per connection. Under the state of Utah's proposed regional conservation goals (Table 2.5), that rate would drop to about 0.54 AFY per connection by 2065, or about 2.16 AFY per acre for a typical 0.25-acre residential lot size. This is very comparable to the 1.7 to 2.1 AFY per acre used by center pivots after LEPA/LESA conversion, or 2 to 2.5 AFY per acre for traditional center pivot irrigation.

2.4 Supply Assessment

2.4.1 Existing Sources

The analysis of available supplies initially considered preparing an inventory of the capacity of the CICWCD and key stakeholders' existing physical infrastructure to produce water from the Cedar Valley Aquifer. Historical practice for the CICWCD and key stakeholders has largely consisted of acquiring sufficient groundwater rights and constructing and operating enough wells to meet demands.

Absent any driver to do otherwise, it is likely that these practices would continue indefinitely as the CICWCD and key stakeholders seek to meet growing demands over time. That is, new wells would be added over time to meet demands on an as-needed basis, and the water providers would continue to make sure that they secured enough water rights to meet the demand.

In reality, the water rights cutbacks detailed in the GMP will eventually become the limiting factor in using the local aquifer to meet demands. At some point, increasing demands will exceed the declining water rights available for use under the GMP, and the CICWCD and key

stakeholders will be legally unable to withdraw enough groundwater from the Cedar Valley Aquifer – no matter how much well capacity is physically in place to pump water from the aquifer. Recognition of this "legal availability" shortage shifted the focus of the Water Needs Assessment away from physical infrastructure capacities and on to legal availability (groundwater rights) over time under the GMP.

2.4.2 Groundwater Management Plan

The GMP for the Cedar City Valley, adopted January 2021, sets a path for reducing depletion of the aquifer to 21,107 AFY. The GMP defines depletion as follows:

Depletion due to municipal use will be the groundwater diversion minus any return flow resulting from the groundwater portion of wastewater effluent returning to the groundwater system and minus any return flow resulting from the groundwater portion of water used for lawn and garden irrigation and any other municipal purposes.

CICWCD's and key stakeholders' depletion water rights in the Cedar Valley Aquifer are summarized in Figure 2.8, starting with existing rights in 2025 and showing a summary of water rights that are expected to remain ("not cut" by DWR) as the GMP is phased in over time.

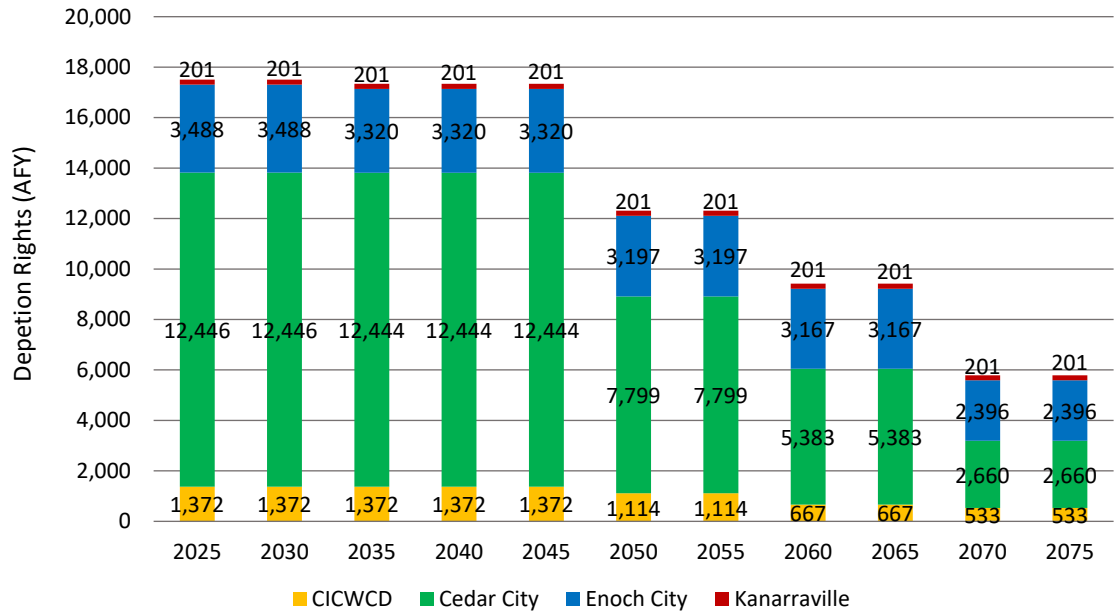


Figure 2.8 CICWCD and Key Stakeholders' Depletion Water Rights Under Draft GMP

2.5 Aquifer Recharge

The CICWCD and key stakeholders have implemented several projects to recharge the aquifer with available Coal Creek surface water when it is physically and legally available for such use. Current practices include operating the recharge projects during the irrigation off-season, when the CICWCD and key stakeholders' water rights are in priority.

Looking forward, it is expected that the CICWCD and key stakeholders will continue to take maximum advantage of recharge opportunities when they arise, in order to offset groundwater pumping activities and preserve water table levels. It is unclear whether DWR would grant a one-for-one credit, where every acre-foot of water recharged would be credited toward additional

depletion withdrawals from the aquifer. However, for the purpose of this study, recharge was tallied and added to the water budget as a net gain in the recharge to the basin.

In later 2019, CICWCD staff conducted an analysis of historical Coal Creek flows from October 1999 through April 2019 to assess recharge potential. That analysis found that seasonal Coal Creek flows (from November through April, the irrigation off-season months) averaged 7,682 AFY, with seasonal flows ranging from 3,822 AFY to 13,748 AFY over this 20-year analysis period.

Clearly, there is some practical limit to the peak flow capacity that constructed facilities can be constructed or physically expected to be able to recharge the aquifer. For purposes of this analysis, a maximum recharge rate of 100 cubic feet per second (cfs) was assumed as a cap on recharge rates, based on input from CICWCD and Ensign Engineering. Flows above 100 cfs were assumed unavailable for recharge, from a physical capacity standpoint. Adding this physical limit to recharge reduced the potential seasonal Coal Creek recharge flows only by about 5 percent, from 7,683 AFY (November through April) to 7,297 AFY (November through April).

CICWCD staff assumed that between 2 and 3 cfs of water is needed to satisfy senior stock watering rights in the irrigation off-season. Assuming that 2.5 cfs of senior stock watering demand exists continuously, 896 AFY is seasonally needed to satisfy that need over the November through April timeframe.

For November through April, subtracting 896 AFY of senior stock watering rights from the 7,297 AFY of Coal Creek flows (capped at 100 cfs) results in a maximum recharge potential of about 6,400 AFY as a long-term average. Figure 2.9 shows the annual flows and the 20-year average Coal Creek seasonal recharge potential of about 6,400 AFY when capped at 100 cfs.

It should be recognized that prior to the urbanization of Cedar Valley water would delta out and was broadcast over fields during the winter and much of that water seeped into the groundwater system. As such it is acknowledged that there is uncertainty and it is unlikely that the DWR would grant the right to withdraw the full 6,400 AFY of recharged water, beyond base depletion rights. Also, no effort was made to allocate the 6,400 AFY of recharge potential to participating utilities. Rather, it was assumed that recharge projects (including existing and future recharge facilities) would be constructed and operated as a regional effort with regional benefits by and for the municipal water suppliers. Perhaps more significantly, climate variability and long-term changes could affect the amount of surface water available for recharge, such that the CICWCD may not be able to reliably access, recharge, and retrieve the full 6,400 AFY on a long-term average, even if DWR does allow full credit for recovering the water that was recharged via the CICWCD's efforts.

Since 2017, available flows for recharge have trended lower, resulting in a significant reduction in annual average recharge volumes. In winter 2022-2023, the area received one of the highest snowpacks on record (approximately 300 percent of average). With current facilities and a strong snowpack, the CICWCD was able to recharge only about 6,000 acre-feet. The District also found that it can only sustain flows of about 35 cfs or 70 acre-feet per day into its two main pits (Schmidt and Western Rock); it plans to increase recharge capacity to the degree feasible through private partnerships and permitting.

Given the uncertainty in the future availability of water for recharge and the amount that would be credited to the CICWCD, the model reflects an assumed net gain of 50 percent of the high-snowpack 2022-2023 recharge amount of 6,000 AFY, or 3,000 AFY. For purposes of the present

analysis, a long-term average recharge rate was considered appropriate (rather than the minimum or maximum, for example), since the aquifer would buffer variability between recharge rates and pumped water use from year to year.

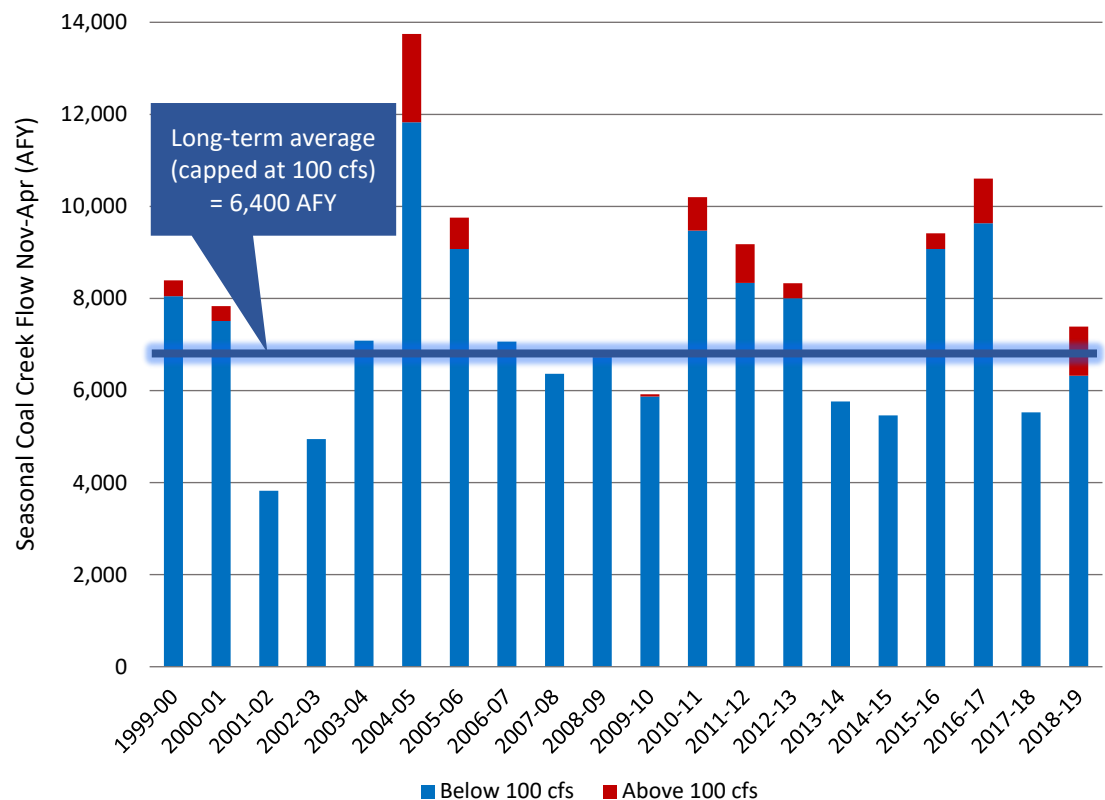


Figure 2.9 Historical Seasonal Coal Creek Flows (November through April)

2.6 Anticipated Supply Shortages and PVWS Implementation Timeline

Anticipated supply shortages were analyzed on a regional level via the following analysis:

- Subtract projected depletion demands (after additional conservation, Figure 2.7) from available depletion rights (Figure 2.8).
- Add credit for regional recharge projects, assuming up to 3,000 AFY of recharge can be credited directly toward groundwater rights, allowing pumping of up to 3,000 AFY more water than the GMP specifies on a regional basis (recognizing that this amount could differ in the future, as discussed above).
- A range of demand from the alternative population growth scenarios.

The net result of this analysis depicts the water shortages that can be anticipated if no action is taken to increase water supply, as shown in Figure 2.10. As the GMP is implemented, and if a regional recharge credit of 3,000 AFY is applied to offset municipal groundwater pumping, water rights would begin to fall short of demands in the Cedar City Valley between 2050 and 2055. This shortage grows to 12,782 AFY in 2075 and will continue to expand to the degree that demands continue to grow. If no recharge credit was available (whether due to recharge supply availability, recharge infrastructure, or permitting constraints), the regional shortage would first be encountered about 5 years sooner.

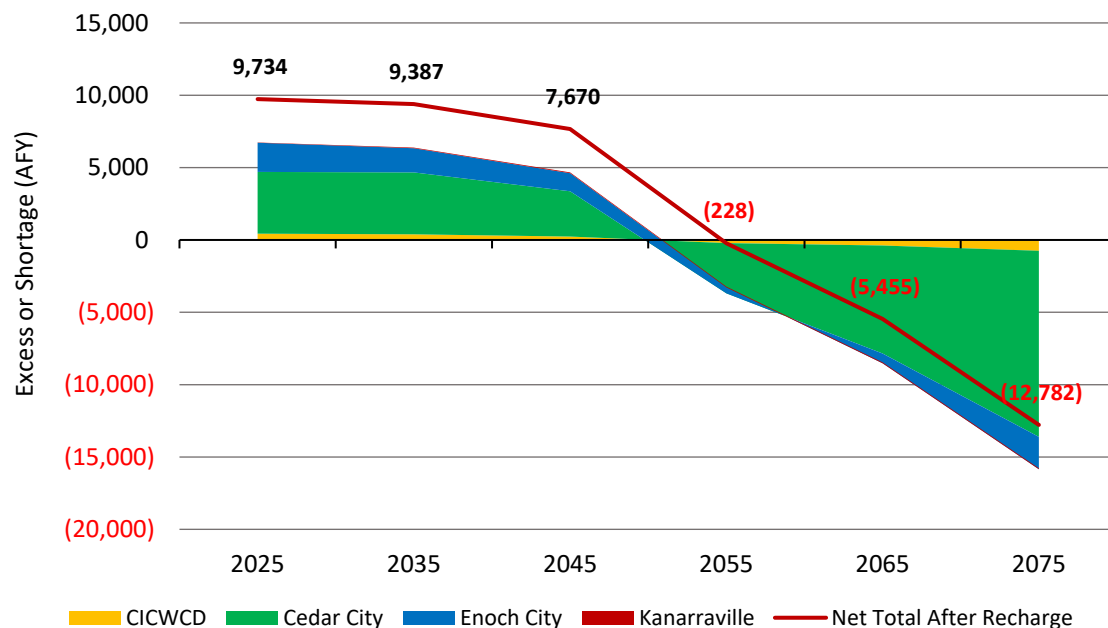


Figure 2.10 Projected Future Supply Surplus or Shortage with No Action

The anticipated water shortages are also estimated using the alternative population growth scenarios, presented in Table 2.6. These scenarios also assume that the GMP is implemented without further changes, and a regional recharge credit of 3,000 AFY is applied to offset municipal groundwater pumping. Under this range of scenarios, water rights would fall short of demands in the Cedar City Valley in 2051 under the Historical Growth scenario, 2060 under the GPI 2022 Baseline scenario, and beyond 2075 under the GPI 2022 Low scenario. The shortage grows to 27,804 AFY in 2075 under the Historical Growth Rate scenario where county population grows by 3 percent per year.

Table 2.6 Alternative Projected Future Supply Surplus or Shortage with No Action

	2025	2035	2045	2055	2065	2075
Historical Growth Rate ⁽¹⁾	9,332	8,008	4,592	(6,074)	(14,890)	(27,804)
GOMB 2012	9,734	9,387	7,670	(228)	(5,455)	(12,782)
GPI 2022 Baseline ⁽¹⁾	8,711	9,042	8,672	2,683	(549)	(5,192)
GPI 2022 Low ⁽¹⁾	9,059	9,287	9,171	3,583	844	(3,199)

Notes:

(1) Future demands in the alternative population growth scenarios are estimated using the average region wide gallons per capita water use with conservation as developed under the GOMB 2012 Municipal Level Growth scenario.

Clearly, such shortages would be unacceptable. In Section 2.7, six different approaches (scenarios) for mitigating these shortages are defined and characterized. Four of those employ combinations of local water supply strategies to completely avoid the projected shortages, while the other two consider using the PVWS project to head off shortages. The PVWS project would add 15,000 AFY of new water supply to the Cedar City Valley, offsetting the projected shortages through at least 2075.

Consideration was given to the potential for demand reduction to mitigate and avoid the projected water supply shortage, whether driven by intentional conservation measures or by consumer reactions to escalating water costs. The projections used in this analysis reflect the State's regional long-term goal of reducing per capita demands by 28 percent, for a weighted average demand in the CICWCD service area of 153 gpcd. In order to completely avoid the 2075 shortage under the GOMB 2012 growth scenario, per capita demands would instead need to be reduced by over 70 percent to 62 gpcd. It is extremely unlikely that this degree of demand reduction could be realized in practice. Under alternate growth scenarios, the timing of the shortage varies, but severe cutbacks in water use affecting the quality of life in the CICWCD service area would still be necessary.

All of the water supply scenarios described in Section 2.7 mitigate the shortages shown in Figure 2.10. The net impact on the Cedar Valley Aquifer with and without the PVWS project is depicted in Figure 2.11. The timing of PVWS implementation is yet to be established; this figure shows PVWS (15,000 AFY from Pine Valley) coming online around 2050 to head off projected water rights shortages.

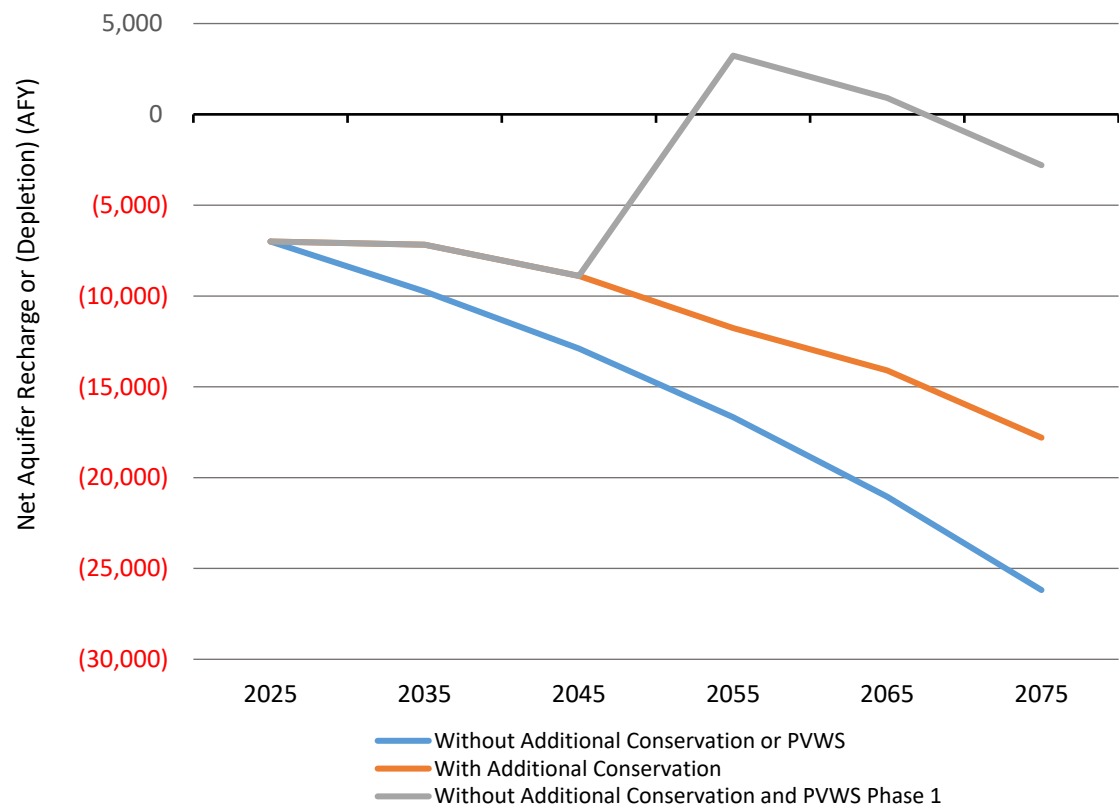


Figure 2.11 Net Recharge or Depletion of Cedar Valley Aquifer with and Without PVWS Project

2.7 Alternate Water Supply Scenarios

Several alternative approaches for avoiding or mitigating the projected water supply shortages were characterized, so they could be evaluated in the Business Case Analysis. These included the following scenarios:

- Scenario 1: 100% Local Well Supply (purchase agricultural groundwater rights, no additional conservation, no recharge, no reuse).
- Scenario 2: Local Wells + Conservation (no recharge, no reuse).
- Scenario 3: Local Wells + Conservation + Recharge (no reuse).
- Scenario 4: Local Wells + Conservation + Recharge + Reuse.
- Scenario 5: Accelerated PVWS (with additional conservation and recharge, no reuse).
- Scenario 6: PVWS at Shortage (with additional conservation and recharge, no reuse).

Each of these scenarios would completely offset the projected water shortages described earlier in this chapter. Scenarios 1 through 4 would do so without the PVWS project, while Scenarios 5 and 6 would use the PVWS project to mitigate the anticipated shortages. A summary of the components included in each of the six scenarios is provided in Table 2.5.

Table 2.7 Overview of Components Comprising Scenarios 1 through 6

	Additional Conservation	Purchase Local Ground-water Rights	Aquifer Recharge	Water Reuse	Accelerated PVWS	PVWS at Shortage
Scenario 1: 100% Local Well Supply		✓				
Scenario 2: Local Wells + Conservation	✓	✓				
Scenario 3: Local Wells + Conservation + Recharge	✓	✓	✓			
Scenario 4: Local Wells + Conservation + Recharge + Reuse	✓	✓	✓	✓		
Scenario 5: Accelerated PVWS	✓		✓		✓	
Scenario 6: PVWS at Shortage	✓		✓			✓

All six scenarios assumed that new wells would be constructed when needed to meet demand, starting in 2025 and continuing either indefinitely (Scenarios 1 through 4) or until the PVWS is constructed and online (Scenarios 5 and 6). Capital costs were based on unit costs provided by CICWCD and Ensign Engineering highlighted in Table 2.6.

Table 2.8 Capital Cost Factors

Item	Value (2022 \$)	Source / Notes
Cost of typical new groundwater well in the Cedar City Valley	\$1,170,000	Escalated from 2019 costs per Ensign Engineering, personal communication 10/28/19.
Yield of typical new groundwater well in the Cedar City Valley	1,000 gallons per minute (gpm)	Estimate per Ensign Engineering, personal communication 10/28/19.
Cost of new groundwater rights in the Cedar City Valley	\$20,000 per AFY	Hymas & Associates 6/27/22 valuation for purchases July 25, 1934, or senior rights of 10 acre-feet or more; costs are expected to escalate more rapidly than construction costs

Key assumptions in the analysis included:

- Existing groundwater wells can meet demand until 2025; new wells will be needed to meet demand in 2026 and beyond. To the degree that existing wells can meet demands beyond 2025, the construction of new wells could be deferred.
- Groundwater rights in the Cedar Valley Aquifer would be available for purchase and would be purchased as needed to offset the demand in Scenarios 1 through 4. Groundwater rights purchases would likely come from agricultural irrigators in the Cedar City Valley. Water rights conversions from agricultural to municipal use were assumed to not require purchase of the associated agricultural land by the CICWCD or key stakeholders, as that land could be transitioned to dryland farming, grazing, municipal development, or other uses.
- Conservation goals established by DNR could be achieved, but in lieu of studies detailing the methods necessary to achieve those goals, unit costs for additional conservation are assumed based on reference studies from Colorado for Scenarios 2 through 6.
- Alternatives that include reuse did not evaluate the potential reduction in aquifer recharge associated with reduced discharge from the Cedar City Wastewater Treatment Plant.
- Reuse system in alternatives that include reuse was based on Alternative 5R (seasonal agricultural irrigation in Enoch Graben) per the Cedar City 2018 Water Reuse Feasibility Study (offsets 2,023 AFY of water demand).
- Cost of water reuse system is \$17.4 million in 2018 dollars per the 2018 Water Reuse Feasibility Study. Reuse system costs were escalated to 2022 dollars at 3 percent per year through 2021 and 10 percent for 2022. Engineering/legal/administrative costs were added at 15 percent of capital. Reuse project implementation assumed design and construction over a 3-year period starting in 2025.
- Under Scenario 5, CICWCD would be responsible for issuing all debt to fund the cost of the PVWS project while Cedar City and Enoch City pay their own proportionate share (based on their respective projected future water demands) of the debt service until they begin receiving water from the project in 2030. It is further assumed beginning in 2030 and beyond, Cedar City and Enoch City would pay their proportionate share of the debt service and all other retail service related costs (i.e., purchased water costs to CICWCD) through a combination of the monthly fixed and volumetric rates charged by CICWCD to each city.

- PVWS project implementation assumed design and construction over a 5-year period.
- Earliest possible PVWS design/construction initiation would be complete by 2030 (for Scenario 5, "PVWS ASAP"), when the Environmental Impact Statement Record of Decision is anticipated. In Scenario 6 ("PVWS at Shortage"), PVWS design/construction would be complete by 2051 so it would be online in time to prevent shortages.
- Once the PVWS is online (Scenarios 5 and 6), no new local wells would be constructed and no further groundwater rights purchases would be made, rather than investing in both the PVWS and new local groundwater infrastructure and supplies.

Multi-year capital projects were assumed to follow a typical capital project design and construction expenditure schedule, as shown in Table 2.7.

Table 2.9 Assumed Capital Project Design and Construction Cost Expenditure Schedule

Project Duration (years)	Percent of Capital Cost Incurred Each Year				
	1	2	3	4	5
1	100%				
2	30%	70%			
3	10%	45%	45%		
4	10%	35%	35%	20%	
5	1%	9%	35%	35%	20%

A summary of water supply components and cost factors for each of the six scenarios is provided in Table 2.8.

Table 2.10 Overview of Groundwater Components in Scenarios 1 through 6

	Number of New Wells 2025-2075	Amount of Purchased Groundwater Rights 2025-2075 (AFY)
Scenario 1: 100% Local Well Supply	12	24,200
Scenario 2: Local Wells + Conservation	7	15,800
Scenario 3: Local Wells + Conservation + Recharge	7	12,800
Scenario 4: Local Wells + Conservation + Recharge + Reuse	7	10,800
Scenario 5: Accelerated PVWS	1	0
Scenario 6: PVWS at Shortage	3	0

Under the GMP, a total of about 23,298 AFY of groundwater rights currently held by municipal, irrigation, and stockwatering/mining/other users would remain available ("not cut" by DWR) after all reductions are in place. Of that amount, about 17,900 AFY is currently held by irrigation and stockwatering/mining/other users. As such, purchasing 24,200 AFY of water rights under Scenario 1 from other (non-municipal) users in the basin is not a viable option. Under Scenarios 2 through 4, in theory, there would be sufficient water rights that could be purchased and converted to municipal use, with varying degrees of impact on agriculture in the Cedar City Valley.

Capital costs for the six scenarios were calculated in unescalated 2022 dollars, serving as the foundation for the business case analyses presented in Chapter 3. A summary of capital costs for the six scenarios is presented in Figure 2.12. Notably, these costs assume escalation rates for groundwater rights purchases in the Cedar Valley Aquifer. In lieu of studies detailing the methods necessary to achieve DNR conservation goals, costs for additional conservation were based on unit costs for conservation from reference studies and included in the costs of Scenarios 2 through 6. Additional conservation was estimated at \$6,700 per AFY of demand reduction, based on estimates by the Colorado Water Conservation Board and communities with established conservation programs.

While Scenario 1 is not technically viable (due to limits on total water rights availability under the GMP), Scenarios 2 through 4 would require purchase of between about 60 to 88 percent of the remaining non-municipal and non-domestic water rights in the Cedar Valley Aquifer after GMP cutbacks are complete. Based on experience in other parts of the United States, purchases would likely have significant negative effects on the agricultural economy in the Cedar City Valley and could change the course of the valley's rich agricultural heritage.

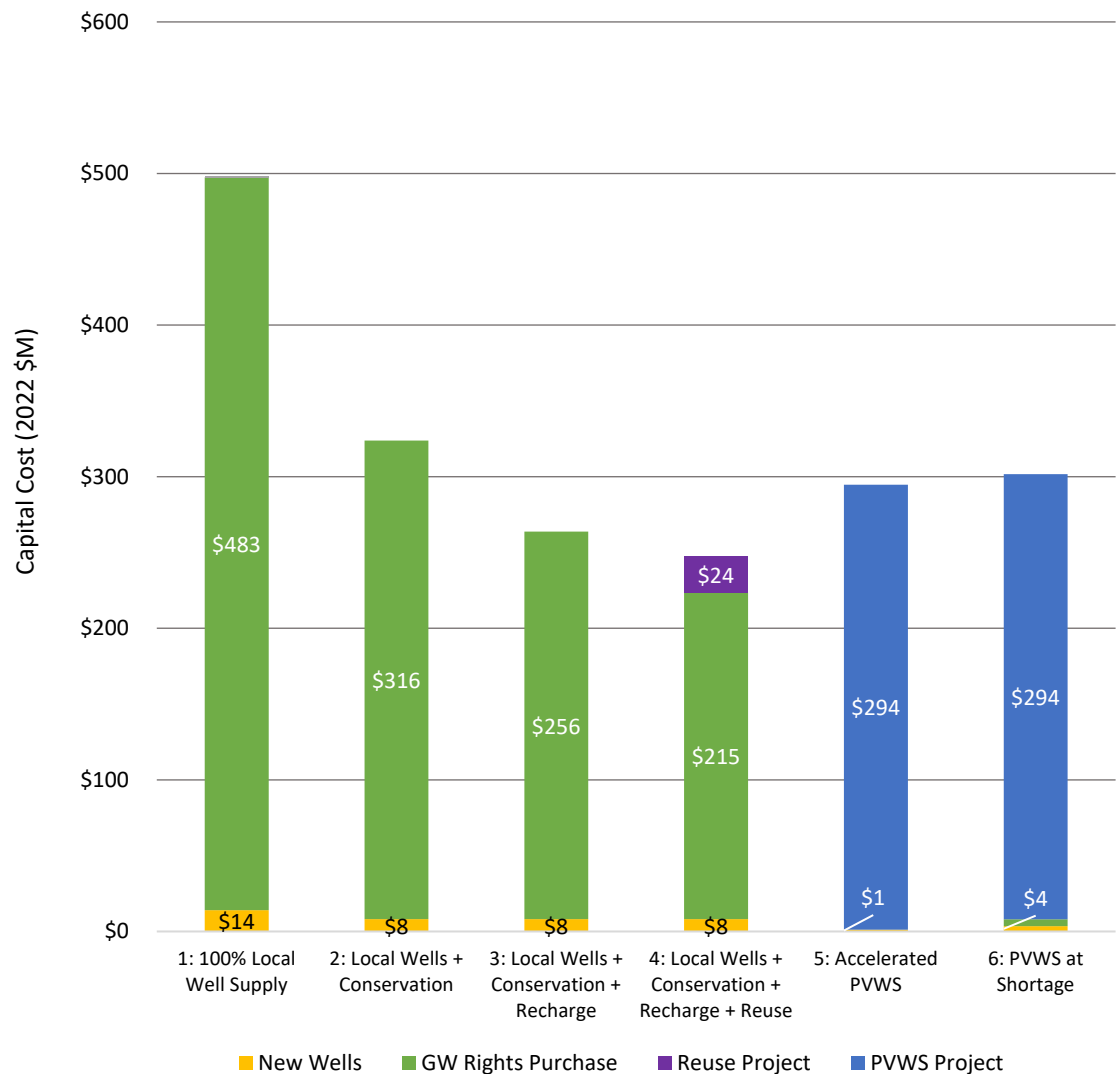


Figure 2.12 Capital Costs for Water Supply Scenarios 1 through 6

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Chapter 3

BUSINESS CASE EVALUATION

3.1 Introduction

Subsequent to identification of water demands, as ascertained from the Water Needs Assessment portion of this analysis, Carollo Engineers (Carollo) was tasked with providing a real-time dynamic financial model that analyzed the financial impact of potential partnerships on the CICWCD and key stakeholders for which financial data were made available (Cedar City and Enoch City). This business case evaluation includes identification of potential outside funding opportunities and their respective financing costs as well as operation and maintenance (O&M) and capital cost projections throughout the study period. The financial model incorporates cash flows from three specific entities – CICWCD, Cedar City, and Enoch City (herein referred to as the collaborating partners) – and presents annual revenue increases as well as comparative annual customer bill impact analyses under each of the identified scenarios.

As discussed previously in Section 2.7, Carollo evaluated six scenarios for this Business Case Evaluation:

- **Scenario 1:** 100% Local Well Supply (purchase agricultural groundwater rights, no additional conservation, no recharge, no reuse).
- **Scenario 2:** Local Wells + Conservation (no recharge, no reuse).
- **Scenario 3:** Local Wells + Conservation + Recharge (no reuse).
- **Scenario 4:** Local Wells + Conservation + Recharge + Reuse.
- **Scenario 5:** Accelerated PVWS (with additional conservation and recharge, no reuse).
- **Scenario 6:** PVWS at Shortage (with additional conservation and recharge, no reuse).

While Scenario 1 is not technically viable (due to limits on total water rights availability under the GMP), it is included as a basis of comparison against the other scenarios.

Scenario 4 evaluates estimated annual water supply shortages for each of the three collaborating partners. In any given year, where water shortages are shown for Cedar City (2050 through 2075) and/or Enoch City (2060 through 2075), it was assumed that water would be purchased from the CICWCD. Additionally, Scenario 4 assumes the CICWCD issues all proposed debt and each of the collaborating partners pays their proportionate share of annual debt service based on 2025 net projected demands after additional conservation savings (i.e., CICWCD retail at 12.0 percent of the total demand, Cedar City at 72.4 percent, Enoch City at 13.9 percent, and the remaining 1.7 percent assumed to be allocated to Kanarrville) until all proposed debt issuances have been retired, regardless of timing of water demands and/or physical deliveries.

Scenario 5 assumes the CICWCD issues all proposed debt to fund the cost of the PVWS project, although each of the three collaborating partners is responsible for their respective and proportionate share of the annual debt service at the time of issuance (projected issuance in 2026 and 2029) and until final maturity, regardless of project completion and timing of physical

water deliveries. Other wholesale related costs will be shared proportionally by Cedar City and Enoch City through their monthly fixed and volumetric rates charged by the CICWCD.

Similar to Scenario 5, Scenario 6 assumes the CICWCD issues all proposed debt to fund the cost of the PVWS project although each of the three collaborating partners is responsible for their respective and proportionate share of the annual debt service at the time of issuance (projected issuance occurs in 2053 to fund construction after using available cash reserves) and until final maturity, regardless of project completion and timing of physical deliveries. Other wholesale related costs will be shared proportionally by Cedar City and Enoch City through their monthly fixed and volumetric rates charged by the CICWCD.

The six scenarios presented in this Business Case Evaluation are merely a starting point for further discussion and consideration as the PVWS project timeline and requirements become further solidified. Ultimately, the actual scenario selected for implementation may or may not be one presented in this evaluation. This FBPWNA study sought to provide the CICWCD with scenarios from varying ends of the spectrum in order to provide a more comprehensive starting point for further evaluations. Additionally, the real-time dynamic financial model developed in this study provides the CICWCD and other key stakeholders with the ability to update information as it becomes available.

3.2 Assumptions

Carollo worked closely with staff from the CICWCD, Cedar City, and Enoch City to acquire and integrate into the financial model the most recent information available. As such, Carollo relied on data provided by each entity and cannot verify its validity or accuracy for the purposes of this analysis. The financial model incorporated budget information and historical data and forecasts from each of the three collaborating partners.

The following items were provided by each entity:

- 2019 Budget (including O&M and capital costs).
- Outstanding Debt Service Schedules (annual principal and interest payments by issuance).
- Annual Water Sales (total revenue and total usage in thousands of gallons [Kgals]).
- Number of Customers (connections to the system; customers receiving a monthly bill).

Carollo also assumed the following inflation rates throughout the financial model:

- General Inflation Rate: 3.0%
- Property Tax Rate: 3.0%
- Connection and Impact Fee Rate: 3.0%
- Interest Income Rate (Cash Balances): 1.0%
- Groundwater Rights Inflation Rate: 7.5%
- Typical Bill Impact Inflationary Trend: 3.0%

Growth rates vary annually by entity. These rates originated from United States Census Bureau data provided by decade and were then calculated annually based on exponential interpolation. The following rates, by entity, provide ranges of growth used throughout the financial model:

- CICWCD: 3.0% to 0.0%
- Cedar City: 2.1% to 1.9%
- Enoch City: 3.8% to 1.9%

Additionally, Carollo, in conjunction with Ensign Engineering, applied preliminary estimates of O&M costs as well as capital costs under each scenario for inclusion, evaluation, and analysis within the financial model.

Lastly, in development of revenues under existing rates for all entities, Carollo assumed a simple average rate (dollars per Kgals) even though each entity's rate structure may include an inclining block rate. As an example, if one of the participating entities received \$750,000 in total revenue for the year and recorded 500,000 thousand gallons of usage, Carollo would subtract monthly fixed charges for the year (assume \$250,000 in this case) and divide the remaining revenue (\$500,000) by the actual recorded usage (500,000 thousand gallons) to calculate the average unit water rate or \$1.00 per Kgals in this example.

3.3 Outside Funding Opportunities

In development of the business case evaluation, Carollo researched a comprehensive list of potential outside funding opportunities, which could assist the CICWCD in funding the PVWS project. For the purposes of this analysis, funding opportunities were classified into two separate groups: loans or grants. Loans must be repaid in full under the terms and conditions set forth by the respective program requirements and within the specified timeframe. Conversely, grants are one-time distributions provided to the CICWCD that do not require repayment. Each funding program provides advantages and disadvantages. Of note is that the selection of certain programs can potentially disqualify the CICWCD from other programs so careful consideration should be given to provide the most optimal funding combination.

Appendix B provides a summary description of potential funding options by program, agency, and type of funding. Additionally, Appendix B provides deadlines and contact information by program and agency.

3.4 Optimal Funding by Scenario

For purposes of this study, funding strategies were required to fully evaluate and compare those scenarios that required capital financing. It is noted that the total combined federal funding sources should not exceed 80 percent of total project cost. The estimated optimal funding opportunity is presented in Table 3.1.

Table 3.1 Estimated Optimal Funding Opportunity

Program	Type	Interest Rate	Term	Percent of Funding	Debt Service Coverage Ratio
Water Infrastructure Finance and Innovation Act (WIFIA)	Loan	3.15%	30	~49%	130x
State Drinking Water State Revolving Fund (SRF) Loan	Loan	2.00%	20	~25%	130x
Revenue Bonds	Loan	5.00%	30	~25%	130x
Cash Reserves	Cash	N/A	N/A	~<1%	N/A

Notes:

(1) Numbers may not total due to rounding.

N/A Not Applicable

Carollo assumed, conservatively, proposed annual debt service coverage (i.e., parity coverage on all debt) of 130x. Stated another way, the CICWCD would be required to have \$1.30 in annual net revenue (calculated as total revenue minus O&M expenses) for every \$1.00 in annual debt service. Similarly, Cedar City and Enoch City are assumed to concurrently maintain an annual debt service coverage ratio of 130x.

It is also important to note that for the purposes of this analysis, grants were excluded, as they tend to have greater uncertainty of being acquired and tend to be smaller in quantity and more sporadically and arbitrarily distributed. Clearly, any acquisition of grant funding would help reduce the financial impact to rate payers for the CICWCD and other key stakeholders. Carollo recommends the CICWCD apply early and frequently (typically annually, on the schedule unique to each opportunity) for all available grants. If the CICWCD chooses to do so, Carollo could assist with completing paperwork in pursuit of potential grant funding opportunities.

3.5 Financial Model Purpose and Background

Carollo's Excel-based financial model incorporated and evaluated cash flows for CICWCD, Cedar City, and Enoch City, as all three entities are assumed to be reliant on one another for execution and delivery of the PVWS project. For the purposes of this analysis, it is assumed that CICWCD will issue all debt related instruments regarding design and construction costs for the PVWS project. Furthermore, Carollo's model assumes Cedar City and Enoch City purchase water directly from CICWCD under Scenarios 4, 5, and 6. These water purchases (sold by CICWCD) are shown as expenses to Cedar City and Enoch City and conversely shown as a revenue source to the CICWCD. Revenue received by the CICWCD through purchased water and inclusive of other miscellaneous revenues will be used to pay down principal and interest on proposed issued debt while simultaneously meeting debt service coverage covenants (130x). If any cash flow (CICWCD, Cedar City, or Enoch City) results in an annual deficit in their respective ending fund balances or a resulting debt service coverage ratio falls below 130x, revenue increases to user rates (water sales) are required to meet the greatest deficiency.

Additionally, and as discussed earlier in this chapter, Scenarios 4, 5, and 6 require each collaborating partner to pay their own proportionate share (based on respective projected future water demands) of the proposed annual debt service at issuance and until final maturity, regardless of timing of water demands and/or physical deliveries. Other wholesale related costs will be shared proportionally by Cedar City and Enoch City through their monthly fixed and volumetric rates charged by the CICWCD.

3.6 Cash Flow Analysis Results

Cash flows were developed for all three of the assumed participating entities (CICWCD, Cedar City, and Enoch City) to gain a broad understanding of the potential financial implications of each of the six scenarios. Each entity has its own individual cash flow that considers their respective 2019 Budgets, growth, and water demands. Under certain scenarios, more specifically Scenarios 4 through 6, Cedar City's and Enoch City's wholesale water rate is entirely dependent upon the rate charged by the CICWCD. These scenarios in turn require revenue adjustments through revenue increases, as appropriate, to remain financially viable. The following subsections highlight results of the cash flow analysis and the potential revenue increases and associated typical monthly bills for each entity's customers under all six scenarios.

3.6.1 Central Iron County Water Conservancy District

Results of the CICWCD's cash flow analysis vary by scenario and result in varying degrees of annual revenue increases and customer bill impacts throughout the study period. As such, the CICWCD's cumulative (compounded) increases and typical monthly bills under each scenario are presented in Table 3.2.

Table 3.2 CICWCD Cash Flow Analysis Results

	Existing	Projected					
	2019	2025	2035	2045	2055	2065	2075
Inflationary Trend							
Cumulative Increase	0.0%	3.0%	38.4%	86.0%	150.0%	236.0%	351.5%
Bill Impact	\$41.56	\$42.81	\$57.53	\$77.32	\$103.91	\$139.65	\$187.69
Scenario 1							
Cumulative Increase	0.0%	0.0%	0.0%	0.0%	238.3%	634.0%	634.0%
Bill Impact	\$41.56	\$41.56	\$41.56	\$41.56	\$140.58	\$305.05	\$305.05
Scenario 2							
Cumulative Increase	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Bill Impact	\$41.56	\$41.56	\$41.56	\$41.56	\$41.56	\$41.56	\$41.56
Scenario 3							
Cumulative Increase	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Bill Impact	\$41.56	\$41.56	\$41.56	\$41.56	\$41.56	\$41.56	\$41.56
Scenario 4							
Cumulative Increase	0.0%	5.5%	17.4%	17.4%	17.4%	17.4%	17.4%
Bill Impact	\$41.56	\$43.85	\$48.80	\$48.80	\$48.80	\$48.80	\$48.80
Scenario 5							
Cumulative Increase	0.0%	30.5%	0.0%	0.0%	0.0%	0.0%	0.0%
Bill Impact	\$41.56	\$54.24	\$41.56	\$41.56	\$41.56	\$41.56	\$41.56
Scenario 6							
Cumulative Increase	0.0%	3.0%	38.4%	86.0%	150.0%	150.0%	150.0%
Bill Impact	\$41.56	\$42.81	\$57.53	\$77.31	\$103.90	\$103.90	\$103.90

As a baseline case, which can provide a more easily understood starting point when comparing multiple scenarios, Carollo created an "Inflationary Trend" scenario that assumes annual increases of 3.0 percent throughout the study period and applied it to the typical monthly bill impact only. It is imperative to recognize the "Inflationary Trend" scenario was excluded from an actual cash flow analysis and may or may not be financially viable under each of the six scenarios. However, this scenario was created to illustrate the cumulative increase required and effect on typical monthly bills for customers. Under this "Inflationary Trend" scenario, CICWCD customers would experience a cumulative increase in their monthly bill of 150.0 percent in 2075. Under this scenario, a CICWCD customer's typical monthly bill would increase from \$41.56 in 2019 to \$103.91 in 2075, an increase of \$62.35 per month.

Scenario 1 requires that CICWCD commence incurring capital costs through drilling additional wells to service and support a combination of growth, water demands, inadequate groundwater rights, and conservation requirements. It is important to note that under this scenario, CICWCD customers do not begin feeling the impact of the aforementioned components, through increases to their rates, until 2055 and throughout the remainder of the study period. Consequently, CICWCD customers would experience a cumulative increase in their monthly bill of 634.0 percent by 2075, moving from typical monthly bill of \$41.56 in 2019 to \$305.05 in 2075, an increase of \$263.49 per month.

Scenarios 2 and 3 are identical in Table 3.2 and exclude water sales made to Cedar City and Enoch City. Under each of these scenarios, CICWCD customers would be unaffected, experiencing no monthly bill impact.

Scenario 4 requires CICWCD provide wholesale water service to both Cedar City and Enoch City as their water demands begin exceeding their available and allowable supply (projected to commence in 2050 and 2059, respectively). Under this scenario, CICWCD would incur significant upfront costs (2025 through 2027) for reuse projects, which are in addition to drilling additional wells and purchasing additional groundwater rights if they are even available that far into the future. As a result, this scenario requires proposed debt issuances under three debt instruments (as illustrated in Table 3.1, a combination of WIFIA at ~49 percent, SRF at ~25 percent, and Revenue Bonds at ~25 percent) totaling \$30.1 million in bond proceeds in 2025 and requires three consecutive 5.5 percent annual revenue increases beginning in 2025 through 2027. Annual debt service totals approximately \$1.951 million and is allocated among all three collaborating partners based on their 2025 net projected water demands with additional conservation savings (i.e., CICWCD retail at 12.0 percent of the total demand, Cedar City at 72.4 percent, Enoch City at 13.9 percent, with the remaining 1.7 percent assumed to be allocated to Kanarraville) until all proposed debt issuances have been retired regardless of timing of water demands and/or physical deliveries. Scenario 4 would see CICWCD customers experience a cumulative increase in their monthly bill of 17.4 percent by 2027 and throughout the remainder of the study period. Customers' typical monthly bills would increase from \$41.56 in 2019 to \$48.80 in 2075 (beginning in 2027 throughout the study period), an increase of \$7.24 per month.

Scenario 5 requires CICWCD to provide wholesale water service to both Cedar City and Enoch City in 2030 and beyond as a result of completion of the PVWS project. With significant capital investment costs projected over the course of 5 years (2026 through 2030), the CICWCD is forced to issue sizeable debt instruments (WIFIA, SRF, and Revenue Bonds) to keep the cash flow viable, which requires an optimal mix of debt issuances and revenue increases over a long-term timeframe. Each collaborating partner would be required to pay their own proportionate share of the annual debt service (based on their respective and projected future water demands) from each and all debt issuances through their respective maturities. Additionally, each collaborating partner would be required to increase their own rates to support annual debt service coverage ratios, as necessary to meet required rate covenants. Under this scenario, the CICWCD begins collecting purchased water revenues from Cedar City and Enoch City in 2030 and as a result is able to decrease their water rates (beginning in 2031) to both retail and wholesale customers (Cedar City and Enoch City in this case) all while maintaining a positive ending fund balance and simultaneously meeting required debt service coverage ratios. This scenario requires proposed debt issuances under three debt instruments in 2026 and 2029 (as illustrated in Table 3.1, a combination of WIFIA at ~49 percent, SRF at ~25 percent, and Revenue Bonds at ~25 percent)

totaling \$374.3 million in bond proceeds and a par amount of \$420.6 million. Annual debt service totals \$24.3 million and is allocated among all three collaborating partners based on their respective projected annual water demands. Scenario 5 would see a CICWCD customer's typical monthly bill increase from \$41.56 in 2019 to \$197.41 in 2030, an increase of \$155.85 per month. However, as a result of the rate reduction in 2031, a CICWCD customer's typical monthly bill is projected to remain at the 2019 level of \$41.56 per month throughout the remainder of the study period.

Scenario 6 requires that CICWCD provide wholesale water service to both Cedar City and Enoch City in 2055 and beyond as a result of completion of the PVWS project. Under this scenario, the CICWCD is forced to issue three debt instruments (WIFIA, SRF, and Revenue Bonds) in 2053 to keep the cash flow viable, which requires an optimal mix of debt issuances and revenue increases over a long-term timeframe. Each collaborating partner would be required to pay their own proportionate share of the annual debt service (based on their respective and projected future water demands) from each and all debt issuances through their respective maturities. Additionally, each collaborating partner would be required to increase their own rates to support annual debt service coverage ratios, as necessary to meet required rate covenants. Under this scenario, the CICWCD begins collecting purchased water revenues from Cedar City and Enoch City in 2055. This scenario requires a single proposed debt issuance under three debt instruments in 2055 (as illustrated in Table 3.1, a combination of WIFIA at ~49 percent, SRF at ~25 percent, and Revenue Bonds at ~25 percent) totaling \$663.0 million in bond proceeds and a par amount of approximately \$745 million. Annual debt service totals approximately \$43 million and is allocated among all three collaborating partners based on their respective projected annual water demands. CICWCD customers would experience a cumulative increase in their monthly bill of 150.0 percent in 2055 to \$103.90 from \$41.56 in 2019, an increase of \$62.34. The goal under this scenario was to increase rates at the same amount as the "Inflationary Trend" scenario and issue the optimal amount of debt instruments to support the cash flow and the projected annual debt service coverage ratios. Note, additional rate increases are unnecessary beyond 2055 to keep the CICWCD financially viable.

3.6.2 Cedar City

Results of the Cedar City cash flow analysis vary by scenario and result in varying degrees of annual revenue increases and customer bill impacts throughout the study period. As such, Cedar City's cumulative (compounded) increases and typical monthly bills under each scenario are presented in Table 3.3.

Table 3.3 Cedar City Cash Flow Analysis Results

	Existing	Projected					
	2019	2025	2035	2045	2055	2065	2075
Inflationary Trend							
Cumulative Increase	0.0%	3.0%	38.4%	86.0%	150.0%	236.0%	351.5%
Bill Impact	\$17.00	\$17.51	\$23.55	\$31.66	\$42.55	\$57.18	\$76.85
Scenario 1							
Cumulative Increase	0.0%	3.0%	38.4%	60.5%	60.5%	60.5%	60.5%
Bill Impact	\$17.00	\$17.51	\$23.53	\$27.28	\$27.28	\$27.28	\$27.28

	Existing	Projected					
	2019	2025	2035	2045	2055	2065	2075
Scenario 2							
Cumulative Increase	0.0%	3.0%	34.4%	34.4%	48.4%	80.9%	84.5%
Bill Impact	\$17.00	\$17.51	\$22.85	\$22.85	\$25.22	\$30.75	\$31.36
Scenario 3							
Cumulative Increase	0.0%	3.0%	34.4%	34.4%	48.4%	72.2%	99.8%
Bill Impact	\$17.00	\$17.51	\$22.85	\$22.85	\$25.22	\$29.27	\$33.97
Scenario 4							
Cumulative Increase	0.0%	28.0%	58.5%	58.5%	58.5%	97.9%	141.3%
Bill Impact	\$17.00	\$21.76	\$26.94	\$26.94	\$26.94	\$33.64	\$41.01
Scenario 5							
Cumulative Increase	0.0%	76.0%	516.5%	516.5%	516.5%	516.5%	516.5%
Bill Impact	\$17.00	\$29.92	\$104.80	\$104.80	\$104.80	\$104.80	\$104.80
Scenario 6							
Cumulative Increase	0.0%	6.5%	99.9%	275.3%	540.0%	540.0%	540.0%
Bill Impact	\$17.00	\$18.11	\$33.99	\$63.80	\$108.80	\$108.80	\$108.80

As a baseline case, which can provide a more easily understood starting point when comparing multiple scenarios, Carollo created an "Inflationary Trend" scenario that assumes annual increases of 3.0 percent throughout the study period and applied it to the typical monthly bill impact only. It is imperative to recognize the "Inflationary Trend" scenario was excluded from an actual cash flow analysis and may or may not be financially viable under each of the six scenarios. However, this scenario was created to illustrate the cumulative increase required and effect on typical monthly bills for customers. Under this "Inflationary Trend" scenario, Cedar City customers would experience a cumulative increase in their monthly bill of 351.5 percent in 2075. Under this scenario, a Cedar City customer's typical monthly bill would increase from \$17.00 in 2019 to \$76.85 in 2075, an increase of \$59.85 per month.

Under Scenario 1, Cedar City customers experience an "Inflationary Trend" increase of 3.0 percent annually from 2025 through 2040. Subsequent increases beyond 2040 are unnecessary as the annual ending fund balances remain positive and annual debt service coverage ratios are met in all years throughout the study period. Under this scenario, a Cedar City customer's typical monthly bill would increase from \$17.00 in 2019 to \$27.28 in 2075 (occurring in 2040 and remaining at that level throughout the study period), an increase of \$10.28 per month.

Under Scenario 2, Cedar City customers experience an "Inflationary Trend" increase of 3.0 percent annually from 2025 through 2034. Additional 2.0 percent annual increases are necessary from 2051 through 2066 due to ending fund balance shortfalls (below \$0 in 2075). Subsequent increases beyond 2067 are unnecessary as the annual ending fund balances remain positive and annual debt service coverage ratios are met in all years throughout the study period. Under this scenario, a Cedar City customer's typical monthly bill would increase from \$17.00 in 2019 to \$31.36 in 2075, an increase of \$14.36 per month.

Under Scenario 3, Cedar City customers experience an "Inflationary Trend" increase of 3.0 percent annually from 2025 through 2034. Additional 2.0 percent annual increases are necessary from 2051 through 2055 as well as 1.5 percent annual increases from 2056 through 2075 due to ending balance shortfalls (below \$0). Under this scenario, a Cedar City customer's typical monthly bill would increase from \$17.00 in 2019 to \$33.97 in 2075, an increase of \$16.97 per month.

Scenario 4 sees Cedar City customers experience increases of 28.0 and 10.0 percent in 2025 and 2026, respectively, due to cash flow deficiencies resulting in ending fund balances below zero. Similarly, 3.0 percent annual increases are necessary from 2027 through 2030 to maintain positive ending fund balances throughout the remainder of the study period. It is important to note that based on Carollo's water assessment, Cedar City is not expected to require CICWCD water until 2050, increasing their demands significantly throughout the remainder of the study period into 2075. Under this scenario, a Cedar City customer's typical monthly bill would increase from \$17.00 in 2019 to \$41.01 in 2075, an increase of \$24.01 per month.

Scenario 5 requires Cedar City to pay its proportionate share of the CICWCD's proposed annual debt service to fund the PVWS project beginning in 2026. The portion Cedar City is responsible for is based on its future projected annual water demands. Beginning in 2030, Cedar City will purchase all its water from the CICWCD as a result of completion of the PVWS project and will remain responsible for paying its proportionate share of the debt service associated with the PVWS project as issued through the CICWCD. Cedar City would also be required to maintain a positive ending fund balance and an annual debt service coverage ratio of at least 130x throughout retirement of each debt issuance. Under this scenario, Cedar City customers experience two 76.0 percent increases in 2025 and 2026 to meet annual debt service coverage requirements of 130x. Additional increases of 27.0 percent from 2027 through 2030 are required to meet annual debt service coverage ratios; however, a rate reduction of 23.5 percent occurs in 2031 to alleviate some of the upward pressures on ratepayers from the previous years' increases. Scenario 5 would see Cedar City's customers' typical monthly bill increase from \$17.00 in 2019 to \$136.99 in 2030, an increase of \$119.99 per month. However, because of the rate reduction in 2031, Cedar City's customers' typical monthly bill is projected to be reduced to \$104.80 per month from 2031 throughout the study period, an increase of \$87.80 per month when compared to the 2019 typical customer bill.

Scenario 6 requires Cedar City to pay its proportionate share of the CICWCD's proposed annual debt service to fund the PVWS project beginning in 2053 with expected physical water deliveries occurring sometime in 2055. The portion Cedar City is responsible for is based on its future projected annual water demands. Beginning in 2055, Cedar City will purchase all its water from the CICWCD as a result of completion of the PVWS project and will remain responsible for paying its proportionate share of the debt service associated with the PVWS project as issued through the CICWCD. Cedar City would also be required to maintain a positive ending fund balance and an annual debt service coverage ratio of at least 130x throughout retirement of each debt issuance. Under this scenario, Cedar City customers experience 6.5 percent annual increases from 2025 through 2047 with additional 6.0 percent annual increases from 2048 through 2054 to meet annual debt service coverage requirements of 130x. Scenario 6 would see Cedar City's customers' typical monthly bill increase from \$17.00 in 2019 to \$108.80 in 2075, an increase of \$91.80 per month.

3.6.3 Enoch City

Results of the Enoch City cash flow analysis vary by scenario and result in varying degrees of annual revenue increases and customer bill impacts throughout the study period. As such, cumulative (compounded) increases and typical monthly bills in Enoch City under each scenario are presented in Table 3.4.

Table 3.4 Enoch City Cash Flow Analysis Results

	Existing	Projected					
	2019	2025	2035	2045	2055	2065	2075
Inflationary Trend							
Cumulative Increase	0.0%	3.0%	38.4%	86.0%	150.0%	236.0%	351.5%
Bill Impact	\$29.00	\$29.87	\$40.15	\$53.97	\$72.53	\$97.49	\$131.01
Scenario 1							
Cumulative Increase	0.0%	9.5%	9.5%	9.5%	9.5%	9.5%	9.5%
Bill Impact	\$29.00	\$31.76	\$31.76	\$31.76	\$31.76	\$31.76	\$31.76
Scenario 2							
Cumulative Increase	0.0%	9.5%	9.5%	9.5%	9.5%	9.5%	9.5%
Bill Impact	\$29.00	\$31.76	\$31.76	\$31.76	\$31.76	\$31.76	\$31.76
Scenario 3							
Cumulative Increase	0.0%	9.5%	9.5%	9.5%	9.5%	9.5%	9.5%
Bill Impact	\$29.00	\$31.76	\$31.76	\$31.76	\$31.76	\$31.76	\$31.76
Scenario 4							
Cumulative Increase	0.0%	53.5%	53.5%	53.5%	53.5%	53.5%	53.5%
Bill Impact	\$29.00	\$44.52	\$44.52	\$44.52	\$44.52	\$44.52	\$44.52
Scenario 5							
Cumulative Increase	0.0%	90.0%	528.0%	528.0%	528.0%	528.0%	528.0%
Bill Impact	\$29.00	\$55.10	\$182.11	\$182.11	\$182.11	\$182.11	\$182.11
Scenario 6							
Cumulative Increase	0.0%	9.5%	105.5%	278.6%	578.1%	578.1%	578.1%
Bill Impact	\$29.00	\$31.76	\$59.61	\$109.81	\$196.65	\$196.65	\$196.65

As a baseline case, which can provide a more easily understood starting point when comparing multiple scenarios, Carollo created an "Inflationary Trend" scenario that assumes annual increases of 3.0 percent throughout the study period and applied it to the typical monthly bill impact only. It is imperative to recognize the "Inflationary Trend" scenario was excluded from an actual cash flow analysis and may or may not be financially viable under each of the six scenarios. However, this scenario was created to illustrate the cumulative increase required and effect on typical monthly bills for customers. Under this "Inflationary Trend" scenario, Enoch City customers would experience a cumulative increase in their monthly bill of 351.5 percent in 2075. Under this scenario, an Enoch City customer's typical monthly bill would increase from \$29.00 in 2019 to \$131.01 in 2075, an increase of \$102.01 per month.

Under Scenarios 1 through 3, Enoch City must increase rates by 9.5 percent in 2025 to meet the minimum debt service coverage requirement of 130x. Subsequent increases beyond 2025 are unnecessary as the annual ending fund balances remain positive and annual debt service coverage ratios are met in all years throughout the study period. Under this scenario, an Enoch City customer's typical monthly bill would increase from \$29.00 in 2019 to \$31.76 in 2075 (occurring in 2025 and remaining at that level throughout the study period), an increase of \$2.76 per month.

Under Scenario 4, Enoch City must increase rates by 53.5 percent in 2025 to meet the minimum debt service coverage requirement of 130x. Subsequent increases beyond 2025 are unnecessary as the annual ending fund balances remain positive and annual debt service coverage ratios are met in all years throughout the study period. It is important to note that based on Carollo's water assessment, Enoch City is not expected to require CICWCD water until 2065, increasing their demands ever so slightly annually throughout the remainder of the study period into 2075. Under this scenario, an Enoch City customer's typical monthly bill would increase from \$29.00 in 2019 to \$44.52 in 2075 (occurring in 2025 and remaining at that level throughout the study period), an increase of \$15.52 per month.

Scenario 5 requires Enoch City to pay its proportionate share of the CICWCD's proposed annual debt service to fund the PVWS project beginning in 2026. The portion Enoch City is responsible for is based on its future projected annual water demands. Beginning in 2030, Enoch City will purchase all its water from the CICWCD as a result of completion of the PVWS project and will remain responsible for paying its proportionate share of the debt service associated with the PVWS project as issued through the CICWCD. Enoch City would also be required to maintain a positive ending fund balance and an annual debt service coverage ratio of at least 130x throughout retirement of each debt issuance. Under this scenario, Enoch City customers experience two 90.0 percent increases in 2025 and 2026 to meet annual debt service coverage requirements of 130x. Additional increases of 23.0 percent from 2027 through 2030 are required to meet annual debt service coverage ratios; however, a rate reduction of 24.0 percent occurs in 2031 to alleviate some of the upward pressures on ratepayers from the previous years' increases. Scenario 5 would see Enoch City's customers' typical monthly bill increase from \$29.00 in 2019 to \$239.62 in 2030, an increase of \$210.62 per month. However, because of the rate reduction in 2031, Enoch City's customers' typical monthly bill is projected to be reduced to \$182.11 per month from 2031 throughout the study period, an increase of \$153.11 per month when compared to the 2019 typical customer bill.

Scenario 6 requires Enoch City to pay its proportionate share of the CICWCD's proposed annual debt service to fund the PVWS project beginning in 2053 with expected physical water deliveries occurring sometime in 2055. The portion Enoch City is responsible for is based on its future projected annual water demands. Beginning in 2055, Enoch City will purchase all its water from the CICWCD as a result of completion of the PVWS project and will remain responsible for paying its proportionate share of the debt service associated with the PVWS project as issued through the CICWCD. Enoch City would also be required to maintain a positive ending fund balance and an annual debt service coverage ratio of at least 130x throughout retirement of each debt issuance. Under this scenario, Enoch City customers experience an initial increase in 2025 of 9.5 percent to meet the annual debt service coverage ratio of 130x followed by 6.5 percent annual increases from 2025 through 2041. Additional 6.0 percent annual increases from 2042 through 2055 to meet annual debt service coverage requirements of 130x. Scenario 6 would see Enoch City's customers' typical monthly bill increase from \$29.00 in 2019 to \$196.65 in 2075, an increase of \$167.65 per month.

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Chapter 4

FINDINGS AND RECOMMENDATIONS

Carollo collaborated with the CICWCD, Cedar City, and Enoch City staff in development of the six scenarios presented in this report. Each of the selected scenarios represents a starting point for further dialogue and consideration as the PVWS Project timeline and requirements become further solidified. The purpose of the six scenarios was to provide the CICWCD, and its potential collaborating partners, with scenarios at varying ends of the spectrum, providing a more comprehensive starting point for further evaluations.

While Scenario 1 is not technically viable (due to limits on total water rights availability under the GMP), Scenarios 2 through 4 would require purchase of between 50 and 97 percent of the remaining non-municipal and non-domestic water rights in the Cedar Valley Aquifer after GMP cutbacks are complete. Based on experience in other parts of the United States, purchases would likely have significant negative effects on the agricultural economy in the Cedar City Valley and could change the course of the valley's rich agricultural heritage.

Selection of any of the local supply scenarios (Scenarios 2 through 4) would require policy-level consideration of the socioeconomic impacts of these actions. The feasibility, methods, and costs required to meet the Utah DNR proposed conservation goals have not been studied and would increase the costs shown in this report for Scenarios 2 through 6. Ultimately, the actual scenario selected for pursuit may or may not be one presented in this analysis.

However, the CICWCD and potential collaborating partners should consider moving forward with the PVWS Project and work towards completion of the project at some optimal point in time between 2030 and 2055. To facilitate this, each collaborating partner would enter into interlocal or intergovernmental agreements for water service to delineate roles and responsibilities for each collaborating partner. Under that arrangement, each collaborating partner should be required to provide a proportionate share, based on water demands, of capital contribution or debt service payments to design and construct the PVWS Project. Finally, it is recommended that a comprehensive cost of service rate study be conducted prior to first delivery of water service to each collaborating partner, to ensure all costs are appropriately allocated and recovered from each of the respective collaborating partners.

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Chapter 5

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Appendix A

EXCERPT FROM 2019 PVWS ECONOMIC AND FISCAL ANALYSIS STUDY

Quantifying the Economic Impacts of the Alternatives

Two Key Considerations

Types of Economic Impacts Considered

1

POSITIVE IMPACTS

One-time construction impacts on the local economy that are sourced to new infrastructure investments (e.g., Pine Valley and Wah Wah Valley projects)

2

NEGATIVE IMPACTS

The recurring economic losses sourced to an insufficient water system in the event no infrastructure investments are made, limiting future growth potential



One-Time Economic Impact of Infrastructure Investments

Quantifying the Impacts

In addition to the broader implications of a reliable water supply system, there are one-time economic impacts associated with the development of new infrastructure

Economic Output



Impact of Total Spending within the Local Economy

Wages and Salaries



Impact on Personal Incomes for Local Residents

Employment



Impact on the Number of Jobs within the Local Economy

One-Time Economic Impact of Infrastructure Investments

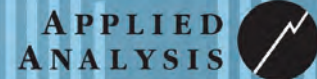
Approach, Methodology, and Assumptions

IMPLAN Model:

- 1 of 3 nationally recognized impact analysis software tools
- Developed by Minnesota IMPLAN Group, Inc. and used by more than 1,000 public and private institutions
- IMPLAN is an input-output model that utilizes complex economic equations to explain how the “outputs” of one industry become the “inputs” of others, and vice versa
- This relationship is sometimes referred to as the “multiplier effect”, illustrating how changes in one sector of the economy can affect other sectors
- See IMPLAN.com

The IMPLAN logo consists of the word "IMPLAN" in white, bold, sans-serif capital letters, centered within a solid teal rectangular background.A horizontal banner with a blue background. On the left, there is a black and white photograph of water being poured into a circular drain. To the right of the photo, the text "WATER RESOURCE" is written in large, white, sans-serif capital letters, and "ECONOMIC AND FISCAL ANALYSIS" is written in smaller, white, sans-serif capital letters below it.

WATER RESOURCE
ECONOMIC AND FISCAL ANALYSIS



One-Time Economic Impact of Infrastructure Investments

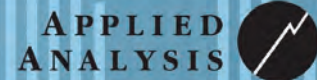
Approach, Methodology, and Assumptions

IMPLAN Model:

- IMPLAN data contains 546 sectors representing all private industries in the United States (anything from grain farming to surgical appliance manufacturing) as defined by the North American Industry Classification System (NAICS) codes
- Employment, employee compensation, industry expenditures, commodity demands, relationships between industries, and more are collected to form IMPLAN's ever-growing database

The IMPLAN logo consists of the word "IMPLAN" in white, bold, sans-serif capital letters, centered within a solid teal rectangular background.A horizontal banner with a blue background. On the left, there is a black and white photograph of water splashing. The text "WATER RESOURCE" is in large, white, sans-serif capital letters, and "ECONOMIC AND FISCAL ANALYSIS" is in smaller, white, sans-serif capital letters below it.

WATER RESOURCE
ECONOMIC AND FISCAL ANALYSIS



One-Time Economic Impact of Infrastructure Investments

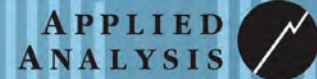
Approach, Methodology, and Assumptions

IMPLAN Model:

- Inputs: For purposes of this analysis, the inputs for the economic impact analyses were sourced to CICWCD's estimated development costs for the Pine Valley (\$253.6 million) and Wah Wah Valley (\$165.7 million) infrastructure projects for a total cost of \$419.3 million
- Location: IMPLAN databases specific to Iron County, Utah were acquired and utilized to develop the economic impacts of the proposed investments

The IMPLAN logo is displayed in white, bold, sans-serif capital letters on a solid teal rectangular background.A horizontal banner with a blue background. On the left, there is a black and white photograph of water being poured into a circular drain. The text "WATER RESOURCE" is in large white capital letters, and "ECONOMIC AND FISCAL ANALYSIS" is in smaller white capital letters below it.

WATER RESOURCE
ECONOMIC AND FISCAL ANALYSIS



One-Time Economic Impact of Infrastructure Investments

Approach, Methodology, and Assumptions

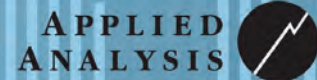
IMPLAN Model:

- Industry: In addition to the cost and location details, industry-specific metrics were utilized that most closely resemble the type of development contemplated (Industry Code 58 - Construction of other new nonresidential structures)
- Multiplier Effect: The following multipliers were generated based on the location and industry classification:



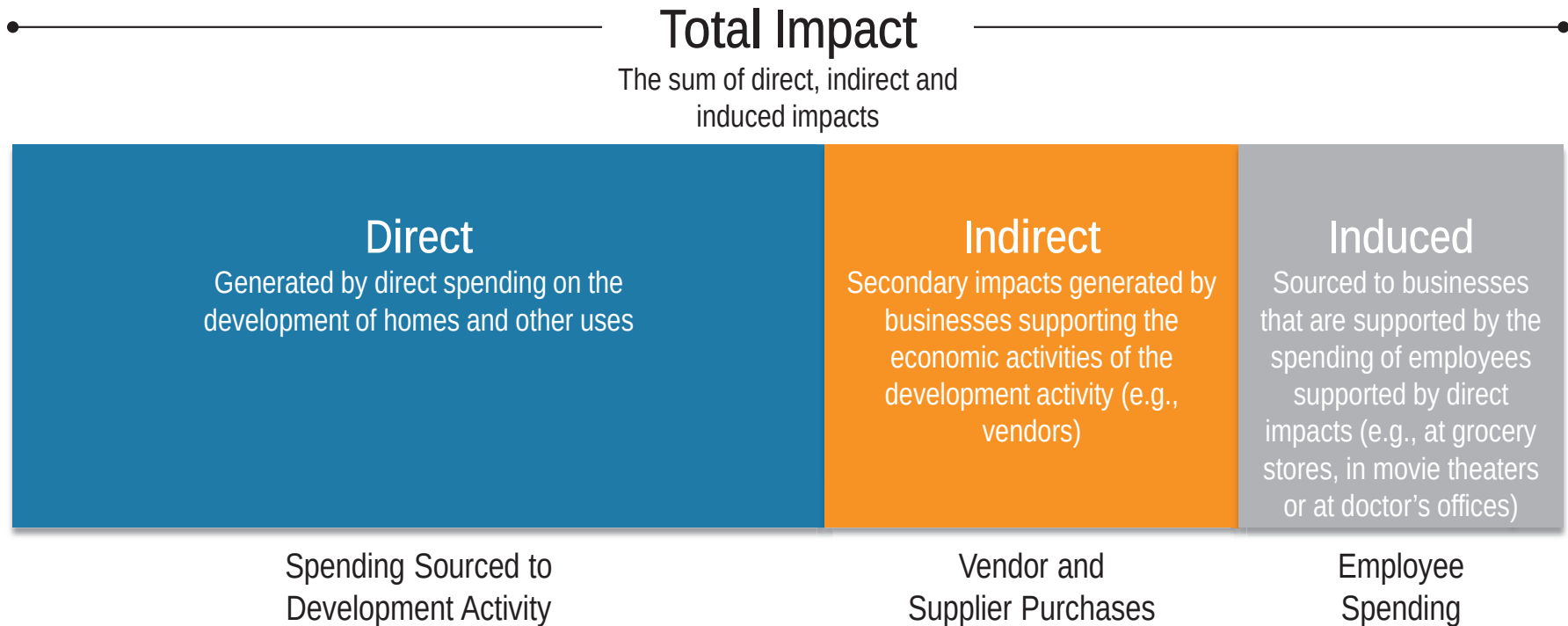
	<u>Direct</u>	<u>Indirect</u>	<u>Induced</u>	<u>Total</u>	<u>Multiplier Effect</u>
Output (Per \$1.00 of Direct Output)	1.00	0.27	0.17	1.44	1.44x
Labor Income (Per \$1.00 of Direct Output)	0.23	0.06	0.04	0.33	1.46x
Employment (Per \$1.0 Million of Direct Output)	7.82	2.77	1.69	12.28	1.57x

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ECONOMIC AND FISCAL ANALYSIS



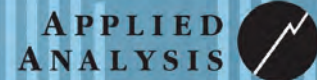
One-Time Economic Impact of Infrastructure Investments

Multiplier Effect



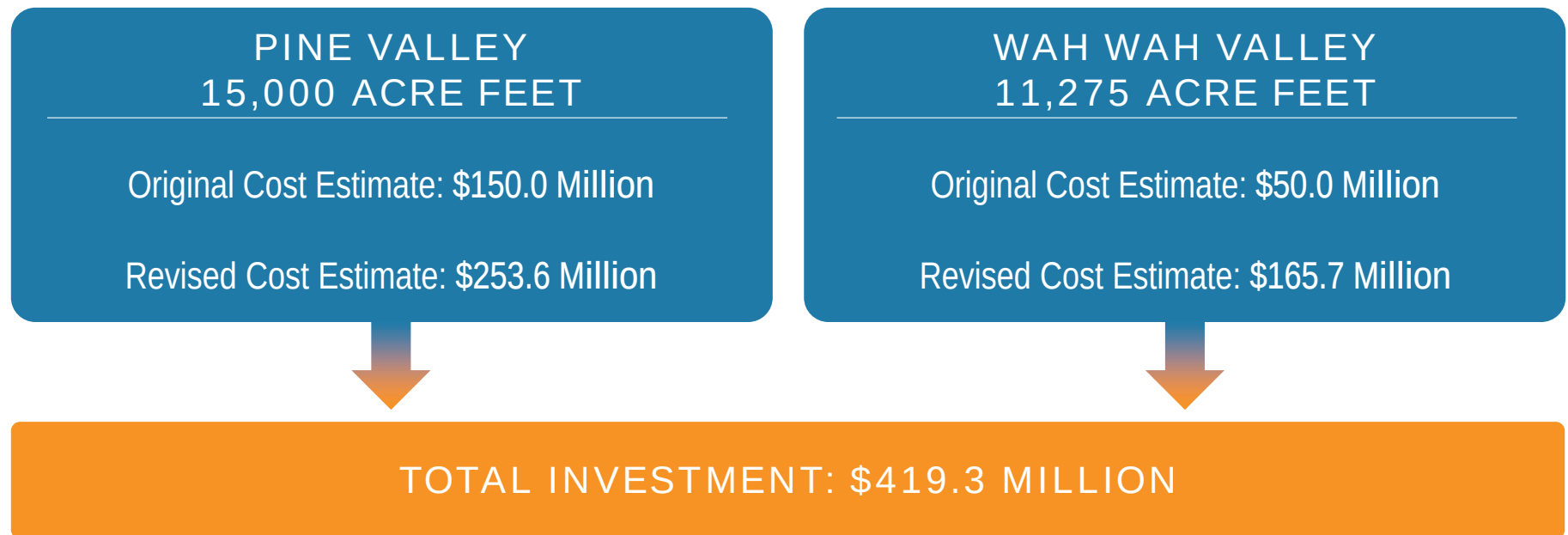
Note: Indirect and induced impacts sourced to IMPLAN.

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ECONOMIC AND FISCAL ANALYSIS



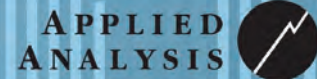
One-Time Economic Impact of Infrastructure Investments

West Desert Supply Project



Source: CICWCD.

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One-Time Economic Impact of Infrastructure Investments

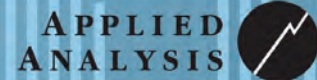
Economic Impact Summary

(\$ in Millions)	Direct	Indirect	Induced	Total
<u>Pine Valley Only: \$254 Million Investment</u>				
Economic Output	\$253.6	\$69.2	\$43.7	\$366.4
Wages & Salaries	\$58.2	\$16.0	\$10.6	\$84.9
Employment	1,982	702	428	3,113
<u>Pine and Wah Wah Valleys: \$419 Million Investment</u>				
Economic Output	\$419.3	\$114.4	\$72.2	\$605.9
Wages & Salaries	\$96.3	\$26.5	\$17.5	\$140.3
Employment	3,278	1,161	708	5,147

The potential economic impacts sourced to large-scale investment in infrastructure are significant with \$606 million in output, supporting approximately \$140 million in wages and an estimated 5,100 person-years of employment.

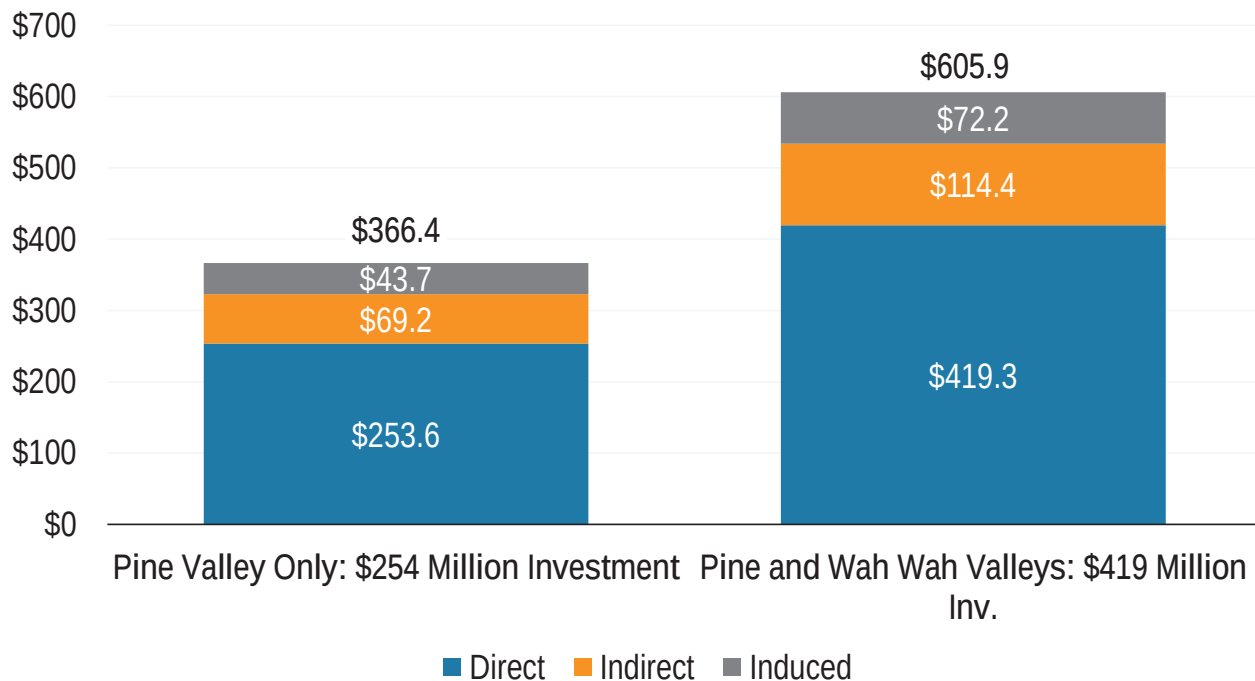
Note: Indirect and induced impacts sourced to IMPLAN; employment stated in person-years of employment (i.e., one person employed for an entire year).

WATER RESOURCE
ECONOMIC AND FISCAL ANALYSIS



One-Time Economic Impact of Infrastructure Investments

Economic Impact Summary: Economic Output



The potential economic impacts sourced to large-scale investment in infrastructure are significant with \$606 million in output, supporting approximately \$140 million in wages and an estimated 5,100 person-years of employment.

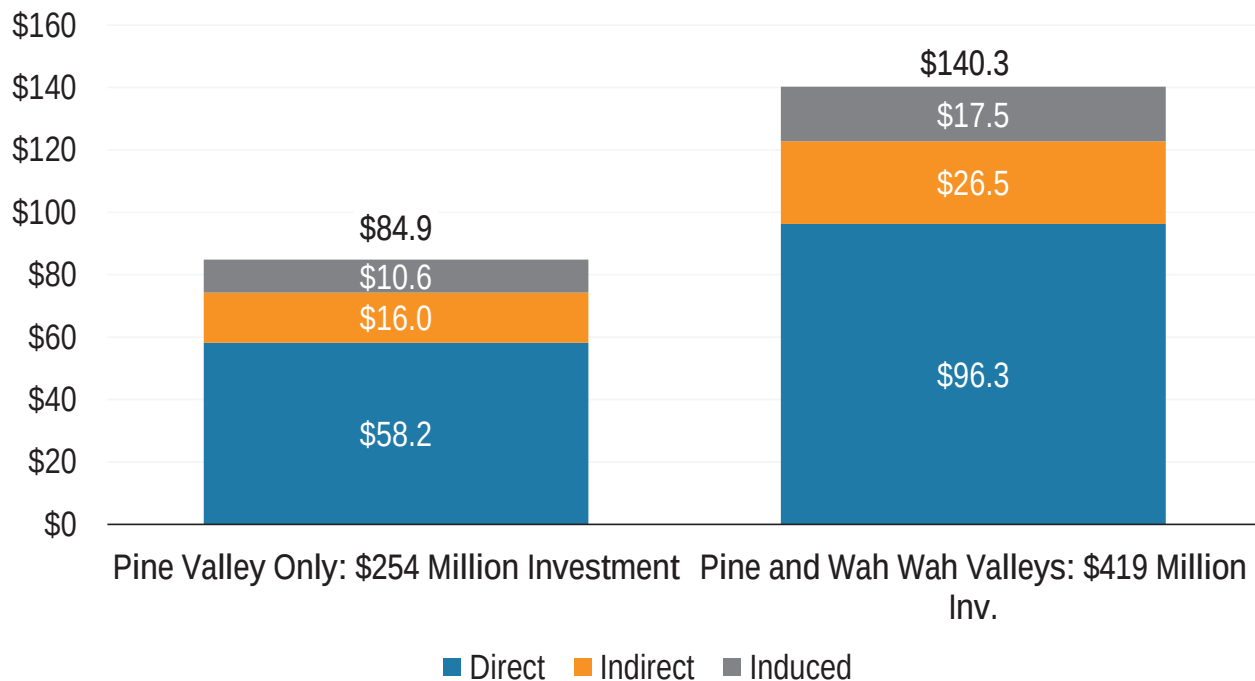
Note: Indirect and induced impacts sourced to IMPLAN; employment stated in person-years of employment (i.e., one person employed for an entire year).

WATER RESOURCE
ECONOMIC AND FISCAL ANALYSIS



One-Time Economic Impact of Infrastructure Investments

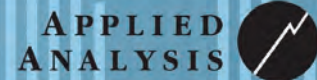
Economic Impact Summary: Wages and Salaries



The potential economic impacts sourced to large-scale investment in infrastructure are significant with \$606 million in output, supporting approximately \$140 million in wages and an estimated 5,100 person-years of employment.

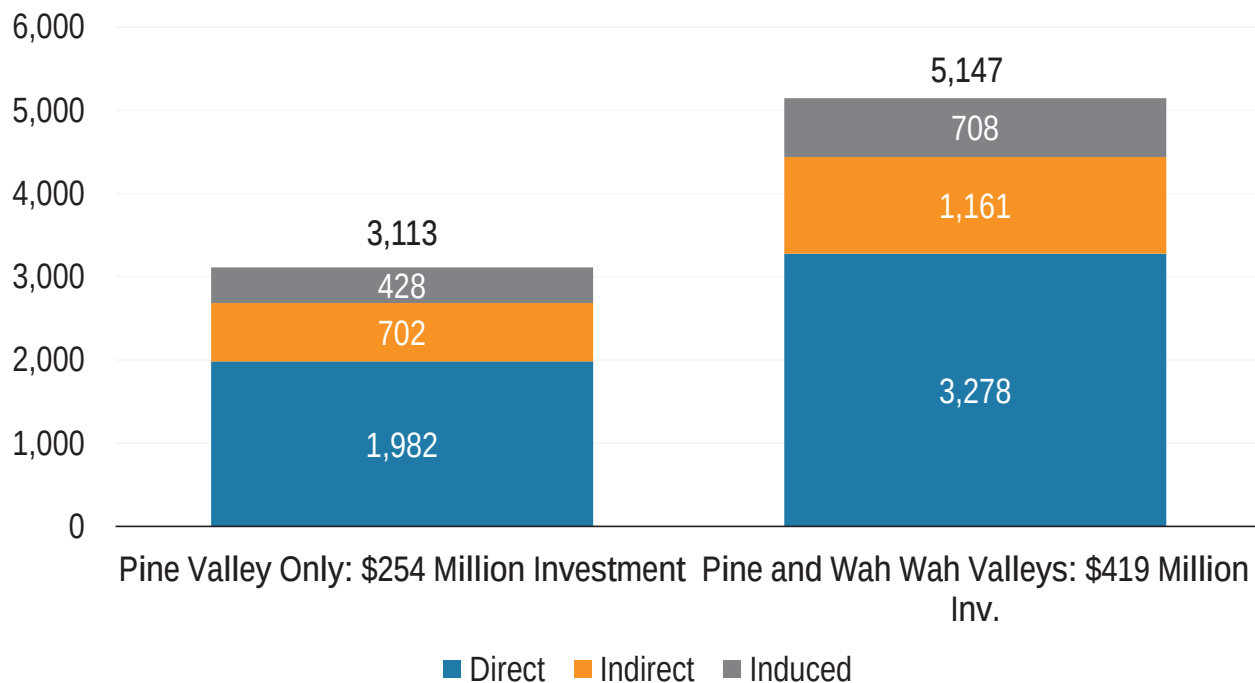
Note: Indirect and induced impacts sourced to IMPLAN; employment stated in person-years of employment (i.e., one person employed for an entire year).

WATER RESOURCE
ECONOMIC AND FISCAL ANALYSIS



One-Time Economic Impact of Infrastructure Investments

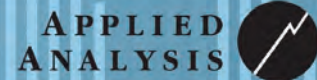
Economic Impact Summary: Employment



The potential economic impacts sourced to large-scale investment in infrastructure are significant with \$606 million in output, supporting approximately \$140 million in wages and an estimated 5,100 person-years of employment.

Note: Indirect and induced impacts sourced to IMPLAN; employment stated in person-years of employment (i.e., one person employed for an entire year).

WATER RESOURCE
ECONOMIC AND FISCAL ANALYSIS



Appendix B

FUNDING SOURCE INFORMATION

Overview

Funding sources investigated for the Pine Valley Water Supply project are summarized in Tables B.1 and B.2.

The larger funding programs, typically focused on implementation projects, provide the best opportunity to obtain large sources of funding. Smaller grants and loans can also be pursued for planning and design activities as they will be helpful in building relationships with funding agencies and reduce the financial burden on the Central Iron County Water Conservancy District (CICWCD). Viable Federal and State funding opportunities for Design, and/or Construction activities, include:

- United States Environmental Protection Agency (EPA) - Water Infrastructure Finance and Innovation Act (WIFIA) (Design/Construction Loan).
- State of Utah Department of Environmental Quality (DEQ) Drinking Water State Revolving Fund (DWSRF) Program – Planning/Design Advances.
- State of Utah DEQ, DWSRF Program – Construction Loan.
- Combination of DEQ’s DWSRF Program and WIFIA Financing (Design/Construction Loan).
- Utah Department of Natural Resources (Division of Water Resources) (Design/Construction Loan).
- State of Utah Permanent Community Impact Fund (CIB).
- State Bonding Bill = Special Project.
- Private Equity Financing.

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Table B.1 Funding Source Summary

Program	Agency	Type	Description	Deadline	Contact Information
Federal					
WIFIA	EPA	Loan	- Financing mechanism for water and wastewater infrastructure projects, which provides financing for large dollar-value water/wastewater projects. Projects must cost more than \$20 million or \$5 million for small community projects (25,000 or fewer) (projects can be combined and submitted as a group of projects). Program provides reimbursement of expenses incurred (similar to the State Revolving Fund [SRF] program). - Cover planning/design (retroactive) and construction activities. - Maximum amount of the loan cannot exceed 49% of the project costs. Requires 51% match (can include SRF or other programs). - The total WIFIA and other federal funding sources shall not exceed 80% of total project cost. - Single fixed rate established at closing – may receive multiple disbursements over several years. - Interest at a fixed rate, calculated by adding one basis point (0.01%) to the rate of securities of a similar maturity (based on the weighted-average life of the WIFIA Loan) as published, on the execution date of the WIFIA Loan Agreement, in the United States Treasury Bureau of Public Debt’s daily rate table for State and Local Government Series (SLGS) securities, currently located on the Internet at https://www.treasurydirect.gov/GA-SL/SLGS/selectSLGSDate.htm. - Maximum loan term is 35 years (or useful life of the project). - Payments maybe deferred 5 years after substantial completion). Payments are semi or annual installments. - Customized repayment schedule to match anticipated revenues and expenses. - Application fees apply (average \$300,000-\$700,000 pending reviews and legal negotiations). - Reserve requirement – 1 year repayment. - Requires compliance with federal requirements (National Environmental Policy Act [NEPA], American Iron and Steel [AIS], Davis Bacon, etc.). - Project completion in 5 years (preferred) up to 7 years. Funding Use: Design (includes environmental, legal, right of ways, etc.) and Construction.	Typical funding opportunity announcement (FOA) in spring Schedule: - Letter of Interest due April/July - Notification of Invitation to apply in late October/ early November 1 year to submit complete application	Karen Fligger 202-564-2992 Jordan Dorfman 202-564-0614 https://www.federalregister.gov/documents/2017/01/10/2016-31828/notice-of-funding-availability-nofa-for-applications-for-credit-assistance-under-the-water
<i>Potential funding program for the project.</i>					

Program	Agency	Type	Description	Deadline	Contact Information
United States Bureau of Reclamation (USBR) Grants					
WaterSMART Water and Energy Efficiency Grants <i>Potential funding program for the project.</i>	USBR	Grant	Eligible projects include projects that result in quantifiable and sustained water savings, increase renewable energy use and improve energy savings, and support broader water quality sustainability benefits. Does not cover reuse or recycled water implementation projects. Projects that benefit endangered and threatened species, support water sustainability benefits, or implement activities to address climate related impacts on water may apply. Requires a 50% cost share. Two funding limits: \$300,000 (typically for projects completed within a year; and up to \$1,000,000 (for projects to be completed in 3 years).<i>Total funding earmarked for Water Marketing and Water & Energy Efficiency Grants of \$34 million for 2019.</i>	Varies	Josh German 303-445-2839 https://www.grants.gov/web/grants/view-opportunity.html?oppld=290172
Drought Contingency Planning <i>Not applicable.</i>	USBR	Grant	- Provides grant funding to entities to support the development of a Drought Management Plan or to update an existing Drought Management Plan. Grant funding requires a 50/50 cost share. Funding up to \$200,000. Sets an entity up for Drought Project FOA. Funding Use: Drought Contingency Planning Document		Darion Mayhorn 303-445-3121
Drought Resiliency Projects <i>Potential funding program for the project.</i>	USBR	Grant	- Funding is for implementation projects building long-term resiliency to drought and reduce the need for emergency response actions that are identified in a Drought Contingency Plan. Projects eligible for funding should address at least one the following: serve to increase the reliability of water supply; improve water management; implement systems to facilitate voluntary water sales, transfers, or exchanges; and provide benefits for the environment are eligible. Types of projects include moving pipelines, small recycling, storage reservoir construction, and projects that increase flexibility in drought. Two Funding: Group 1 \$300,000 (complete in 2 years); Group 2 \$750,000 (complete in 3 years). Funding Use: Implementation		Darion Mayhorn 303-445-3121
United States Department of Agriculture (USDA)					
Water and Waste Disposal Predevelopment Planning Grants in Utah <i>Not applicable - CICWCD does not meet population criteria. Included in case applicable to a community benefiting from project.</i>	Rural Develop.	Grants Loans	- This program assists low-income communities with initial planning and development of applications for USDA Rural Development Water and Waste Disposal direct loan/grant and loan guarantee programs. Requirements: - Population must be less than 10,000 people. - Median household income below the poverty line or less than 80% of the statewide non-metropolitan median household income. - Maximum grant amount of \$30,000 or 75% of the predevelopment planning costs. 25% cost share from applicant or third-party sources. Funding Use: Planning		Heath Price, Community Programs Director 801-524-4325 Pam Snedeger (435) 893-3349 https://www.rd.usda.gov/programs-services/water-waste-disposal-predevelopment-planning-grants/ut
Rural Water Loan Fund (RWLF) <i>Not applicable - Financing is too small in amount. Included in case applicable to a community benefiting from project.</i>	National Rural Water Association	Loan	- RWLF is a funding program specifically designed to meet the unique needs of small water and wastewater utilities. The RWLF provides low-cost loans for short-term repair costs, small capital projects, or pre-development costs associated with larger projects. The RWLF was established through a grant from the USDA/Rural Utilities Service, and repaid funds used to replenish the fund and make new loans. Loan amounts may not exceed \$100,000 or 75% of total project cost, whichever is less. Loan offers below market interest rate and maximum repayment period of 10 years. Funding Use: Planning		nrwarwlf@nrwa.org 1-800-332-8715

Program	Agency	Type	Description	Deadline	Contact Information
Rural Utilities Service Offices	Electric Program	Loan	Provides financing for basic infrastructure including electricity, telecommunications and water/waste systems. The Electric Program offers loans and loan guarantees for generation, transmission, and distribution facilities serving rural areas. The Energy Efficiency and Conservation Loan Program expands the types of projects that can be supported by the Electric Program to include energy efficiency activities, including distributed generation for on or off grid renewable energy systems. The High Energy Cost Grant Program offers competitive grants for community energy facilities, including renewable energy systems and energy efficiency projects serving extremely high energy cost rural communities.		
<i>Project element specific – perhaps for pumping facilities. Low award amounts.</i>	Energy Efficiency and Conservation Loan Program				
	High Energy Cost Grant Program				
Department of Energy					
Energy Efficiency Block Grants	Energy Efficiency and Renewable Energy	Loans, Grants or Incentives	Provides funds for energy efficiency and conservation programs and projects communitywide, as well as renewable energy installations on government buildings. This grant program is funded through the 2009 American Recovery and Reinvestment Act and its availability varies from year to year and, depending on the timing, this funding may or may not be available.		https://www.energy.gov/eere/wip/o/energy-efficiency-and-conservation-block-grant-program
State					
State Drinking Water SRF Loan Program	Utah DEQ - SRF Program Administered by Utah Division of Water Quality	Loan	- Utah’s DWSRF provides low interest loans to public water systems to finance the cost of infrastructure projects needed to achieve or maintain compliance with SDWA requirements in Utah. Projects funded through the SRF may receive funding from the following: (a) SRF Capitalization Grants; (b) SRF loan repayments; and (c) State matching funds. Currently projects are awarded funding based on readiness to proceed (based on current demand), however there is a foreseeable demand on the program through 2025 due to several large projects requesting funding. As monies are from both Federal and State sources - federal requirements apply including NEPA, A&E Procurement, AIS, Davis Bacon, and other requirements. Requires Engineering Report. - The Program can fund Planning, Design, and Construction. Planning and Design are Advances/Grants and Construction funds are provided as low Interest loans. - Scored and given a priority point. - Low interest 2-4%. 20 year loan term (or life of project). - Up to 18 months prior to first repayment. Payment schedule is likely annual. - Origination fee of 1% (normally paid at closing – 1 time). - Debt service reserve account – Annual (at a min) deposits to an account in the amount of one-tenth of the annual payment on the bond(s) purchased by the Board. Continue until the total amount in the debt service reserve fund is equal to the annual payment. - Capital Facilities Replacement Reserve account – 5% of agency’s drinking water system’s annual operating budget including debt service and depreciation until bond is redeemed. - No early pre-payment penalty.	Ongoing	Michael Grange 801-536-0069 mgrange@utah.gov https://deq.utah.gov/drinking-water/state-revolving-fund-srf-drinking-water
<i>Potential funding program for construction of the project.</i>					
			Funding Use: Construction or Design/ Construction		

Program	Agency	Type	Description	Deadline	Contact Information
State Drinking Water SRF - Planning and Design Advances <i>Potential funding program for the planning and design of the project.</i>	Utah DEQ - Program - Division of Water Quality	Grant	- Through the SRF Program, Utah's Division of Water Quality may provide advance funding for the Planning and Design of SRF applicable projects (especially to help smaller communities). As the project progresses from the Planning to the Design phase, the advances are rolled into the SRF Construction loan for repayment (in order to recapture the Planning/Design grants). Projects that do not proceed to design and/or construction are still required to repay the advance. - No match - however, if a match is provided, it demonstrates a strong community investment in the project under consideration. Funding Use: Planning and Design	Ongoing	Michael Grange 801-536-0069 mgrange@utah.gov
Green Project Reserve (GPR)	Utah (DEQ) - Program Administered by Utah Water Quality Board and Division of Water Quality	Grant	- To the extent there are sufficient eligible project applications, not less than 20% of the SRF funds shall be for projects, or portions of projects, that include green infrastructure, water or energy efficiency improvements or other environmentally innovative activities. GPR projects must address water or energy efficiency, mitigate stormwater runoff, or encourage sustainable project planning, design and construction. Loan principal forgiveness is available for GPR projects with a forgiveness limit of 50% for construction costs and 75% for planning costs. Funding Use: Construction and Planning	Ongoing	
Financial Assistance Program - Revolving Construction Fund, Cities Water Loan Fund and Conservation and Development Fund <i>Potential funding program for construction of the project.</i>	Utah Department of Natural Resources (Division of Water Resources)	Loan	- Three revolving construction loan programs (Revolving Construction Fund, Cities Water Loan Fund and Conservation and Development Fund). Funding is available for projects that conserve, protect, or more efficiently use present water supplies, develop new water, or provide flood control (e.g., agricultural projects, canal lining, flood control, dam construction, water facilities, etc.). Cities Water Loan Fund provides assistance to districts for the construction of municipal water projects. The Conservation and Development Fund helps finance large construction projects, e.g., dams and large municipal drinking water systems. To be eligible, the project cannot be routine operation and maintenance, not sponsored by a developer or private entity, and cannot be for a domestic water system where less than half of residents live in the service area year round. Funds cannot be used for construction of treatment facilities but can be used for infrastructure, storage, and land application). - Provides for zero to low-interest (around 3% or less) funding (loans or bonds) for water projects statewide. - Loan term is generally less than 25 years. - Requires a 15-25% cost share (match) from applicant. - Grants are only provided for dam repair projects. - Program is funded by the state of Utah (do not have to comply with federal compliance requirements including architecture and engineering (A&E) procurement, AIS, Davis Bacon, etc.). Funding Use: Design and Implementation	Ongoing <i>(however, set application deadlines to prepare for Board Meeting)</i>	Todd Stonely 801-538-7277 Joel Williams 801-538-7249 https://water.utah.gov/funding.html
Permanent Community Impact Fund <i>Potential funding program for the project. Perhaps pursue for planning and design phase?</i>	Permanent Community Impact Fund Board	Loans and Grants	- The Permanent CIB is a program which provides loans and/or grants to state agencies and subdivisions of the state which are or may be socially or economically impacted, directly or indirectly, by mineral resource development on federal lands. CIB can fund the following types of activities: planning, construction and maintenance of public facilities, and provision of public services. Total participation in any given project will generally be limited to a maximum of \$5,000,000 regardless of grant/loan mix. Planning, study or design requests require 50% match (match cannot be donated labor or staff time; has to have a demonstrated value (e.g., real property)). Funding Use: Planning, Design and Implementation (pending County)	Funding cycles by trimester: 1st Trimester - June 1 2nd Trimester - Oct. 1 3rd Trimester - Feb 1	Candace Powers, CIB Program Manager 801-468-0131 cpowers@utah.gov https://jobs.utah.gov/housing/cib/

Program	Agency	Type	Description	Deadline	Contact Information
Community Development Block Grants	Housing & Community Development	Grant	- The Community Development Block Grant program provides grants to Cities of <50,000 or Counties <200,000. <i>Small Cities Program</i> is targeted to assist in developing viable communities by providing decent housing and a suitable living environment and expanding economic opportunities, principally for persons of low and moderate incomes. Grants range \$25,000 to \$200,000.		https://jobs.utah.gov/housing/community/cdbg/index.html
U-Save Energy Efficiency Fund	Governor's Office of Energy Development	Loan	Finances energy efficiency improvements, including retrofits and new construction enhancements, for public buildings owned by school districts, cities, and counties.		Shawna Cuan scuan@utah.gov
Other					
Wattsmart Business Program	Rocky Mountain Power	Grant	- To provide planning and design advances to communities in need of assistance (e.g. when the cost of water or wastewater improvements increase rates above 1.4% modified adjusted gross income [MAGI]). These advances turn into grants and do not need to be repaid. Funding Use: Planning and Design		
Private Equity Funding	Private Industry/ Company	Loan	- Ridgewood Infrastructure – private investment group that partners with public agencies to provide private equity funding for water and energy infrastructure in the United States. - Provides financing for planning, design and construction. Full or specific aspects of projects. - Project costs minimum is \$50M-\$200M; can fund CICWCD Project. - Loan term flexible –20-30-year note. - Repayment structure is flexible to fit CICWCD needs (semi-annual or annual); can repay interest only or interest and capital. - Interest rate is comparable to the market rate (8-10%). - No early payment penalty. - No strings or requirements (e.g., NEPA, federal requirements, etc.). - Ridgewood would be more involved in project design, construction, and potentially operations (could be P3 or hybrid). - Potential conflict with other funding sources due to private financing.		
Long Term Effort or Track Future Funding					
Water Infrastructure Restricted Account (WIRA)	State of Utah - Legislature/ Governor's Bonding Bill/Budget	Loan	- Pursuit of project financing via Governors special projects or legislative action (via local State Representative) such as: - SB281 – Water Infrastructure Restricted Account (WIRA) - Designated for financing the Bear River Project and the Lake Powell Pipeline Project; and for issuing revolving loans to repair and replace some existing federal water infrastructure. One time appropriation from the General Fund for \$5 million has been placed in the account. Financed through bonds issued by the State for the development of waters of the Bear and Colorado Rivers. Administered by the Division of Water Resources.		Long-term pursuit but worth investigating if broader range of benefits – Discuss with State and/or legislative lobbyist.
Special Appropriation Act Projects	EPA	Grant	Difficult to secure.		Discuss with Federal Legislative Lobbyist as to feasibility
America's Water Infrastructure Act 2018 Programs	EPA	Loans/ Grants	H.R. 3387 Drinking Water System Improvement Act of 2017. Pending appropriations there maybe potential funding programs for the CICWCD Project.		

Table B.2 Funding Source Details

Program	Agency	Type	Description
Federal			
WIFIA	EPA	Loan	• Funding for Planning and Design (retroactive is okay) and Construction Activities. • Program provides for the reimbursement of incurred expenses. • Requires compliance with federal requirements (NEPA, AIS, Davis Bacon, etc.). • 49% of the eligible project costs; 51% match by agency (total federal funding < 80% of project cost). • Loan term is 35 years (or useful life of the project); Payments maybe deferred 5 years after substantial completion. • Single fixed interest rate set at closing. Rate is calculated by adding one basis point (0.01%) to the rate of securities of a similar maturity (based on the weighted-average life of the WIFIA Loan). • Customized repayment schedule to match anticipated revenues and expenses (typ. semi or annual installments). • Application fees apply (average \$300,000-\$700,000 pending reviews and legal negotiations). • Reserve requirement – 1 year. • Project completion in 5 years (preferred) up to 7 years. • Annual application cycle (April-July period).
WaterSMART Water and Energy Efficiency Grants	USBR	Grant	• Projects that result in quantifiable and sustained water savings, increase renewable energy use and improve energy savings, and support broader water quality sustainability benefits. • Two funding limits: \$300,000 (typically for projects completed within a year or \$1,000,000 (for projects to be completed in 3 years). • Match requirement of 75%.
Drought Resiliency Plans	USBR	Grant	• Funding to support the development of a Drought Management Plan or to update an existing Drought Management Plan. • Funding up to \$200,000. • Match requirement of 50%.
Drought Resiliency Projects	USBR	Grant	• Funding for the implementation of projects that build long-term resiliency to drought/reduce the need for emergency response actions. Projects must be identified in a Drought Contingency Plan or similar. • Two Funding: Group 1 \$300,000 (complete in 2 years); Group 2 \$750,000 (complete in 3 years). • Match requirement of 75%.
Water & Waste Disposal Pre- development Planning Grants	USDA - Rural Develop.	Grant/ Loans	• Funding assistance for low-income communities for initial planning and development of applications for USDA Rural Development Water and Waste Disposal programs. • Population must be less than 10,000 people. • Median household income below the poverty line or less than 80% of the statewide non-metropolitan median household income. • Maximum grant amount of \$30,000 or 75% of the predevelopment planning costs. • Match Requirement: 25% cost share from applicant or third-party sources.
Rural Water Loan Fund (RWLF)	USDA - National Rural Water Assoc.	Loan	• Program provides small water and wastewater utilities with low-cost loans for short-term repair costs, small capital projects, or pre-development costs associated with larger projects. • Maximum loan amounts \$100,000 or 75% of total project cost, whichever is less. • Below market interest rate. • Maximum repayment period of 10 years.

Program	Agency	Type	Description
State			
State Drinking Water State Revolving Fund Loan Program (SRF)	Utah DEQ - Utah Division of Water Quality	Loan	- Funding for Planning, Design, and Construction activities for public water systems to finance the cost of infrastructure projects. - Requires compliance with federal requirements apply (NEPA, A&E Procurement, AIS, Davis Bacon, and others). - Interest rate varies 2-4% and based on community. - Loan term – 20-40 years or life of project (pending Disadvantaged Community etc.) rkempe@sbcglobal.net. - Up to 18 months prior to first repayment. Annual payment schedule. - One-time origination fee of 1% (normally paid at closing). - Debt service reserve account – Required to deposit in the amount of one-tenth of the annual payment on the bond(s) purchased by the Board until the amount in the reserve fund is equal to the annual payment. - Capital Facilities Replacement Reserve account – 5% of agency's drinking water system's annual operating budget including debt service and depreciation until bond is redeemed. - No early pre-payment penalty. - On-going application cycle.
State Drinking Water SRF - Planning and Design Advances	Utah (DEQ) - Division of Water Quality	Grant	- Advances (loan forgiveness) for Planning and Design activities of SRF applicable projects. As the project progresses from the Planning to the Design and eventually construction phase, the advances are rolled into the SRF Construction loan for repayment. - No Match – however, if a match is provided, it demonstrates a strong community investment in the project under consideration. - Projects that do not proceed to design and/or construction are still required to repay the advance.
Green Project Reserve (GPR)	Utah (DEQ) - Water Quality Board and Division of Water Quality	Grant	- SRF grant funding for projects that include green infrastructure, water or energy efficiency improvements or other environmentally innovative activities. GPR projects must address water or energy efficiency, mitigate stormwater runoff, or encourage sustainable project planning, design and construction. - Loan principal forgiveness of 50% for construction costs and 75% for planning costs. - Program capacity is 20% of total SRF funds.
Financial Assistance Program - Revolving Construction Fund, Cities Water Loan Fund and Conservation and Development Fund	Utah Department of Natural Resources (Division of Water Resources)	Loan	- The Revolving Construction Fund, Cities Water Loan Fund and Conservation and Development Fund provide loan funding for projects that conserve, protect, or more efficiently use present water supplies, develop new water, or provide flood control. Cities Water Loan Fund provides assistance to districts for the construction of municipal water projects. Conservation and Development Fund helps finance large construction projects, like dams and large municipal drinking water systems. - Public entity. - Provides for zero to low-interest (around 3% or less) funding. - Loan term: less than 25 years. - Requires a 15-25% cost share (match) from applicant. - Grants are only provided for dam repair projects. - State funds so does NOT have to comply with federal compliance requirements.
Permanent Community Impact Fund	Permanent Community Impact Fund Board	Loans and Grants	- Provides loans and/or grants to state agencies and subdivisions of the state, which are or may be socially or economically impacted, directly or indirectly, by mineral resource development on federal lands. - Types of activities: planning, construction and maintenance of public facilities, and provision of public services. - Maximum award of \$5,000,000 regardless of grant/loan mix. - Planning, study or design requests require 50% match (match has to have a demonstrated value).
Community Development Block Grants	Housing & Community Development	Grant	<i>Small Cities Program</i> is targeted to assist in developing viable communities by providing decent housing and a suitable living environment and expanding economic opportunities, principally for persons of low and moderate incomes. - Grants to Cities of <50,000 or Counties <200,000. - Grants range \$25,000 to \$200,000.

Program	Agency	Type	Description
Other			
Wattsmart Business Program	Rocky Mountain Power	Grant	To provide planning and design advances to communities in need of assistance (e.g., when the cost of water or wastewater improvements increase rates above 1.4% MAGI). These advances turn into grants and do not need to be repaid.
Private Equity Funding	Private Industry/ Company	Loan	- Ridgewood Infrastructure – private investment group which partners with public agencies to provide private equity for water and energy infrastructure in the United States. - Provides financing for planning, design and construction. Full or specific aspects of projects. - Project costs minimum is \$50M-\$200M; can fund CICWCD Project. - Loan term flexible – 20-30-year note. - Repayment structure is flexible to fit CICWCD needs (semi-annual or annual); can repay interest only or interest and capital. - Interest rate is comparable to the market rate (8-10%). - No early payment penalty. - No strings or requirements (e.g. NEPA, federal requirements, etc.). - Ridgewood would be more involved in project design, construction and potentially operations (could be P3 or hybrid). - Potential conflict with other funding sources due to private financing.
Water Infrastructure Restricted Account (WIRA)	Utah Governor's/Legislature/ Bonding Bill/Budget	Loan	- Pursuit of project financing via Governors special projects or legislative action (via local State Representative) such as - SB281 – Water Infrastructure Restricted Account (WIRA).
Special Appropriation Act Projects	EPA	Grant	Funds dedicated to project via a special appropriation. Difficult to secure.
America's Water Infrastructure Act 2018 Programs	EPA	Loans/ Grants	Track to see what programs are funded through H.R. 3387 Drinking Water System Improvement Act of 2017. Pending appropriations there maybe potential funding programs for the CICWCD Project.

EXHIBIT G

Review of Economic and Financial Analysis Supporting the Proposed
Pine Valley Water Supply Project

Ryan Stifter and Anrew Zdon, Roux Associates, Inc.

January 5, 2026

Date:	January 5, 2026
To:	Keven Whicker, Beaver County Natural Resource Specialist Beaver County Board of Commissioners
From:	Ryan Stifter, M.S., Roux Andrew Zdon, P.G., Roux
Subject:	Review of Economic and Financial Analysis Supporting the Proposed Pine Valley Water Supply Project

Introduction

This memorandum providing technical comments on the economic and financial analysis prepared in support of the Administrative Final Environmental Impact Statement (AFEIS) for the Central Iron County Water Conservancy District's (CICWCD) acquisition of right-of-way permits from the Bureau of Land Management (BLM) to construct portions of the Pine Valley Water Supply project (PVWSP) has been prepared by Roux Associates, Inc. (Roux) on behalf of the Beaver County Commissioners (Beaver County) at their request.

The PVWSP is the first phase of the three-phase West Desert Water Supply and Conservation Project (Project). In 2019, CICWCD acquired Project groundwater rights in the amount of 15,000 acre-feet per year (AFY) in Pine Valley and 11,000 AFY in Wah Wah Valley, located in Beaver County, Utah. CICWCD also maintains applications for Project water rights in Hamlin Valley in the amount of 10,000 AFY, which also are intended to serve a future phase of the Project. As proposed, the PVWSP comprises 15 groundwater production wells within the Pine Valley basin; 70 miles of lateral and main pipeline; a 200-acre solar field; 11.7 miles of power transmission lines; 6.1 miles of access roads; and a 10-million-gallon water storage tank site.

A *Financial Business Plan and Water Needs Assessment* prepared in 2020 by Carollo Engineers ("Carollo 2020 Analysis") evaluated six alternative water supply scenarios for meeting CICWCD's future municipal and industrial (M&I) water demand and endorsed the PVWSP that would import water via pipeline from Beaver County to the CICWCD service area. In 2023, Carollo updated its analysis ("Carollo 2023 Analysis") with more recent baseline water consumption rates for water demand projections and a proposed financing arrangement debt for capital project development costs assumed by CICWCD and repaid through water sales. Water rates paid by Cedar City and Enoch City are forecast to increase by more than 500 percent (from 2019 levels) by as early as by 2035. Carollo's financial feasibility addresses *only* the PVWSP cost and Roux necessarily evaluates only the economics of the first Project phase.

Summary of Findings

1. Capital Development Costs Are Significantly Underestimated. PVWSP capital costs have risen sharply since 2019, with inflation and material price increases pushing current estimates far above original projections. Depending on the index used, current costs could range from \$360.8 million to \$679.2 million, compared to the initial \$259.1 million estimate (in 2019 dollars). Water rights mitigation and monitoring costs, which are essential due to projected drawdowns and potential impacts on springs, were excluded from previous financial models. Roux estimates total monitoring costs over 50 years at present value \$15 million. An estimate of mitigation costs is not possible based on the information available as such a program has not yet been proposed.

2. Financing Assumptions are Unrealistic. Roux's analysis questions the feasibility of relying on low-interest rate federal loan programs to cover 74% of project capital costs, given limited appropriations and high nationwide demand for drinking water infrastructure investment projects. Annual debt service costs funded by water rate increases are underestimated, as current interest rates and potential funding shortfalls could add millions annually to project expenses.
3. Operation & Maintenance (O&M) Costs are Underestimated. O&M costs could be 2–10 times higher than estimated, with the existing estimates lacking supporting evidence and failing to adequately account for inflation.
4. Population Forecasts Used for Water Demand Projections are Outdated. CICWCD relies on an obsolete population forecast, which overstates future M&I water demand in the CICWCD service area. Updated projections suggest a much lower future deficit, which could be offset by agricultural water savings.
5. Planned Water Rate Increases Will Reduce Consumption. The financial model assumes water demand is unaffected by price, ignoring established microeconomic principles. In reality, the significant rate hikes will lead to reduced consumption, and lower revenues, resulting in the need for further rate increases.
6. Demand-Side Conservation Measures May Play a Larger Role. Tiered water pricing structures are proven to achieve conservation, but the existing regimes of CICWCD and its wholesale customers are far more conservative than in peer jurisdictions where more significant declines in water use were achieved. Carollo should quantify a CICWCD demand scenario reflecting contemporary tiered pricing.
7. Revised Water Rate Forecasts are Not Readily Computed. The extent of additional water rate increases necessitated to cover actual project costs, anticipated water purchase shortfalls, and uncertain financing costs is indeterminable because the annual rate increases are not computed within Carollo's Excel Spreadsheet model, and it is unclear whether the specific input parameters and all relevant data necessary even to replicate the modeled rate increases have been made available.
8. Economic Benefits of the PVWSP are Overstated. The projected local economic impact is inflated by assuming all capital spending remains within the region, despite substantial leakage (e.g., raw steel production occurs elsewhere). Additionally, higher water rates may shift household spending away from sectors with greater economic multipliers, resulting in a net loss.

These findings are based on the available documentation. Roux may consider revising these findings if additional documentation provides evidence that such revisions are appropriate.

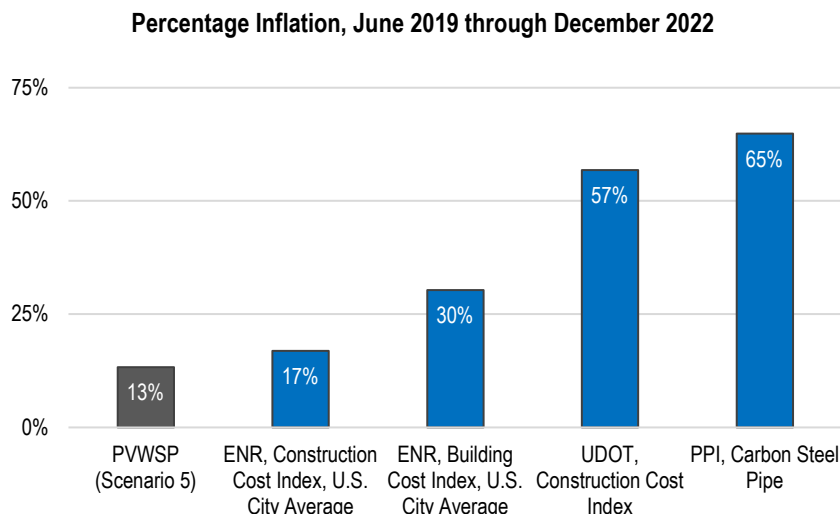
PVWSP Costs are Underestimated

The following sections provide comments on the reasonableness and accuracy of PVWSP costs presented in Carollo's 2023 Analysis. Among the aspects evaluated are implementation of inflation adjustments to previous cost estimates, the scope of anticipated costs, capital financing, monitoring and mitigation costs, and O&M cost estimates.

PVWSP Capital Costs are Substantially Higher than the Original Estimate

PVWSP capital costs were originally estimated at \$259.1 million in 2019 dollars.¹ Carollo later restated the cost at \$293.6 million in 2022 dollars—a 13% increase—without providing a basis for the adjustment.

Notwithstanding an apparent error, Carollo would have forecast greater water rate escalation had it followed the standard practice of measuring inflation with recognized price indexes.²



Notes: PVWSP Scenario 5 refers to water supply alternative 5 in the Carollo Analyses published in 2020 and 2023. ENR is Engineering News-Record. UDOT is Utah Department of Transportation. PPI is Producer Price Index.

For example, the *Engineering News-Record* (ENR) Building Cost Index shows 30% inflation, while carbon steel pipe prices—representing over half of the hard costs—rose 65%.³ These data suggest that 2022 costs were 30–65% higher than in 2019, and capital costs were \$382 million–\$485 million in 2022 dollars. Inflation has persisted after accelerating during the COVID-19 pandemic, with increases of 39–163% between June 2019 and June 2025 across key indexes. Applying these measures puts current capital costs between \$361 million and \$679 million. This adopts the unit cost estimate produced by Ensign Engineering (Ensign) in 2019—assessing its accuracy is outside the scope of Roux’s analysis.

Water Rights and Environmental Mitigation Costs are Excluded

Water rights in the Pine Valley basin are threatened by PVWSP operations. The United States Geological Survey’s model projects a 5-foot drawdown across 1,000 square miles, potentially drying springs appropriated by senior water rights owners. Additionally, senior groundwater rights throughout the area of drawdown stand to be impacted. Carollo’s cash flow model excludes both monitoring and mitigation costs for these water rights impacts. Additionally, the costs to mitigate impacts to environmental resources throughout the area of drawdown also are excluded.

Roux estimates monitoring costs alone at present value \$15 million (2022 dollars). One-time capital costs total \$12.0 million for eight paired wells (depths of 1,500 ft and 350 ft) at \$1.5 million per pair, including instrumentation, baseline analyses, geological logging, and related expenses. Annual monitoring costs are \$100,000 for four events at \$25,000 each. Monitoring costs over 50 years equal \$5 million undiscounted, and \$3 million, discounted to present value at a 2.3% real annual discount rate.⁴ At approximately \$20,000 per AFY, the total cost of compensating impaired water rights would likely greatly eclipse the total monitoring cost. However, these costs are not quantifiable because the specific water rights, impaired quantities, and timing of impairment are highly uncertain absent submission of a Project monitoring and mitigation plan.

Debt Service Costs are Underestimated

It is unclear whether the Water Infrastructure Finance and Innovation Act (WIFIA) and State Revolving Fund (SRF) loans can cover 74% of PVWSP capital costs. These programs fall far short of existing demand. Meeting the USEPA's projected 20-year nationwide drinking water infrastructure investment needs using a similar loan portfolio would require \$462 billion in WIFIA and SRF funds, yet their combined fiscal 2025 appropriations total less than \$2.8 billion.⁵ CICWCD's assumed reliance on WIFIA loans for 49% of capital costs equates to more than four years of the program's annual federal appropriation.⁶ Moreover, Congress is considering cuts to these programs. Given this reality, securing government loans in the amount assumed by Carollo is subject to significant uncertainty, and financing PVWSP capital costs using higher cost revenue bonds may be necessary. Even if WIFIA and SRF loans were available, debt service costs would still be underestimated. Current 30-year Treasury yields—the basis for WIFIA interest rates—are 4.85%, or 165 basis points higher than in the Carollo 2020 Analysis.⁷ Uncertainty about the availability of government loans and rising interest rates each add millions of dollars annually to projected debt service costs, thereby requiring even higher future water rates to cover PVWSP capital costs than Carollo projects.

Carollo's Underestimated Debt Service Costs, Alternative Water Supply Scenario 5, Carollo 2023 Analysis

Optimal Funding Scenario	Interest Rate	Debt Service Cost, \$MM/year	Difference, \$MM/year	Difference, Percentage
Carollo	3.33%	\$24.3	–	–
Revenue Bonds Only ^a	5.00%	\$27.4	\$3.1	12.8%
Carollo, Current Rates	4.17%	\$26.8	\$2.5	10.3%

Notes: a/ Assumes revenue bonds repaid over 30 years at 5% annual interest fund the assumed 99% of PVWSP capital costs.

Operation & Maintenance Costs are Underestimated

CICWCD omits any explanation or discussion regarding the basis for PVWSP O&M costs, which are underestimated. O&M costs (Carollo 2023 Analysis Scenario 5) are estimated at \$64 million in 2019 dollars, but Carollo fails to adjust for inflation through 2022. Annual O&M of \$1.52 million (adjusted to 2022 dollars following Carollo's model) is approximately 0.5% of the \$294 million capital cost, far below the typical 1% to 5% figure.⁸ Actual O&M costs could be 2–10 times greater *before* considering the revised PVWSP capital cost estimates with an adequate accounting of inflation since 2019. The existing O&M cost estimate is also undocumented—it is simply a formula without reference to a source document.⁹ Ability to scrutinize its basis is important because O&M materially impacts CICWCD's cash flow—the \$180 million nominal cost (as Carollo estimates it) is more than three-quarters of CICWCD's baseline projected operating expenses.

Cumulative Impact of Carollo's Cost Underestimation and Unquantified Uncertainty

Roux's analysis finds that Carollo significantly underestimates the cost of constructing, financing, and operating the PVWSP. The following inputs and assumptions were developed to quantify the degree to which Carollo's cost estimates are understated and their degree of uncertainty:

- 30% (low) to 65% (high) inflation between 2019 and 2022 applied to the 2019 estimate by Ensign.
- Carollo assumed financing (low) or entirely financed by revenue bonds (high).
- Annual O&M (infrastructure) costs equal 1% (low) to a conservative 1.5% (high) of the estimated capital cost.
- Capital costs are annualized over the 50-year project life applying an assumed 5% discount.

Roux's estimated ranges for the costs of specific PVWSP components that result from applying these parameters are presented alongside Carollo's estimates in the following chart:

Comparison of PVWSP Cost Estimates, Millions of 2022\$

Cost Estimate	Carollo Scenario 5	Roux	
		Low	High
PVWSP Infrastructure Capital Cost	293.6	382.5	484.0
Monitoring Capital Cost	n/a	12.0	12.0
Total Capital Cost	293.6	394.5	496.0
Annual Debt Service Obligation (Nominal\$)	24.2	32.6	36.7
Infrastructure O&M Cost (50 Years)	74.3	191.3	363.0
Monitoring O&M Cost (50 Years)	n/a	5.0	5.0
Total Capital and O&M Cost	367.9	590.8	864.0
Equivalent Annualized Total Cost (r = 5%)	20.2	32.4	47.3

Notes: All costs are normalized for inflation to 2022 price levels except for annual debt service costs that are current (nominal) dollars following Carollo's assumed 3% annual inflation. O&M costs are converted to present value at a 2.3% real annual discount rate.

Overall, Roux's estimated costs exceed Carollo's by approximately \$170 million to \$299 million, or \$6.8 million to \$12.9 million on an equivalent annualized basis. Notably, Carollo's underestimation of PVWSP costs increases if water rights and environmental mitigation costs are included and costs are restated for inflation through 2025 instead of 2022.

CICWCD Relies on an Obsolete Population Forecast

Population forecasts are critical for estimating regional M&I water demand. Carollo relies on the outdated 2012 Governor's Office of Management and Budget (GOMB) forecast rather than the 2022 baseline forecast from the Kem C. Gardner Policy Institute (GPI), Utah's official source for planning projections. Differences in the future M&I water balance are significant. GPI 2022 projects 2,000 more residents in CICWCD's service area by 2035 than GOMB 2012, but by 2065 predicts nearly 40,000 fewer, and 70,000 fewer by 2075.

Carollo's rationale for GOMB 2012 is unconvincing. Its claim that GPI's 2022 study found GOMB 2012 to be most accurate omits that GPI's own 2022 forecast was not included in that comparison.¹⁰ Instead, GPI explicitly recommends using its 2022 baseline scenario for most applications (Hollingshaus et al., 2022). Subcounty population forecasts do not make GOMB 2012 superior; smaller geographic units exacerbate forecast error. At a minimum Carollo could have allocated GPI's updated county-level forecast using GOMB 2012's subcounty populations.

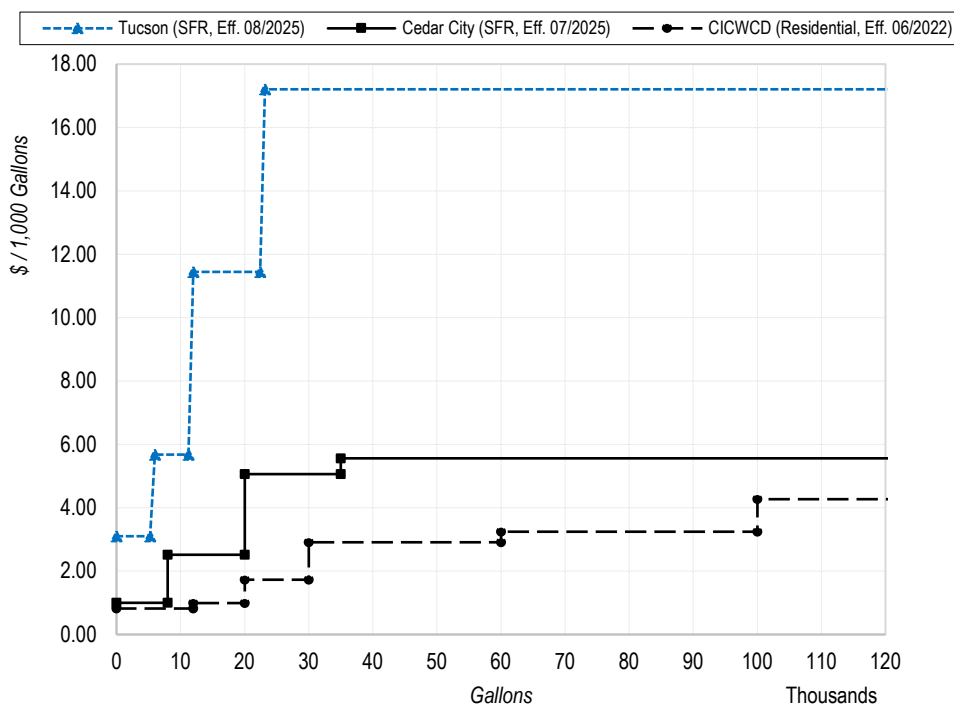
Using GPI 2022 shifts the onset of CICWCD's projected M&I water deficit from 2055 to 2065. Even then, the deficit of 549 AFY in 2065 and 5,192 AFY by 2075 could be offset by agricultural water savings from CICWCD's irrigation conversion programs. Some estimate agricultural water savings from irrigation efficiency upgrades through the Low-Elevation Spray Application/Low-Energy Precision Application program at 1,890–3,600 AFY, before accounting of growth-induced land conversion (GBWN, 2022; Applied Analysis, 2019).¹¹ Agricultural water savings appear to be excluded from Carollo's water supply analysis. Carollo cites limited data on efficiency gains and uncertain program participation, but nearly

three more years of data are available as of the AFEIS, and the 8,000 acres contemplated would convert within ten years if the participation rate through 2022 (2,500 acres) continues.

Conservation Measures May Play a Larger Role

Carollo's demand projections assume CICWCD meets Utah's water-use reduction targets, but these targets are modest compared to those of other western municipalities. Utah's 2019 Regional M&I Water Conservation Goals emphasize tiered volumetric pricing as a key strategy, yet CICWCD's current rate structures lag its peers. For example, Cedar City's highest tier begins at 35,000 gallons/month with a \$0.50 increase per 1,000 gallons, while Tucson imposes a \$5.76 increase at just 22,400 gallons/month—despite similar median incomes. And other cities actively target high-use customers. Los Angeles and Las Vegas employ “excessive use” pricing, recognizing that top-tier consumers disproportionately drive demand. LVVWD, for instance, applies penalties above 21,000 gallons/month, prompting rapid reductions.

Comparison of Tiered Residential Water Rate Structures



Notes: Volumetric rates are obtained from the URLs referenced with City of Tucson (2025), Cedar City (n.d.), and CICWCD (2022). “SFR” is single-family residential.

While Carollo highlights that Iron County has cut water use by 18% since 1995, other western cities have achieved greater gains. Tucson reduced potable water use to 137 gpcd in 2022—a 24% drop since 2000. Phoenix reached 92 gpcd in 2023, down 34% since 1990, even as its population nearly doubled. By contrast, projected 2025 M&I demand in Enoch and Cedar City remains high at 197–212 gpcd, with no expectation of dropping below 142 gpcd before 2075.

The foregoing data demonstrates that significant conservation is possible with growing populations, and that the effectiveness of balancing supply and demand through water pricing warrants greater attention. Carollo models only the future rate increases needed to fund additional supply through the PVWSP—the degree to which calibrating its tiered pricing structure now balances future demand with supply is unknown.

Planned Water Rate Increases Will Reduce Future Water Consumption

Carollo does not provide a “dynamic financial model” as claimed.¹² Instead, it assumes that revenue from pre-determined water sales—at rates more than 500% higher than 2019 levels—will cover CICWCD’s debt financing for PVWSP capital costs. However, the planned water rate increases are likely to be significantly understated. The law of demand—a core microeconomic principle—states that consumers purchase less of a good as the price increases. The degree of this response is measured by the price elasticity of demand. Carollo’s model assumes M&I water demand is unaffected by price even though research presented in the AFEIS shows otherwise. Water demand is generally price-inelastic in the short-run, but elasticity increases over time as consumers adjust. Yoo et al. (2014) found that in Phoenix, long-run (2000 to 2008) price elasticity was -1.55, meaning a 1.0% increase in rates led to a more than proportional 1.55% decrease in water use.

The reality is that actual revenues will fall short of Carollo’s modeled revenues as consumers adopt conservation measures in response to price increases. CICWCD acknowledges this risk, noting in the AFEIS that if conservation significantly reduces demand, *rates may need to rise again* to fund either action alternative. CICWCD should assess potential revenue shortfalls, factoring in the additional conservation embedded into projected CICWCD water demand, and determine the additional rate increases that are necessary, particularly because the burden of increased water rates falls disproportionately on low-income households that tend to have less room for additional conservation (Castañón, 2023). This analysis is nontrivial because much of the existing price elasticity literature will be uninformative to CICWCD because the estimates do not reflect the size of the planned rate increases.¹³

The Revised Water Rate Increases are Not Readily Computed

Water rates needed to fund the PVWSP will likely be much higher due to a 30–65% increase in capital costs (even in 2022 dollars), addition of defensible O&M and monitoring and mitigation cost estimates, and the associated debt service costs, even with government loans. Using updated population forecasts and accounting for reduced consumption in response to higher rates means less water is purchased, requiring further rate hikes because project costs are fixed. Roux attempted to simulate potential further rate increases but found that the percentage rate increases are not calculated within Carollo’s Excel Spreadsheet.¹⁴ The “guess and check” work necessary simply to replicate the forecast water rate increases according to Carollo’s description is beyond Roux’s scope of work, and it is not possible to assess PVWSP feasibility under the true modeled water rate increases after resolving these inaccuracies and accounting for uncertainty.

Economic Benefits of PVWSP Construction are Overstated

The PVWSP’s economic impact on Iron and Beaver counties is overstated. Applied Analysis’ IMPLAN (IMpact Analysis for PLANning) model assumes the full \$295 million capital cost as local spending, but raw steel production occurs outside the region—only steel fabrication happens locally. The production value of raw steel represents leakage of spending from the region. One can account for leakage using IMPLAN by adjusting the Local Purchase Percent (LPP) for Commodity Output Events or the (gross) Margins for Industry Events (Nealy, 2022).

Including leaked raw steel spending inflates direct, indirect, and induced output effects, as well as supported labor income estimates, and CICWCD also acknowledged further leakage if non-local contractors win construction bids. Additionally, planned water rate increases will shift household spending toward utilities, causing a net economic loss to the region if the displaced spending would have occurred in industries with higher multipliers.

Conclusion

In conclusion, it is Roux's assessment that serious flaws with the financial analysis supporting the PVWSP persist. Project capital and O&M costs are substantially underestimated—by \$170 million to \$299 million (\$6.8 million to \$12.9 million annually) in 2022 dollars—through an inadequate accounting of inflation and omission of critical costs. Even accepting Carollo's estimate, the annual debt service obligation for capital costs may be underestimated if low-interest government loans are unavailable due to high demand among competing water infrastructure projects and funding shortfalls. Decreases in both apparent water demand based on the most recent population forecasts and in consumption through response to higher rates will necessitate further water rate increases beyond what Carollo projects. Carollo fails to quantify the amount of future water demand that is conserved by instituting contemporary tiered water pricing regimes now. Inadequate documentation prohibits assessing the validity of water rates forecasted when these factors are accounted. Finally, economic benefits to the local economy appear overstated though a failure to deduct spending on raw steel that would occur outside Iron and Beaver counties. In sum, the underestimation of costs, the uncertainty embedded in each component of the Carollo analysis, and the lack of transparency in the projection of future water rates, prevent any meaningful assessment of the PVWSP's true economic impact on CICWCD's ratepayers or its ability to finance and construct the PVWSP. Notably, Roux may consider revising these findings if additional documentation provides evidence that such revisions are appropriate.

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- ¹ It is unclear where this figure originates. Ensign Engineering's estimate for the "Basin 14 Water Import Project" was \$254 million as of June 1, 2019. Roux adopts Carollo's estimate for the purpose of this review.
- ² The formula in Carollo's Spreadsheet Model fails to include inflation during 2020. That explains why the 2022 capital cost of \$293.6 million is only 13% greater than the 2019 capital cost instead of 16% greater, as Carollo seemingly intended: "3 percent annually through 2021 and 10 percent for 2022". PVWSP capital costs are \$302.4 million in 2022 dollars after correcting the formula to include inflation during 2020.
- ³ The ENR Building Cost Index is more applicable to pipeline construction because materials including steel are a greater component than labor when compared with the ENR Construction Cost Index.
- ⁴ The real discount rate is derived by Fisher's equation where the expected annual inflation rate is 2.5%, equal to the Federal Reserve target rate plus 50 basis points, and the nominal interest rate is 4.8%, equal to the annual average yield on 10-year treasury bills at constant maturity, 1985 through 2025 year-to-date. Roux obtained treasury yield data from the Federal Reserve Board of St. Louis Economic Data (FRED).
- ⁵ EPA projects the 20-year national drinking water infrastructure investment needs are \$625 billion and a WIFIA/SRF funding rate of 74% equals \$462.5 billion. See American Water Works Association (n.d.). See also American Society of Civil Engineers (n.d.).
- ⁶ The PVWSP capital cost in 2022 dollars, \$294.6 million, divided by the fiscal 2025 WIFIA federal appropriation amount, \$72 million, equals 4.08 years. See AWWA (n.d.).
- ⁷ Roux obtained daily treasury par yield rates from the United States Department of the Treasury at <https://home.treasury.gov/policy-issues/financing-the-government/interest-rate-statistics>.
- ⁸ As an example, annual O&M costs are between 2.7% and 3.1% of initial capital costs for the 50-mile Indian Wells Valley Groundwater Authority (IWVGA) Ridgecrest Water Pipeline project that requires BLM to conduct NEPA review. See Clean Energy Capital (2024). See also BLM National NEPA Register, DOI-BLM-CA-D050-2023-0020-EA.
- ⁹ The formula is written in the worksheet entitled 'CICWCD O&M and Capital Cost' and comprises typed dollar amounts added together rather than individually referenced from another worksheet or table identifying the source(s).
- ¹⁰ The comparison set includes updated long-term population forecasts at five-year intervals and necessarily terminates with the 2017 forecast considering that the population counts in the 2020 Census are the measure of accuracy. See Albers, E. (2022).
- ¹¹ Applied Analysis states 2019 projected water demand at 23,000 AFY that declines to 18,084 AFY by 2080 with agricultural conversion. Adding LEPA/LESA adoption to the scenario further reduces 2080 demand to 14,484 AFY. The implied contribution of LEPA/LESA is equal to 18,084 AFY – 14,484 AFY. See Applied Analysis. (June 2019). *Water Resource Economic and Fiscal Analysis*. Working Draft – Subject to Material Revision.
- ¹² Carollo Engineers. (June 2023). *Financial Business Plan and Water Needs Assessment*. Pine Valley Water Supply and Conservation Project. CICWCD. Page 3-1.
- ¹³ Measures of price elasticity are determined empirically using observed changes in water rates. Their interpretation in other policy scenarios is limited to those with similar price increases. For example, the Phoenix area volumetric prices examined by Yoo et al. (2014) increased 66% from 2000 to 2008. That compares with increases of nearly 100% to over 400% in Cedar City and Enoch City from 2025 to 2035. Characteristics of the subject population may also affect responsiveness through the income effect that, if ignored, may be mistaking for a price effect. Finally, the conservation measures adopted and the ultimate reduction in consumption also depend on the physical and biological limits.
- ¹⁴ How exactly Carollo determines the water rate increases for the action alternatives is not apparent. In reviewing its Excel Spreadsheet Model, Roux found that the percentage water rate increases do not reference any formulas, that is, they are "hard coded". Also, the percentage increases appear under the heading "INPUT: ANNUAL RATE REVENUE INCREASE BY SCENARIO".



PROFESSIONAL PROFILE



Ryan Stifter, MS

Principal, Economic & Complex Analytics

CONTACT INFORMATION

Main: (415) 967-6000

Direct: (415) 967-6036

Email: rstifter@rouxinc.com

Website: www.rouxinc.com

555 12th Street, Suite 250
Oakland, CA 94607

EDUCATION

MS, Agricultural & Resource
Economics, University of
California at Davis, 2004
BS, Managerial Economics,
University of California at
Davis, 2003

PROFESSIONAL AFFILIATIONS

Agricultural & Applied
Economics Association
Association of Environmental
and Resource Economists
American Bar Association,
Section on Energy and
Environment (SEER)
Defense Research Institute (DRI)

EXPERIENCE SUMMARY

Twenty years of experience applying microeconomics, econometrics, statistical modeling, market and non-market valuation methods, and financial analysis in complex business and environmental litigation matters, insurance claims, natural resource damage assessment (NRDA), environmental and natural resource planning, and risk management decisions.

- Roux, Principal, 2020-Present; Technical Director, 2018-2020.
- ERM, Senior Consultant, 2015-2018.
- Cardno, Senior Consultant/Economist, 2014-2015; Senior Project Economist, 2010-2014.
- OnPoint Analytics, Staff Economist, 2005-2010.
- ENTRIX, Economist, 2005.
- Independent Consultant, 2004-2005.

Mr. Stifter's litigation support experience spans his entire career and comprises roles as consulting expert and testifying expert. His work has been applied in matters involving property value diminution, natural resource valuation, natural resource damages, economic torts, commercial property damage, construction delay, business interruption, product design defect, antitrust, lost wages and income, and discriminatory practices, among others.

Mr. Stifter supports the regulated community with quantifying economic-environment tradeoffs of changes in environmental quality and natural resource use and allocation underlying proposed rulemakings and environmental planning analysis. Ryan has regularly supported responsible parties and insurance carriers evaluate and assess natural resource damages, including the highest profile oil releases in recent history. His work also includes supporting industry with contingent liability exposure management, regulatory compliance strategies, and other risk management functions.

TECHNICAL SPECIALTIES

Mr. Stifter's areas of technical competency derive from training in microeconomics, econometrics, mathematical programming, statistical modeling and inference, and accounting applied to agriculture, the environment and natural resources, and industrial organization, and their honing through numerous economic consulting studies.

- Econometric modeling and appraisal techniques in real estate damages analysis.
- Forensic economic and financial analysis.
- Non-market valuation of environmental goods and natural resources.
- Natural resource damage assessment (NRDA).
- Applying and interpreting microeconomic and econometric research.
- Benefit-cost analysis of environmental rulemaking and natural resource policy.
- Decision modeling techniques.
- Forecasting methods for contingent environmental liabilities.

REPRESENTATIVE PROJECTS

Property Value Diminution and Real Estate Damages

- Evaluating class wide claims of diminution in property value arising from unanticipated concerns about soil contamination allegedly affecting a multi-phase master planned community.
- Providing regulatory hearing testimony about the appropriateness of economic and appraisal methods used to evaluate diminution in value from soil contamination at or proximate to nearly 100 residential properties.

- Providing trial testimony on behalf of defendants about the economic factors contributing to observed declines in residential and commercial property values following actions to eradicate aquatic invasive species in a nearby recreational fishery and water supply reservoir.
 - Providing testimony on the damages incurred by a commercial retail/office property owner including investigation and response costs and the value of damages mitigation arising from selling the property in its contaminated state before remedy implementation.
 - Providing critical review of an appraisal report and modeling economic damages arising from alleged residential water delivery system malfunctions and service disruptions affecting more than 30 luxury condominium units.
 - Authoring an expert report on damages arising from lost use of a commercial property subject to environmental investigation and response orders.
 - Authoring an expert rebuttal report on damages from delays to a multi-phase residential housing development allegedly resulting from unanticipated pollution investigation.
 - Providing expert opinions about the economic value arising from removing land use restrictions through environmental remediation actions.
 - Authoring an expert report opining on the appropriate reasonable rental value of a property undergoing environmental investigation and redevelopment.
- Natural Resource Damages**
- Developing an expert opinion about the extent of NRD over time arising from mine acid drainage releases to the Upper Animas River within the Bonita Peak Mining District.
 - Quantifying potential NRD liability exposure for aesthetic and ecological service losses arising from nutrient pollution of state waterways and lakes.
 - Developing a technical response to the Trustees' Preassessment Screen of a metals processing facility and providing strategic support to the responsible party (RP) through the NRDA.
 - Developing comments on the feasibility, technical adequacy and applicability of assessment approaches proposed in the Trustees' Assessment Plan documents for industrial waterways in the northeastern U.S.
 - Advising on indemnification of potential groundwater NRD liability at a multi-parcel Class II-A groundwater Classification Exception Area/Well Restriction Area in New Jersey.
 - Quantifying future NRD claim amounts from groundwater, wetlands, and surface water contamination at a nationwide portfolio of sites where a bankrupt entity holds liability.
 - Quantifying and valuing recreation service losses following a marine oil release across thousands of miles of public coastline, fishing areas, and marine waters.
 - Evaluating Trustee conclusions for recreational fishing losses from historical closures and long-term mercury fish consumption health advisories at a freshwater lake.
 - Quantifying and valuing shore-based recreation service losses at beaches, state parks, and campgrounds following an onshore coastal oil release.
 - Developing a decision model informing the RP's NRDA and settlement strategy for an oil release affecting marine habitats, birds, fish, marine mammals, and shore-based recreation.
 - Valuing recreation use gains from shoreline, fishing, boating, and wildlife viewing access enhancements; hazard removal, and fish habitat enhancements at coastal sites, nearshore waters, and marine waters across five states culminating in a \$200 million early restoration benefit for the RP.
 - Valuing recreation use gains from trail interconnections and extensions, jetty and pier enhancements, new fishing access, and an equestrian center forming the basis for an NRD settlement involving hazardous substance releases to a freshwater lake and creeks.
 - Evaluating real estate market analysis as the basis for quantifying willingness-to-pay for groundwater that meets state health exposure limits for per- and polyfluorinated alkyl substances (PFAS).
 - Evaluating conjoint survey methods used as the basis for valuing fishing recreation service losses from fish consumption health advisories.
 - Evaluating habitat equivalency analysis (HEA) as the basis for valuing compensatory damages for wetland service losses from PFAS releases.
 - Evaluating the basis for and reasonableness of the NRD Trustees' settlement demand of an individual PRP at a mega sediment site.
 - Evaluating another consultants' HEA inputs and assumptions as the basis for an insured PRP's prospective NRD liability at a sediment site.
 - Reviewing the NRD Trustees' HEA and projecting a reasonable allocation to an individual PRP's operations at a PNW mega sediment site.

- Developing an approach for allocating across time an NRD settlement for drinking water service losses from groundwater contaminated by PFAS releases at multiple sites.
- Providing technical review of the Trustees' HEA purporting to quantify lost wetland services and the scale and cost of compensatory wetland restoration projects as NRD for PCB releases.
- Evaluating the federal government's multimillion-dollar settlement demand for habitat destruction and lost use of public forest lands within a wildfire burn area.
- Analyzing angler visitation and fish consumption survey data to assess the statistical reliability of EPA-determined risk parameters forming preliminary remediation goals at a Superfund Site.
- Contributing economic research and modeling to value an agricultural property's lost use of the groundwater in an aquifer affected by oil field produced water.

Business Interruption/Commercial Property Damage

- Providing expert opinions on the loss in profits from temporary closure of an inert solid waste landfill.
- Evaluating the loss in profits claimed by a retail gasoline station shuttered for several months following a catastrophic explosion.
- Evaluating the basis and reliability of future loss in profits claimed by an insulation product manufacturing company.
- Determining the appropriate amounts for lost profits and extra expenses available to a medical center for mold pollution in its surgical sterilization room.
- Evaluating estimates for a full-service hotel's claimed lost profits caused by a so-called "super-spreader event" for SARS-CoV-2.
- Evaluating the claimed lost profits and extra expenses at a 230-room hotel that discovered mold pollution in rooms and amenities and producing analysis facilitating an insurance claim settlement.
- Determining lost profits and extra expenses when a real estate brokerage office was destroyed in a catastrophic wildfire.
- Evaluating a museum operator's lost profits from closure during wildfire response and subsequent closures arising from post-fire weather events.
- Determining the reasonableness of amounts the insured chemical manufacturer claimed for chemical product losses, remediation costs, and customers' lost profits.

Intellectual Property Damages

- Authoring an expert report opining on an international agricultural biotechnology company's lost profits after losing exclusive rights for its novel plant seed.
- Leading analysis to determine the number of vegetable harvesting machines a manufacturer could have sold but for alleged theft of its product design specifications.
- Contributing quantitative and qualitative economic research into the factors leading to commercial success of a branded diabetes drug.
- Contributing econometric analysis of advertising impacts on the sales and commercial success of a branded proton pump inhibitor.

Breach of Contract Damages

- Determining the present value of the net income stream accruing to an owner/operator of the surface estate for mining caliche and river rock.
- Applying econometric modeling to quantify market price erosion and calculating resulting lost profits to a joint venture party after losing access to a fresh fruit domestic brand label.
- Conducting quantitative analysis determining if No. 14 sugar contract price movements triggered non-performance of a sugar beet supply contract and computing profits from forgone refined sugar sales.

Product/Design Defect Damages

- Providing expert opinions about the loss in profits of a seafood wholesaling operation due to a refrigeration system failure.
- Providing opinions and testimony in rebuttal to the measure of damages resulting from an alleged failed water pollution remedy at a Superfund Site.
- Contributing survey research, market research, and microeconomic analysis to determine a food distributor's damages from defective desiccants.

Crop Loss Damages

- Testifying about the value of open-field and greenhouse vegetable crops destroyed during Hurricane Irma.
- Determining the orchard and vineyard value diminution from tree and vine losses at multiple properties and operations allegedly exposed to industrial herbicide Imazapyr® during railroad operator maintenance.
- Determining the value of a young walnut and almond orchards allegedly destroyed by chemical applications.
- Quantifying probabilistic yield outcomes at a large processing tomato operation alleging pesticide drift caused its crop losses.

- Determining yield diminution and price erosion for a pistachio crop accidentally sprayed directly with the glyphosate herbicide product Roundup®.

Environmental Regulation and Enforcement

- Assessing the “economic benefit,” as the term is defined in USEPA’s Clean Water Act civil penalty process, that a food processing facility allegedly obtained through delaying upgrades to its wastewater treatment plant.
- Assessing the “economic benefit” component of USEPA’s Clean Water Act civil penalty process that an agricultural holding company allegedly obtained through developing a walnut orchard on jurisdictional wetlands. Authored a rebuttal expert report and the regulated party and the United States reached a settlement thereafter.
- Developing a model estimating nationwide annual cleanup costs at NPL sites if PFOA and PFOS are designated CERCLA hazardous substances.
- Developing a model estimating nationwide annual water system treatment costs for complying with alternative PFAS drinking water maximum contaminant limits.
- Researching and quantifying the economic impact on consumers and producers of a ban on commercially relevant PFAS in the automotive, semiconductor, and aerospace industries.

Water Resources

- Providing expert opinions on the quantum of damages from misappropriation of pre-1914 water rights that were assigned to a California municipality.
- Contributing analysis quantifying the impact of uncertainty and documenting unmet concerns with contingent valuation and benefits transfer methods for the USEPA/USACE Regulatory Impact Assessment (RIA) of the Federal Clean Water Rule.
- Quantifying the economic impact of operational changes at a FERC reservoir affecting water levels, instream flows, irrigation water supply, and municipal water supply.
- Applying non-market valuation methods to monetize the environmental and social benefits of water quality and supply reliability improvements from recycling, reuse and other capital improvement projects proposed by 20 southern California water agencies applying for millions of dollars in Proposition 84 Grant Funds.
- Contributing analysis of replacement cost and market transactions to value a California cattle ranch’s water rights allegedly impeded by an upstream landowner.

- Conducting survey research regarding irrigation district and grower response to reduced Central Valley Project water deliveries required to meet new San Joaquin River instream flow requirements.

Air Quality & Climate Change

- Contributing rebuttal testimony about the extent of oil & gas wells idled and abandoned in response to compliance costs for meeting VOC emission capture standards in an EPA non-attainment area.
- Quantifying GHG emissions leakage risk associated with steel industry’s compliance with Washington’s proposed Clean Air Rule. Legal counsel relied on the analysis in the state legislative process.
- Quantifying uncertainty with the BLM’s estimated costs and benefits of venting and flaring limits for midstream and upstream oil & gas sources. A trade association relied on the analysis in the Rulemaking process.
- Evaluating the extent to which a proposed bulk energy trade terminal would increase baseline global GHG emissions through coal exports.

Natural Resources Development & Land Use

- Analyzing the potential for the COVID-19 pandemic to affect the economic feasibility of proposed mixed-use, high-density multifamily real estate development in the suburban San Francisco Bay Area.
- Evaluating the socioeconomic impacts of an oil refinery facility expansion to produce new petroleum by-products for domestic and export markets.
- Developing an econometric model forecasting heating fuel oil prices for the Alaska Industrial Development and Export Authority’s use managing heating fuel oil demand.
- Overseeing technical approaches to valuing social costs and benefits of alternative plantation configurations supporting shared benefits from tree production, livestock operation, and weed abatement.

Habitat & Species Conservation

- Valuing the Monterey County Water Resource Agency’s proposed flood mitigation measures, which would affect aquatic habitat, in terms of economic output and wage losses avoided by mitigating cropland flooding.
- Contributing to an econometric study quantifying the net environmental benefit of the United States’ closure of Hawaiian waters to longline swordfish fishing during 2001-2004. The findings were published in Marine Policy.

- Describing the potential direct and indirect economic consequences from impacts to rice production in California's northern Sacramento Valley from instream flow requirements designed to enhance California steelhead trout survival.
- Supporting research for quantifying real estate developers' costs to mitigate and avoid losses of species within "Critical Habitat" under the Endangered Species Act (ESA).

Contingent Liability Forecasting

- Quantifying liability for toxic tort claims and environmental response costs relating to a facility's alleged PFAS releases and disposal.
- Predicting the scope and per-site cost of oil and gas well pad soil and groundwater remediation at a major oil and gas lease.
- Assimilating data from thousands of retail gasoline stations and remediation and closure history to develop probability distributions for aggregate claims on the portfolio.
- Quantifying environmental response, NRD, bodily injury and other liabilities associated with legacy mine failure risk scenarios.
- Modeling probabilistic future net decommissioning cost outcomes for industrial scale photovoltaic (PV) solar power plants for use in establishing the financial assurance required by local governments.
- Developing data and probabilistic models monetizing risk exposure for cleanup and response costs, NRD, property damage, business interruption, and bodily injury from petroleum storage tank failures.
- Developing estimates for NRD liability risk exposure at a chemical manufacturing facility located near sensitive environmental receptors.

Financial Analysis

- Computing an electric power utility's weighted average cost of capital (WACC) as the annual interest rate for discounting future environmental response and site remediation costs.
- Determining annual inflation rates applicable to soil and groundwater remediation costs at chemical distribution sites and the discount rate applicable to future costs.
- Conducting a forensic accounting of a testing laboratory company's SEC disclosures to determine the balance of indemnity funds available for existing and future groundwater remediation obligations.
- Conducting a forensic accounting of municipal government financial statements and its appropriation of legal settlements obtained from alleged polluters to remedy groundwater pollution conditions.

- Conducting market research into sugar beet supply conditions and market demand for refined sugar by-products to advise a sugar refiner on the economic viability of expanding facility capacity.

Antitrust & Competition and Class Certification

- Leading analysis to define the scope of the relevant geographic market for assessing the degree of market power that an alleged cartel of bottled milk processors and grower cooperatives could have exercised over price premiums paid to dairy farmers. Analyzed grower price premiums to assess common impact of the cartel's alleged actions.
- Leading economic research and quantitative analysis to define the relevant product and geographic markets for assessing the degree of market power that a vertically integrated hardwood lumber producer could have exercised over prices paid by direct finished lumber purchasers. Evaluating the reliability and workability of a class wide damages model offered by the opposing party's expert.
- Leading quantitative analysis and research to define the scope of the geographic market relevant for assessing the degree of market power that an alleged cartel of hospital systems could have exercised over nurse wages.
- Contributing quantitative research and econometric analysis of a merged vertically integrated pork processing company's incentive to suppress wages paid to contract hog producers along their supply chain. Supported a presentation to the FTC/DOJ that resulted in approval of the merger with minimal divestiture of assets unrelated to the hog production segment.
- Contributing quantitative economic research into the degree of market power that an alleged cartel of insurance carriers and brokers could have exercised over property and casualty insurance premiums.

Personal Injury Damages

- Analyzing a valuation for the change in a transportation employee's future earning potential following injuries sustained on the job.
- Analyzing a valuation for a mesothelioma decedent's future earnings, Social Security Retirement Income (SSRI), and household services.
- Forecasting a professional athlete's future endorsement income at risk from allegedly false sexual abuse claims.

REPRESENTATIVE EXPERT RETENTIONS/APPEARANCES

Pennington et al. v. Tetra Tech, Inc., Tetra Tech EC, Inc., et al., United States District Court for the Northern District of California, No. 3:18-cv-05330-JD, Expert Report (2025), Supplemental Expert Report (2025), Deposition Testimony (2025).

Michael Keith McGuire, Aimee Marie McGuire vs. Verdun Oil EF LLC, Verdun Oil and Gas, LLC, District Court for the 156th Judicial District, McMullen County, Texas, Case No. M-23-0006-CV-B. Expert Report (2024), Deposition Testimony (2024), Trial Testimony (2025).

Reserve Silica Corporation v. Prospect, LLC et al. In the Superior Court for the State of Washington In and for the County of King, Case No. 23-2-15241-7 KNT. Deposition Testimony (2024).

Manfield Partnership #2 LP v. Cal Plate, Inc., et al., United States District Court for the Central District of California, Case No. 2:21-cv-07860-AS. Expert Report (2024).

Edward Korthof and Ikuko Korthof v. Ryker Flint, Flint Commercial, Inc., Maureen McGinley et al., Superior Court of The State of California, County of Sacramento, Case No.: 34-2018-00247212. Deposition Testimony (2024).

New Hampshire Ball Bearings, Inc. v. GeoSierra Environmental, Inc., and Hull & Associates, Inc., United States District Court for the District of New Hampshire, Case No. 1:20-cv-00258-PB. Expert Report (2021). Supplemental Expert Report (2022). Deposition Testimony (2023).

Union Pacific Railroad Company v. Robert E. Hill, et al., United States District Court Northern District of California, Case No. 5:21-cv-03216-SVK. Expert Report (2023).

Petition of the Attorney General Pursuant to G.L. c. 164, § 93, Requesting a Review of the Price of Gas Provided by New England Gas Company Related to Environmental Response Costs, Docket No. D.P.U. 11-54. Affidavit and Pre-filed Testimony (2022).

The Successor Agency to The Former Emeryville Redevelopment Agency and The City of Emeryville vs. Swagelok Company et al., United States District Court Northern District of California, Case No. 3:17-cv-00308-WHO. Expert Report (2022).

Arrow Electronics, Inc. v. Aetna Casualty & Surety Company n/k/a Travelers Casualty & Surety Company a/k/a St. Paul Travelers and Liberty Mutual Insurance Company, United States District Court, For the Central District of California, Case No. 2:17-CV-05247-JFW-JEM. Expert Report (2020).

The Board of Trustees of the Leland Stanford Junior University v. Agilent Technologies, Inc., and HP Inc., United States District Court Northern District of California, San Francisco Division, Case No. 3:18-CV-01199 VC. Expert Report (2020).

Paisley v. A.W. Chesterton Company et al., In the Third Circuit Court, Third Judicial Court, Madison County, Illinois, Case No. 19 L 508. Expert Report (2019).

AgriGenetics, Inc. v. Semillas Papalotla, S.A. de C.V., United States District Court for the Southern District of New York, Case No. 1:20-cv-429-LTS. Expert Report (2019).

Bloomfield Vineyards et al. v. BNSF Railway et al., Superior Court of California for the County of Contra Costa, Case No. MSC18-00058. Mediation (2019).

Certain Underwriters at Lloyds of London Subscribing to Policy No. B0799MC029630k v. Pero Family Farm Food Co., Ltd., United States District Court, Southern District of Florida, Case No. 9:18-cv-81680-RLR, Expert Report (2019), Deposition Testimony (2020).

Confidential matter involving evaluation of a Clean Water Act civil penalty for impacts to jurisdictional wetlands, United States District Court, Eastern District of California, Expert Report (2018).

Ira A. Adams, et al. v. State of California, acting by and through the Department of Fish & Game (Individuals Phase) Superior Court of California, County of Plumas, Case No. CV09-00065, Deposition and Trial Testimony (2018).

Ira A. Adams, et al. v. State of California, acting by and through the Department of Fish & Game (City of Portola Phase) Superior Court of California, County of Plumas, Case No. CV09-00065, 2015. Deposition and Trial Testimony (2015).

PUBLICATIONS

Rausser, Gordon, Hamilton, Steven, Kovach, Marty, Stifter, Ryan, (2009). "Unintended Consequences: The Spillover Effects of Common Property Regulations." *Marine Policy*, 33(1):24-39.

"Assessing the Reliability of Damages Valuations." 2020. Paper presented at the DRI Toxic Torts and Environmental Law Seminar, Phoenix, Arizona, February 19–21, 2020.

"Review of the Economic Impact Analyses for Colorado Air Pollution Control Division's Proposed VOC Non-Attainment Rule" (with Lisa Campbell, P.E., Doug MacNair, Ph.D.). October 2017. JIWG-REB EX-C.

"Chapter 11. Social and Economic Environment" (with Kristina Mitchell, Benjamin Sussman, and Theodore Tomasi, Ph.D.). 2017. Tesoro Anacortes Refinery Clean Products Upgrade Project Draft Environmental Impact Statement.

"Steel Industry Emissions Leakage Risk from the proposed Washington Clean Air Rule dated May 31, 2016" (with Scott Weaver, Ariane Burwell, and Michael Shelly, Ph.D.). 2016.

SELECTED PRESENTATIONS

"Calculating Agricultural PFAS Damages Associated with Biosolids Application" (with Betsy Delaney, Debra Forsythe, and Brian Gross). Environmental Risk and PFAS Litigation Conference. New York, June 17-18, 2025.

"PFAS: Everything Everywhere All at Once" (with Sarah Bell, Tanya Nesbitt, Maxine McReynolds, and John Gilmour). American Bar Association Environmental & Energy, Mass Torts, and Products Liability Litigation Committees' Joint Regional CLE Program. Avon, January 31-February 2, 2024.



“California Recycling: Keeping Up with the Chasing Arrows” (with Sarah Bell, Elizabeth Dorsi, and Donald Sobelman). Race to the Finish 2023 Half-day CLE Event Sponsored by the American Association of Corporate Counsel. Virtual, January 25, 2023.

“Environmental Claims Arising Out of the Agriculture Industry” (with Linda Bondi Morrison, Jennifer Martin, Briana Schroeder). Forum for Environmental and Toxic Tort Issues Conference. Chicago, September 22-23, 2022.

“NRD and Other Potential PFAS Liabilities.” Law Seminars International PFAS Contamination and Regulation in California Conference. Virtual, February 11-12, 2021.

“Valuing Damages Using Applied Economics.” Defense Research Institute (DRI) Toxic Tort and Environmental Law Conference. Phoenix, February 19-21, 2020.

“Minnesota v. 3M PFAS Settlement: Comments on the Evidence Provided on Injured Natural Resource Services and their Values.” Law Seminars International PFAS Litigation Conference. San Diego, December 9-10, 2019.

“Valuing Environmental Damages in the Context of Global Climate Change: Economic and Financial Implications & Opportunities.” Law Seminars International Natural Resource Damages Conference. Santa Fe, July 18-19, 2019.

EXHIBIT H-1

Settlement Agreement

SETTLEMENT AGREEMENT

THIS SETTLEMENT AGREEMENT (the "**Agreement**") is made and entered into by and between Kent L. Jones in his capacity as the Utah State Engineer (the "**State Engineer**"), Utah School and Institutional Trust Lands Administration ("**SITLA**"), Central Iron County Water Conservancy District (the "**District**"), Utah Alunite Corporation ("**UAC**"); and Beaver County (the "**County**") (collectively referred to as the "**Parties**").

RECITALS

The Parties are involved in a consolidated lawsuit captioned *Central Iron County Water Conservancy District v. Jones*, Case No. 140500016, pending in the Fifth Judicial District Court in and for Beaver County, State of Utah (the "**Litigation**"). The Litigation involves *de novo* judicial review of three applications to appropriate groundwater: A76677 (69-101) filed by the District to appropriate 12,000 acre-feet (AF) of groundwater from Wah Wah Valley; A76676 (14-118), filed by the District to appropriate 15,000 AF of groundwater from Pine Valley; and F79462 (69-115), filed jointly by UAC and SITLA to appropriate 6,500 AF of groundwater from Wah Wah Valley. The State Engineer approved A76677 (69-101) for the appropriation of 6,525 AF; approved A76676 (14-118) for the appropriation of 15,000 AF; and approved F79462 (69-115) for the appropriation of 6,500 AF for a 30-year fixed-time period. Also related to the litigation is unapproved application A76677a (69-118), a segregated portion of application A76677 filed by the District.

The District anticipated using water available under the District's applications to supply water to District customers through the District's planned West Desert Pipeline Project. The joint UAC/SITLA application was filed to provide water for mining and processing purposes on SITLA lands in Wah Wah Valley known as the Blawn Mountain Property. Since the time of filing, UAC has conveyed its interest in water right 69-115 to SITLA and retained a contract right to use water available to SITLA for mining and processing at the Blawn Mountain Property.

In addition to the above, the County has filed two applications to appropriate: A78814 (69-109) to appropriate 6,650 AF of groundwater from Wah Wah Valley, and A78815 (14-124) to appropriate 13,900 AF of water groundwater from Pine Valley. The State Engineer has not yet acted on the County's applications, and those applications are not the subject of *de novo* review. But, the County seeks approval to appropriate water from the same sources as the District's and UAC's applications. The County claimed a portion of the unappropriated groundwater in Wah Wah Valley should be reserved for use in that valley, and a portion of the unappropriated groundwater in Pine Valley should be reserved for use in that valley.

This Settlement Agreement contains settlement terms which will resolve the Litigation, allow the District's West Desert Pipeline Project to proceed, allow mining and processing at the Blawn Mountain Property, allow the County to acquire a portion of the water from Wah Wah Valley for use in that valley, and allow the County to proceed to seek approval of its application to appropriate water from Pine Valley.

AGREEMENT

The Parties exchange the following consideration and agree as follows:

1. **Water Availability.** The Parties acknowledge they have a difference of opinion regarding the amount of water available for development in the Wah Wah Valley and the Pine Valley – namely, the safe yield of the aquifers in those valleys. By way of this Agreement the State Engineer will allow the non-State Engineer Parties to proceed with plans to develop the amount of water stated herein with the understanding that the non-State Engineer Parties assume all risk and full responsibility for the possibility that the safe annual yield of the Wah Wah Valley aquifer and/or the Pine Valley aquifer is less than the amounts referenced in this Agreement. The non-State Engineer Parties expressly understand and acknowledge that the State Engineer is making no warranty or representation about the amount of water available for development in the Wah Wah Valley and the Pine Valley, and that approvals provided under this Agreement may be for more water than future facts demonstrate is actually available for long-term beneficial use. They further understand and acknowledge that under Utah Code Section 73-5-15, the State Engineer may regulate groundwater withdrawals within a specific groundwater basin by adopting a groundwater management plan in accordance with that section for any groundwater basin or aquifer or combination of hydrologically connected groundwater basins or aquifers. Nothing in this Agreement affects or is intended to affect the State Engineer's authority under that section as it presently exists and as it may change. The non-State Engineer Parties expressly understand and acknowledge that proper exercise of that authority may result in a reduction of the amount of water authorized for diversion under this Agreement.

2. **District Wah Wah Valley Application A76677 (69-101).** A76677 (69-101) will be approved for the permanent appropriation of 6,525 AF (100% consumptive) of groundwater.

3. **District Segregated Wah Wah Valley Application A76677a (69-118).** The portion of A76677 not approved by the Engineer (5,475 AF) was segregated and assigned Water Right No. 69-118 (Application to Appropriate No. A76677a). To accommodate the terms of this Agreement, the District segregated 725 AF from A76677a (69-118) to A76677aa (69-120) and 4,025 AF from A76677a to A76677ab (69-121) leaving 725 AF in A76677a (69-118). As a result, the District has three segregated applications to appropriate: A76677a (69-118) for the appropriation of 725 AF, A76677aa (69-120) for the appropriation of 725 AF, and A76677ab (69-121) for the appropriation of 4,025 AF. Those pending applications' status is currently unapproved.

a. A76677a (69-118). A76677a (69-118) will be approved for the permanent appropriation of 725 AF (100% consumptive) of groundwater. The Parties agree to reduce the priority of Water Right 69-118 to October 18, 2006.

b. A76677aa (69-120). A76677aa (69-120) will be approved for the permanent appropriation of 725 AF (100% consumptive) of groundwater. The Parties agree to reduce the priority of Water Right 69-120 to October 19, 2006.

c. A76677ab (69-121). A76677ab (69-121) will be approved for a 40-year fixed-time appropriation of 4,025 AF (100% consumptive) of groundwater. The Parties agree to reduce the priority of Water Right 69-121 to October 19, 2006.

Upon completion, the quantities of water and priorities will be as follows:

69-101	6,525 AF	October 17, 2006
69-118	725 AF	October 18, 2006
69-120	725 AF	October 19, 2006
69-121	4,025 AF	October 19, 2006

4. Conveyance of District Segregated Wah Wah Valley Application A76677a (69-118). The District will deed Water Right 69-118, which will have been approved for the permanent appropriation of 725 AF (100% consumptive) of groundwater, to the County via water right special warranty deed in the form attached as Exhibit A. The District will deliver an executed copy of Exhibit A to Escrow to be recorded as provided in Paragraph 12. The County shall pay the recording fees for the deed. After the conveyance described in this Paragraph, the County may, in compliance with statute, file any applications seeking to modify the use of Water Right 69-118.

5. Execution of SITLA/District Water Supply Agreement. SITLA and the District will execute a water supply agreement in the form attached as Exhibit B, to be delivered in counterparts to Escrow. The water supply agreement will be effective upon delivery by Escrow as provided in Paragraph 12.

6. SITLA Wah Wah Valley Application F79462 (69-115). SITLA will withdraw its Application to Appropriate A79462 (later F79462 and 69-115) in its entirety. It will deliver an executed withdrawal request, in the form attached as Exhibit C, to Escrow, to be filed as provided in Paragraph 12. Upon withdrawal of A79462/F79462, the State Engineer's issued order on F79462 (69-115) will be void.

7. County Wah Wah Valley Application A78814 (69-109). Application to Appropriate A78814 (69-109) was filed by the County for 6,650 AF of groundwater from Wah Wah Valley and has not been acted on by the State Engineer. The County will withdraw its Application to Appropriate A78814 (69-109) in its entirety. It will deliver an executed withdrawal request, in the form attached as Exhibit D, to Escrow, to be filed as provided in Paragraph 12.

8. District Pine Valley Application A76676 (14-118). The District's Pine Valley Application to Appropriate, A76676 (14-118), will be approved for permanent appropriation of 15,000 AF (100% consumptive) of groundwater.

9. County Pine Valley Application A78815 (14-124). Application to Appropriate A78815 (14-124) was filed by the County for 13,900 AF of groundwater from Pine Valley. The State Engineer has not acted on A78815 (14-124). The County will reduce Application to Appropriate A78815 (14-124) from 13,900 AF to 1,650 AF. It will deliver an executed letter, in the form attached as Exhibit E, to Escrow, to be filed as provided in Paragraph 12. Once the Utah Division of Water Rights amends Application to Appropriate A78815 (14-124) on its database reducing the amount to 1,650 AF in response to the County's letter, the District will withdraw its protest to A78815 (14-124). It will deliver an executed letter withdrawing its protest, in the form

attached as Exhibit E, to Escrow, to be filed as provided in Paragraph 12. The County shall not apply to appropriate or claim a right to more than 1,650 AF under Application to Appropriate A78815 (14-124) following the letter to the Utah Division of Water Rights described in this Paragraph.

10. Non-Opposition. SITLA, UAC, the District, and the County will not protest, and will not cause or encourage others to protest, change applications, exchange applications, applications for extension of time to submit proof, applications for extension of fixed-time period, or applications for non-use relating to A76677 (69-101), A76677a (69-118), A76677aa (69-120), A76677ab (69-121) changed to F76677ab (69-121), A76676 (14-118), or A78815 (14-124), except with respect to issues relating to local interference or water quality concerns. Before filing such a protest, the would-be Party-protestant will first make efforts that are reasonable under the circumstances to discuss its concerns with the applicant.

11. Dismissal of the Litigation. Upon execution of this Agreement and confirmation from Escrow that all documents identified in Paragraph 12 have been received, the District will file the Stipulated Motion for Entry of Judgment and Dismissal attached to this Settlement Agreement as Exhibit G, which has previously been reviewed and approved by counsel for the Parties, requesting that the Court enter judgment consistent with Paragraphs 2, 3, and 8 of this Settlement Agreement and dismiss all remaining claims with prejudice. The Parties have approved the proposed Stipulated Judgment attached to this Settlement Agreement as Exhibit H, which shall be filed with the Stipulated Motion for Entry of Judgment and Dismissal.

12. Escrow and Closing. John Schutz of Mabey, Wright & James shall serve as the escrow agent (Escrow) for this Agreement. Provided Escrow has received the documents from all Parties as provided in this Agreement, this Agreement shall be closed as follows:

a. Escrow shall provide notice to all Parties that all required documents have been received and that he is ready to close. Upon such notice, the District shall file the Stipulated Motion for Entry of Judgment and Dismissal with the associated proposed Stipulated Judgment described in Paragraph 11 (Exhibits G and H to this Agreement);

b. Upon notice that the Court has entered the Stipulated Judgment described in Paragraph 11 (Exhibit H to this Agreement), which any Party may provide, Escrow shall, in the following order: (1) file the withdrawal requests described in Paragraphs 6 and 7 with the Utah Division of Water Rights; (2) record the deed described in Paragraph 4; (3) deliver executed copies of the water supply agreement described in Paragraph 5 to the District and SITLA; and (4) file the reduction letter described in Paragraph 9 with the Utah Division of Water Rights;

c. Upon confirmation that the Utah Division of Water Rights has updated its records to reflect the reduction described in Paragraph 9, Escrow shall file the withdrawal letter described in Paragraph 9 with the Utah Division of Water Rights, at which point the closing shall be complete.

13. No Precedential Value. This Agreement is unique and does not serve as precedent for any other situation, settlement, or basis for State Engineer evaluation or decision on any other water right application or in any other matter. The Agreement's singularity is not limited to

circumstances, party sophistication, or case posture, and in no circumstances may the Agreement's content, or its perceived or imagined means or underlying reasoning for settlement terms be used in any other case, matter, or proceeding.

14. Miscellaneous.

- a. No Third-Party Beneficiaries. The Parties expressly acknowledge and agree that there are no third-party beneficiaries to this Agreement.
- b. Binding on Successors. This Agreement shall be binding on the Parties' successors and run with the water rights referenced herein.
- c. Integration. This Agreement constitutes the entire understanding and agreement of the Parties with regard to the subject matter of this Agreement, and any and all prior understandings or representations are hereby terminated and cancelled in their entirety and are of no force and effect.
- d. Amendment. No amendment, change, or modification of this Agreement shall be valid unless in writing and signed by the Parties.
- e. Waiver. The waiver by any Party to this Agreement of a breach of any provision of the Agreement shall not be deemed a continuing waiver or waiver of any subsequent breach, whether of the same or another provision of this Agreement.
- f. Attorneys' Fees. In the event any suit or action is instituted to interpret or enforce the terms of this Agreement or to rescind this Agreement, the prevailing Party shall be entitled to recover from any non-State Engineer Party at fault such sum as the Court may adjudge reasonable as attorneys' fees at trial, on any appeal, and on any petition for review, and in any bankruptcy proceedings related to this Agreement, in addition to all other sums provided by law. No attorneys' fees or any other related sums may be recovered from the State Engineer.
- g. Fees and Expenses. The Parties shall each bear their own respective costs and expenses, including attorneys' fees, incurred in connection with the Litigation and this Agreement.
- h. Choice of Law. This Agreement shall in all respects be governed by the laws of the State of Utah. Nothing contained herein shall be construed to require the commission of any act contrary to law. Wherever there is any conflict between any provision contained herein and any present or future statute, law, ordinance or regulation, the latter shall prevail, and the affected provision of this Agreement shall be curtailed and limited to the extent necessary to bring it within the requirements of the law.
- i. Counterparts and Facsimile Signatures. This Agreement may be executed in counterparts, each of which when executed and delivered shall be deemed to be an original, binding between the Parties, and all of which together constitute one and the same instrument. Original, facsimile or power of attorney signatures shall be binding upon the Party.

KENT L. JONES, UTAH STATE ENGINEER

Date: 2-21-2019

Kent Jones

UTAH SCHOOL AND INSTITUTIONAL
TRUST LAND ADMINISTRATION

Date: _____

By _____
Name: _____
Its: _____

Attest:

CENTRAL IRON COUNTY WATER
CONSERVANCY DISTRICT

Date: _____

By _____
Name: _____
Its: _____

Attest:

UTAH ALUNITE CORPORATION

Date: _____

By _____
Name: _____
Its: _____

KENT L. JONES, UTAH STATE ENGINEER

Date: _____

Attest:

UTAH SCHOOL AND INSTITUTIONAL
TRUST LAND ADMINISTRATION

Date: 2/26/19

By David Lee
Name: DAVID LEE
Its: Director

Attest:

CENTRAL IRON COUNTY WATER
CONSERVANCY DISTRICT

Date: _____

By _____
Name: _____
Its: _____

Attest:

UTAH ALUNITE CORPORATION

Date: _____

By _____
Name: _____
Its: _____

KENT L. JONES, UTAH STATE ENGINEER

Date: _____

Attest:

UTAH SCHOOL AND INSTITUTIONAL
TRUST LAND ADMINISTRATION

Date: _____

By _____

Name: _____

Its: _____

Attest:

CENTRAL IRON COUNTY WATER
CONSERVANCY DISTRICT

Date: 2-20-2019

By 

Name: Brett F. Hunter

Its: Chairman

Attest:


Paul Monroe

UTAH ALUNITE CORPORATION

Date: _____

By _____

Name: _____

Its: _____

KENT L. JONES, UTAH STATE ENGINEER

Date: _____

**UTAH SCHOOL AND INSTITUTIONAL
TRUST LAND ADMINISTRATION**

Date: _____

By _____

Name: _____

Its: _____

Attest:

**CENTRAL IRON COUNTY WATER
CONSERVANCY DISTRICT**

Date: _____

By _____

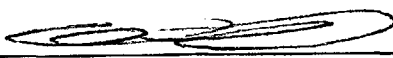
Name: _____

Its: _____

Attest:

UTAH ALUNITE CORPORATION

Date: FEB 26 / 2019

By 

Name: ANDREW SQUIRES

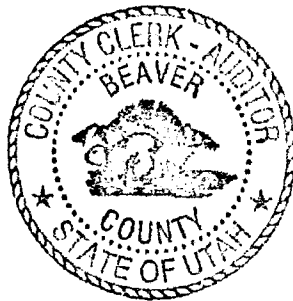
Its: DIRECTOR

BEAVER COUNTY

Date: 2/19/19

By: [Signature]
Name: Michael Datto
Its: Beaver County Chairman

Attest: [Signature], Clerk Auditor



4831-0268-1222, v. 1

EXHIBIT H-2

Stipulated Judgment

14-118

SHAWN E. DRANEY (4026)
SCOTT H. MARTIN (7750)
DANI CEPERNICH (14051)
SNOW CHRISTENSEN & MARTINEAU
10 Exchange Place, 11th Floor
Post Office Box 45000
Salt Lake City, Utah 84145
Telephone: (801) 521-9000
Facsimile: (801) 363-0400
e-mail: sed@scmlaw.com
shm@scmlaw.com
dnc@scmlaw.com

Attorneys for Central Iron County Water Conservancy District

IN THE FIFTH JUDICIAL DISTRICT COURT
IN AND FOR BEAVER COUNTY, STATE OF UTAH

CENTRAL IRON COUNTY WATER
CONSERVANCY DISTRICT, BEAVER
COUNTY, UTAH ALUNITE CORP.,
AND UTAH SCHOOL AND TRUST
LANDS ADMINISTRATION,

Petitioners,

v.

KENT L. JONES, the Utah State
Engineer, CENTRAL IRON COUNTY
WATER CONSERVANCY DISTRICT,
UTAH ALUNITE CORP., and UTAH
SCHOOL AND TRUST LANDS
ADMINISTRATION,

Respondents.

STIPULATED JUDGMENT

Case No.: 140500016

Judge: Keith C. Barnes

Pursuant to the Stipulated Motion for Judgment and Dismissal submitted by Central Iron County Water Conservancy District (the District), Utah Alunite Corp. (UAC), the Utah School and Institutional Trust Lands Administration (SITLA), Beaver County, and Kent L. Jones, the Utah State Engineer (collectively, the Parties), the Court enters this **STIPULATED JUDGMENT**, as outlined in the attached Orders, as follows:

1. The State Engineer's May 13, 2014, order approving in part and rejecting in part the District's Wah Wah Valley application, A76677 (69-101), is hereby replaced by this Judgment.

a. A76677 (69-101), as currently reflected in the records of the State Engineer, is **APPROVED** for the permanent appropriation of 6,525 AF (100% consumptive) of groundwater as set forth in Exhibit 1.

b. A76677a (69-118), a segregated portion of A76677 (69-101), is **APPROVED** for the permanent appropriation of 725 AF (100% consumptive) of groundwater as set forth in Exhibit 2.

c. A76677aa (69-120), a segregated portion of A76677 (69-101), is **APPROVED** for the permanent appropriation of 725 AF (100% consumptive) of groundwater as set forth in Exhibit 3.

d. A76677ab (69-121), a segregated portion of A76677 (69-101), is **APPROVED** for a 40-year fixed-time appropriation of 4,025 AF (100% consumptive) of groundwater as set forth in Exhibit 4.

2. The State Engineer's May 13, 2014, order approving in part and rejecting in part the District's Pine Valley application, A76676 (14-118), is hereby replaced by this Judgment.

A76676 (14-118) is **APPROVED** for the permanent appropriation of 15,000 AF (100% consumptive) of groundwater as set forth in Exhibit 5.

3. Each attached exhibit (Exhibits 1 through 5), rather than the forgoing paragraphs, is the Court's Order of approval on each application and shall be administered accordingly.

4. In this regard, this Stipulated Judgment and the attached Orders (Exhibits 1 through 5) are unique and are not intended to serve as precedent for any other situation, settlement, or basis for State Engineer evaluation of or decision on any other water right application or in any other matter.

5. All remaining claims in this case are **DISMISSED WITH PREJUDICE** with each party bearing its own costs and fees.

**THE COURT'S ELECTRONIC SIGNATURE APPEARS
AT THE TOP OF THE FIRST PAGE OF THIS DOCUMENT**

Approved as to form:

SNOW CHRISTENSEN & MARTINEAU

STOEL RIVES LLP

/s/ Dani Cepernich
Shawn E. Draney
Scott H. Martin
Dani Cepernich
*Attorneys for Central Iron County Water
Conservancy District*

/s/ Richard R. Hall
Richard R. Hall
Attorneys for Utah Alunite Corp.
(signed with permission given via 2/25/19 email)

UTAH SCHOOL AND INSTITUTIONAL
TRUST LANDS ADMINISTRATION

PARSONS BEHLE & LATIMER

/s/ Richard R. Hall
Richard R. Hall
Attorneys for SITLA
(signed with permission given via 2/26/19 email)

/s/ Wendy Bowden Crowther
Michael P. Petrogeorge
Wendy Bowden Crowther
Attorneys for Beaver County
(signed with permission given via 2/26/19 email)

SEAN REYES
UTAH ATTORNEY GENERAL

/s/ Norman K. Johnson
Julie I. Valdes
Norman K. Johnson
Assistant Attorneys General
*Attorneys for Respondent Utah State
Engineer*
(signed with permission given via 2/21/19 email)

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that on the 27th day of February, 2019, I served the foregoing **STIPULATED JUDGMENT** via United States first-class mail to the following:

Julie I. Valdes
Norman K. Johnson
Assistant Attorneys General
1594 West North Temple, #300
Salt Lake City, UT 84116
Attorneys for Kent L. Jones, Utah State Engineer

Michael P. Petrogeorge
mpetrogeorge@parsonsbehle.com
Wendy Bowden Crowther
wcrowther@parsonsbehle.com
PARSONS BEHLE & LATIMER
201 South Main Street, Suite 1800
Salt Lake City, Utah 84111
Attorneys for Beaver County

Richard R. Hall
rrhall@stoel.com
STOEL RIVES, LLP
201 So. Main Street, Suite 1100
Salt Lake City, UT 84111
Attorneys for UAC and SITLA

Mike Johnson
mjohnson@utah.gov
UTAH SCHOOL AND INSTITUTIONAL
TRUST LANDS ADMINISTRATION
675 East 500 South, Suite 500
Salt Lake City, UT 84102
Attorneys for SITLA

/s/ Shelly Deal
Legal Assistant

EXHIBIT 1

AMENDED ORDER

For Application to Appropriate Water Number 69-101 (A76677)

Background

Application to Appropriate Water Number 69-101 (A76677), in the name of Central Iron County Water Conservancy District (the District), was filed on October 17, 2006, to appropriate 6,525.0 acre-feet (af) of water from the groundwater in Wah Wah Valley. It is proposed to divert water from 16-inch wells drilled between 100 and 2000 feet in depth to be located: (1) North 1400 feet and West 2500 feet from the SE Corner of Section 36, T27S, R14W, SLB&M; (2) North 900 feet and West 2350 feet from the SE Corner of Section 31, T27S, R13W, SLB&M; (3) North 1200 feet and West 300 feet from the SE Corner of Section 6, T28S, R14W, SLB&M; (4) South 2100 feet and East 250 feet from the NW Corner of Section 4, T28S, R14W, SLB&M; (5) South 1600 feet and East 1500 feet from the NW Corner of Section 3, T28S, R14W, SLB&M; (6) South 550 feet and West 300 feet from the NE Corner of Section 2, T28S, R14W, SLB&M; (7) South 600 feet and West 250 feet from the NE Corner of Section 12, T28S, R14W, SLB&M; (8) South 300 feet and West 2300 feet from the NE Corner of Section 11, T28S, R14W, SLB&M; (9) North 2400 feet and East 650 feet from the SW Corner of Section 10, T28S, R14W, SLB&M; (10) South 2400 feet and West 2200 feet from the NE Corner of Section 35, T27S, R14W, SLB&M; (11) South 2300 feet and West 2500 feet from the NE Corner of Section 34, T27S, R14W, SLB&M; (12) North 2500 feet and West 700 feet from the SE Corner of Section 28, T27S, R14W, SLB&M; (13) South 1650 feet and East 550 feet from the NW Corner of Section 33, T27S, R14W, SLB&M; (14) South 300 feet and East 600 feet from the NW Corner of Section 32, T27S, R14W, SLB&M; (15) North 850 feet and East 400 feet from the SW Corner of Section 31, T27S, R14W, SLB&M; (16) South 750 feet and West 1900 feet from the NE Corner of Section 8, T28S, R14W, SLB&M; (17) South 2600 feet and East 2200 feet from the NW Corner of Section 16, T28S, R14W, SLB&M; (18) South 2650 feet and West 1900 feet from the NE Corner of Section 14, T28S, R14W, SLB&M; (19) North 900 feet and East 250 feet from the SW Corner of Section 15, T28S, R14W, SLB&M; and (20) South 1750 feet and West 1400 feet from the NE Corner of Section 27, T28S, R14W, SLB&M. The water is to be used for the year-round stockwatering of 2000.00 equivalent livestock units in cattle, horses, or equivalent species (elus) and year-round municipal purposes within the service area of the District.

Notice of the application was published in The Beaver Press on November 23 and 30, 2006, and in the Spectrum on November 23 and 29, 2006. Protests were received from: National Park Service; U.S. Department of the Interior (late protest); Marie Puffer and Duray G. Dalley (late protest); Lyle Wiseman (late protest); Dustin S. Wiseman (late protest); Steve Judd; Bruce P. Dalley (late protest); Beaver High School Students; Matthew Wood (late protest); Viola Reynolds (late protest); Shaun and Tammy Pearson (late protest); Minersville Town (late protest); Gary and Gina Mayer (late protest); Seth Davie (late protest); Carla and Dale Eyre (late protest); David Robinson (late protest); Jetta Robinson (late protest); Elsie Mayer (late protest); Ruby and D. Magnuson (late protest); Helena and W. Bartsch (late protest); Allan and Syble Smith (late protest); Stacy and Chris Barnes (late protest); Jodi Robinson (late protest); Jared Smith (late protest); Dixie (late protest); Dustin and Heidi Thomas (late protest); Ruth Carter (late protest); Barbara Farnsworth (late protest); Deyette and Gary Bradley (late protest); Louise and Darrell Alford (late protest); Natalie Rollins (late protest); Lisa Hendrickson (late protest); Norman and Virginia Bradshaw (late protest); John Carter; Wayne Burrows (late protest); Eric Jessup; Theron and Linda Jessup; Darlene Vaughn; Emma and Ray Davis; Michelle Smith; Steven Yardley; Jeannie Yardley; Lori Ann Hoffman; Board of County Commissioners of Millard County; K. Hussry; Kim Oakden; Crystal Bradshaw; Lisa and Brent Carter; Lynn and Phyllis Bradshaw; Jennie Smith; Resident; Jan and Miles Barney; Concerned Citizens of Beaver Co.; Bradshaw Farms & Equipment and Kents Lake Irrigation Co. and Harris Willis Irrigation Co.; Brady Bradshaw; Collette and Robbie Bradshaw; Jonney Quarnberg; Greg Gunderson and Residents; Max Carter; I. Linda and Lem Lucey; William and Betty Treder; Denise and Dwane Bradshaw; Harlon Thomas; R. Larson Sheep Co.; Green Diamond Ranch; Barry Thiriot; Lyle Wiseman; William Chad Dalton; Beaver County; Elk Meadows Special Service District; Southern Nevada Water Authority; Gilbert and Denise and Emily Yardley; Roger and Ronda Williams; Lisa Nielson; Seldon Nowers; Davis and Alisha Edwards; David and Susan Edwards; Lee Foster; United States Department of the Interior; Lary Carter; James Carter; Southern Utah Water Study, L.C.; Teresa and Michael Bradshaw; S & W Hall Co. Inc.; Robert Storey; James Williams; Mark Whitney; Tina and Tomas Smith; Ray and Shirley Morris; Carl Best; Sly Family; Nickole and Lou Montoya; Kaylene Eyre-Quarnberg; Warren Quarnberg; Sportsmen for Fish & Wildlife; Robert Christensen; Robert Christensen; Clinton Beaumont; Gene and Cerrie Gatz; Arlan Mayer; Jolene Mayer; Jace and Amy Lambeth; Second South Bench Reservoir & Irrigation Co.; Arlene

Edwards; Anne Swindlehurst; Ray Walbeck; John and Heather Gates; Kent and Mary Marshall; Eleana Marshall; Hinal and Shirley Wright; Dan Joseph; W. Neal Wood; Steve Becelleow; Bruce and Benaley Randall; Smith Family et al; Kelly CasMiller; F. Kelly Mortensen; Kim Wood; Rhonda McQuarrie; David Heshington; Joyce and Donald Pettit; Jeffrey Joseph; John Dee and Susan Smith; Julie Chatur; S. Noel; Terry and Penny Levering; Helen Murchie; Lana Reed; Kimberly Solberg; Raymond Benson and Betty Harwell; Thomas Bartts; Russell and Stephanie Helm; Michael and Barbara Robinson; David and Tina Robinson; Norma Thomas; Janet Oakden; Ray Alan and April R. and Kasey Yardley; L. Farnsworth; Reed Dalton; David and LaDona Reynolds; P. A. Duncan; Clyde D. Alford; Francis Bridges; Fern S. Wilber; Val and Ila Smith; Rachel Stewart; Madlyne and George M. Griffiths; Vernon A. and Carol J. Condie; Orson and JoAnn Blackner; Ronald and Vickie Turner; Chitt and Tina Pearsen; Sharen R. and Douglas E. Turner; Gerald W. Thomas; Connie Hudleston; Casidy Barnson; Neil Ammon Cadie; Eva Yardley; Janette Brannwell; Harold LaMorr Morris; ElRoy L. and Alda Stucki; Richard and Noreen Bradshaw; Ronald C. Beebe; Clark Grimshaw; Dennis Hardy; Minersville Land and Livestock; W. Kelly Wood; L. Ben and Melinda Dalton; Honey Low; Cheryl Low; Christine Clitso; Mitch and Rebecca Carter; Reed and Debra Carter; Daniel and Breezy Carter; Jay and Melissa Carter; Robert H. and Mary Helen Lee; Mark J. Yardley; Joseph R. and Penny Yardley; Robert J. Yardley; Kiley Eyre; Kellee and Mitchell Dalton; Mary J. and Ray Yardley; Richard M. Davis; William I. Bradshaw; Beverly C. Barek; Dean and Teri Eyre; Brad Eyre; Leeola G. and Burton R. Myers; Margaret Miller; William and Kathy Acklin; Delmont and Jolene Goff; Susan Maggard; Russ T. Bradshaw; Jeb, Christina, Blake and Todd Marshall; Harold W. and Marilyn Bradshaw; Wayne and Traci Bradshaw; Clarence D. Pope; Colleen Freeman; Charles S. Barnes; Deborah and Eddie Smith; Mary Jane and Max L. Thompson; Lee and Cynthia Hansen; Sandra and Tom Nickell; Blake Marshall; Terri Nelson; Dewey B. Hawkins; Leslie and Lynn Kitchen; Brent McCulley and Kathy Ryan; Sue Byers; Debora K. Nichols; Joanne Geotzelman; Gary W. and Carol G. Roberts; Allan and Christine McCulley; Wayne and Evelyn McCulley; Justin McCulley; Claude R. Fordham; Westside Irrigation Co.; Michael W. Smith; Clark Carter; Clark W. Smith; Duane and Maurine Yardley; Dale A. Yardley; Floyd Yardley; Concerned Citizens of Beaver County Utah; Fairview Land & Livestock Co., Inc.; Jane Scott; Thomas and Margorie McLaughlin; D. G. and Faye McShane; Hal D. Murdock; Millie Ritchie; Marjorie Staheli; Rebecca Hale; Gayle Cooney; Joyce M. Joseph; Yvonne E. Leilua; James E. Bohn; Ann Marshall; David Christensen; City of Milford; Dean Carter; Shanna and Lyle Carter; Joan Davis; Sheldon and Mary Albrecht; Karen and Arnell Gale; S. Edwards; Jennifer Cox; Jason L. Davis; Virginia Marshall; Idonna L. Doerig and Karma M. Mitchell; Robert Eyre; Dixie Power-Water-Light & Telephone, Inc.; LaMar J. and Pearl Briggs; Beverly R. and Rondo Farrer; Donald C. and Leah Glenn; Lynn B. and Melissa Yardley; Wm. E. and Georgean Warby; Beth Puffer; Paul and Marilyn Anderson; Leonard and Beryl Brown; Brent, Sandra and Bessie Edwards; Kristen Sisneros; Tina Harris; Joan Ruplinger; Sandra Lawsen; Marjorie S. Raddon; Gordon G. and Ann Eyre; Orvis and Ruby Bowers; Velby N. Ashworth; Beatrice Willden; Carol Crandy; Lucille P. Strong; Hal and Mary Christensen; Wayne A. Thompson; Peggy Blackner; Shirley M. Howard; Alan and Shaunna Mayer; J. Grant and Gayle L. Wood; Leslie and Nanette Davis; Milford Valley Water Users Board; Scott and Wilma Hansen; Chris L. Kesler; Al J. Boyt; Jennifer L. Brennan; Harold Deems; Alan Gale; Maureen Hodges; Ralph L. Smith; Bruce M. and Karen Marchant; Joyce D. Boyter; D. Carol McCulley; Donald P. and Julia M. Moore; M. P. Thompson; John and Carmen Caffrey; Lucille P. Strong; Frank H. Smith; Roy and Alvina M. Kramer; Delbert and Audrey Kent; Afton S. Kesler; Bryan D. Graham; and Frank and Janice Smith. A hearing was held on July 14, 2010.

On May 13, 2014 an Order of the State Engineer was issued under the signature of Kent L. Jones, P.E., State Engineer, partially approving the application for municipal use within the service area of the District. The order rejected the proposed use for stockwatering of 2,000 elus and approved the municipal use for 6,525.0 af. The District was allowed to segregate the unapproved portion of the application thereby creating water right 69-118 with a proposed use of 5,475.0 af for municipal use. The instant *de novo* judicial review action followed. All protestants were given notice and an opportunity to intervene. Aside from the parties to this action, no protestants did so. The parties to this action subsequently reached a settlement agreement (the Agreement) resolving all claims.

The Agreement contemplates the incorporation of the points of diversion, places of uses, and uses found under application to appropriate 69-115 (A79462), which was renumbered as a fixed time application numbered 69-115 (F79462) on June 19, 2014, by Order of the State Engineer. Notice of that application (69-115 (A79462)) was published in the Beaver County Journal on September 12 and 19, 2012. After protests were submitted, a hearing was held on November 20, 2013. To accommodate the Agreement, this Order fully integrates the points of diversion, places of uses, and uses found under application to appropriate 69-115 (F79462) as outlined in paragraph number 4 of the Conclusion. Upon execution of this Amended Order, Application Number 69-115 (F79462) will be withdrawn as per the Agreement.

Legal Framework

For an application to be approved, the Utah Code Section 73-3-8 criteria must be met. The statute reads:

(1)(a) It shall be the duty of the state engineer to approve an application if there is reason to believe that:

(i) for an application to appropriate, there is unappropriated water in the proposed source;
(ii) the proposed use will not impair existing rights or interfere with the more beneficial use of the water;

(iii) the proposed plan:

(A) is physically and economically feasible, unless the application is filed by the United States Bureau of Reclamation; and

(B) would not prove detrimental to the public welfare;

(iv) the applicant has the financial ability to complete the proposed works;

(v) the application was filed in good faith and not for purposes of speculation or monopoly; and

(vi) if applicable, the application complies with a groundwater management plan adopted under Section 73-5-15.

(b) If the state engineer, because of information in the state engineer's possession obtained either by the state engineer's own investigation or otherwise, has reason to believe that an application will interfere with the water's more beneficial use for irrigation, municipal and industrial, domestic or culinary, stock watering, power or mining development, or manufacturing, or will unreasonably affect public recreation or the natural stream environment, or will prove detrimental to the public welfare, the state engineer shall withhold approval or rejection of the application until the state engineer has investigated the matter.

(c) If an application does not meet the requirements of this section, it shall be rejected.

Analysis

1. Although the State Engineer is concerned that there is less water available in the Wah Wah Valley Aquifer than what is being proposed to be used under all applications to appropriate in the area, the State Engineer along with all signatories of the settlement agreement resolving this action have committed, among other things, to the following:

The Parties acknowledge they have a difference of opinion regarding the amount of water available for development in the Wah Wah Valley and the Pine Valley – namely, the safe yield of the aquifers in those valleys. By way of this Agreement the State Engineer will allow the non-State Engineer Parties to proceed with plans to develop the amount of water stated herein with the understanding that the non-State Engineer Parties assume all risk and full responsibility for the possibility that the safe annual yield of the Wah Wah Valley aquifer and/or the Pine Valley aquifer is less than the amounts referenced in this Agreement. The non-State Engineer Parties expressly understand and acknowledge that the State Engineer is making no warranty or representation about the amount of water available for development in the Wah Wah Valley and the Pine Valley, and that approvals provided under this Agreement may be for more water than future facts demonstrate is actually available for long-term beneficial use. They further understand and acknowledge that under Utah Code Section 73-5-15, the State Engineer may regulate groundwater withdrawals within a specific groundwater basin by adopting a groundwater management plan in accordance with that section for any groundwater basin or aquifer or combination of hydrologically connected groundwater basins or aquifers. Nothing in this Agreement affects or is intended to affect the State Engineer's authority under that section as it presently exists and as it may change. The non-State Engineer Parties expressly understand and acknowledge that proper exercise of that authority may result in a reduction of the amount of water authorized for diversion under this Agreement.

2. There are existing rights to use water in Wah Wah Valley. Utah Code Section 73-3-8(1)(a)(i) requires that unappropriated water be available for approval of an application to appropriate. The District proposes to divert and export a significant quantity of groundwater from the valley. This has raised concern among existing users. The most prominent existing use in the valley diverts water from Wah Wah Springs, which discharge at an elevation of approximately 5600 feet above mean sea level. All of the District's proposed wells are located on land below that elevation where known groundwater levels are several hundred feet below land surface. Groundwater flow in the valley is presumed to be primarily from South to North with East and West margins of the valley flowing toward the center (based on Technical Publication 47 and other more recent studies). Wah Wah Springs is located northwest of the District's proposed wells and is considered warm (15° higher than the mean annual air temperature, Tech Pub 47). Those factors taken together suggest a separation between the groundwater flow system supplying water to Wah Wah Springs and the system from which the District plans to divert water. It appears pumping the valley-fill aquifer as proposed will not likely diminish the yield of the springs. Other uses of water dependent on streamflow and springs along the margins of the valley are most likely similarly situated. There is reason to believe this application meets Section 73-3-8(1)(a)(i) criterion and there is limited unappropriated water available in Wah Wah Valley. Additionally, there is reason to believe that approval of this application will not impair prior rights and it therefore complies with Section 73-3-8(1)(a)(ii).
3. The District does not own land upon which to locate wells or other infrastructure necessary to implement this project and has not presented evidence that those property rights have been obtained or negotiations to obtain them have commenced. All land ownership, access, or use issues must be resolved by the District including obtaining authority from and conforming to the rules and regulations promulgated by agencies of the federal government for public land use. A critical element of this project is the District's ability to obtain authority to use federal land. Pending approval from land owners, there is reason to believe this application meets the criteria of Section 73-3-8(1)(a)(iii) in that it is feasible to divert water as proposed.
4. The District has the ability under Section 17B-1-103 to sell bonds, levy taxes, assess user fees, and obtain financing through other means within limits established by the legislature. There is reason to believe that the District meets the Section 73-3-8(1)(a)(iv) criterion.
5. There is reason to believe granting this application is consistent with Section 73-3-8(1)(a)(iii)(B) and the proposed plan would not prove detrimental to the public welfare.
6. There is reason to believe that this application was filed in good faith and not filed for purposes of speculation and monopoly.
7. There is reason to believe the application meets the criteria of Section 73-3-8, and should be approved.

Conclusion

It is, therefore, **ORDERED**: Application to Appropriate Water Number 69-101 (A76677) is hereby **APPROVED** subject to prior rights and the following conditions:

1. As noted, this approval is granted subject to prior rights. The District must, as necessary, mitigate or provide compensation for any impairment of prior rights such as may be stipulated among parties or decreed by a court of competent jurisdiction.
2. This approval is limited to the rights to divert and beneficially use water and does not grant any rights of access to, or use of, land or facilities not owned by the District.
3. Water use under this approval is limited to a cumulative maximum annual diversion of 6,525 af for the stockwatering of 2,000 elus, municipal use within the service area of the District and Wah Wah

Valley, and for mining purposes from those points of diversion and within the places of use described under condition four. It is noted that the diversion of water from Wah Wah Valley is able to be fully consumed by the District for these uses. The priority of water right 69-101 is the same date of the filing of the underlying Application to Appropriate or October 17, 2006.

4. The application is modified to integrate and include the following points of diversion and places of use, in addition to those originally proposed, to accommodate the mining use detailed under condition 3:

Points of Diversion: (1) Well - South 200 feet and East 200 feet from the NW Corner of Section 16, T28S, R14W, SLB&M (16-inch, 1500 feet deep); (2) Well - North 980 feet and West 1550 feet from the SW Corner of Section 14, T29S, R15W, SLB&M (16-inch, 1500 feet deep); (3) Well - South 200 feet and West 200 feet from the NE Corner of Section 16, T28S, R14W, SLB&M (16-inch, 1500 feet deep); (4) Well - South 200 feet and West 200 feet from the NE Corner of Section 27, T28S, R14W, SLB&M (16-inch, 1500 feet deep); (5) Well - North 200 feet and West 200 feet from the SE Corner of Section 16, T28S, R14W, SLB&M (16-inch, 1500 feet deep); (6) Well - South 200 feet and East 200 feet from the NW Corner of Section 21, T28S, R14W, SLB&M (16-inch, 1500 feet deep); (7) Well - South 200 feet and West 200 feet from the NE Corner of Section 28, T28S, R14W, SLB&M (16-inch, 1500 feet deep); (8) Well - South 200 feet and West 200 feet from the NE Corner of Section 26, T28S, R14W, SLB&M (16-inch, 1500 feet deep); and (9) Well - South 200 feet and West 200 feet from the NE Corner of Section 22, T28S, R14W, SLB&M (16-inch, 1500 feet deep).

Places of Use: Sections 16, 21, 22, 26, 27, 28, 32, 33, 34, 35, & 36, T28S, R14W, SLB&M; Section 36, T28S, R15W, SLB&M; Sections 2, 3, 4, 5, 6, 7, 8, 9, 10, & 16, T29S, R14W, SLB&M; Sections 1, 2, 11, 12, 13, 14, 15, 16, 21, 22, 23, 24, 25, 26, 27, 28, 29, 32, 33, 34, 35, & 36, T29S, R15W, SLB&M; and Section 2, T30S, R15W, SLB&M.

5. Each well under this application is to be individually metered and a permanent record of the water diverted from each well shall be maintained. The District shall make those records of the diversions made available for inspection by personnel of the Division of Water Rights upon reasonable request. **An annual report of all water diversions under this approval shall be submitted to the Division of Water Rights.**
6. The documents submitted as proof of beneficial use for this application, as required by statute at Section 73-3-16 shall include a full and correct copy of the metering record maintained as required herein.
7. All wells used as public water supply wells are regulated by the Utah Division of Drinking Water. Plans for the construction of new wells must be reviewed and approved by the Division of Drinking Water prior to any drilling or construction activity being commenced. The approval of this water right application does not constitute approval of the well for use as a public water supply by the Division of Drinking Water. The District is advised to contact the Division of Drinking Water at (801) 536-4200 to review applicable standards and for information about approval of a source of supply for public use.
8. Along with this approval, the District shall develop a monitoring program to ensure that no prior rights are being impaired. Plans for this monitoring program must be submitted to and approved by the State Engineer prior to diversion of any water from the proposed sources.

The District is strongly cautioned that other permits are required before any development of this application can begin and it is the responsibility of the District to determine the applicability of and acquisition of such permits. Once all other permits have been acquired, this is your authority to develop the water under the above referenced application which under Sections 73-3-10 and 73-3-12, Utah Code Annotated, 1953, as amended, must be diligently prosecuted to completion. The water must be put to beneficial use and proof must be filed on or before **February 28, 2033** or a request for extension of time must be acceptably filed; otherwise the application will be lapsed.

Proof of beneficial use is evidence to the State Engineer that the water has been fully placed to its intended beneficial use. By law, it must be prepared by a registered engineer or land surveyor, who will certify to the location, uses and extent of your water right. Upon the submission of proof as required by Section 73-3-16, the District must identify every source of water used under this application and the amount of water diverted from that source. The proof must also show the capacity of the sources of supply and demonstrate that each source can provide the water claimed to be diverted under this right as well as all other water rights which may be approved to be diverted from those sources. Failure on your part to comply with the requirements of the applicable statutes may result in the lapsing of this Application to Appropriate Water.

The right to beneficially use water as described in this order shall be administered by the State Engineer the same as if this order had been issued by the State Engineer.

**THE COURT'S ELECTRONIC SIGNATURE APPEARS
AT THE TOP OF THE FIRST PAGE OF THE JUDGMENT
TO WHICH THIS ORDER IS ATTACHED**

EXHIBIT 2

ORDER

For Application to Appropriate Water Number 69-118 (A76677a)

Background

Application to Appropriate Water Number 69-118 (A76677a) in the name of Central Iron County Water Conservancy District (the District), was filed on October 17, 2006, to appropriate 725.00 acre-feet (af) of water from the groundwater in Wah Wah Valley. It is proposed to divert water from 16-inch wells drilled between 100 and 2000 feet in depth to be located: (1) North 1400 feet and West 2500 feet from the SE Corner of Section 36, T27S, R14W, SLB&M; (2) North 900 feet and West 2350 feet from the SE Corner of Section 31, T27S, R13W, SLB&M; (3) North 1200 feet and West 300 feet from the SE Corner of Section 6, T28S, R14W, SLB&M; (4) South 2100 feet and East 250 feet from the NW Corner of Section 4, T28S, R14W, SLB&M; (5) South 1600 feet and East 1500 feet from the NW Corner of Section 3, T28S, R14W, SLB&M; (6) South 550 feet and West 300 feet from the NE Corner of Section 2, T28S, R14W, SLB&M; (7) South 600 feet and West 250 feet from the NE Corner of Section 12, T28S, R14W, SLB&M; (8) South 300 feet and West 2300 feet from the NE Corner of Section 11, T28S, R14W, SLB&M; (9) North 2400 feet and East 650 feet from the SW Corner of Section 10, T28S, R14W, SLB&M; (10) South 2400 feet and West 2200 feet from the NE Corner of Section 35, T27S, R14W, SLB&M; (11) South 2300 feet and West 2500 feet from the NE Corner of Section 34, T27S, R14W, SLB&M; (12) North 2500 feet and West 700 feet from the SE Corner of Section 28, T27S, R14W, SLB&M; (13) South 1650 feet and East 550 feet from the NW Corner of Section 33, T27S, R14W, SLB&M; (14) South 300 feet and East 600 feet from the NW Corner of Section 32, T27S, R14W, SLB&M; (15) North 850 feet and East 400 feet from the SW Corner of Section 31, T27S, R14W, SLB&M; (16) South 750 feet and West 1900 feet from the NE Corner of Section 8, T28S, R14W, SLB&M; (17) South 2600 feet and East 2200 feet from the NW Corner of Section 16, T28S, R14W, SLB&M; (18) South 2650 feet and West 1900 feet from the NE Corner of Section 14, T28S, R14W, SLB&M; (19) North 900 feet and East 250 feet from the SW Corner of Section 15, T28S, R14W, SLB&M; and (20) South 1750 feet and West 1400 feet from the NE Corner of Section 27, T28S, R14W, SLB&M. The water is to be used for year-round municipal purposes within the service area of the District.

Notice of the application was published in The Beaver Press on November 23 and 30, 2006, and in the Spectrum on November 23 and 29, 2006. Protests were received from: National Park Service; U.S. Department of the Interior (late protest); Marie Puffer and Duray G. Dalley (late protest); Lyle Wiseman (late protest); Dustin S. Wiseman (late protest); Steve Judd; Bruce P. Dalley (late protest); Beaver High School Students; Matthew Wood (late protest); Viola Reynolds (late protest); Shaun and Tammy Pearson (late protest); Minersville Town (late protest); Gary and Gina Mayer (late protest); Seth Davie (late protest); Carla and Dale Eyre (late protest); David Robinson (late protest); Jetta Robinson (late protest); Elsie Mayer (late protest); Ruby and D. Magnuson (late protest); Helena and W. Bartsch (late protest); Allan and Syble Smith (late protest); Stacy and Chris Barnes (late protest); Jodi Robinson (late protest); Jared Smith (late protest); Dixie (late protest); Dustin and Heidi Thomas (late protest); Ruth Carter (late protest); Barbara Farnsworth (late protest); Deyette and Gary Bradley (late protest); Louise and Darrell Alford (late protest); Natalie Rollins (late protest); Lisa Hendrickson (late protest); Norman and Virginia Bradshaw (late protest); John Carter; Wayne Burrows (late protest); Eric Jessup; Theron and Linda Jessup, Darlene Vaughn; Emma and Ray Davis; Michelle Smith; Steven Yardley; Jeannie Yardley; Lori Ann Hoffman; Board of County Commissioners of Millard County; K. Hussry; Kim Oakden; Crystal Bradshaw; Lisa and Brent Carter; Lynn and Phyllis Bradshaw; Jennie Smith; Resident; Jan and Miles Barney; Concerned Citizens of Beaver Co.; Bradshaw Farms & Equipment and Kents Lake Irrigation Co. and Harris Willis Irrigation Co.; Brady Bradshaw; Collette and Robbie Bradshaw; Jonney Quarnberg; Greg Gunderson and Residents; Max Carter; I. Linda and Lem Lucey; William and Betty Treder; Denise and Dwane Bradshaw; Harlon Thomas; R. Larson Sheep Co.; Green Diamond Ranch; Barry Thiriot; Lyle Wiseman; William Chad Dalton; Beaver County; Elk Meadows Special Service District; Southern Nevada Water Authority; Gilbert and Denise and Emily Yardley; Roger and Ronda Williams; Lisa Nielson; Seldon Nowers; Davis and Alisha Edwards; David and Susan Edwards; Lee Foster; United States Department of the Interior; Lary Carter; James Carter; Southern Utah Water Study, L.C.; Teresa and Michael Bradshaw; S & W Hall Co. Inc.; Robert Storey; James Williams; Mark Whitney; Tina and Tomas Smith; Ray and Shirley Morris; Carl Best; Sly Family; Nickole and Lou Montoya; Kaylene Eyre-Quarnberg; Warren Quarnberg; Sportsmen for Fish & Wildlife; Robert Christensen; Robert Christensen; Clinton Beaumont; Gene and Cerrie Gatz; Arlan Mayer; Jolene Mayer; Jace and Amy Lambeth; Second South Bench Reservoir & Irrigation Co.; Arlene Edwards; Anne Swindlehurst; Ray Walbeck; John and Heather Gates; Kent and Mary Marshall; Eleana Marshall;

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The State Engineer issued an order on May 13, 2014, approving in part and denying in part Application to Appropriate Water Number 69-101 (A76677), from which this application was segregated. The unapproved portion of 69-101 (A76677) was segregated and assigned Water Right No. 69-118 (Application to Appropriate No. A76677a). The instant *de novo* judicial review action followed. All protestants were given notice and an opportunity to intervene. Aside from the parties to this action, no protestants did so. The parties to this action subsequently reached an agreement resolving all claims. To accommodate the terms of that agreement, the District segregated 725 AF from A76677a to A76677aa (69-120) and 4,025 AF from A76677a to A76677ab (69-121) leaving 725 AF in this application (A7677a (69-118)).

Legal Framework

For an application to be approved, the Utah Code Section 73-3-8 criteria must be met. The statute reads:

- (1)(a) It shall be the duty of the state engineer to approve an application if there is reason to believe that:*
- (i) for an application to appropriate, there is unappropriated water in the proposed source;*

(ii) the proposed use will not impair existing rights or interfere with the more beneficial use of the water;

(iii) the proposed plan:

(A) is physically and economically feasible, unless the application is filed by the United States Bureau of Reclamation; and

(B) would not prove detrimental to the public welfare;

(iv) the applicant has the financial ability to complete the proposed works;

(v) the application was filed in good faith and not for purposes of speculation or monopoly; and

(vi) if applicable, the application complies with a groundwater management plan adopted under Section 73-5-15.

(b) If the state engineer, because of information in the state engineer's possession obtained either by the state engineer's own investigation or otherwise, has reason to believe that an application will interfere with the water's more beneficial use for irrigation, municipal and industrial, domestic or culinary, stock watering, power or mining development, or manufacturing, or will unreasonably affect public recreation or the natural stream environment, or will prove detrimental to the public welfare, the state engineer shall withhold approval or rejection of the application until the state engineer has investigated the matter.

(c) If an application does not meet the requirements of this section, it shall be rejected.

Analysis

1. Although the State Engineer is concerned that there is less water available in the Wah Wah Valley Aquifer than what is being proposed to be used under all applications to appropriate in the area, the State Engineer along with all signatories of the settlement agreement resolving this action have committed, among other things, to the following:

The Parties acknowledge they have a difference of opinion regarding the amount of water available for development in the Wah Wah Valley and the Pine Valley – namely, the safe yield of the aquifers in those valleys. By way of this Agreement the State Engineer will allow the non-State Engineer Parties to proceed with plans to develop the amount of water stated herein with the understanding that the non-State Engineer Parties assume all risk and full responsibility for the possibility that the safe annual yield of the Wah Wah Valley aquifer and/or the Pine Valley aquifer is less than the amounts referenced in this Agreement. The non-State Engineer Parties expressly understand and acknowledge that the State Engineer is making no warranty or representation about the amount of water available for development in the Wah Wah Valley and the Pine Valley, and that approvals provided under this Agreement may be for more water than future facts demonstrate is actually available for long-term beneficial use. They further understand and acknowledge that under Utah Code Section 73-5-15, the State Engineer may regulate groundwater withdrawals within a specific groundwater basin by adopting a groundwater management plan in accordance with that section for any groundwater basin or aquifer or combination of hydrologically connected groundwater basins or aquifers. Nothing in this Agreement affects or is intended to affect the State Engineer's authority under that section as it presently exists and as it may change. The non-State Engineer Parties expressly understand and acknowledge that proper exercise of that authority may result in a reduction of the amount of water authorized for diversion under this Agreement.

2. There are existing rights to use water in Wah Wah Valley. Utah Code Section 73-3-8(1)(a)(i) requires that unappropriated water be available for approval of an application to appropriate. The District proposes to divert and export a significant quantity of groundwater from the valley. This has raised concern among existing users. The most prominent existing use in the valley diverts water from Wah Wah Springs, which discharge at an elevation of approximately 5600 feet above mean sea level. All of the District's proposed wells are located on land below that elevation where known groundwater levels are several hundred feet below land surface. Groundwater flow in the

valley is presumed to be primarily from South to North with East and West margins of the valley flowing toward the center (based on Technical Publication 47 and other more recent studies). Wah Wah Springs is located northwest of the District's proposed wells and is considered warm (15° higher than the mean annual air temperature, Tech Pub 47). Those factors taken together suggest a separation between the groundwater flow system supplying water to Wah Wah Springs and the system from which the District plans to divert water. It appears pumping the valley-fill aquifer as proposed will not likely diminish the yield of the springs. Other uses of water dependent on streamflow and springs along the margins of the valley are most likely similarly situated. There is reason to believe this application meets Section 73-3-8(1)(a)(i) criterion and there is limited unappropriated water available in Wah Wah Valley. Additionally, there is reason to believe that approval of this application will not impair prior rights and it therefore complies with Section 73-3-8(1)(a)(ii).

3. The District does not own land upon which to locate wells or other infrastructure necessary to implement this project and has not presented evidence that those property rights have been obtained or negotiations to obtain them have commenced. All land ownership, access, or use issues must be resolved by the District including obtaining authority from and conforming to the rules and regulations promulgated by agencies of the federal government for public land use. A critical element of this project is the District's ability to obtain authority to use federal land. Pending approval from land owners, there is reason to believe this application meets the criteria of Section 73-3-8(1)(a)(iii) in that it is feasible to divert water as proposed.
4. The District has the ability under Section 17B-1-103 to sell bonds, levy taxes, assess user fees, and obtain financing through other means within limits established by the legislature. There is reason to believe that the District meets the Section 73-3-8(1)(a)(iv) criterion.
5. There is reason to believe granting this application is consistent with Section 73-3-8(1)(a)(iii)(B) and the proposed plan would not prove detrimental to the public welfare.
6. There is reason to believe that this application was filed in good faith and not filed for purposes of speculation and monopoly.
7. There is reason to believe the application meets the criteria of Section 73-3-8, and should be approved.

Conclusion

It is, therefore, **ORDERED:** Application to Appropriate Water Number 69-118 (A76677a) is hereby **APPROVED** subject to prior rights and the following conditions:

1. As noted, this approval is granted subject to prior rights. The District must, as necessary, mitigate or provide compensation for any impairment of prior rights such as may be stipulated among parties or decreed by a court of competent jurisdiction.
2. This approval is limited to the rights to divert and beneficially use water and does not grant any rights of access to, or use of, land or facilities not owned by the District.
3. Water use under this approval shall be limited to municipal use within the service area of District with a maximum annual diversion allowance of 725.0 af of water for this use all uses occurring within the District's service area. It is noted that the diversion of water from Wah Wah Valley is able to be fully consumed by the District for these uses. The priority of water right 69-118 is, by agreement, October 18, 2006.
4. Each well under this application is to be individually metered and a permanent record of the water diverted from each well shall be maintained. The District shall make those records of the diversions made available for inspection by personnel of the Division of Water Rights upon reasonable request. **An annual report of all water diversions under this approval shall be submitted to the Division**

of Water Rights.

5. The documents submitted as proof of beneficial use for this application, as required by statute at Section 73-3-16 shall include a full and correct copy of the metering record maintained as required herein.
6. All wells used as public water supply wells are regulated by the Utah Division of Drinking Water. Plans for the construction of new wells must be reviewed and approved by the Division of Drinking Water prior to any drilling or construction activity being commenced. The approval of this water right application does not constitute approval of the well for use as a public water supply by the Division of Drinking Water. The District is advised to contact the Division of Drinking Water at (801) 536-4200 to review applicable standards and for information about approval of a source of supply for public use.
7. Along with this approval, the District shall develop a monitoring program to ensure that no prior rights are being impaired. Plans for this monitoring program must be submitted to and approved by the State Engineer prior to diversion of any water from the proposed sources.

The District is strongly cautioned that other permits may be required before any development of this application can begin and it is the responsibility of the District to determine the applicability of and acquisition of such permits. Once all other permits have been acquired, this is your authority to develop the water under the above referenced application which under Sections 73-3-10 and 73-3-12, Utah Code Annotated, 1953, as amended, must be diligently prosecuted to completion. The water must be put to beneficial use and proof must be filed on or before **February 28, 2033**, or a request for extension of time must be acceptably filed; otherwise the application will be lapsed.

Proof of beneficial use is evidence to the State Engineer that the water has been fully placed to its intended beneficial use. By law, it must be prepared by a registered engineer or land surveyor, who will certify to the location, uses and extent of your water right.

Upon the submission of proof as required by Section 73-3-16 for this application, the District must identify every source of water used under this application and the amount of water used from that source. The proof must also show the capacity of the sources of supply and demonstrate that each source can provide the water claimed to be diverted under this right as well as all other water rights which may be approved to be diverted from those sources.

Failure on your part to comply with the requirements of the applicable statutes may result in the lapsing of this Application to Appropriate Water.

The right to beneficially use water as described in this order shall be administered by the State Engineer the same as if this order had been issued by the State Engineer.

**THE COURT'S ELECTRONIC SIGNATURE APPEARS
AT THE TOP OF THE FIRST PAGE OF THE JUDGMENT
TO WHICH THIS ORDER IS ATTACHED**

EXHIBIT 3

ORDER

For Application to Appropriate Water Number 69-120 (A76677aa)

Background

Application to Appropriate Water Number 69-120 (A76677aa) in the name of Central Iron County Water Conservancy District (the District), was filed on October 17, 2006, to appropriate 725.00 acre-feet (af) of water from the groundwater in Wah Wah Valley. It is proposed to divert water from 16-inch wells drilled between 100 and 2000 feet in depth to be located: (1) North 1400 feet and West 2500 feet from the SE Corner of Section 36, T27S, R14W, SLB&M; (2) North 900 feet and West 2350 feet from the SE Corner of Section 31, T27S, R13W, SLB&M; (3) North 1200 feet and West 300 feet from the SE Corner of Section 6, T28S, R14W, SLB&M; (4) South 2100 feet and East 250 feet from the NW Corner of Section 4, T28S, R14W, SLB&M; (5) South 1600 feet and East 1500 feet from the NW Corner of Section 3, T28S, R14W, SLB&M; (6) South 550 feet and West 300 feet from the NE Corner of Section 2, T28S, R14W, SLB&M; (7) South 600 feet and West 250 feet from the NE Corner of Section 12, T28S, R14W, SLB&M; (8) South 300 feet and West 2300 feet from the NE Corner of Section 11, T28S, R14W, SLB&M; (9) North 2400 feet and East 650 feet from the SW Corner of Section 10, T28S, R14W, SLB&M; (10) South 2400 feet and West 2200 feet from the NE Corner of Section 35, T27S, R14W, SLB&M; (11) South 2300 feet and West 2500 feet from the NE Corner of Section 34, T27S, R14W, SLB&M; (12) North 2500 feet and West 700 feet from the SE Corner of Section 28, T27S, R14W, SLB&M; (13) South 1650 feet and East 550 feet from the NW Corner of Section 33, T27S, R14W, SLB&M; (14) South 300 feet and East 600 feet from the NW Corner of Section 32, T27S, R14W, SLB&M; (15) North 850 feet and East 400 feet from the SW Corner of Section 31, T27S, R14W, SLB&M; (16) South 750 feet and West 1900 feet from the NE Corner of Section 8, T28S, R14W, SLB&M; (17) South 2600 feet and East 2200 feet from the NW Corner of Section 16, T28S, R14W, SLB&M; (18) South 2650 feet and West 1900 feet from the NE Corner of Section 14, T28S, R14W, SLB&M; (19) North 900 feet and East 250 feet from the SW Corner of Section 15, T28S, R14W, SLB&M; and (20) South 1750 feet and West 1400 feet from the NE Corner of Section 27, T28S, R14W, SLB&M. The water is to be used for year-round municipal purposes within the service area of the District.

Notice of the application was published in The Beaver Press on November 23 and 30, 2006, and in the Spectrum on November 23 and 29, 2006. Protests were received from: National Park Service; U.S. Department of the Interior (late protest); Marie Puffer and Duray G. Dalley (late protest); Lyle Wiseman (late protest); Dustin S. Wiseman (late protest); Steve Judd; Bruce P. Dalley (late protest); Beaver High School Students; Matthew Wood (late protest); Viola Reynolds (late protest); Shaun and Tammy Pearson (late protest); Minersville Town (late protest); Gary and Gina Mayer (late protest); Seth Davie (late protest); Carla and Dale Eyre (late protest); David Robinson (late protest); Jetta Robinson (late protest); Elsie Mayer (late protest); Ruby and D. Magnuson (late protest); Helena and W. Bartsch (late protest); Allan and Syble Smith (late protest); Stacy and Chris Barnes (late protest); Jodi Robinson (late protest); Jared Smith (late protest); Dixie (late protest); Dustin and Heidi Thomas (late protest); Ruth Carter (late protest); Barbara Farnsworth (late protest); Deyette and Gary Bradley (late protest); Louise and Darrell Alford (late protest); Natalie Rollins (late protest); Lisa Hendrickson (late protest); Norman and Virginia Bradshaw (late protest); John Carter; Wayne Burrows (late protest); Eric Jessup; Theron and Linda Jessup, Darlene Vaughn; Emma and Ray Davis; Michelle Smith; Steven Yardley; Jeannie Yardley; Lori Ann Hoffman; Board of County Commissioners of Millard County; K. Hussry; Kim Oakden; Crystal Bradshaw; Lisa and Brent Carter; Lynn and Phyllis Bradshaw; Jennie Smith; Resident; Jan and Miles Barney; Concerned Citizens of Beaver Co.; Bradshaw Farms & Equipment and Kents Lake Irrigation Co. and Harris Willis Irrigation Co.; Brady Bradshaw; Collette and Robbie Bradshaw; Jonney Quarnberg; Greg Gunderson and Residents; Max Carter; I. Linda and Lem Lucey; William and Betty Treder; Denise and Dwane Bradshaw; Harlon Thomas; R. Larson Sheep Co.; Green Diamond Ranch; Barry Thiriot; Lyle Wiseman; William Chad Dalton; Beaver County; Elk Meadows Special Service District; Southern Nevada Water Authority; Gilbert and Denise and Emily Yardley; Roger and Ronda Williams; Lisa Nielson; Seldon Nowers; Davis and Alisha Edwards; David and Susan Edwards; Lee Foster; United States Department of the Interior; Lary Carter; James Carter; Southern Utah Water Study, L.C.; Teresa and Michael Bradshaw; S & W Hall Co. Inc.; Robert Storey; James Williams; Mark Whitney; Tina and Tomas Smith; Ray and Shirley Morris; Carl Best; Sly Family; Nickole and Lou Montoya; Kaylene Eyre-Quarnberg; Warren Quarnberg; Sportsmen for Fish & Wildlife; Robert Christensen; Robert Christensen; Clinton Beaumont; Gene and Cerrie Gatz; Arlan Mayer; Jolene Mayer; Jace and Amy Lambeth; Second South Bench Reservoir & Irrigation Co.; Arlene Edwards; Anne Swindlehurst; Ray Walbeck; John and Heather Gates; Kent and Mary Marshall; Eleana Marshall;

Hinal and Shirley Wright; Dan Joseph; W. Neal Wood; Steve Becelleow; Bruce and Benaley Randall; Smith Family et al; Kelly CasMiller; F. Kelly Mortensen; Kim Wood; Rhonda McQuarrie; David Heshington; Joyce and Donald Pettit; Jeffrey Joseph; John Dee and Susan Smith; Julie Chatur; S. Noel; Terry and Penny Levering; Helen Murchie; Lana Reed; Kimberly Solberg; Raymond Benson and Betty Harwell; Thomas Bartts; Russell and Stephanie Helm; Michael and Barbara Robinson; David and Tina Robinson; Norma Thomas; Janet Oakden; Ray Alan and April R. and Kasey Yardley; L. Farnsworth; Reed Dalton; David and LaDona Reynolds; P. A. Duncan; Clyde D. Alford; Francis Bridges; Fern S. Wilber; Val and Ila Smith; Rachel Stewart; Madlyne and George M. Griffiths; Vernon A. and Carol J. Condie; Orson and JoAnn Blackner; Ronald and Vickie Turner; Chitt and Tina Pearsen; Sharen R. and Douglas E. Turner; Gerald W. Thomas; Connie Hudleston; Casidy Barnson; Neil Ammon Cadie; Eva Yardley; Janette Brannwell; Harold LaMorr Morris; ElRoy L. and Alda Stucki; Richard and Noreen Bradshaw; Ronald C. Beebe; Clark Grimshaw; Dennis Hardy; Minersville Land and Livestock; W. Kelly Wood; L. Ben and Melinda Dalton; Honey Low; Cheryl Low; Christine Clitso; Mitch and Rebecca Carter; Reed and Debra Carter; Daniel and Breezy Carter; Jay and Melissa Carter; Robert H. and Mary Helen Lee; Mark J. Yardley; Joseph R. and Penny Yardley; Robert J. Yardley; Kiley Eyre; Kellee and Mitchell Dalton; Mary J. and Ray Yardley; Richard M. Davis; William I. Bradshaw; Beverly C. Barek; Dean and Teri Eyre; Brad Eyre; Leeola G. and Burton R. Myers; Margaret Miller; William and Kathy Acklin; Delmont and Jolene Goff; Susan Maggard; Russ T. Bradshaw; Jeb, Christina, Blake and Todd Marshall; Harold W. and Marilyn Bradshaw; Wayne and Traci Bradshaw; Clarence D. Pope; Colleen Freeman; Charles S. Barnes; Deborah and Eddie Smith; Mary Jane and Max L. Thompson; Lee and Cynthia Hansen; Sandra and Tom Nickell; Blake Marshall; Terri Nelson; Dewey B. Hawkins; Leslie and Lynn Kitchen; Brent McCulley and Kathy Ryan; Sue Byers; Debora K. Nichols; Joanne Geotzelman; Gary W. and Carol G. Roberts, Allan and Christine McCulley; Wayne and Evelyn McCulley; Justin McCulley; Claude R. Fordham; Westside Irrigation Co.; Michael W. Smith; Clark Carter; Clark W. Smith; Duane and Maurine Yardley; Dale A. Yardley; Floyd Yardley; Concerned Citizens of Beaver County Utah; Fairview Land & Livestock Co., Inc.; Jane Scott; Thomas and Margorie McLaughlin; D. G. and Faye McShane; Hal D. Murdock; Millie Ritchie; Marjorie Staheli; Rebecca Hale; Gayle Cooney; Joyce M. Joseph; Yvonne E. Leilua; James E. Bohn; Ann Marshall; David Christensen; City of Milford; Dean Carter; Shanna and Lyle Carter; Joan Davis; Sheldon and Mary Albrecht; Karen and Arnell Gale; S. Edwards; Jennifer Cox; Jason L. Davis; Virginia Marshall; Idonna L. Doerig and Karma M. Mitchell; Robert Eyre; Dixie Power-Water-Light & Telephone, Inc.; LaMar J. and Pearl Briggs; Beverly R. and Rondo Farrer; Donald C. and Leah Glenn; Lynn B. and Melissa Yardley; Wm. E. and Georgean Warby; Beth Puffer; Paul and Marilyn Anderson; Leonard and Beryl Brown; Brent, Sandra and Bessie Edwards; Kristen Sisneros; Tina Harris; Joan Ruplinger; Sandra Lawsen; Marjorie S. Raddon; Gordon G. and Ann Eyre; Orvis and Ruby Bowers; Velby N. Ashworth; Beatrice Willden; Carol Crandy; Lucille P. Strong; Hal and Mary Christensen; Wayne A. Thompson; Peggy Blackner; Shirley M. Howard; Alan and Shaunna Mayer; J. Grant and Gayle L. Wood; Leslie and Nanette Davis; Milford Valley Water Users Board; Scott and Wilma Hansen; Chris L. Kesler; Al J. Boyt; Jennifer L. Brennan; Harold Deems; Alan Gale; Maureen Hodges; Ralph L. Smith; Bruce M. and Karen Marchant; Joyce D. Boyter; D. Carol McCulley; Donald P. and Julia M. Moore; M. P. Thompson; John and Carmen Caffrey; Lucille P. Strong; Frank H. Smith; Roy and Alvina M. Kramer; Delbert and Audrey Kent; Afton S. Kesler; Bryan D. Graham; and Frank and Janice Smith. A hearing was held on July 14, 2010.

The State Engineer issued an order on May 13, 2014, approving in part and denying in part Application to Appropriate Water Number 69-101 (A76677), from which this application was segregated. The unapproved portion of 69-101 (A76677) was segregated and assigned Water Right No. 69-118 (Application to Appropriate No. A76677a). The instant *de novo* judicial review action followed. All protestants were given notice and an opportunity to intervene. Aside from the parties to this action, no protestants did so. The parties to this action subsequently reached an agreement resolving all claims. To accommodate the terms of that agreement, the District segregated 725 AF from A76677a to A76677aa (69-120).

Legal Framework

For an application to be approved, the Utah Code Section 73-3-8 criteria must be met. The statute reads:

- (1)(a) It shall be the duty of the state engineer to approve an application if there is reason to believe that:*
 - (i) for an application to appropriate, there is unappropriated water in the proposed source;*
 - (ii) the proposed use will not impair existing rights or interfere with the more beneficial use of the*

water;

(iii) the proposed plan:

(A) is physically and economically feasible, unless the application is filed by the United States Bureau of Reclamation; and

(B) would not prove detrimental to the public welfare;

(iv) the applicant has the financial ability to complete the proposed works;

(v) the application was filed in good faith and not for purposes of speculation or monopoly; and

(vi) if applicable, the application complies with a groundwater management plan adopted under Section 73-5-15.

(b) If the state engineer, because of information in the state engineer's possession obtained either by the state engineer's own investigation or otherwise, has reason to believe that an application will interfere with the water's more beneficial use for irrigation, municipal and industrial, domestic or culinary, stock watering, power or mining development, or manufacturing, or will unreasonably affect public recreation or the natural stream environment, or will prove detrimental to the public welfare, the state engineer shall withhold approval or rejection of the application until the state engineer has investigated the matter.

(c) If an application does not meet the requirements of this section, it shall be rejected.

Analysis

1. Although the State Engineer is concerned that there is less water available in the Wah Wah Valley Aquifer than what is being proposed to be used under all applications to appropriate in the area, the State Engineer along with all signatories of the settlement agreement resolving this action have committed, among other things, to the following:

The Parties acknowledge they have a difference of opinion regarding the amount of water available for development in the Wah Wah Valley and the Pine Valley – namely, the safe yield of the aquifers in those valleys. By way of this Agreement the State Engineer will allow the non-State Engineer Parties to proceed with plans to develop the amount of water stated herein with the understanding that the non-State Engineer Parties assume all risk and full responsibility for the possibility that the safe annual yield of the Wah Wah Valley aquifer and/or the Pine Valley aquifer is less than the amounts referenced in this Agreement. The non-State Engineer Parties expressly understand and acknowledge that the State Engineer is making no warranty or representation about the amount of water available for development in the Wah Wah Valley and the Pine Valley, and that approvals provided under this Agreement may be for more water than future facts demonstrate is actually available for long-term beneficial use. They further understand and acknowledge that under Utah Code Section 73-5-15, the State Engineer may regulate groundwater withdrawals within a specific groundwater basin by adopting a groundwater management plan in accordance with that section for any groundwater basin or aquifer or combination of hydrologically connected groundwater basins or aquifers. Nothing in this Agreement affects or is intended to affect the State Engineer's authority under that section as it presently exists and as it may change. The non-State Engineer Parties expressly understand and acknowledge that proper exercise of that authority may result in a reduction of the amount of water authorized for diversion under this Agreement.

2. There are existing rights to use water in Wah Wah Valley. Utah Code Section 73-3-8(1)(a)(i) requires that unappropriated water be available for approval of an application to appropriate. The District proposes to divert and export a significant quantity of groundwater from the valley. This has raised concern among existing users. The most prominent existing use in the valley diverts water from Wah Wah Springs, which discharge at an elevation of approximately 5600 feet above mean sea level. All of the District's proposed wells are located on land below that elevation where known groundwater levels are several hundred feet below land surface. Groundwater flow in the valley is presumed to be primarily from South to North with East and West margins of the valley

flowing toward the center (based on Technical Publication 47 and other more recent studies). Wah Wah Springs is located northwest of the District's proposed wells and is considered warm (15° higher than the mean annual air temperature, Tech Pub 47). Those factors taken together suggest a separation between the groundwater flow system supplying water to Wah Wah Springs and the system from which the District plans to divert water. It appears pumping the valley-fill aquifer as proposed will not likely diminish the yield of the springs. Other uses of water dependent on streamflow and springs along the margins of the valley are most likely similarly situated. There is reason to believe this application meets Section 73-3-8(1)(a)(i) criterion and there is limited unappropriated water available in Wah Wah Valley. Additionally, there is reason to believe that approval of this application will not impair prior rights and it therefore complies with Section 73-3-8(1)(a)(ii).

3. The District does not own land upon which to locate wells or other infrastructure necessary to implement this project and has not presented evidence that those property rights have been obtained or negotiations to obtain them have commenced. All land ownership, access, or use issues must be resolved by the District including obtaining authority from and conforming to the rules and regulations promulgated by agencies of the federal government for public land use. A critical element of this project is the District's ability to obtain authority to use federal land. Pending approval from land owners, there is reason to believe this application meets the criteria of Section 73-3-8(1)(a)(iii) in that it is feasible to divert water as proposed.
4. The District has the ability under Section 17B-1-103 to sell bonds, levy taxes, assess user fees, and obtain financing through other means within limits established by the legislature. There is reason to believe that the District meets the Section 73-3-8(1)(a)(iv) criterion.
6. There is reason to believe granting this application is consistent with Section 73-3-8(1)(a)(iii)(B) and the proposed plan would not prove detrimental to the public welfare.
7. There is reason to believe that this application was filed in good faith and not filed for purposes of speculation and monopoly.
8. There is reason to believe the application meets the criteria of Section 73-3-8, and should be approved.

Conclusion

It is, therefore, **ORDERED:** Application to Appropriate Water Number 69-120 (A76677aa) is hereby **APPROVED** subject to prior rights and the following conditions:

1. As noted, this approval is granted subject to prior rights. The District must, as necessary, mitigate or provide compensation for any impairment of prior rights such as may be stipulated among parties or decreed by a court of competent jurisdiction.
2. This approval is limited to the rights to divert and beneficially use water and does not grant any rights of access to, or use of, land or facilities not owned by the District.
3. Water use under this approval shall be limited to municipal use within the service area of the District with a maximum annual diversion allowance of 725.0 af of water for this use all uses occurring within the District's service area. It is noted that the diversion of water from Wah Wah Valley is able to be fully consumed by the District for these uses. The priority of water right 69-120 is, by agreement, October 19, 2006.
4. Each well under this application is to be individually metered and a permanent record of the water diverted from each well shall be maintained. The District shall make those records of the diversions made available for inspection by personnel of the Division of Water Rights upon reasonable request. **An annual report of all water diversions under this approval shall be submitted to the Division of Water Rights.**

5. The documents submitted as proof of beneficial use for this application, as required by statute at Section 73-3-16, shall include a full and correct copy of the metering record maintained as required herein.
6. All wells used as public water supply wells are regulated by the Utah Division of Drinking Water. Plans for the construction of new wells must be reviewed and approved by the Division of Drinking Water prior to any drilling or construction activity being commenced. The approval of this water right application does not constitute approval of the well for use as a public water supply by the Division of Drinking Water. The District is advised to contact the Division of Drinking Water at (801) 536-4200 to review applicable standards and for information about approval of a source of supply for public use.
7. Along with this approval, the District shall develop a monitoring program to ensure that no prior rights are being impaired. Plans for this monitoring program must be submitted to and approved by the State Engineer prior to diversion of any water from the proposed sources.

The District is strongly cautioned that other permits may be required before any development of this application can begin and it is the responsibility of the District to determine the applicability of and acquisition of such permits. Once all other permits have been acquired, this is your authority to develop the water under the above referenced application which under Sections 73-3-10 and 73-3-12, Utah Code Annotated, 1953, as amended, must be diligently prosecuted to completion. The water must be put to beneficial use and proof must be filed on or before February 28, 2033, or a request for extension of time must be acceptably filed; otherwise the application will be lapsed.

Proof of beneficial use is evidence to the State Engineer that the water has been fully placed to its intended beneficial use. By law, it must be prepared by a registered engineer or land surveyor, who will certify to the location, uses and extent of your water right.

Upon the submission of proof as required by Section 73-3-16, for this application, the District must identify every source of water used under this application and the amount of water used from that source. The proof must also show the capacity of the sources of supply and demonstrate that each source can provide the water claimed to be diverted under this right as well as all other water rights which may be approved to be diverted from those sources.

Failure on your part to comply with the requirements of the applicable statutes may result in the lapsing of this Application to Appropriate Water.

The right to beneficially use water as described in this order shall be administered by the State Engineer the same as if this order had been issued by the State Engineer.

**THE COURT'S ELECTRONIC SIGNATURE APPEARS
AT THE TOP OF THE FIRST PAGE OF THE JUDGMENT
TO WHICH THIS ORDER IS ATTACHED**

EXHIBIT 4

ORDER

For Application to Appropriate Water Number 69-121 (A76677ab)
which herein becomes F76677ab

Background

Application to Appropriate Water Number 69-121 (A76677ab) in the name of Central Iron County Water Conservancy District (the District) was filed on October 17, 2006, to appropriate 4025.00 acre-feet (af) of water from the groundwater in Wah Wah Valley. It is proposed to divert water from 16-inch wells drilled between 100 and 2000 feet in depth to be located: (1) North 1400 feet and West 2500 feet from the SE Corner of Section 36, T27S, R14W, SLB&M; (2) North 900 feet and West 2350 feet from the SE Corner of Section 31, T27S, R13W, SLB&M; (3) North 1200 feet and West 300 feet from the SE Corner of Section 6, T28S, R14W, SLB&M; (4) South 2100 feet and East 250 feet from the NW Corner of Section 4, T28S, R14W, SLB&M; (5) South 1600 feet and East 1500 feet from the NW Corner of Section 3, T28S, R14W, SLB&M; (6) South 550 feet and West 300 feet from the NE Corner of Section 2, T28S, R14W, SLB&M; (7) South 600 feet and West 250 feet from the NE Corner of Section 12, T28S, R14W, SLB&M; (8) South 300 feet and West 2300 feet from the NE Corner of Section 11, T28S, R14W, SLB&M; (9) North 2400 feet and East 650 feet from the SW Corner of Section 10, T28S, R14W, SLB&M; (10) South 2400 feet and West 2200 feet from the NE Corner of Section 35, T27S, R14W, SLB&M; (11) South 2300 feet and West 2500 feet from the NE Corner of Section 34, T27S, R14W, SLB&M; (12) North 2500 feet and West 700 feet from the SE Corner of Section 28, T27S, R14W, SLB&M; (13) South 1650 feet and East 550 feet from the NW Corner of Section 33, T27S, R14W, SLB&M; (14) South 300 feet and East 600 feet from the NW Corner of Section 32, T27S, R14W, SLB&M; (15) North 850 feet and East 400 feet from the SW Corner of Section 31, T27S, R14W, SLB&M; (16) South 750 feet and West 1900 feet from the NE Corner of Section 8, T28S, R14W, SLB&M; (17) South 2600 feet and East 2200 feet from the NW Corner of Section 16, T28S, R14W, SLB&M; (18) South 2650 feet and West 1900 feet from the NE Corner of Section 14, T28S, R14W, SLB&M; (19) North 900 feet and East 250 feet from the SW Corner of Section 15, T28S, R14W, SLB&M; and (20) South 1750 feet and West 1400 feet from the NE Corner of Section 27, T28S, R14W, SLB&M. The water is to be used for year-round municipal purposes within the service area of the District.

Notice of the application was published in The Beaver Press on November 23 and 30, 2006, and in the Spectrum on November 23 and 29, 2006. Protests were received from: National Park Service; U.S. Department of the Interior (late protest); Marie Puffer and Duray G. Dalley (late protest); Lyle Wiseman (late protest); Dustin S. Wiseman (late protest); Steve Judd; Bruce P. Dalley (late protest); Beaver High School Students; Matthew Wood (late protest); Viola Reynolds (late protest); Shaun and Tammy Pearson (late protest); Minersville Town (late protest); Gary and Gina Mayer (late protest); Seth Davie (late protest); Carla and Dale Eyre (late protest); David Robinson (late protest); Jetta Robinson (late protest); Elsie Mayer (late protest); Ruby and D. Magnuson (late protest); Helena and W. Bartsch (late protest); Allan and Syble Smith (late protest); Stacy and Chris Barnes (late protest); Jodi Robinson (late protest); Jared Smith (late protest); Dixie (late protest); Dustin and Heidi Thomas (late protest); Ruth Carter (late protest); Barbara Farnsworth (late protest); Deyette and Gary Bradley (late protest); Louise and Darrell Alford (late protest); Natalie Rollins (late protest); Lisa Hendrickson (late protest); Norman and Virginia Bradshaw (late protest); John Carter; Wayne Burrows (late protest); Eric Jessup; Theron and Linda Jessup, Darlene Vaughn; Emma and Ray Davis; Michelle Smith; Steven Yardley; Jeannie Yardley; Lori Ann Hoffman; Board of County Commissioners of Millard County; K. Hussry; Kim Oakden; Crystal Bradshaw; Lisa and Brent Carter; Lynn and Phyllis Bradshaw; Jennie Smith; Resident; Jan and Miles Barney; Concerned Citizens of Beaver Co.; Bradshaw Farms & Equipment and Kents Lake Irrigation Co. and Harris Willis Irrigation Co.; Brady Bradshaw; Collette and Robbie Bradshaw; Jonney Quarnberg; Greg Gunderson and Residents; Max Carter; I. Linda and Lem Lucey; William and Betty Treder; Denise and Dwane Bradshaw; Harlon Thomas; R. Larson Sheep Co.; Green Diamond Ranch; Barry Thiriot; Lyle Wiseman; William Chad Dalton; Beaver County; Elk Meadows Special Service District; Southern Nevada Water Authority; Gilbert and Denise and Emily Yardley; Roger and Ronda Williams; Lisa Nielson; Seldon Nowers; Davis and Alisha Edwards; David and Susan Edwards; Lee Foster; United States Department of the Interior; Lary Carter; James Carter; Southern Utah Water Study, L.C.; Teresa and Michael Bradshaw; S & W Hall Co. Inc.; Robert Storey; James Williams; Mark Whitney; Tina and Tomas Smith; Ray and Shirley Morris; Carl Best; Sly Family; Nickole and Lou Montoya; Kaylene Eyre-Quarnberg; Warren Quarnberg; Sportsmen for Fish & Wildlife; Robert Christensen; Robert Christensen; Clinton Beaumont; Gene and Cerrie Gatz; Arlan Mayer; Jolene Mayer; Jace and Amy Lambeth; Second South Bench Reservoir & Irrigation Co.; Arlene

Edwards; Anne Swindlehurst; Ray Walbeck; John and Heather Gates; Kent and Mary Marshall; Eleana Marshall; Hinal and Shirley Wright; Dan Joseph; W. Neal Wood; Steve Becelleow; Bruce and Benaley Randall; Smith Family et al; Kelly CasMiller; F. Kelly Mortensen; Kim Wood; Rhonda McQuarrie; David Heshington; Joyce and Donald Pettit; Jeffrey Joseph; John Dee and Susan Smith; Julie Chatur; S. Noel; Terry and Penny Levering; Helen Murchie; Lana Reed; Kimberly Solberg; Raymond Benson and Betty Harwell; Thomas Bartts; Russell and Stephanie Helm; Michael and Barbara Robinson; David and Tina Robinson; Norma Thomas; Janet Oakden; Ray Alan and April R. and Kasey Yardley; L. Farnsworth; Reed Dalton; David and LaDona Reynolds; P. A. Duncan; Clyde D. Alford; Francis Bridges; Fern S. Wilber; Val and Ila Smith; Rachel Stewart; Madlyne and George M. Griffiths; Vernon A. and Carol J. Condie; Orson and JoAnn Blackner; Ronald and Vickie Turner; Chitt and Tina Pearsen; Sharen R. and Douglas E. Turner; Gerald W. Thomas; Connie Hudleston; Casidy Barnson; Neil Ammon Cadie; Eva Yardley; Janette Brannwell; Harold LaMorr Morris; ElRoy L. and Alda Stucki; Richard and Noreen Bradshaw; Ronald C. Beebe; Clark Grimshaw; Dennis Hardy; Minersville Land and Livestock; W. Kelly Wood; L. Ben and Melinda Dalton; Honey Low; Cheryl Low; Christine Clitso; Mitch and Rebecca Carter; Reed and Debra Carter; Daniel and Breezy Carter; Jay and Melissa Carter; Robert H. and Mary Helen Lee; Mark J. Yardley; Joseph R. and Penny Yardley; Robert J. Yardley; Kiley Eyre; Kellee and Mitchell Dalton; Mary J. and Ray Yardley; Richard M. Davis; William I. Bradshaw; Beverly C. Barek; Dean and Teri Eyre; Brad Eyre; Leeola G. and Burton R. Myers; Margaret Miller; William and Kathy Acklin; Delmont and Jolene Goff; Susan Maggard; Russ T. Bradshaw; Jeb, Christina, Blake and Todd Marshall; Harold W. and Marilyn Bradshaw; Wayne and Traci Bradshaw; Clarence D. Pope; Colleen Freeman; Charles S. Barnes; Deborah and Eddie Smith; Mary Jane and Max L. Thompson; Lee and Cynthia Hansen; Sandra and Tom Nickell; Blake Marshall; Terri Nelson; Dewey B. Hawkins; Leslie and Lynn Kitchen; Brent McCulley and Kathy Ryan; Sue Byers; Debora K. Nichols; Joanne Geotzelman; Gary W. and Carol G. Roberts, Allan and Christine McCulley; Wayne and Evelyn McCulley; Justin McCulley; Claude R. Fordham; Westside Irrigation Co.; Michael W. Smith; Clark Carter; Clark W. Smith; Duane and Maurine Yardley; Dale A. Yardley; Floyd Yardley; Concerned Citizens of Beaver County Utah; Fairview Land & Livestock Co., Inc.; Jane Scott; Thomas and Margorie McLaughlin; D. G. and Faye McShane; Hal D. Murdock; Millie Ritchie; Marjorie Staheli; Rebecca Hale; Gayle Cooney; Joyce M. Joseph; Yvonne E. Leilua; James E. Bohn; Ann Marshall; David Christensen; City of Milford; Dean Carter; Shanna and Lyle Carter; Joan Davis; Sheldon and Mary Albrecht; Karen and Arnell Gale; S. Edwards; Jennifer Cox; Jason L. Davis; Virginia Marshall; Idonna L. Doerig and Karma M. Mitchell; Robert Eyre; Dixie Power-Water-Light & Telephone, Inc.; LaMar J. and Pearl Briggs; Beverly R. and Rondo Farrer; Donald C. and Leah Glenn; Lynn B. and Melissa Yardley; Wm. E. and Georgean Warby; Beth Puffer; Paul and Marilyn Anderson; Leonard and Beryl Brown; Brent, Sandra and Bessie Edwards; Kristen Sisneros; Tina Harris; Joan Ruplinger; Sandra Lawsen; Marjorie S. Raddon; Gordon G. and Ann Eyre; Orvis and Ruby Bowers; Velby N. Ashworth; Beatrice Willden; Carol Crandy; Lucille P. Strong; Hal and Mary Christensen; Wayne A. Thompson; Peggy Blackner; Shirley M. Howard; Alan and Shaunna Mayer; J. Grant and Gayle L. Wood; Leslie and Nanette Davis; Milford Valley Water Users Board; Scott and Wilma Hansen; Chris L. Kesler; Al J. Boyt; Jennifer L. Brennan; Harold Deems; Alan Gale; Maureen Hodges; Ralph L. Smith; Bruce M. and Karen Marchant; Joyce D. Boyter; D. Carol McCulley; Donald P. and Julia M. Moore; M. P. Thompson; John and Carmen Caffrey; Lucille P. Strong; Frank H. Smith; Roy and Alvina M. Kramer; Delbert and Audrey Kent; Afton S. Kesler; Bryan D. Graham; and Frank and Janice Smith. A hearing was held on July 14, 2010.

The State Engineer issued an order on May 13, 2014, approving in part and denying in part Application to Appropriate Water Number 69-101 (A76677), from which this application was segregated. The unapproved portion of 69-101 (A76677) was segregated and assigned Water Right No. 69-118 (Application to Appropriate No. A76677a). The instant *de novo* judicial review action followed. All protestants were given notice and an opportunity to intervene. Aside from the parties to this action, no protestants did so. The parties to this action subsequently reached an agreement resolving all claims. To accommodate the terms of that agreement, the District segregated 4,025 AF from A76677a to A76677ab (69-121).

Legal Framework

For an application to be approved, the Utah Code Section 73-3-8 criteria must be met. The statute reads:

- (1)(a) It shall be the duty of the state engineer to approve an application if there is reason to believe that:*
 - (i) for an application to appropriate, there is unappropriated water in the proposed source;*

(ii) the proposed use will not impair existing rights or interfere with the more beneficial use of the water;

(iii) the proposed plan:

(A) is physically and economically feasible, unless the application is filed by the United States Bureau of Reclamation; and

(B) would not prove detrimental to the public welfare;

(iv) the applicant has the financial ability to complete the proposed works;

(v) the application was filed in good faith and not for purposes of speculation or monopoly; and

(vi) if applicable, the application complies with a groundwater management plan adopted under Section 73-5-15.

(b) If the state engineer, because of information in the state engineer's possession obtained either by the state engineer's own investigation or otherwise, has reason to believe that an application will interfere with the water's more beneficial use for irrigation, municipal and industrial, domestic or culinary, stock watering, power or mining development, or manufacturing, or will unreasonably affect public recreation or the natural stream environment, or will prove detrimental to the public welfare, the state engineer shall withhold approval or rejection of the application until the state engineer has investigated the matter.

(c) If an application does not meet the requirements of this section, it shall be rejected.

Analysis

1. Although the State Engineer is concerned that there is less water available in the Wah Wah Valley Aquifer than what is being proposed to be used under all applications to appropriate in the area, the State Engineer along with all signatories of the settlement agreement resolving this action have committed, among other things, to the following:

The Parties acknowledge they have a difference of opinion regarding the amount of water available for development in the Wah Wah Valley and the Pine Valley – namely, the safe yield of the aquifers in those valleys. By way of this Agreement the State Engineer will allow the non-State Engineer Parties to proceed with plans to develop the amount of water stated herein with the understanding that the non-State Engineer Parties assume all risk and full responsibility for the possibility that the safe annual yield of the Wah Wah Valley aquifer and/or the Pine Valley aquifer is less than the amounts referenced in this Agreement. The non-State Engineer Parties expressly understand and acknowledge that the State Engineer is making no warranty or representation about the amount of water available for development in the Wah Wah Valley and the Pine Valley, and that approvals provided under this Agreement may be for more water than future facts demonstrate is actually available for long-term beneficial use. They further understand and acknowledge that under Utah Code Section 73-5-15, the State Engineer may regulate groundwater withdrawals within a specific groundwater basin by adopting a groundwater management plan in accordance with that section for any groundwater basin or aquifer or combination of hydrologically connected groundwater basins or aquifers. Nothing in this Agreement affects or is intended to affect the State Engineer's authority under that section as it presently exists and as it may change. The non-State Engineer Parties expressly understand and acknowledge that proper exercise of that authority may result in a reduction of the amount of water authorized for diversion under this Agreement.

2. There are existing rights to use water in Wah Wah Valley. Utah Code Section 73-3-8(1)(a)(i) requires that unappropriated water be available for approval of an application to appropriate. The District proposes to divert and export a significant quantity of groundwater from the valley. This has raised concern among existing users. The most prominent existing use in the valley diverts water from Wah Wah Springs, which discharge at an elevation of approximately 5600 feet above mean sea level. All of the District's proposed wells are located on land below that elevation where known groundwater levels are several hundred feet below land surface. Groundwater flow in the

valley is presumed to be primarily from South to North with East and West margins of the valley flowing toward the center (based on Technical Publication 47 and other more recent studies). Wah Wah Springs is located northwest of the District's proposed wells and is considered warm (15° higher than the mean annual air temperature, Tech Pub 47). Those factors taken together suggest a separation between the groundwater flow system supplying water to Wah Wah Springs and the system from which the District plans to divert water. It appears pumping the valley-fill aquifer as proposed will not likely diminish the yield of the springs. Other uses of water dependent on streamflow and springs along the margins of the valley are most likely similarly situated. There is reason to believe this application meets Section 73-3-8(1)(a)(i) criterion and there is limited unappropriated water available in Wah Wah Valley. Additionally, there is reason to believe that approval of this application will not impair prior rights and it therefore complies with Section 73-3-8(1)(a)(ii).

3. The District does not own land upon which to locate wells or other infrastructure necessary to implement this project and has not presented evidence that those property rights have been obtained or negotiations to obtain them have commenced. All land ownership, access, or use issues must be resolved by the District including obtaining authority from and conforming to the rules and regulations promulgated by agencies of the federal government for public land use. A critical element of this project is the District's ability to obtain authority to use federal land. Pending approval from land owners, there is reason to believe this application meets the criteria of Section 73-3-8(1)(a)(iii) in that it is feasible to divert water as proposed.
4. The District has the ability under Section 17B-1-103 to sell bonds, levy taxes, assess user fees, and obtain financing through other means within limits established by the legislature. There is reason to believe that the District meets the Section 73-3-8(1)(a)(iv) criterion.
5. There is reason to believe granting this application is consistent with Section 73-3-8(1)(a)(iii)(B) and the proposed plan would not prove detrimental to the public welfare.
6. There is reason to believe this application was filed in good faith and not filed for purposes of speculation and monopoly.
7. There is reason to believe the application meets the criteria of Section 73-3-8, and should be approved.
8. This application will be converted to a Fixed Time Application to Appropriate with associated conditions.

Conclusion

It is, therefore, **ORDERED**: Application to Appropriate Water Number 69-121 (A76677ab), which shall be administratively renumbered to 69-121 (F76677ab), is hereby **APPROVED** subject to prior rights and the following conditions:

1. As noted, this approval is granted subject to prior rights. The District must, as necessary, mitigate or provide compensation for any impairment of prior rights such as may be stipulated among parties or decreed by a court of competent jurisdiction.
2. This approval is limited to the rights to divert and beneficially use water and does not grant any rights of access to, or use of, land or facilities not owned by the District.
3. Water use under this approval shall be limited to municipal use within the service area of the District with a maximum annual diversion allowance of 4,025 af of water for this use all uses occurring within the District's service area. It is noted that the diversion of water from Wah Wah Valley is able to be fully consumed by the District for these uses. The priority of this water right is, by agreement, October 19, 2006.

4. **The records of the State Engineer shall be modified to show the application number as 69-121 (F76677ab). This application is approved pursuant to 73-3-8(2), Utah Code Annotated, for an initial forty (40) year fixed-time period ending forty years after use of this water is initiated.** The initiation of use of water under this application shall be based on measurement records submitted to the Division as they relate to this water right diverted by the District or successor(s) from Wah Wah Valley. Current statutes state that fixed-time applications expire at the end of the fixed-time period but may be extended by the state engineer if the purpose of the original application has not been satisfied and the water is still available.
5. Each well under this application is to be individually metered and a permanent record of the water diverted from each well shall be maintained. The District shall make those records of the diversions made available for inspection by personnel of the Division of Water Rights upon reasonable request. **An annual report of all water diversions under this approval shall be submitted to the Division of Water Rights.**
6. All wells used as public water supply wells are regulated by the Utah Division of Drinking Water. Plans for the construction of new wells must be reviewed and approved by the Division of Drinking Water prior to any drilling or construction activity being commenced. The approval of this water right application does not constitute approval of the well for use as a public water supply by the Division of Drinking Water. The District is advised to contact the Division of Drinking Water at (801) 536-4200 to review applicable standards and for information about approval of a source of supply for public use.
7. Along with this approval, the District shall develop a monitoring program to ensure that no prior rights are being impaired. Plans for this monitoring program must be submitted to and approved by the State Engineer prior to diversion of any water from the proposed sources.

The District is strongly cautioned that other permits may be required before any development of this application can begin and it is the responsibility of the District to determine the applicability of and acquisition of such permits. Once all other permits have been acquired, this is your authority to develop the water under the above referenced application which under Sections 73-3-10 and 73-3-12, Utah Code Annotated, 1953, as amended, must be diligently prosecuted to completion.

Failure on your part to comply with the requirements of the applicable statutes may result in the lapsing of this Application to Appropriate Water.

The right to beneficially use water as described in this order shall be administered by the State Engineer the same as if this order had been issued by the State Engineer.

**THE COURT'S ELECTRONIC SIGNATURE APPEARS
AT THE TOP OF THE FIRST PAGE OF THE JUDGMENT
TO WHICH THIS ORDER IS ATTACHED**

EXHIBIT 5

AMENDED ORDER

For Application to Appropriate Water Number 14-118 (A76676)

Background

Application to Appropriate Water Number 14-118 (A76676), in the name of Central Iron County Water Conservancy District (the District), was filed on October 17, 2006, to appropriate 15,000.00 acre-feet (af) of water from the groundwater in Pine Valley. It is proposed divert water from 16-inch wells drilled between 100 and 2000 feet in depth to be located: (1) North 1900 feet and East 1300 feet from the SW Corner of Section 17, T30S, R16W, SLB&M; (2) North 2300 feet and West 1650 feet from the SE Corner of Section 14, T28S, R17W, SLB&M; (3) South 1000 feet and East 1700 feet from the NW Corner of Section 24, T29S, R18W, SLB&M; (4) North 500 feet and East 500 feet from the SW Corner of Section 14, T29S, R17W, SLB&M; (5) South 400 feet and East 2200 feet from the NW Corner of Section 19, T29S, R16W, SLB&M; (6) South 1850 feet and West 2000 feet from the NE Corner of Section 25, T29S, R17W, SLB&M; (7) North 500 feet and East 350 feet from the SW Corner of Section 32, T29S, R16W, SLB&M; (8) South 2000 feet and East 2550 feet from the NW Corner of Section 2, T30S, R17W, SLB&M; (9) North 2250 feet and East 500 feet from the SW Corner of Section 15, T30S, R17W, SLB&M; and (10) South 300 feet and East 250 feet from the NW Corner of Section 36, T30S, R17W, SLB&M. The water is to be used for the year-round stockwatering of 2000.00 equivalent livestock units in cattle, horses, or equivalent species (elus); and year-round municipal purposes within the service area of Central Iron County Water Conservancy District.

Notice of the application was published in The Beaver Press on November 23 and 30, 2006, and the Spectrum on November 23 and 29, 2006. Protests were received from: National Park Service, U.S. Dept. of the Interior (late protest); Beaver High School Students; Marie Puffer and Duray G. Dalley (late protest); Bruce P. Dalley (late protest); Lyle Wiseman (late protest); Dustin S. Wiseman (late protest); Matthew Wood (late protest); Viola Reynolds (late protest); Shaun and Tammy Pearson (late protest); Minersville Town (late protest); Gary and Gina Mayer (late protest); Seth Davie (late protest); Carla and Dale Eyre (late protest); David Robinson (late protest); Jetta Robinson (late protest); Elsie Mayer (late protest); Ruby and D. Magnuson; Helena Bartsch (late protest); Allan and Syble Smith (late protest); Stacy and Chris Barnes (late protest); Jodi Robinson (late protest); Jared Smith (late protest); Dixie (late protest); Dustin and Heidi Thomas (late protest); Ruth Carter (late protest); Babara Farnsworth (late protest); Deyette and Gary Bradley (late protest); Louise and Darrell Alford (late protest); Resident; Natalie Rollins (late protest); Lisa Hendrickson (late protest); Norman and Virginia Bradshaw (late protest); John Carter (late protest); Wayne Burrows (late protest); Eric Jessup; Theron and Linda Jessup; Darlene Vaughn; Lori Ann Hoffman; Steven Yardley; Roger and Ronda Williams (protest withdrawn); Mark J. Wintch; Green Diamond Ranch; Lyle Wiseman; William Chad Dalton; Beaver County; Barry Thiriot; Gilbert and Denise and Emily Yardley; Elk Meadows Special Service District; Southern Nevada Water Authority; Lisa Nielson; Seldon Nowers; Davis and Alisha Edwards; David and Susan Edwards; Lee Foster; Resident; United States Department of the Interior; Lary Carter; James Carter; Southern Utah Water Study, L.C.; Michelle Smith; Jeannie Yardley; John Dee and Susan Smith; Julie Chatur; S. Noel; Terry and Penny Levering; David Heshington; Helen Murchie; Lana Reed; Kim Solberg; Raymond Benson and Betty Harwell; Thomas Bartts; Russell and Stephanie Helm; David and Tina Robinson; Norma Thomas; Janet Oakden; K. Hussry; Kim Oakden; Crystal Bradshaw; Jennie Smith; Concerned Citizens of Beaver Co.; Bradshaw Farms & Equipment & Kents Lake Irrigation Co. and Harris Willis Irrigation Co.; Brady Bradshaw; Collette and Robbie Bradshaw; Jonney Quarnberg; Greg Gunderson and Residents; Max Carter; I. Linda and Lem Lucey; William and Betty Treder; Denise and Dwane Bradshaw; Emma and Ray Davis; Harlon Thomas; S & W Hall Co. Inc.; Robert Storey; James Williams; Brent and Sandra and Bessie Edwards; Lisa and Brent Carter; Mark Whitney; Tina and Tomas Smith; Teresa and Michael Bradshaw; Ray and Shirley Morris; Carl Best; Sly Family; Nickole and Lou Montoya; Lynn Bradshaw; Kaylene Eyre-Quarnberg; Warren Quarnberg; Sportsmen for Fish & Wildlife; Robert Christensen; Clinton Baumont; Jan and Miles Barney; Gene and Cerrie Gatz; Arlan Mayer; Jolene Mayer; Jace and Amy Lambeth; Second South Bench Reservoir & Irrigation Co.; Anne Swindlehurst; Ray Walbeck; John and Heather Gates; Kent and Mary Marshall; Eleana Marshall; Hinal and Shirley Wright; Steve Judd; Scott Wiseman; Dan Joseph; W. Neal Wood; Steve Becelleow; Bruce and Benaley Randall; Smith Family et al; Kelly CasMiller; Michael and Barbara Robinson; F. Kelly Mortensen; Kim Wood; Rhonda McQuarrie; Jeffrey Joseph; Joyce and Donald Pettit; Ronald C. Beebe; Clark W. Grimshaw; Dennis Hardy; Minersville Land and Livestock; W. Kelly Wood; L. Ben and Melinda Dalton; Honey Low; Cheryl Low; Christine Clitso; Ray Alan and April R. and Kasey Yardley; L. Farnsworth; Reed Dalton; David and LaDona Reynolds; P. A.

Duncan, Clyde D. Alford; Francis Bridges; Fern S. Wilber; Val and Ila Smith; Racheal Stewart; Madlyne and George M. Griffiths; Vernon A. and Carol J. Condie; Orson and JoAnn Blackner; Ronald and Vickie Turner; Chitt and Tina Pearsen; Sharen R and Douglas E. Turner; Gerald W. Resident; Connie Huddleston; Casidy Barnson; Neil Ammon Cadie; Eva Yardley; Janette Brannwell; Harold LaMorr Morris; ElRoy L. and Alda Stucki; Richard and Noreen Bradshaw; Alan Gale; Ralph Smith; Joyce D. Boyter; Lynn B. and Melissa Yardley; Wm. E. and Georgean Warby; Beth Puffer; Paul and Marilyn Anderson; Leonard and Beryl Brown; Arlene Edwards; Kristen Sisneros; Tina Harris; Joan Ruplinger; Sandra Lawsen; Marjorie S. Raddon; Craig and Lois Willden; Gordon G. and Ann Eyre; Orvis and Ruby Bowers; Velby N. Ashworth; Beatrice Willden; Carol Crandy; Lucille P. Strong; Peggy Blackner; Hal and Mary Christensen; Shirley M. Howard; Scott and Wilma Hansen; Alan and Shaunna Mayer; Milford Valley Water Users Board; Leslie and Nanette Davis; J. Grant and Gayle L. Wood; Wayne A. Thompson; Alan and Vicki Gurney; Dale A Yardley; Mitch and Rebecca Carter; Reed and Debra Carter; Daniel and Breezy Carter; Jay and Meliss Carter Lane; Robert H. and Mary Helen Lee; Mark J. Yardley; Joseph R. and Penny Yardley; Robert J. Yardley; Kiley Eyre; Kellee and Mitchell Dalton; Mary J. and Ray Yardley; Richard M. Davis; William I. Bradshaw; Beverly C. Barek; Dean and Teri Eyre; Brad Eyre; Leeola G. and Burton R. Myers, Margaret Miller; William and Kathy Acklin; Delmont and Jolene Goff; Susan Maggard; Russ T. Bradshaw; Jeb, Christina, Blake and Todd Marshall; Harold W. and Marilyn Bradshaw; Wayne and Traci Bradshaw; Clarence D. Pope; Colleen Freeman; Charles S. Barnes; Tony Christensen; Deborah and Eddie Smith; Mary Jane and Max L. Thompson; Lee and Cynthia Hansen; Sandra and Tom Nickell; Blake Marshall; Terri Nelson; Leslie and Lynn Kitchen; Dewey B. Hawkins; Floyd Yardley; Concerned Citizens of Beaver County Utah; Brent McCulley and Kathy Ryan; Sue Byers; Debora K. Nichols; Joanne Geotzelman; Gary W. and Carol G. Roberts; Allan and Christine McCulley; Wayne and Evelyn McCulley; Justin McCulley; Claude R. Fordham; Westside Irrigation Co.; Michael Smith; Clark Carter; Clark W. Smith; Duane and Maurine Yardley; Joan Davis; Sheldon and Mary Albrecht; Karen and Arnell Gale; S. Edwards; Jennifer Cox; Virginia Marshall; Jason S. Davis; Idonna L. Doerig and Karma M. Mitchell; Robert Eyre; Dixie Power-Water-Light & Telephone, Inc.; Lucille P. Strong; Welby K. Aagard Family L.C.; Fairview Land & Livestock Co., Inc.; Jane Scott; Thomas and Margorie McLaughlin; Resident; D. G. and Faye McShane; Hal D. Murdock; Millie Ritchie; Marjorie Staheli; Rebecca Hale; Gayle Conney; Joyce M. Joseph; Yvonne E. Leilua; James E. Bohn; Ann Marshall, David Christensen; City of Milford; Dean Carter; Shanna and Lyle Carter; Bryan D. Graham; Al J. Boyt; D. Carol McCulley; LaMar J. and Pearl Briggs; Donald C. and Leah Glenn; Beverly R. and Rondo Farrer; Jennifer L. Brennan; Harold Deems; Maureen Hodges; Bruce M. and Karen Marchant; M. P. Thompson; John and Carmen Caffrey; Frank H. Smith; Roy Kramer; Delbert and Audrey Kent; Chris L. Kesler; Afton S. Kesler; Donald P. and Julia M. Moore; and Frank and Janice Smith. A hearing was held on July 14, 2010.

1. On May 13, 2014 an Order of the State Engineer was issued under the signature of Kent L. Jones, P.E., State Engineer, partially approving the application for municipal use within the service area of the District. The order rejected the proposed use for stockwatering of 2,000 elus approving the remainder for municipal use of 15,000 af. The instant *de novo* judicial review action followed. All protestants were given notice and an opportunity to intervene. Aside from the parties to this action, no protestants did so. The parties to this action subsequently reached an agreement resolving all claims.

Legal Framework

For an application to be approved, the Utah Code Section 73-3-8 criteria must be met. The statute reads:

- (1)(a) It shall be the duty of the state engineer to approve an application if there is reason to believe that:*
- (i) for an application to appropriate, there is unappropriated water in the proposed source;*
 - (ii) the proposed use will not impair existing rights or interfere with the more beneficial use of the water;*
 - (iii) the proposed plan:*
 - (A) is physically and economically feasible, unless the application is filed by the United States Bureau of Reclamation; and*
 - (B) would not prove detrimental to the public welfare;*
 - (iv) the applicant has the financial ability to complete the proposed works;*
 - (v) the application was filed in good faith and not for purposes of speculation or monopoly; and*
 - (vi) if applicable, the application complies with a groundwater management plan adopted under*

Section 73-5-15.

(b) If the state engineer, because of information in the state engineer's possession obtained either by the state engineer's own investigation or otherwise, has reason to believe that an application will interfere with the water's more beneficial use for irrigation, municipal and industrial, domestic or culinary, stock watering, power or mining development, or manufacturing, or will unreasonably affect public recreation or the natural stream environment, or will prove detrimental to the public welfare, the state engineer shall withhold approval or rejection of the application until the state engineer has investigated the matter.

(c) If an application does not meet the requirements of this section, it shall be rejected.

Analysis

Although the State Engineer is concerned that there is less water available in the Pine Valley Aquifer than what is being proposed to be used under all applications to appropriate in the area, the State Engineer along with all signatories of the settlement agreement resolving this action have committed, among other things, to the following:

The Parties acknowledge they have a difference of opinion regarding the amount of water available for development in the Wah Wah Valley and the Pine Valley – namely, the safe yield of the aquifers in those valleys. By way of this Agreement the State Engineer will allow the non-State Engineer Parties to proceed with plans to develop the amount of water stated herein with the understanding that the non-State Engineer Parties assume all risk and full responsibility for the possibility that the safe annual yield of the Wah Wah Valley aquifer and/or the Pine Valley aquifer is less than the amounts referenced in this Agreement. The non-State Engineer Parties expressly understand and acknowledge that the State Engineer is making no warranty or representation about the amount of water available for development in the Wah Wah Valley and the Pine Valley, and that approvals provided under this Agreement may be for more water than future facts demonstrate is actually available for long-term beneficial use. They further understand and acknowledge that under Utah Code Section 73-5-15, the State Engineer may regulate groundwater withdrawals within a specific groundwater basin by adopting a groundwater management plan in accordance with that section for any groundwater basin or aquifer or combination of hydrologically connected groundwater basins or aquifers. Nothing in this Agreement affects or is intended to affect the State Engineer's authority under that section as it presently exists and as it may change. The non-State Engineer Parties expressly understand and acknowledge that proper exercise of that authority may result in a reduction of the amount of water authorized for diversion under this Agreement.

1. USGS Technical Publication No. 51 indicates that precipitation within the Pine Valley surface drainage basin contributes 21,000 acre-feet per year of groundwater recharge to the groundwater system. The publication also indicates that 3,000 acre-feet per year of this recharge contributes to the groundwater of Wah Wah Valley by subsurface inflow leaving a total estimated annual recharge to the groundwater in Pine Valley of 18,000 acre-feet. A more recent study, USGS Scientific Investigations Report 2017-5072, estimates that recharge in Pine Valley is 11,000 acre-feet per year. There has been very little actual pumping of groundwater in Pine Valley to stress the groundwater system such that recharge estimates can be verified through a quantitative analysis. Although the State Engineer believes there is water available for appropriation, estimates of the amount of water should be considered preliminary at this time. The District should understand that this decision is based on the information and data currently available. Should the groundwater resource prove to be over appropriated as diversions under this and other applications are made, a groundwater management plan could be formulated in the future to address that issue.
2. There are existing rights to use water in Pine Valley. Utah Code Section 73-3-8(1)(a)(i) requires that unappropriated water be available. The District, based on currently available hydrologic data,

proposes to divert and export most or all of the unappropriated groundwater in the valley. This has raised concern among existing users. The District's proposed wells are located on land where known groundwater levels are more than two hundred feet, and exceeding in most locations several hundred feet, below land surface based on the well driller's reports for the area. It appears pumping the valley-fill aquifer within the limitations of the safe yield of the aquifer will not likely diminish the yield of springs located along the margins of the valley-fill. There is reason to believe this application meets Section 73-3-8(1)(a)(i) criterion and there is limited unappropriated water available in Pine Valley. Additionally, there is reason to believe that approval of this application will not impair prior rights and it therefore complies with Section 73-3-8(1)(a)(ii).

3. The District does not own land upon which to locate wells or other infrastructure necessary to implement this project and has not presented evidence that those property rights have been obtained or negotiations to obtain them have commenced. All land ownership, access, or use issues must be resolved by the District including obtaining authority from and conforming to the rules and regulations promulgated by agencies of the federal government for public land use. A critical element of this project is the District's ability to obtain authority to use federal land. Pending approval from land owners, there is reason to believe this application meets the criteria of Section 73-3-8(1)(a)(iii) in that it is feasible to divert water as proposed.
4. The District has the ability under Section 17B-1-103 to sell bonds, levy taxes, assess user fees, and obtain financing through other means within limits established by the legislature. There is reason to believe that the District meets the Section 73-3-8(1)(a)(iv) criterion.
5. There is reason to believe granting this application is consistent with Section 73-3-8(1)(a)(iii)(B) and the proposed plan would not prove detrimental to the public welfare.
6. There is reason to believe that this application was filed in good faith and not filed for purposes of speculation and monopoly.
7. There is reason to believe that the application meets the Section 73-3-8 criteria and should be approved.

Conclusion

It is, therefore, **ORDERED**: Application to Appropriate Water Number 14-118 (A76676) is hereby **APPROVED** subject to prior rights and the following conditions:

1. As noted, this approval is granted subject to prior rights. The District must, as necessary, mitigate or provide compensation for any impairment of prior rights such as may be stipulated among parties or decreed by a court of competent jurisdiction.
2. This approval is limited to the rights to divert and beneficially use water and does not grant any rights of access to, or use of land or facilities not owned by the District.
3. Water use under this approval shall be limited to a cumulative maximum annual diversion of 15,000 af for the stockwatering of 2,000 elus and municipal use within the service area of the District and Pine Valley. It is noted that the diversion of water from Pine Valley is able to be fully consumed by the District for these uses. The priority date of the underlying application is October 17, 2006.
4. Each well under this application is to be individually metered and a permanent record of the water diverted from each well shall be maintained. The District shall make those records of the diversions made available for inspection by personnel of the Division of Water Rights upon reasonable request. **An annual report of all water diversions under this approval shall be submitted to the Division of Water Rights.**
5. The documents submitted as proof of beneficial use for this application, as required by statute at

Section 73-3-16 shall include a full and correct copy of the metering record maintained as required herein.

6. All wells used as public water supply wells are regulated by the Utah Division of Drinking Water. Plans for the construction of new wells must be reviewed and approved by the Division of Drinking Water prior to any drilling or construction activity being commenced. The approval of this water right application does not constitute approval of the well for use as a public water supply by the Division of Drinking Water. The District is advised to contact the Division of Drinking Water at (801) 536-4200 to review applicable standards and for information about approval of a source of supply for public use.
7. Along with this approval, the District shall develop a monitoring program to ensure that no prior rights are being impaired and that the aquifer system is not exceeding safe yield. Plans for this monitoring program must be submitted to and approved by the State Engineer prior to diversion of any water from the proposed sources.

The District is strongly cautioned that other permits may be required before any development of this application can begin and it is the responsibility of the District to determine the applicability of and acquisition of such permits. Once all other permits have been acquired, this is your authority to develop the water under the above referenced application which under Sections 73-3-10 and 73-3-12, Utah Code Annotated, 1953, as amended, must be diligently prosecuted to completion. The water must be put to beneficial use and proof must be filed on or before **February 28, 2033**, or a request for extension of time must be acceptably filed; otherwise the application will be lapsed.

Proof of beneficial use is evidence to the State Engineer that the water has been fully placed to its intended beneficial use. By law, it must be prepared by a registered engineer or land surveyor, who will certify to the location, uses and extent of your water right.

Upon the submission of proof as required by Section 73-3-16, for this application, the District must identify every source of water used under this application and the amount of water used from that source. The proof must also show the capacity of the sources of supply and demonstrate that each source can provide the water claimed to be diverted under this right as well as all other water rights which may be approved to be diverted from those sources.

Failure on your part to comply with the requirements of the applicable statutes may result in the lapsing of this Application to Appropriate Water.

The right to beneficially use water as described in this order shall be administered by the State Engineer the same as if this order had been issued by the State Engineer.

**THE COURT'S ELECTRONIC SIGNATURE APPEARS
AT THE TOP OF THE FIRST PAGE OF THE JUDGMENT
TO WHICH THIS ORDER IS ATTACHED**