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

IN THE MATTER OF APPLICATIONS 53987 THROUGH 53992, INCLUSIVE, AND APPLICATIONS 54003 THROUGH 54015, INCLUSIVE, AND APPLICATIONS 54019 AND 54020, FILED TO APPROPRIATE THE UNDERGROUND WATERS OF CAVE VALLEY, DELAMAR VALLEY, DRY LAKE VALLEY, AND SPRING VALLEY (HYDROGRAPHIC BASINS 180, 181, 182 AND 184), LINCOLN COUNTY AND WHITE PINE COUNTY, NEVADA.	**RULING** **#6446**

GENERAL

I. INTRODUCTION

A summary of the proceedings concerning these Applications is included to reintroduce the reader to the history of this matter as a foundation for this ruling on remand. The full background is lengthy. The procedural history of these Applications, the entire list of protesting parties, the complete recitation of protest grounds and protests that were withdrawn is fully set out in State Engineer Rulings 6164 through 6167.[1] Those portions of Rulings 6164 through 6167 will not be repeated here, but are incorporated herein by reference.

In 1989, the Las Vegas Valley Water District filed 146 water right applications for interbasin transfers of groundwater to the Las Vegas Valley. Twenty-five of the applications sought to appropriate the underground waters of Spring Valley, Cave Valley, Dry Lake Valley and Delamar Valley.

The first hearing on the Spring Valley applications was held September 11-25, 2006, and Ruling 5726 was issued on April 16, 2007, which denied four applications (54016, 54017, 54018 and 54021) and granted 60,000 acre-feet under the remaining applications.[2] The first hearing on the Cave, Dry Lake and Delamar Valley applications was held February 4-8, 2008, and Ruling 5875 was issued on July 9, 2008, which granted 4,678 acre-feet in Cave Valley, 11,584 acre-feet in Dry Lake Valley, and 2,493 acre-feet in Delamar Valley.[3] Both rulings were appealed. Ultimately, the Nevada Supreme Court's opinion in *Great Basin Water Network v. Taylor*, 126 Nev. 187, 234 P.3d 912 (2010), was dispositive of both supreme court appeals by requiring that the State Engineer re-open the protest period on the applications.

The State Engineer did re-open the protest period on the applications, after which, a hearing was held on all applications in the four basins between September 26, 2011 to November 18, 2011. Following the hearing, the State Engineer issued Rulings 6164 through 6167 on March 22, 2012, granting and denying Southern Nevada Water Authority's[4] (the Applicant) Applications. In Ruling 6164, the State Engineer again

[1] Exhibit Nos. SE_140, pp. 2-26 and SE_141, 142, and 143 all at pp. 2-16, public administrative hearing before the State Engineer. The full 2017 remand hearing exhibit list is available at *www.water.nv.gov.*
[2] Exhibit No. SNWA_571.
[3] Exhibit No. SNWA_551.
[4] The Southern Nevada Water Authority assumed ownership of the Applications from the Las Vegas Valley Water District.

denied four applications in Spring Valley (54016, 54017, 54018, and 54021) and granted 61,127 acre-feet under the remaining applications.[5] In Ruling 6165, the Applicant was granted 5,235 acre-feet in Cave Valley[6]; in Ruling 6166 the Applicant was granted 11,584 acre-feet in Dry Lake Valley[7]; and in Ruling 6167, the Applicant was granted 6,042 acre-feet in Delamar Valley.[8] All applications that were granted were subject to certain conditions, including compliance with monitoring, management and mitigation plans.[9]

II. SUBSEQUENT APPEAL AND THE REMAND ORDER

Certain Protestants appealed Rulings 6164 through 6167 to the Seventh Judicial District Court in and for White Pine County, Nevada. In an order entered on December 13, 2013 (the "Remand Order"), the District Court remanded Rulings 6164 through 6167 to the State Engineer for:

> 1. The addition of Millard and Juab counties, Utah in the mitigation plan so far as water basins in Utah are affected by pumping of water from Spring Valley Basin, Nevada;
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> 2. A recalculation of water available for appropriation from Spring Valley assuring that the basin will reach equilibrium between discharge and recharge in a reasonable time;
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> 3. [Defining] standards, thresholds or triggers so that mitigation of unreasonable effects from pumping of water are neither arbitrary nor capricious in Spring Valley, Cave Valley, Dry Lake Valley and Delamar Valley, and;
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> 4. [Recalculation] of the appropriations from Cave Valley, Dry Lake and Delamar Valley to avoid [over-appropriation] or conflicts with down-gradient, existing water rights.[10]

The State Engineer filed a direct appeal of the Remand Order to the Nevada Supreme Court, which dismissed the appeal on February 6, 2015, for lack of jurisdiction over a non-final order.[11] The State Engineer and the Applicant also filed separate writ

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[5] Exhibit No. SE_140.
[6] Exhibit No. SE_141.
[7] Exhibit No. SE_142.
[8] Exhibit No. SE_143.
[9] Exhibit No. SE_140, pp. 216-18; Exhibit No. SE_141, pp. 169-70; Exhibit No. SE_142, pp. 163-64; Exhibit No. SE_143, pp. 161-62.
[10] Exhibit No. SE_118, p. 23.
[11] *See* Exhibit No. SE_139.

petitions to the Nevada Supreme Court challenging the Remand Order.[12] Both petitions were denied when the Court determined the petitioning parties had an adequate remedy at law in the form of petition for judicial review of an adverse decision on remand.[13] Finally, The Corporation of the Presiding Bishop of the Church of Jesus Christ of Latter-Day Saints, on behalf of Cleveland Ranch (CPB), also filed a writ petition regarding the finding in Remand Order that affirmed the State Engineer's interpretation of NRS 533.3705(1) concerning staged development. CPB's writ petition was denied after the court determined the State Engineer properly interpreted and applied the statute, resulting in the decision reported at *CPB v. Seventh Jud. Dist. Ct.*, 132 Nev. Adv. Op. 6, 366 P.3d 1117 (2016).[14]

With the dismissal of the State Engineer's appeal and writ petition, the Remand Order was fully before the State Engineer, and a status conference was set for September 14, 2016, to develop a plan to move forward with the remand.[15] In a letter dated September 12, 2016, counsel for the Great Basin Water Network, *et al*., (GBWN) took the position that no additional hearing was necessary to comply with the Remand Order.[16] All parties appeared at the status conference and the other parties to the proceeding disagreed with GBWN, opining that an additional hearing before the State Engineer was necessary.[17] Consequently, on October 3, 2016, the State Engineer issued an Interim Order on Pre-Hearing Scheduling and determined that an additional administrative hearing was necessary to provide the parties the opportunity to fully address the issues remanded by the District Court.[18]

III. PRE-HEARING MOTIONS

Numerous pre-hearing motions were filed concerning discovery requests, scheduling and motions in limine. CPB filed a motion with the State Engineer regarding discovery and mandatory presentations of proposed written testimony.[19] The Applicant filed a motion regarding a proposed schedule, proper parties and offer of exhibits.[20] The

[12] *See* Exhibit Nos. SE_136 and 137.
[13] *Id.*
[14] *See* Exhibit No. SE_138.
[15] Exhibit No. SE_119.
[16] Exhibit No. SE_120, p. 2.
[17] Exhibit No. SE_120, p. 2.
[18] Exhibit No. SE_120.
[19] Exhibit No. SE_133, p. 2.
[20] Exhibit No. SE_133, p. 6.

Confederated Tribes of the Goshute Reservation (CTGR) filed a motion to dismiss for failure to join United States Department of the Interior (DOI) Bureaus,[21] which was joined by GBWN.[22] Timely oppositions and replies were filed on the motions.

The State Engineer issued a Notice of Hearing and Interim Order on November 28, 2016, which denied CPB's motion for pre-hearing discovery and written direct testimony and required that expert witnesses submit written reports.[23] The State Engineer also denied CTGR's motion to dismiss, finding that the participation of the DOI Bureaus was not essential, and that the law does not require joinder of a party in the absence of a formal protest to an application by that party.[24] The State Engineer found that once the DOI Bureaus stipulated to withdraw their protests, the Bureaus were no longer parties and joinder was unnecessary.[25] As to the Applicant's motion regarding scheduling, proper parties, and offer of exhibits, the State Engineer found that the Applicant had dropped its objection as to proper parties.[26] Further, the State Engineer denied in part, and granted in part, the Applicant's offer of exhibits.[27] The State Engineer also identified five additional documents that were pre-marked as exhibits.[28]

The Applicant filed two motions in limine.[29] The first motion in limine sought to exclude portions of Exhibit CPB 19, the expert Report of Aquaveo, LLC, and related testimony. The Applicant argued that the identified portions of the exhibit and related testimony should be excluded because: (1) water budgets, sustainability, safe yield, and the State Engineer's calculation of the perennial yield of Spring Valley were outside the scope of the remand hearing; (2) the legal question of whether evapotranspiration (ET) capture is required under Nevada law had already been decided and was therefore outside the limited scope of the remand hearing; and (3) issues related to alleged impacts that the Applicant's pumping might have on Cleveland Ranch had already been decided and were outside the limited scope of the remand hearing.[30]

[21] Exhibit No. SE_133, pp. 3-6.
[22] Exhibit No. SE_133, p. 3.
[23] Exhibit No. SE_133, p. 3.
[24] Exhibit No. SE_133, pp. 5-6.
[25] Exhibit No. SE_133, pp. 5-6.
[26] Exhibit No. SE_133, p. 6.
[27] Exhibit No. SE_133, pp. 6-7.
[28] Exhibit No. SE_133, p. 7.
[29] Exhibit No. SE_157, p. 6, 10.
[30] Exhibit No. SE_157, pp. 6-8.

The Applicant's second motion in limine sought to exclude the majority of Exhibit GBWN 281, the expert report of Tom Myers, Ph.D., and the entirety of Exhibit GBWN 282, an article by Brown, *et al.*, entitled *Groundwater-dependent ecosystems in Oregon: an assessment of their distribution and associated threats*; Exhibit 290 an article by Fairley, *et al*., entitled *Rapid transport pathways for geothermal fluids in an active Great Basin fault zone*; and Exhibit 292, an article by Howard, *et al*., entitled *Mapping Groundwater Dependent Ecosystems in California*. The Applicant argued that the reports or the portions thereof and any testimony should be excluded because: (1) recharge and discharge estimates were determined in the previous hearing; (2) projected drawdown and model impacts in Spring Valley were outside the scope of the remand hearing; (3) the construction of the model was determined in the previous hearing; (4) an equilibrium analysis in the White River Flow System was not included in the Remand Order; (5) interbasin flow calculations were determined in the prior hearing; (6) that Dr. Myers was not an expert in 3M plans; (7) that Dr. Myers was not an expert in Nevada water rights; and (8) that Dr. Myers was not an expert in the field of biology for wetlands.[31]

CPB also filed two motions in limine.[32] The first sought to exclude Exhibit SNWA Exhibits 608 and 609, the curriculum vitae and the Declaration of Don Barnett, P.E., P.G., and any testimony of Mr. Barnett.[33] CPB argued that these exhibits did not contain a written report with expert opinions as mandated by the State Engineer's Notice of Hearing and Interim Order.[34] CPB's second motion in limine sought to exclude testimony and evidence related to the Applicant's ET capture scenario consisting of 101 wells.[35] CPB argued that testimony during the hearing should be limited to the points of diversion described in the applications.[36] Timely oppositions and replies were filed to all in limine motions.[37]

On December 13, 2017, the State Engineer granted CPB's motion in limine concerning the testimony of Don Barnett and ordered that the testimony of Mr. Barnett be limited to that of a factual witness.[38] The State Engineer denied all remaining motions

[31] Exhibit No. SE_157, pp. 10-12.
[32] Exhibit No. 157, pp. 2, 5.
[33] Exhibit No. SE_157, pp. 5-6.
[34] Exhibit No. SE_157, pp. 5-6.
[35] Exhibit No. SE_157, p. 2.
[36] Exhibit No. SE_157, p. 2.
[37] *See* Exhibit Nos. SE_149, SE_150, SE_151, SE_152, SE_153, SE_154, SE_155, and SE_156.
[38] Exhibit No. SE_157, p. 6.

in limine and indicated that he would determine what weight, if any, to give the evidence at the appropriate time.[39]

IV. 2017 HEARING

Consistent with the State Engineer's finding that an additional administrative hearing was necessary to provide the parties the opportunity to fully address the remand issues, the State Engineer conducted a hearing between September 25, 2017, and October 6, 2017. Counsel and representatives for the Applicant were in attendance and presented evidence in support of its position. Certain Protestants appeared through counsel and put on evidence in support of their claims, including GBWN, CTGR, and CPB. Millard and Juab Counties, Utah, were also represented by counsel during the hearing, but did not present a case.

In addition to the presentation of cases by parties at the hearing, 72 written public comments were filed in the Office of the State Engineer from September 11, 2017, through October 23, 2017. Additionally, the State Engineer made accommodations for the public to comment during the remand hearing on the afternoon of September 29, 2017, at which time further public comment was received.

V. HEARING SCOPE

As noted previously in Section II, the Remand Order identified four issues on remand, and the scope of the hearing was limited to those four issues. Beyond the four remand issues, the Remand Order did "not disturb the findings of the Engineer."[40] Accordingly, other than the four issues specifically remanded, all other findings in Rulings 6164, 6165, 6166, and 6167, which have not been overturned, remain valid and are incorporated herein by reference. Additionally, although the State Engineer is fully complying with the Remand Order, the State Engineer's misgivings regarding aspects of the Remand Order have not been examined through an appeal, despite his efforts to commence appellate review and to obtain writ relief after the Remand Order was issued.[41] Because the State Engineer's concerns were not taken up by the Nevada Supreme Court,

[39] Exhibit No. SE_157.
[40] Exhibit No. SE_118, p. 23.
[41] The State Engineer argued in the appeal and in his writ petition that the Remand Order was legally improper and conflicted with longstanding policy that the State Engineer followed to consistently manage the waters of the state and that following the Remand Order would result in unwarranted delay and expenditure of judicial and administrative resources in carrying out the remand.

the State Engineer does not waive any right to challenge the Remand Order by complying with the requirements of the Order in the issuance of this Ruling.

FINDINGS OF FACT

I. THE ADDITION OF MILLARD AND JUAB COUNTIES IN THE MONITORING, MANAGEMENT AND MITIGATION PLAN (Remand Issue Number 1)

The first remand issue, the addition of Millard and Juab Counties in the mitigation plan, concerns monitoring, management and mitigation. Therefore, whether the Applicant properly included Millard and Juab Counties in a Monitoring, Management and Mitigation (3M) Plan is addressed later in the Ruling in Finding of Fact Section IV, in conjunction with Remand Issue Number 3, concerning standards, thresholds or triggers for mitigation.

II. RECALCULATION OF WATER AVAILABLE IN SPRING VALLEY FOR APPROPRIATION (Remand Issue Number 2)

The District Court remanded Ruling 6164 for:[42]

> A recalculation of water available for appropriation from Spring Valley assuring that the basin will reach equilibrium between discharge and recharge in a reasonable time.

The District Court accepted the State Engineer's initial calculation of available water as 61,127 acre-feet annually (afa), but required that number to be reduced by the amount of uncaptured ET. The District Court's remand instruction was based on its evaluation of evidence in the 2011 record that pertained to whether Spring Valley would reach a new equilibrium in a reasonable amount of time based on the prior award (in Ruling 6164) of 61,127 acre feet. The District Court determined that the evidence in the 2011 administrative record showed that after 200 years, "SNWA will likely capture . . . [84%] of the E.T."[43] In arriving at this finding, the District Court relied on the Applicant's District Court Answering Brief that referenced evidence from a groundwater model simulation in the BLM's Draft Environmental Impact Statement (DEIS) for the project.[44]

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[42] Exhibit No. SE_118, p. 23. This instruction has been referred to as the "ET Capture Rule" or "Equilibrium Analysis" during the remand proceedings.
[43] Exhibit No. SE_118, p. 12.
[44] SNWA's Answering Br. to CPB, p. 20, *Millard Co., Utah et al. v. King*, CV-1204049 (7th Jud. Dist. Ct. Nev. Apr. 15, 2013); *see also* Exhibit No. GBWN_110, p. ES-51; 2017 Transcript, Vol.4 p. 981:4-21 (Burns) (discussing DEIS and Remand Order).

The DEIS model simulation depicted pumping using a wellfield configuration of 81 wells distributed throughout Spring Valley—not just the 15 points of diversion that are included in the Applicant's remanded permits.[45,46] The District Court then used the 84% value from the DEIS model simulation to conclude that "SNWA pumping and evapotranspiration removes 70,977 afa from the basin with no equilibrium in sight. That is 9,780 afa more than SNWA's grant."[47]

A. The Applicant's Evidence Regarding ET Capture Based on a Conceptual Wellfield

The Applicant and Protestants presented evidence to comply with this remand instruction requiring the recalculation of water available from Spring Valley. However, the parties disagreed whether the State Engineer should be limited to considering only the Applicant's 15 points of diversion under the Applications; or, whether the State Engineer could consider some other conceptual wellfield, as the District Court did in the Remand Order. The Applicant took the position that the District Court's reliance on the DEIS model simulation of 81 wells as an endorsement by the Court of an alternative wellfield design. Accordingly, at the 2017 hearing before the State Engineer, the Applicant submitted evidence regarding a conceptual wellfield of 101 wells, which was different than the 81 wellfield scenario from the DEIS, but was still conceptual in that it was not limited to the Applicant's 15 points of diversion.

In so doing, the Applicant first updated its 2011 "Central Carbonate Rock Province" or "CCRP Model" with the factual findings made by the State Engineer in

[45] Exhibit No. GBWN_110, p. 3.3-99; 2017 Transcript, Vol.4 p. 984:1-21 (Burns).
[46] In Ruling 6127 the State Engineer explained that the DEIS groundwater model was created as part of the Applicant's right-of-way request to BLM for its analysis of the environmental impacts of issuing the right-of-way application. For purposes of the right-of-way application, the site specific locations of the wells were not yet known for the DEIS, and the DEIS groundwater model was intended to provide a broad-scale, programmatic analysis of the effects of issuing the right of way. For that reason, the DEIS model included multiple alternative pumping scenarios which distributed pumping throughout Spring Valley. Exhibit No. SE_140, State Engineer Ruling 6164 pp. 122, 129. One of the alternative pumping scenarios was the configuration of 81 wells that the District Court relied on in its ET capture analysis.
[47] Exhibit No. SE_118, p. 11. At the remand hearing, a witness for SNWA described the calculations used by the District Court. *See* 2017 Transcript, Vol.4 p. 988:2-21 (Burns). To arrive at the 9,780 afa value of uncaptured ET, the District Court simply multiplied the approved pumping duty (61,127 afa) by 16% (the percentage of groundwater ET that remains uncaptured in the DEIS preferred alternative model simulation) to arrive at a figure of 9,780 afa of uncaptured ET after 200 years. The Court then added the quantity of uncaptured ET (9,780 afa) to the approved project pumping (61,127 afa) to arrive at the 70,977 afa estimate of total withdrawals from the basin attributable to SNWA's project (the actual value is 70,907, not 70,977. The difference between the actual value and the value reported by the District Court appears to be an inadvertent error).

Ruling 6164.[48] These updates included raising the groundwater discharge figure in Spring Valley to 84,100 afa, and lowering simulated pumping to 61,127 afa (the amount awarded in Ruling 6164).[49] Additionally, to adjust the value of groundwater utilized by plants, the Applicant found that it was necessary to modify the recharge efficiencies for the Great Salt Lake region, of which Spring Valley is a part, and the recharge factor was increased from 1.000 to 1.0947.[50]

The Applicant's experts provided a summary of the CCRP Model's limitations and uncertainties in their model scenario report. These limitations result primarily from the regional scale of the CCRP Model and the lack of aquifer response data associated with large volumes of pumping in Spring Valley. The Applicant's expert witness, Andrew Burns, best described the model's regional scale as follows, "one way to look at it is if you think of yourself at a model node in the groundwater discharge area of Spring Valley. And we know that the dimensions of the model cell is 1,000 meters by 1,000 meters."[51] In other words, the size of the scale of the model cells is very large and each cell can only provide a single, average, value for groundwater head and ET extinction depth[52] that does not reflect the diversity that actually exists within that cell boundary.

Then, the Applicant created a simulated pumping scenario based on the 15 points of diversion under the pending applications *in addition to* 86 theoretical points of diversion for a wellfield totaling 101 wells disbursed throughout the basin.[53] The spatial distribution and production volumes of wells were selected to present a modeling scenario to demonstrate how the model could be used to identify new well locations to increase the effectiveness of ET capture.[54]

After the start of full production, the Applicant's simulations projected that after 75 years of pumping, 96% of project pumping was attributable to ET capture.[55] After 100 years the capture rate increased to 97%, and after 200 years it reached 98%.[56] As a result of these simulations, the Applicant requested that there be no reduction to the prior

[48] Exhibit No. SNWA_475, p. 3-1.
[49] Exhibit No. SNWA_475, p. 2-1 (Table 2-1).
[50] Exhibit No. SNWA_475, p. 3-2; 2017 Transcript, Vol. 4 p. 1002:21 – 1003:9 (Drici).
[51] 2017 Transcript, Vol. 4 p. 994:15-20.
[52] *See* Exhibit No. SNWA_475, p. 7-1 ("Extinction depth is defined as the depth below the land surface at which ET ceases.")
[53] Exhibit No. SNWA_475, p. 4-3 and p. 4-4 (Figure 4-2).
[54] Exhibit No. SNWA_475, p. 4-1.
[55] Exhibit No. SNWA_475, p. 6-2 (Table 6-1).
[56] Exhibit No. SNWA_475, p. 6-2 (Table 6-1).

award of 61,127 afa granted to the Applicant in Spring Valley by Ruling 6164. In the alternative, the Applicant requested that any deduction be limited to 9,780 afa, which was the amount calculated by the District Court.[57]

Prior to and during the hearing, the Protestants objected to the Applicant's evidence of a conceptual wellfield. Although the Applicant demonstrated that a conceptual plan could be developed to capture ET within a reasonable time, the State Engineer finds Protestants' arguments, discussed below, have advanced sound reasons for applying the remand issue to the 15 points of diversion identified in the Spring Valley applications.

1. Considering Alternative Wellfields Would Be Inconsistent with Nevada Water Law

As required by NRS 533.335, an application to appropriate water in Nevada "shall contain," among other things, "the following information":

> (3) The amount of water which it is desired to appropriate, expressed in terms of cubic feet per second . . . .
>
> (4) The purpose for which the application is being made.
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> (5) A substantially accurate description of the location of the place at which the water is to be diverted from its source . . . .
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> (6) A description of the proposed works [*e.g.*, wells, pipelines, etc.].
>
> (7) The estimated cost of such works.
>
> (8) The estimated time required to construct the works, and the estimated time to complete the application of the water to beneficial use.

Nevada law requires the State Engineer to consider only applications that are filed, which must include their specific points of diversion. Pursuant to NRS 533.370, the State Engineer shall approve or reject *an application*.[58] The State Engineer applies the statutory criteria to each application, which may be supported by evidence, information requested by the State Engineer or matters of record officially noticed by the State Engineer. The State Engineer "shall reject" an application and "refuse to issue the requested permit" where "[1] there is no unappropriated water in the proposed source of supply, or [2] where its proposed use or change conflicts with existing rights or with

[57] SNWA Closing Brief, p. 14.
[58] NRS 533.370.

protectable interests in existing domestic wells . . . , or [3] threatens to prove detrimental to the public interest."[59] Where the statutory standards are not met, the State Engineer has no discretion and is mandated to deny the applications.[60]

The applicant must also provide proof of: "(1) Intention in good faith to construct any work necessary to apply the water to the intended beneficial use with reasonable diligence; and (2) Financial ability and reasonable expectation actually to construct the work and apply the water to the intended beneficial use with reasonable diligence."[61] The burden of proof is on the applicant to show that the statutory standards for approval are met.[62]

In order to properly carry out his statutory obligations, the State Engineer can only consider the applications that are before him, which describe their proposed pumping rate, point of diversion, diversion works, and any supporting evidence. Nevada water law does not authorize the State Engineer to approve an application that does not meet the statutory criteria based on the possibility, or even the promise, of potential changes in pumping rates or points of diversion not described in the submitted application. Such approval would not only be contrary to Nevada law, but would be based upon speculation and is inherently arbitrary.

The constraint placed by the Remand Order limits the State Engineer to granting appropriations to the amount of discharge captured, assuring that the basin will reach equilibrium between discharge and recharge in a reasonable time. The State Engineer finds that he cannot approve the existing applications based on the possibility or promise by the Applicant of future changes to the wellfield design under later applications not before him. Consequently, the State Engineer finds that Nevada law requires that the remand instruction be applied to the 15 applications now pending, which correspond to the applied-for points of diversion.

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[59] NRS 533.370(2).

[60] NRS 533.370(2) (". . . The State Engineer shall reject the application and refuse to issue the requested permit.").

[61] NRS 533.370(1)(c).

[62] *See Bacher v. State Engineer*, 122 Nev. 1110, 1116, 146 P.3d 793, 797 (2006) ("NRS Chapter 533 prescribes the general requirements that every applicant must meet to appropriate water.").

2. The State Engineer Previously Indicated He Was Disinclined to Consider Conceptual Applications or Wellfield Designs

While it is true that the District Court relied on the Applicant's citation to the DEIS model, which simulated 81 wells,[63] it is not clear whether the District Court was aware of the wellfield design behind this scenario. Ultimately, whether the District Court was aware is immaterial, because the State Engineer previously indicated during the 2011 hearing that he was disinclined to consider evidence that was not limited to the proposed points of diversion. At the 2011 hearing on these same Applications, the Applicant attempted to proffer information about possible changes to the wellfield design. The Hearing Officer interjected and explained why this evidence would not be allowed:[64]

> [The Applicant has] applied for a diversion rate from specifically 19 wells[65], and that's all the State Engineer is considering. He's not considering a different wellfield . . . . We're talking about the applications under consideration here . . . . [A]nd we've had people in here arguing, Well, I'm going to move the wellfield [to] other places. And I have said that's not what we're considering. We're considering the applications that are before us.

In Ruling 6164, the State Engineer reaffirmed that only the pending applications were before him,[66] including stating in Ruling 6164 that:[67]

> . . . Dr. Myers provided many simulations of pumping at alternative points of diversion. At this time, the State Engineer is only considering the points of diversion for the Applications before him. If the Applicant wishes to change the points of diversion of the Applications, it must submit further applications to change the points of diversion to the State Engineer pursuant to NRS 533.345. If such applications are submitted, the State Engineer will consider pumping at the new points of diversion. Alternative points of diversion are irrelevant to the analysis of whether the proposed pumping unreasonably conflicts with existing rights for this hearing.

The District Court did not require the State Engineer to take or evaluate evidence on remand in any particular way and left the question open to the State Engineer to answer.[68] The State Engineer finds that he previously rejected consideration of

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[63] Exhibit No. SE_118 at p. 11:14-17.
[64] 2011 Transcript Vol. 11, pp. 2507:23-2508:10 (Oct. 10, 2011).
[65] During the 2011 hearing, there were 19 applications pending in Spring Valley. Applications 54016, 54017, 54018 and 54021 were denied in Ruling 6164 and the denial of these applications was not disturbed by the District Court. Accordingly, 15 applications that remain pending in Spring Valley are those presently under consideration by the State Engineer, as discussed in the preceding section.
[66] Exhibit No. SE_140, p. 129.
[67] Exhibit No. SE_140, p. 150.
[68] *See* Exhibit No. SE_118.

conceptual applications or wellfields in 2011, and although the Remand Order imposed new requirements for this remand proceeding, the State Engineer is statutorily required to look only at the applications before him. Despite the fact that the District Court relied on the DEIS model as a basis for the remand does not open the door for the State Engineer to consider a conceptual wellfield to answer the question on remand.

Further, assuming *arguendo*, the State Engineer considered the Applicant's conceptual wellfield, CPB argues that this violates due process. The State Engineer already ruled in the Interim Order on the Motions in Limine, that there would be no due process violation because the Applicant would still be required to file any change applications, giving CPB notice and affording interested parties the opportunity to protest.[69] Nevertheless, as set out above, the State Engineer is considering only the Applicant's points of diversion as identified in its existing applications.

3. Reliance On A Conceptual Wellfield Creates A Disconnect With Other Findings By The State Engineer That Were Not Disturbed On Appeal And With Other Issues Under Consideration On Remand

With the exception of the issues that were remanded to the State Engineer, the findings of the State Engineer were undisturbed by the District Court. Although the Applicant's simulations show that the conceptual 101 wellfield could reach equilibrium, the Applicant did not analyze how much the water table would be lowered as a result,[70] and a conflicts analysis was not performed for the 101 wellfield concept.[71] Additionally, the Applicant's Spring Valley Monitoring, Management and Mitigation Plan (3M Plan) is based upon the applied-for 15 points of diversion.[72] For these reasons, the State Engineer finds that it is proper to limit consideration of the pending Applications to their current points of diversion based on the State Engineer's prior statements rejecting

[69] *See* NRS 533.365.
[70] 2017 Transcript, Vol. 5, p. 1081:3-7 (Burns).
[71] 2017 Transcript, Vol. 5, pp. 1081:8-16 (Waltrus) and 1085:21 – 1086:9 (Burns).
[72] Exhibit No. SNWA_592.

alternative theories, Nevada law, and consistent treatment of the evidence regarding the 3M Plan.

B. The Protestants' Evidence Regarding ET Capture at the Proposed Points of Diversion

The District Court remanded the matter to the State Engineer "for an award less than the calculated E.T. for Spring Valley" and with some prospect of reaching equilibrium.[73] To address the remand requirement, CPB updated SNWA's 2011 CCRP model and performed model simulations to predict whether the basin would reach equilibrium within a reasonable time at the proposed points of diversion.[74] In summary, CPB's updates to the CCRP model included reducing the pumping rate from 91,000 afa to 61,000 afa, increasing the ET discharge from 75,000 afa to 84,100 afa to match the updated ET estimate provided by Ruling 6164, and updating the baseline simulation to include water rights purchased by the Applicant in recent years.[75]

CPB's model simulations, limited to the 15 wells identified as proposed points of diversion, demonstrated that the proposed pumping of 61,000 afa from these 15 wells will never reach a new equilibrium.[76] The primary reason is that the proposed wells are too remote from the ET discharge zone(s). In addition to capturing ET from within Spring Valley, model simulations indicated that the proposed pumping would still be withdrawing storage from the aquifer after several centuries of pumping, and would induce a substantial amount of groundwater flow from neighboring basins. [77]

CPB's evidence predicted that after 75 years of pumping, the system would be capturing about 38,000 afa (about 62%) from captured ET, while still withdrawing 15,155 afa from storage and 8,218 afa from adjacent valleys.[78] After 200 years of pumping, ET capture would be at 69%, with the rest being withdrawn from storage (9,000 afa) and interbasin subsurface flow from adjacent valleys (10,000 afa).[79] After 200 years, the model predicted that the Applicant would have withdrawn 3.68 million acre feet from storage which is 43% to 77% of the Applicant's estimate of the total amount of storage

[73] Exhibit No. SE_118, p. 13.
[74] Exhibit Nos. CPB_19, and CPB_25.
[75] 2017 Transcript, Vol. 6, pp. 1181:14-1182:4 (Jones).
[76] Exhibit No. CPB_19.
[77] 2017 Transcript, Vol. 6, pp. 1178:23-1179:9 (Jones/Mayo).
[78] 2017 Transcript, Vol. 6, pp. 1192:10 – 1193:2 (Jones).
[79] 2017 Transcript, Vol. 6, pp. 1188:15-1190:6 (Jones/Mayo).

in the upper 100 feet of the Spring Valley aquifer.[80] About 1.5 to 2 million acre feet would have been withdrawn from adjacent valleys.[81] Hence, CPB argued that the system would still be far from a new equilibrium.[82]

The Applicant points out that these numbers do not account for transitional storage, which is a necessary and unavoidable component of the perennial yield concept. Transitional storage is the quantity of water removed during the transition between pre-development equilibrium conditions and a new equilibrium, or the amount of stored water which is available for withdrawal by pumping during the non-equilibrium period of development (Scott, *et al*.).[83]

CPB also ran a series of model simulations with fractional levels of project pumping ranging from 90 percent of the previously approved pumping volume (54,977 afa) down to 10 percent of the previously approved pumping volume (6,108 afa). While the percentage of ET captured increased slightly with reduced pumping volumes, none of the fractional pumping scenarios achieved an ET capture rate higher than 83 percent.[84] As noted by CPB's experts, "No matter how much the pumping is reduced, none of the fractional pumping scenarios reach equilibrium."[85] CPB's experts thus concluded that "changing the pumping rate has little impact on the outcome."[86]

The Applicant's expert, Andrew Burns, agreed with the CPB's conclusion that there is no pumping rate at which the system would ever reach equilibrium under the current wellfield configuration.[87] The pumping regime offered by the Applicant "does not reach equilibrium after 200 years of pumping," the Applicant concedes, "because the production well configuration was not designed to capture ET."[88] The State Engineer finds that this exemplifies the futility of attempting full development of the state's water resources under an ET capture requirement as ordered by the District Court.

The State Engineer allowed the Applicant's evidence of a conceptual wellfield of 101 wells into the record, but finds it is worthy of little to no weight in the State Engineer's

[80] 2017 Transcript, Vol. 6, pp 1191:15-22 (Jones).
[81] 2017 Transcript, Vol. 6, pp. 1194:8-5 (Jones).
[82] 2017 Transcript, Vol. 6, pp. 1194:16-17 (Jones).
[83] Exhibit No. SNWA_597, pg. 4.
[84] Exhibit No. CPB_025, p. 15.
[85] Exhibit No. CPB_025, p. 15.
[86] Exhibit No. CPB_025. p. 15.
[87] 2017 Transcript, Vol. 4, pp. 990:6 – 991:14 (Burns).
[88] Exhibit No. SNWA_597, p. 6.

decision, as the State Engineer is limited to considering the pending Applications at their current points of diversion. The Applicant demonstrated no legal basis for the State Engineer to consider a conceptual wellfield. The State Engineer also rejects the Applicant's alternative argument that the maximum reduction should be limited to 9,780 afa (as calculated by the District Court) because that amount is based on the DEIS model utilizing a conceptual wellfield of 81 wells, and the State Engineer already rejected deriving ET capture based on a conceptual wellfield. The Applicant did not offer any evidence that limited its analysis to the 15 points of diversion identified in the Applications before the State Engineer; therefore, the State Engineer finds that the Applicant failed to demonstrate that a reduced amount can be granted that has some prospect of reaching equilibrium within a reasonable time.

CPB's evidence demonstrated that the maximum ET that could be captured at the proposed 15 points of diversion is 69% after 200 years; which, according to the remand instruction, does not demonstrate a prospect of reaching equilibrium within a reasonable time. Further, the fractional pumping analysis performed by CPB demonstrates that there is no lesser amount that can be awarded which has some prospect of reaching equilibrium within a reasonable time. Therefore, the State Engineer finds that, under the mandate imposed by the Remand Order, no water can be awarded under the applications in Spring Valley and, consequently, the applications are subject to denial.

C. <u>Notwithstanding the State Engineer's Findings, An Exception to the Law of the Case Doctrine Permits the District Court to Re-Examine Its Findings in the Remand Order</u>

The State Engineer recognizes that the Remand Order is the law of the case and he has endeavored to carry out the remand ordered by the District Court.[89] While the doctrine of law of the case "is designed to ensure judicial consistency and to prevent the reconsideration, during the course of a single continuous lawsuit, of those decisions which are intended to put a particular matter to rest," federal courts have adopted three specific exceptions to the law of the case doctrine, concluding that a court may revisit a prior ruling when (1) subsequent proceedings produce substantially new or different

[89] *See Hsu v. Clark County*, 123 Nev. 625, 173 P.3d 724 (2007) (Under the law of the case doctrine, when an appellate court states a principle or rule of law necessary to a decision, the principle or rule becomes the law of the case and must be followed throughout its subsequent progress, both in the lower court and upon subsequent appeal, as long as the facts remain substantially unchanged.).

evidence, (2) there has been an intervening change in controlling law, or (3) the prior decision was clearly erroneous and would result in manifest injustice if enforced.[90] Nevada has expressly adopted the second exception and has, by implication, acknowledged the third exception, stating that "[w]e will depart from our prior holdings only where we determine that they are so clearly erroneous that continued adherence to them would work a manifest injustice."[91] As discussed below, there are compelling reasons, pursuant to the third exception, for the District Court to consider re-examining its findings and order made in the Remand Order.

1. Imposition of the District Court's Mandated ET Capture Rule Upsets the Established State Policy for Appropriating Groundwater

Twice before, in 2007 and 2012, the State Engineer granted the Applicant 60,000 acre-feet and 61,127 acre-feet annually, respectively, based on water availability in Spring Valley under these same applications. There are 256 hydrographic groundwater basins in Nevada, each having an estimate of groundwater availability (perennial yield). Of the 256 groundwater basins, Spring Valley has the highest estimate of perennial yield (84,100 acre-feet) of any other groundwater basin in the state. It is undisputed that there is only 22,873 acre-feet committed in the basin, leaving over 60,000 acre-feet uncommitted. However, this remand issue, as ordered by the Court, forces the State Engineer to completely disregard prior policies and practices in determining how much water is available for appropriation. The District Court supported the Order with a definition of perennial yield often used by the State Engineer:

> The perennial yield of a groundwater reservoir may be defined as the maximum amount of groundwater that can be salvaged each year over the long term without depleting the groundwater reservoir. Perennial yield is ultimately limited to the maximum amount of natural discharge that can be salvaged for beneficial use. The perennial yield cannot be more than the natural recharge to a groundwater basin and in some cases is less.

Perennial yield, as historically applied, has been used as a guideline to determine the quantity of water available for appropriation based on a basin-scale water budget. The State Engineer prefers relying on discharge as opposed to recharge in establishing the

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[90] *Hsu*, 123 Nev. at 630-1, 173 P.3d at 729 (additional citation omitted).
[91] *Hsu*, 123 Nev. at 631, 173 P.3d at 729 (quoting *Clem v. State*, 119 Nev. 615, 620, 81 P.3d 521, 525 (2003*); and see also*, *Leslie v. Warden*, 118 Nev. 773, 780, 59 P.3d 440, 445 (2002) (the Nevada Supreme Court revisited its decision upholding a death penalty sentence when the Court determined that failure to do so "would amount to a fundamental miscarriage of justice.").

perennial yield of a basin because *measurements* of discharge are generally more accurate than *estimates* of recharge. Notwithstanding the inclusion of the word "salvaged" in the definition of perennial yield, Nevada groundwater appropriations have never required that a post-development equilibrium condition be achieved within a defined period of time. In applying the Remand Order, the State Engineer is shackled into determining water availability based on capturing discharge in a *reasonable amount of time*. Given Nevada's arid geography, such requirements imposed by the Remand Order are antithetical to the doctrine of prior appropriation and to the prevailing policy which encourages the maximum beneficial use of the state's waters.

The District Court stated that "the amended award [should have] *some prospect* of reaching equilibrium," holding that the "time to reach equilibrium is not a valid reason to *deny* the grant of water, but may very well be a reason to *limit* the appropriation below the calculated E.T.[92] All the Parties agree with the District Court that groundwater is available for appropriation in Spring Valley. CPB's attorney stated that CPB has "never denied that there's water available for appropriation [in Spring Valley]."[93] Dr. Mayo and Dr. Jones, CPB's expert witnesses, agreed that there is water available for appropriation in Spring Valley.[94] Likewise, Dr. Myers, GBWN's expert, when asked if there is an amount of water available for appropriation in Spring Valley, stated unequivocally "I absolutely believe that there is."[95]

Requiring ET capture with the goal of reaching basin equilibrium in a reasonable amount of time when considering water availability would not only completely disrupt the way the State Engineer currently administers groundwater basins in Nevada, but would also disturb the public's ability to appropriate groundwater in Nevada. Experts for both CPB and GBWN posit that the State Engineer's practice of calculating a perennial yield and estimating the water available for appropriation in groundwater basins based on a water budget analysis should be radically altered.[96] Protestant's experts advocate

[92] Exhibit No. SE_118, pp. 11, 13 (emphasis added).
[93] 2017 Transcript, Vol. 1 p. 30:20-21 (Hejmanowski).
[94] 2017 Transcript, Vol. 6 p. 1309:9-15 (Mayo and Jones). Dr. Mayo and Dr. Jones also agreed that, using the State Engineer's definition of groundwater mining from Ruling 6164, the project does not constitute groundwater mining. 2017 Transcript, Vol.6 p. 1307:3-15 (Mayo and Jones).
[95] 2017 Transcript, Vol. 9 p.1858:13-15 (Myers). Dr. Myers also tentatively agreed that, using the State Engineer's definition of groundwater mining from Ruling 6164, the project does not constitute groundwater mining. 2017 Transcript, Vol. 9 p.1850:8-23 (Myers).
[96] Exhibit No. CPB_019, pp. 9-17.

implementing the District Court's remand instruction in a way that would eliminate the State Engineer's basin-wide water budget approach utilizing perennial yield in favor of individual determinations of water availability made on a case-by-case basis.[97]

Dr. Jones, CPB's expert witness, admitted during testimony that the use of the approach advocated by him and Dr. Mayo would require the State Engineer to perform an individualized equilibrium analysis for every submitted application.[98] Dr. Jones stated that there should not be a perennial yield assigned to each basin, but rather a sustainable yield developed independently for each water right application.[99] Dr. Jones conceded that, from an administrative efficiency standpoint, implementing such a system would be challenging.[100] He suggested that one solution would be to exempt small appropriations from the requirement, but could not define what quantity of water would qualify for such treatment.[101]

Dr. Myers, GBWN's expert witness, also agreed that his concept of sustainable yield would require the State Engineer to make a separate determination of the quantity of water available for appropriation based on the individual well configuration for each submitted application.[102] However, Dr. Myers did not provide any details regarding how such a process could be implemented.

Eliminating the long-established practice of using a water budget to establish a perennial yield for each basin runs counter to the specific and recent direction from the Nevada Legislature. In 2017, the Legislature specifically directed the State Engineer to establish a water budget for each groundwater basin in Nevada that can be relied upon by the public.[103] The water budget must include "an estimate of the amount of all groundwater that is available for appropriation in the basin."[104] A major purpose behind

[97] Exhibit No. CPB_019, pp. 9-17.
[98] 2017 Transcript, Vol. 6 p. 1313:5-14 (Jones).
[99] 2017 Transcript, Vol. 6 p. 1314:15-24 (Jones).
[100] 2017 Transcript, Vol. 6 p. 1313:14-16 (Jones).
[101] 2017 Transcript, Vol. 6 pp. 1313:17 – 1314:2 (Jones). The State Engineer notes that the process propounded by Protestants' experts could raise concerns related to fairness and due process. Without standards to make such determinations, or the existence of a rational basis to explain why "small" appropriations should be exempted from the rule, let alone the absence of any statutory authority, this approach could expose the State Engineer to charges of ad-hoc decision making.
[102] 2017 Transcript, Vol. 9 p. 1880:6 – 1881:1 (Myers).
[103] NRS 532.167.
[104] NRS 532.167(3).

this legislative requirement is to "provide the needed certainty in water availability."[105] The enforcement of a rule that requires determinations regarding how much water is available for appropriation to be made on a case-by-case basis, as advocated by the Protestant's experts, runs counter to this legislative goal of providing transparency, and a degree of certainty, in the appropriation process.

Application of the District Court's remand instruction eliminates the basin-wide water budget approach in favor of individual determinations of water availability made on a case-by-case basis. This would disrupt the current, accepted method of water resource administration in Nevada, and would result in inconsistent and variable estimates of the amount of groundwater available for appropriation in any given basin. Requiring individual analyses for every application would also have the effect of hindering the ability for applicants to plan the water supply component of a project with any certainty (because the available resource would be unknown until after an application was filed). This uncertainty would, in turn, negatively affect the ability of any but the largest and most well-funded project proponents to develop water within the State of Nevada.

a. <u>The new ET Capture Rule is Manifestly Unfair to the Applicant as Applied in this Case</u>

Nearly 30 years have passed since these Applications were filed. In that time, the Applications have been granted twice under the method used by the State Engineer to determine water availability—a method that has not been repudiated by the Legislature and which has been affirmed by the Nevada Supreme Court.[106] The Applications have been remanded to the State Engineer two times. Now, on the second remand, the District Court has imposed new requirements concerning ET capture and timed equilibrium that

[105] *Hearing on SB 47 Before the A. Comm. On Natural Resources, Agriculture, and Mining* (May 4, 2017) (statement of Susan Juetten, Great Basin Resource Watch); *see also Hearing on SB 47 Before the S. Comm. On Natural Resources* (April 13, 2017) (statement of Jason King, P.E., Nevada State Engineer) ("By doing this, you can see basin by basin how much water is available . . ."); *Hearing on SB 231 Before the S. Comm. On Natural Resources* (March 23, 2017) (statement of Erika Castro, Progressive Leadership Alliance of Nevada) ("We believe this bill is one way to . . . provide more certainty in knowing the amount of water that is actually available.").

[106] While the Remand Order cites *Pyramid Lake Paiute Tribe of Indians v. Ricci*, 126 Nev. Adv. Op. 48, 245 P.3d 1145 (2010) for the definition of perennial yield (Remand Order at 12:11-14), in the *Ricci* case, the Nevada Supreme Court affirmed the State Engineer's use of the water budget method to determine water availability. *See id*., at 126 Nev. Adv. Op. at ___, 245 P.3d at 1149 ("Of the 2,100 afa perennial yield, 672 afa had already been committed to permanent, permitted use. The remaining 1,428 afa was unappropriated water available for permanent use.").

have never before been required in Nevada. The GDP was not designed as an ET capture project, as conceded by the Applicant, and the Applicant is not permitted to change Applications now to make it an ET capture project. Despite the fact that there are tens of thousands of acre-feet of water available for appropriation in Spring Valley, the new requirements of the Remand Order constrain the State Engineer to deny the Applications decades after their filing based upon a new legal standard. The imposition of extra-statutory requirements by the Remand Order decades later on remand, in the opinion of the State Engineer, not only sets harmful water policy for the state, but is manifestly unfair to the Applicant and should be examined under an exception to the law of the case.

2. The Remand Order Erroneously Assumed There Was an Amount That Could Simply Be Deducted from the Prior Award to Answer the Question

Prior to the issuance of the Remand Order, the State Engineer has never required applicants to perform an equilibrium analysis or provide assurances that their pumping will show some prospect of reaching equilibrium between discharge and recharge in a reasonable time.[107] CPB cited State Engineer Ruling 3486 in the Pahrump Valley Artesian Basin, arguing that this Ruling issued in 1988, around the time frame these applications were filed in 1989, should have alerted the Applicant that the State Engineer believed natural discharge salvage through ET capture was a critical analytical factor in a hydrologically closed basin. At closing argument, the Applicant dismissed the relevance of Ruling 3486. The State Engineer has reviewed Ruling 3486 and determined that the applications in that ruling were not denied due to a failure to demonstrate full capture of groundwater used by plants (ET) within a reasonable period of time; rather, the applications were denied on the basis that existing pumping in the basin already exceeded the calculated perennial yield.[108] Consequently, the State Engineer rejects the

[107] Mr. Burns, SNWA's expert witness, testified that he was not aware of any groundwater projects in Nevada that were designed to fully capture groundwater discharge via evapotranspiration (ET) (2017 Transcript, Vol. 4 p. 992:13-20 (Burns)). Dr. Myers, GBWN's expert witness, testified that a demonstration that a project will reach equilibrium conditions has not previously been required under Nevada law (2017 Transcript, Vol. 9 p. 1851:14-21 (Myers)). On cross-examination, Dr. Jones, CPB's expert witness, was unable to identify a groundwater project in either Nevada or Utah that was required to demonstrate full capture of groundwater used by plants as a condition of approval (2017 Transcript, Vol. 6 pp. 1257:4 – 1258:7 (Jones)). Mr. Barnett, SNWA's witness, noted that Nevada and Utah are geologically and climatically very similar and, thus, have similar water regulations and policies (2017 Transcript, Vol. 4, pp. 948:6 – 949:2 (Barnett)).

[108] *See* State Engineer Ruling 3486, p. 6, dated Jan. 11, 1988, official records in the Office of the State Engineer ("A substantial basin-wide overdraft on the groundwater reservoir exists in Pahrump Valley as

argument that Ruling 3486 and two additional rulings issued in the Pahrump Valley Hydrographic Basin between 1987 and 1989 announced a general policy requiring ET capture and timed equilibrium, when, in fact, the applications in all three rulings were denied on other grounds.[109]

The District Court performed its own analysis of the ET capture question and suggested there was an amount that could simply be subtracted from the prior award allowing the basin to reach equilibrium in a reasonable amount of time. The Court's analysis is incorrect. First, as explained previously, the 84% ET capture value was from a model simulation for a wellfield with 81 wells, but the project as described under the subject Applications includes only 15 wells. Second, the Remand Order appears to indicate that the District Court believed that the State Engineer could balance the water budget simply by reducing the quantity of water awarded to the Applicant by 9,780 afa, to 51,347 afa. Even if the 84% capture figure was germane, the existing project could never reach equilibrium because applying this factor to *any* appropriation value will not result in directly capturing that amount of ET in any given time frame. Simply reducing the quantity of water awarded to the Applicant will have little impact on the time it takes for the basin to reach a new equilibrium because it does not honor accepted science and is mathematically incorrect. The percentage is a comparison of quantities after the calculations from modelled capture were completed; it is not an adjustment factor or efficiency coefficient. There is substantial evidence in the record that an alternative well configuration will have the greatest impact on the project's prospect for reaching equilibrium, not the quantity of water pumped. Of course, as further discussed below, the Applicant has no ability to revise its proposed points of diversion on remand some 20 years after the applications were filed, but rather, in the words of CPB, the Applicant "must start all over."

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the net pumping draft continues to exceed the perennial yield. . . . The present basin-wide overdraft within Pahrump Valley will create a sustained depletion of stored groundwater and continued static water level declines. . . . The granting of [the applications] would allow an additional appropriation of 857 acre-feet annually, creating an additional burden and stress upon the Pahrump Valley Ground Water Basin which would further aggravate the basin-wide overdraft."). *And see also*, Ruling 3462 (September 25, 1987) and Ruling 3607 (June 2, 1989) official records in the Office of the State Engineer (reaching the same conclusion).

[109] In any event, even if the Rulings could be construed as announcing such a policy in the Pahrump cases, which the State Engineer denies, the weight of over 6,000 published rulings and the issuance of over 42,000 groundwater rights over the past 115 years by the State Engineer, overwhelmingly support the policy that the State Engineer applied. Notwithstanding, the State Engineer is also not bound by stare decisis, in any event. *Desert Irr. v. State*, 113 Nev. 1049, 944 P.2d 835 (1997) (citing *Motor Cargo v. Public Service Comm'n*, 108 Nev. 335, 337, 830 P.2d 1328, 1330 (1992)).

3. Maintaining Principles of Prior Appropriation, Maximization of the Beneficial Use of the State's Waters, and Implications of Federal Land Ownership

The implementation of an appropriation scheme based on the approach recommended by Protestant's experts is alarming to State Engineer because such an approach is in conflict with Nevada's established prior appropriation system. CPB expert Dr. Jones acknowledged that the appropriation system Dr. Mayo and he proposed would favor property owners whose property is located nearer to ET discharge zones over property owners whose property is located farther from such areas.[110]

The adoption of Nevada's prior appropriation system represented a specific rejection of the common law doctrine of riparian rights. Under the riparian rights system, water rights are allocated to property owners based on the proximity of the water source to their property.[111] In 1885, the Nevada Supreme Court expressly overruled the common law doctrine of riparian rights in favor of prior appropriation.[112] In doing so, the Court recognized that the doctrine of riparianism was in conflict with the realities of Nevada's climate and geography.[113] The Nevada common law principle of prior appropriation was statutorily codified in 1905 (for surface water) and 1939 (for groundwater) and remains in full force and effect today. Nevada is not unique in this regard, as nearly all western states have adopted the prior appropriation doctrine.

The record in this case clearly indicates that well location is a primary factor in the time it takes for groundwater pumping to capture water that naturally discharges from plants within a basin.[114] Application of the remand instruction would disproportionately favor water applicants who own property adjacent to areas of natural discharge, or who have the right to access such property, as confirmed by Dr. Jones's testimony.[115] The conversion to such a paradigm is deeply troubling to the State Engineer in light of the fact that 80% of the state is federally owned.[116] The practical effect of strictly applying the

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[110] 2017 Transcript, Vol. 6 p. 1315:1-11 (Jones).
[111] *Vansickle v. Haines*, 7 Nev. 249, 260 (1872).
[112] *Jones v. Adams*, 19 Nev. 78, 84-88, 6 P. 442, 444-448 (1885).
[113] *Reno Smelting, Milling & Reduction Works v. Stevenson*, 20 Nev. 269, 282, 21 P. 317, 322 (1889) ("Our conclusion is that the common-law doctrine of riparian rights is unsuited to the condition of our state.").
[114] 2017 Transcript, Vol. 6 p. 1315:10-11 (Jones).
[115] 2017 Transcript, Vol. 6 p. 1315:6-9 (Jones).
[116] Vincent, Carol Hardy, L.A. Hansen, and C.N. Argueta *Federal Land Ownership: Overview and Data*, Congressional Research Service Report R42346, March 3, 2017. p. 8.

remand instruction, as advocated by the Protestants, would be to reintroduce principles of riparianism into Nevada's groundwater law—principles that were specifically rejected by the Nevada judiciary over 130 years ago. Consequently, such a paradigm may unwittingly turn over control of the development of the state's waters from a traditional state function to the federal government, as a majority landowner of the state, or to owners of private lands located adjacent to groundwater discharge areas.

a. Maintaining the Ability to Effectively Develop Water

The District Court's remand instruction restricts Nevada's ability to place its limited groundwater resources to beneficial use. The evidence presented at the remand hearing demonstrates that application of the District Court's remand instruction limits the ability of appropriators to fully develop groundwater resources. These challenges are highlighted by evidence presented about the San Luis Closed Basin project (Closed Basin project) located in southern Colorado and by evidence regarding Nevada's unique geographic setting.

The Closed Basin project is a unique project that was specifically designed and intended to capture water used by plants. The project was built by the United States Bureau of Reclamation to salvage water used by plants in the San Luis basin in order to augment the flows of the Rio Grande River and assist the United States in meeting its 1906 treaty obligations to Mexico.[117] The project originally anticipated capturing 104,000 afa of groundwater.[118] The project consists of 170 salvage wells located within the groundwater discharge area of the basin that are drilled to depths between 85 and 110 feet.[119] The first wells were drilled in the early 1980s and the project was fully built by the mid-1990s.[120]

Unfortunately, the Closed Basin project has not proven to be a success. Mr. Burns, the Applicant's expert witness, testified that, at its height, the project delivered only 40,000 afa of water to the Rio Grande and that it currently produces between 15,000 and 20,000 afa.[121] Dr. Mayo, CPB's expert witness, testified that from a water management perspective, the project "was just a total disaster."[122] Both experts identified

[117] Exhibit No. SNWA_611, p. 2.
[118] Exhibit No. SNWA_611, p. 4; 2017 Transcript, Vol. 4 pp. 1022:23-1023:5 (Burns).
[119] Exhibit No. SNWA_611, p. 5.
[120] Exhibit No. SNWA_611, p. 5.
[121] 2017 Transcript, Vol. 4 p. 1023:6-10; pp. 1025:24-1026:6 (Burns).
[122] 2017 Transcript, Vol. 6 p. 1232:14-23 (Mayo).

problems with the project, including the poor quality of water and unnecessary conflicts that resulted from placing the wells directly within the ET discharge area.[123] Both experts agreed that, although the most expeditious way to capture water discharged by plants is to place wells within the discharge area, water quality and other operational concerns dictate that it would be preferable to place the Applicant's production wells on the alluvial fans outside of the discharge area.[124]

The lesson learned from the Closed Basin project is that a trade-off exists between the rapidity with which a groundwater development project is able to capture water used by plants and the need to meet the operational goals of a project. Placing wells in the discharge area will decrease the time required for the basin to achieve a new equilibrium but may result in poor water quality and increase the likelihood that unreasonable effects will manifest. By contrast, placing the wells on the alluvial fan reduces the likelihood of encountering these operational problems but significantly increases the time required for the basin to reach a new equilibrium condition. Accordingly, if the remand instruction is applied, less productive, less efficient, and more expensive wells would be required to meet a water right applicant's needs.

b. <u>Geographic Setting in Nevada</u>

Dr. Jones, an expert witness for CPB, discussed the geography of the Spring Valley basin at length and how that geography limits the ability to fully capture groundwater used by plants. In particular, Dr. Jones noted that because Spring Valley is a long and narrow basin, full capture of groundwater used by plants, while possible, may be impractical to achieve.[125] However, the geography of Spring Valley is not particularly exceptional within Nevada. In 1896, Major Clarence Dutton famously described the mountain ranges of Nevada as resembling "an army of caterpillars crawling northward."[126] These unique ranges create especially long and narrow valleys throughout the state. Combined with Dr. Jones's testimony regarding the difficulty of capturing the groundwater used by plants in long and narrow basins, it is clear that enforcement of the District Court's equilibrium rule in Nevada could effectively eliminate the opportunity

[123] 2017 Transcript, Vol. 4 pp. 1029:17-1030:10 (Burns); 2017 Transcript, Vol. 6 p. 1231:16-22 (Mayo).
[124] 2017 Transcript, Vol. 6 p. 1233:6-9 (Mayo).
[125] 2017 Transcript, Vol. 6 p. 1195:7-15 (Jones).
[126] Clarence E. Dutton, *Mount Taylor and the Zuni Plateau* (located in Powell, J.W., *Sixth Annual Report of The United States Geological Survey to the Secretary of the Interior 1884-1885*. U.S. Geological Survey 1885. p. 116.).

for Nevadans to fully develop and beneficially use the state's limited groundwater resources.[127] What's more, because not all groundwater basins have ET occurring, the new requirement of ET capture creates different rules and requirements among groundwater appropriators. This point is demonstrated by the very basins that are the subject of the Ruling. As explained at length in the State Engineer's prior Rulings Spring Valley has a large amount of groundwater discharging to the surface and a relatively small volume of subsurface flow. Conversely, Dry Lake and Delamar Valleys have virtually no ET and water discharges through subsurface flow. The result of an ET capture requirement in a basin where ET is occurring forces the application of disparate rules and requirements in contrast to appropriators in basins without ET.

The problem of ET capture was highlighted in Dr. Myers's testimony. Dr. Myers, a GBWN expert, noted that within the basins that make up the central carbonate flow system,[128] there is approximately 580,000 afa of groundwater recharge occurring.[129] Currently, there is approximately 100,000 afa of groundwater development within these basins.[130] Dr. Myers testified that this means that the central carbonate flow system is not fully appropriated and water remains available for beneficial use.[131] Dr. Myers, however, also reported that existing pumping in the basins has not reached equilibrium and, based on his computer models, shows no prospect of doing so over the course of the next 250 years.[132] If the remand instruction were applied at the time the original appropriations were requested, the development of those groundwater resources could not have been approved. Hence, application of the remand instruction in this manner runs counter to the long-established intent of Nevada water law—the maximization of the beneficial use of the state's limited water resources.[133] Application of the rule would also stymie economic development efforts throughout the state since economic development

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[127] *See* NRS 534.020 (evidencing a clear legislative intent favoring the development and use of Nevada's limited groundwater resources).
[128] *See* Exhibit No. GBWN_281, p. 6 (depicting the area and basins making up the central carbonate flow system (CCFS)).
[129] 2017 Transcript, Vol. 9 p. 1894:8-9 (Myers).
[130] 2017 Transcript, Vol. 9 p. 1894:10-11 (Myers).
[131] 2017 Transcript, Vol. 9 p. 1894:12-14 (Myers).
[132] 2017 Transcript, Vol. 9 p. 1894:15-20; p. 1895:9-13 (Myers).
[133] *See Desert Irr., Ltd. v. State*, 113 Nev. 1049, 944 P.2d 835 (1997)) **(**The concept of beneficial use is singularly the most important public policy underlying the water laws of Nevada and many of the western states. In fact, the principle of beneficial use is so well entrenched in our legal lexicon that the Nevada Legislature declared almost a century ago that "[b]eneficial use shall be the basis, the measure and the limit of the right to the use of water.").

in an arid state like Nevada is closely tied to the ability to develop available water resources.

c. Capturing Groundwater That Is Currently Used by Plants Will Not Eliminate All Plants in Spring Valley

The State Engineer must make clear that groundwater development in Nevada does not come at the expense of eliminating all plants. The District Court stated in the Remand Order that "death of most of the phreatophytes is a trade-off for the beneficial use of water."[134] In making this statement, the District Court relied on the State Engineer's statement in the 2013 Answering Brief that was filed with the District Court, stating that "the idea behind the capture of ET is that pumping will lower the water table until the top of the aquifer is below the root zone of phreatophytes and evapotranspiration will cease."[135] Protestants initially pointed to the District Court's statement to claim the Applicant's project will completely eliminate all plants in Spring Valley and cause an ecological disaster.[136] This is not true. Groundwater development in Spring Valley will capture only the groundwater that plant communities utilize, not the considerable surface water or precipitation that those plant communities will continue to receive. The State Engineer finds, and Protestants' experts conceded in testimony, that the evidence does not indicate the Applicant's project will completely dry up the basin or result in the elimination of all plant communities.

First, plant communities currently exist in Spring Valley that are outside the area where groundwater is discharged by plants (a.k.a the "groundwater discharge area"). These plants utilize both surface water runoff from mountains and streams and direct precipitation. The Applicant's project will not capture either of these sources of water. Second, the State Engineer previously adopted the Applicant's estimate that the *total* average discharge from plants in the groundwater discharge area of Spring Valley is 174,500 afa, and the District Court did not disturb this finding.[137] Also, the State Engineer previously found that the groundwater utilized by plants in the main

[134] Exhibit No. SE_118, p. 10.
[135] Nev. State Engineer's Answering Br., pp. 53-54, *Millard Co., Utah et al. v. King*, CV-1204049 (7th Jud. Dist. Ct. Nev. Apr. 15, 2013).
[136] *See e.g*. Exhibit No. GBWN_297, p. 13 (assertion that SNWA's pumping will "completely dry[] all wetlands and springs within Spring Valley.").
[137] State Engineer Ruling 6164, p. 72, dated Mar. 22, 2012, official records in the Office of the State Engineer Ruling (Ruling 6164). (Exhibit No. SE_140) *see also* 2017 Transcript, Vol. 4 pp. 1034:14 – 1035:4.

groundwater discharge area in Spring Valley is 84,100 afa, and the District Court did not disturb that finding.[138] Accordingly, within the primary groundwater discharge area in Spring Valley, the total quantity of discharge from plants is approximately 174,500 afa, and only 84,100 afa of this total is derived from the groundwater aquifer. The remaining 90,400 afa of plant discharge comes from surface water runoff and precipitation, two sources that will not be captured by the Applicant's project.[139] Even if the groundwater table is lowered below the root zone of plants in Spring Valley, and groundwater can no longer be utilized by plant communities, those plant communities will continue to receive more than 90,000 afa of water from surface runoff and precipitation.[140]

Mr. Marshall, the Applicant's expert, testified that certain plants are considered facultative phreatophytes, which are plants that can utilize both ground and surface water supplies.[141] When these plant communities lose access to groundwater they are expected "to reduce in their total cover and [to be] replaced over time by plants that are more advantaged in their ecology and are able to do better just on precipitation."[142] This transition may be very gradual in plant communities that are less sensitive to water table declines, considering the testimony of Dr. Huntington, another of Applicant's expert witnesses, who has personally observed the continued existence of healthy shrub communities in basins in Nevada that have experienced decades of groundwater development and groundwater level declines.[143]

Specific evidence was provided from the San Luis Closed Basin project in Colorado that transitions in plant communities can occur in response to groundwater development and lower groundwater levels. The Cooper, *et al*. (2006) study documented a reduction in groundwater ET and a transition from wetland grasses and grass-like species to phreatophytic shrubs. The authors also observed that the lowering of the water table in some locations can improve the soil conditions for certain plant communities by allowing precipitation to leach salts to deeper depths.[144] The Cooper study provides evidence that even where a purposeful and concerted effort is made to fully capture

[138] Ruling 6164, p.73.
[139] 2017 Transcript, Vol. 4 p. 1035:4-13 (Burns).
[140] 2017 Transcript, Vol. 4 p. 1035:2-7 (Burns).
[141] 2017 Transcript, Vol. 3 pp. 584:15 – 585:13 (Marshall).
[142] 2017 Transcript, Vol. 3 588:1-5 (Marshall); Exhibit No. SNWA_507 p. 6-90.
[143] 2017 Transcript, Vol. 1 pp. 225:15 – 226:2 (Huntington).
[144] Exhibit No. SNWA_620, p. 32.

groundwater that is utilized by plants, viable plant communities can remain, and not all phreatophytes are eliminated.

The Protestants' experts agreed that project pumping will not completely dry up the basin.[145] When specifically asked whether all phreatophytes will die in Spring Valley as predicted in his rebuttal report,[146] Dr. Myers, GBWN's expert witness, stated that "no they won't, they won't all die in Spring Valley."[147] Dr. Roundy, CPB's expert witness, stated that his expert report's prediction that certain plant species would be "doomed" by project pumping was hyperbole and was not intended to be believed as true.[148]

While the District Court did not provide specific instruction to the State Engineer regarding this issue, it is imperative that the State Engineer correct the perceived widespread misconception that salvaging groundwater used by plants will result in an ecological disaster. The State Engineer therefore finds that there is no evidence in the record to support any contention that the capture of groundwater in Spring Valley that was formerly used by plants will result in death to all plant communities in Spring Valley, or that phreatophytes must be *completely* eliminated to achieve full ET capture. Furthermore, there is substantive evidence in the 2011 and 2017 administrative records that existing plant communities can successfully transition to healthy and sustainable plant communities because considerable precipitation and surface water will remain available.[149]

This testimony indicates that the approach advocated by the Protestants would lead to several unintended consequences including severely restricting the ability of Nevadans to maximize the beneficial use of the State's limited water resources. To avoid these unintended consequences, the State Engineer requests that the District Court re-examine its findings in the Remand Order, carefully considering the unintended consequences of the newly imposed rule and unforgiving result coming 20+ years after these applications were filed. There are sound reasons to apply an exception to the law of the case doctrine, and for the court to re-examine the findings and conclusions made

[145] 2017 Transcript, Vol. 9 p. 1861:22 – 1862:3 (Myers); 2017 Transcript, Vol.9 p.1876:18-21 (Myers).
[146] Exhibit No. GBWN_297, p.13.
[147] 2017 Transcript, Vol. 9 p. 1876:18-21 (Myers).
[148] 2017 Transcript, Vol. 7 p. 1463:16 – 1464:2 (Roundy).
[149] Exhibit No. SE_140, pp. 187-93; 2017 Transcript, Vol. 4 p. 929:1-23 (Prieur).

in the Remand Order concerning the requirement that the Applicant demonstrate ET capture within the basin, reaching equilibrium within a reasonable time.[150]

III. RECALCULATION OF APPROPRIATIONS IN CAVE, DRY LAKE AND DELAMAR VALLEYS (Remand Issue Number 4)

With respect to Rulings 6165, 6166, and 6167, the Remand Order requires the State Engineer to "[r]ecalculate the appropriations from Cave Valley, Dry Lake Valley and Delamar Valley [CDD] to avoid over appropriations or conflicts with down-gradient, existing water rights."[151] The District Court ordered this recalculation to address the contention that, after accounting for the water awarded to the Applicant in Rulings 6165, 6166, and 6167, insufficient water may remain in the downgradient basins to fulfill existing water rights.[152]

Cave Valley, Dry Lake Valley, and Delamar Valley are all part of the White River Flow System (WRFS). Groundwater that recharges throughout the WRFS is discharged primarily in White River Valley, Pahranagat Valley, and the Muddy River Springs Area. The complex hydrogeology and time frames for interbasin flow in the WRFS were evaluated at length during the 2011 hearing and in Rulings 6165, 6166, and 6167. In these rulings, the State Engineer made determinations of the amount of water available to appropriate in upgradient basins by considering the best science available, evidence and testimony, and the professional judgement of the State Engineer. The State Engineer addressed the uncertainty of potential conflicts in the far future by requiring a monitoring, management, and mitigation (3M) plan. The plan was designed to measure the actual effects of pumping in the CDD basins, which can then be used to revise groundwater models and alter groundwater pumping to prevent conflict, with provisions for mitigation if conflicts were to occur. Additionally, a portion of the Cave Valley water budget was reserved to account for subsurface outflow that discharges to springs in White River Valley. This reasoning for approving the applications in 2011 with a 3M plan differs from other recent examples where the State Engineer denied applications to appropriate

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[150] *See, e.g., U.S. v. Alpine Land and Res. Co*., 27 F.Supp.2d 1230, 1241 (D. Nev.) (*Alpine IV*) (recognizing that it was bound to apply the law as set forth in *Alpine III*, but the court respectfully urged the court of appeals to revisit the issue); *Suire v. Oleum Operating Co*., 2017 WL 4987635, ___So.3d___ (La.App. 3 Cir. 2017) (Since the law of the case doctrine is discretionary, a prior appellate court ruling does not preclude reconsideration of an issue on appeal, nor does it prevent the appellate court from reaching a different conclusion.).
[151] Exhibit No. SE_118, p. 23.
[152] Exhibit No. SE_118, p. 19.

water because the best available science demonstrated that conflicts were likely to occur within a planning horizon of up to several years or decades, and no monitoring plan was needed to evaluate uncertainties.[153]

The State Engineer found in Rulings 6165, 6166, and 6167 that if no measurable impacts to existing rights occur within hundreds of years, then the statutory requirement of not conflicting with existing rights is satisfied.[154] The District Court disagreed, finding that NRS 533.370(2) provides that applications shall be rejected if a finding of a conflict is made, regardless of whether that conflict will take a long time to manifest itself.[155]

The District Court was concerned that "the same water has been awarded twice, once in the upper basins, and again in the lower basins."[156] To illustrate this point, the Remand Order used the example of groundwater in Dry Lake Valley flowing down-gradient to Delamar Valley, then continuing from Delamar to Coyote Spring Valley. There is virtually no groundwater ET in Dry Lake and Delamar Valleys. Groundwater discharge occurs through subsurface interbasin flow. The Remand Order contended, based on the system water budget, that water removed by pumping in the upper basins cannot also be available to satisfy existing rights in down-gradient basins.

Regional flow patterns for the WRFS are exhibited in the WRFS water budget presented as evidence in the 2011 hearing and later accepted by the State Engineer with minor revisions in Rulings 6165, 6166 and 6167.[157] Acceptance of the WRFS water budget was undisturbed by the District Court.[158] The WRFS water budget shows mean annual values for recharge and ET for each basin, the magnitude and direction of subsurface groundwater flow between basins, and the subsurface flow entering or exiting the boundaries of the WRFS. The WRFS water budget is for a long-term steady state condition. It *does not* consider geologic uncertainties and complexity, nor transience in the aquifer system.

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[153] *See, e.g.,* State Engineer Ruling Nos. 6254, 6311 and 6440.
[154] Exhibit No. SE_ 141, pp. 47-48; Exhibit No. SE_142, pp. 47-48; Exhibit No. SE_ 143, pp. 47-48.
[155] Exhibit No. SE_118, p. 20.
[156] Exhibit No. SE_118, p. 19:19-23.
[157] In 2011, the Applicant utilized an Excel Solver (Solver). The Solver is a tool created by the Applicant that was modified by the State Engineer after the 2011 proceeding. The Solver was used to develop a water budget for the WRFS that yielded values of recharge, ET, and subsurface groundwater flow for each basin in the WRFS. *See* Exhibit No. SE_135.
[158] Exhibit No. SE_135.

The District Court acknowledged that there may be water from the CDD basins that could properly be appropriated without conflicting with downgradient rights, but concluded that the evidence did not include such a calculation. To address this concern, the District Court ordered a recalculation of unappropriated water to determine how much water could be appropriated without conflicting with existing rights in the lower basins.[159]

A. The Applicant's Evidence Regarding Recalculation of Appropriations in CDD

The Applicant addressed this remand issue through the report, exhibits, and testimony of Michael Stanka, a Nevada Registered Professional Engineer and an expert in water rights research, quantification, vested rights, chain of title, and surveying, and through the testimony of James Watrus, an expert hydrologist.[160] Protestant GBWN addressed this remand issue through the report, exhibits, and testimony of Dr. Tom Myers, an expert hydrogeologist and groundwater modeler.[161]

During the remand hearing, the Applicant submitted evidence accounting for the amount of committed groundwater in the 11 upgradient basins within the WRFS (11-basin WRFS), including the amounts awarded to the Applicant in the prior rulings and water reserved by the State Engineer for future growth. The Applicant added all committed groundwater rights for the 11-basin WRFS basins and compared the sum with the total amount of water available in those basins. This approach was used to conclude that sufficient water was available in the WRFS to fulfill all groundwater commitments, including those previously granted to the Applicant.

In their estimate of water available to appropriate in the WRFS, the Applicant included subsurface interbasin discharge that flows out of the WRFS toward Tikapoo Valley, which is part of the Death Valley Flow System (DVFS). The amount of this subsurface discharge is estimated to be 4,100 afa.[162] This was contested by Dr. Myers using the same logic as the Remand Order, which reasoned that the same water cannot be appropriated twice, once in the upper basins and again in the lower basins. To the extent that subsurface discharge occurs, it may already be appropriated in downgradient basins.

The Applicant concluded that after subtracting the committed groundwater rights from the estimate of water available within the 11-basin WRFS, 39,000 afa remains

[159] Exhibit No. SE_118, p. 20:14-19.
[160] 2017 Transcript, Vol. 1 pp. 41:15 – 42:1 (Stanka); 2017 Transcript, Vol. 1 p. 144:14-21 (Watrus).
[161] 2017 Transcript, Vol. 8 p. 1660:15-20.
[162] Exhibit No. SE_143, pp. 63-65.

available to account for subsurface flows leaving the 11-basin WRFS and entering Coyote Spring Valley. This 39,000 afa is the amount of water determined by the State Engineer in Ruling 6255 to be the supply of water to Coyote Spring Valley and other downgradient basins.[163] By preserving this amount somewhere in the WRFS, the Applicant argued that downgradient rights are protected.

The procedure used by the Applicant to calculate committed groundwater resources in the 11-basin WRFS accounted for all groundwater rights, including rights sourced from certain springs, and adjusted for (1) groundwater rights that are supplemental to other groundwater rights, (2) groundwater rights that are supplemental to surface water rights, (3) the estimated percentage of the supplemental rights actually used, and (4) the amounts actually consumed by irrigation and domestic use.

Mr. Watrus's testimony addressed the rationale for including springs in Mr. Stanka's analysis of committed groundwater rights based on their connection to the regional groundwater system.[164] Dr. Myers testified about the calculation of committed groundwater rights in the WRFS from a hydrogeologic perspective, specifically addressing the methodology and assumptions used by the Applicant.[165]

The State Engineer finds that the methods used by the Applicant to calculate committed groundwater resources were reasonably accurate, and that the additional analysis of Mr. Watrus and Dr. Myers attests to the complexity and uncertainty in making this determination. However, this exercise is not consistent with the Remand Order's directive that the State Engineer recalculate the appropriations from Cave Valley, Dry Lake Valley and Delamar Valley to avoid over appropriation or *to avoid conflicts* with down-gradient existing water rights.

B. <u>Whether the Applicant's Evidence Satisfies the Remand Order</u>

The District Court noted that in basins like Cave Valley, Dry Lake and Delamar Valley where some amount of groundwater is discharged into a downgradient basin, there is a risk that appropriating water upgradient may cause the water to be withdrawn and used before flowing to downgradient basins, possibly depriving downgradient water right holders of water they need. Where subsurface outflow occurs from one basin to another, there is a potential for pumping in an upgradient basin to conflict with existing rights in

[163] Exhibit No. SNWA_483, p. 1-6; Ruling 6255, p. 25.
[164] 2017 Transcript, Vol. 1 p. 146-153.
[165] 2017 Transcript, Vol. 8 p. 1794-1811.

a downgradient basin, given enough time and suitable hydrogeologic conditions for that pumping stress to propagate through the aquifer system. On the other hand, where upgradient pumping is eventually balanced by a reduction in downgradient groundwater ET or a reduction in transitional storage, then a conflict with existing water rights does not necessarily occur.

The Applicant did not complete an analysis to demonstrate that its appropriations could be granted without conflicting with existing downgradient water rights in the manner ordered by the District Court.[166,167] Dr. Myers, GBWN's expert testified that the Applicant's water rights accounting procedure did not address potential conflicts because it failed to consider where recharge, discharge, and pumping occurs within the regional flow system.[168]

The State Engineer finds, despite the uncertainty, that to satisfy the direction of the Remand Order, it must be demonstrated that the Applicant's appropriations will not decrease flow that is already appropriated downgradient, regardless of how long that might take. The Applicant's evidence failed to make this demonstration. The Applicant's evidence did not consider where recharge occurs, how and where interbasin flows occur in the affected valleys, or whether it could actually be captured. No analysis was done showing that 39,000 afa of subsurface flows leaving the 11-basin WRFS and entering Coyote Spring Valley would remain to satisfy downgradient appropriations. Similarly, no evidence was presented to demonstrate that interbasin subsurface flow that occurs from the WRFS to the DVFS is available to appropriate without conflicting with existing rights in downgradient basins.

The Applicant presented no new hydrologic evidence demonstrating that upgradient pumping would not capture the water required to satisfy existing rights in downgradient basins, including the required 39,000 afa of subsurface flow leaving the 11-basin WRFS and entering Coyote Spring Valley. Instead, the Applicant referred to evidence presented in the 2011 hearing by the protestant's witness Dr. Myers in which he simulated a reduction in Muddy Springs flow of up to 0.5 cfs after 4,000 years using the USGS RASA model.[169] The Applicant concluded that 0.5 cfs after 4,000 years amounts

[166] 2017 Transcript, Vol. 1 p. 139:6 – 140:11 (Stanka).
[167] 2017 Transcript, Vol. 1 p. 163:22-25(Watrus).
[168] 2017 Transcript, Vol. 8 pp. 1785-1793 and 1812-1824 (Myers).
[169] 2017 Transcript, Vol. 9 pp. 1972:23 – 1973:2 (Myers).

to no conflict because of the small magnitude and very long time to occur.[170] This conclusion is consistent with State Engineer's Ruling 6167.[171] However, in the 2017 testimony, Dr. Myers discounted the accuracy of his previous simulation, explaining that the model underestimates flow decreases that could occur in the Muddy River Springs because model parameterization does not accurately represent preferential flow zones in carbonate formations that support the Muddy River Springs.[172] Given this interpretation by Dr. Myers of the model, the evidence presented during the 2017 hearing neither demonstrates that conflicts *will not* occur nor that 39,000 afa would remain as subsurface flow to Coyote Spring Valley. By the same token, the Protestants did not provide an analysis to demonstrate with certainty that conflicts *will* occur within any reasonable planning horizon.

For over a century, the State Engineer has interpreted NRS 533.370(2) to mean that an application should be granted unless it has been shown there is a conflict with existing rights. This is in keeping with the original intent of the statute that was enacted through the 1913 Water Act.[173] Under current scientific methodologies, it is not possible to determine with certainty whether a conflict will exist at some non-specific future time prior to pumping groundwater and monitoring the effects. Nevertheless, the District Court's Order identifies conflict by using a system-wide steady state condition without considering time scale, aquifer transience, and planning horizons. In so doing, the District Court interprets NRS 533.370(2) to presume that a conflict exists unless otherwise demonstrated, and irrespective of the time it may take to manifest. On this basis, under the Remand Order, the State Engineer finds that there was not substantial evidence to indicate that no conflict would occur with existing downgradient rights and the applications are subject to denial.

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[170] SNWA Closing Br., pp. 28-29.
[171] Exhibit SE_143, pp. 77-79.
[172] 2017 Transcript, Vol. 8 pp. 1816 – 1817.
[173] When enacted, Section 63 of the 1913 Statutes of Nevada, Chapter 140 provided:

> It shall be the duty of the state engineer to approve all applications made in proper form where all fees, as in this act provides, have been paid, which contemplate the application of water to beneficial use, and where the proposed use or change does not tend to impair the value of existing rights, or be otherwise detrimental to the public welfare. But where there is no unappropriated water in the proposed source of supply, or where its proposed use or change conflicts with existing rights, or threatens to prove detrimental to the public interests, it shall be the duty of the state engineer to reject said application and refuse to issue the permit asked for.

C. The Exception to the Law of the Case Doctrine Permits the Court to Re-Examine This Requirement in Any Later Proceedings

As with Remand Issue 2, an exception to the law of the case doctrine permits a District Court to review its findings concerning the requirement to recalculate the appropriations from CDD to avoid over appropriations or conflicts with down-gradient, existing water rights. Regarding groundwater, in 1904, the Texas Supreme Court in *Houston & Tex. Central R.R. Co. v. East*, 81 S.W. 279 (Tex. 1904) stated that:

> Because the existence, origin, movement and course of such waters, and the causes which govern and direct their movements, are so secret, occult and concealed that an attempt to administer any set of legal rules in respect to them would be involved in hopeless uncertainty, and would therefore be practically impossible.

Although great strides have been made concerning the knowledge and science of groundwater movement and occurrence, much remains to be discovered. In the face of such uncertainty, the State Engineer believes it is poor water policy to presume the existence of a conflict when it is obscured by the uncertainty of what can be determined within a reasonable planning horizon. It is unseemly to the State Engineer that requiring examination of every application against suggested, but indefinite, flow paths as the basis for denying such applications is contrary to maximizing beneficial use of the waters of the driest state in the nation.

As originally stated by the Legislature in 1913, the State Engineer is duty-bound to grant applications unless a conflict exists. The State Engineer believes that when looking at potential conflicts within a regional groundwater flow system, unless a conflict is shown to be likely within a reasonable planning horizon, it is permissible to appropriate what may be the same water by subsequent applications, particularly where such appropriations are subject to safeguards such as vigorous 3M Plans as discussed in the next section.

IV. MONITORING MANAGEMENT AND MITIGATION (Remand Issue Number 3)

With respect to 3M Plans, the Remand Order required the State Engineer to "[d]efine standards, thresholds or triggers so that mitigation of unreasonable effects from pumping of water are neither arbitrary nor capricious in Spring Valley, Cave Valley, Dry Lake Valley and Delamar Valley." Additionally, the Remand Order required "[t]he

addition of Millard and Juab counties, Utah in the mitigation plan so far as water basins in Utah are affected by pumping of water from Spring Valley Basin, Nevada." While the foregoing findings mandate a conclusion that no water can be awarded under the pending applications, the State Engineer nevertheless answers these remand questions, assuming *arguendo*, reinstatement of any water granted under the Applications in Rulings 6164, 6165, 6166 or 6167, through any later proceedings.[174]

A. The Applicant's Evidence Regarding Standards, Thresholds or Triggers to Avoid Unreasonable Effects

The Applicant presented many exhibits in support of this remand instruction. The primary pieces of evidence discussed here include the Applicant's main expert report entitled *Technical Analysis Report Supporting the Spring Valley and Delamar, Dry Lake, and Cave Valleys, Nevada, 3M Plans*, (Technical Analysis Report).[175] The Technical Analysis Report was prepared to provide the rationale and evidentiary support for the *SNWA Monitoring, Management, and Mitigation Plan for Spring Valley, Nevada*, (Spring Valley 3M Plan),[176] and the *SNWA Monitoring, Management, and Mitigation Plan for Delamar, Dry Lake, and Cave Valleys, Nevada*, (CDD 3M Plan).[177] The Spring Valley 3M Plan and the CDD 3M Plan are collectively referred to as the "3M Plans." The Applicant presented the following witnesses who prepared the Technical Analysis Report and the 3M Plans: (1) James Prieur, an expert in hydrogeology; (2) Zane Marshall, an expert in biological resources; and (3) Lisa Luptowitz, a factual witness.[178]

After the District Court entered the Remand Order, the Nevada Supreme Court decided *Eureka County v. State Engineer*, which identified principles for what a monitoring, management, and mitigation plan must have to comply with Nevada water law.[179] The Supreme Court held that if the State Engineer approves an application based on a 3M plan, the decision must be based on presently known substantial evidence,[180] and must be sufficiently explained and supported to allow for judicial review.[181] Approval of

[174] *See* Exhibit No. SNWA_592 at p. 1-1 (SNWA prepared the Spring Valley 3M Plan to meet the conditions for permits 54003-54015, inclusive, 54019 and 54020).
[175] Exhibit No. SNWA_507.
[176] Exhibit No. SNWA_592.
[177] Exhibit No. SNWA_593; 2017 Transcript, Vol. 2 pp. 333:14 – 334:15 (Prieur).
[178] 2017 Transcript, Vol. 2 pp. 323:19-324:7.
[179] 131 Nev. Adv. Op. 84, 359 P.3d 1114 (2015).
[180] *Eureka County v. State Engineer*, 131 Nev. Adv. Op. 84, 14, 359 P.3d 1114, 1120 (2015).
[181] *Eureka County v. State Engineer*, 131 Nev. Adv. Op. 84, 15, 359 P.3d 1114, 1120-21 (2015).

a 3M plan must also be based on evidence in the record that demonstrates that mitigation would be successful and adequate to fully protect those existing rights.[182,183] The State Engineer finds that, in addition to complying with the District Court's remand instruction, the Applicant's 3M plans must also meet the requirements the Nevada Supreme Court established in *Eureka County v. State Engineer*.

1. Identification of Analysis Area and Resources

The 3M Plans defined an analysis area that encompasses the basins where the points of diversion for Applicant's water right applications are located (the "project basins"), and adjacent basins.[184] The analysis area was initially delineated based on the likelihood of interbasin flow as presented in Rulings 6164-6167.[185] The area was then refined by considering analyses of potential effects from the Applicant's Groundwater Development Project (GDP), a 2011 effects analysis, the Bureau of Land Management (BLM) Final Environmental Impact Statement (FEIS) for the GDP, and the U.S. Fish and Wildlife Service's Biological Opinion for the GDP (USFWS BO).[186] Based on this information, the Applicant determined that the analysis area for the development of the 3M Plans should be the four project basins and four adjacent areas: northern Hamlin Valley, southern Snake Valley, southern White River Valley, and Pahranagat Valley.[187]

Protestants did not challenge the Applicant's delineation of the analysis area that was considered for the development of the 3M Plans. The State Engineer finds that the 3M Plan has established an objective and logical approach to delineate the analysis area.

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[182] *Eureka County v. State Engineer*, 131 Nev. Adv. Op. 84, 15-16, 359 P.3d 1114, 1121 (2015).

[183] *Eureka I* provides clear guidance regarding 3M plans; however, it is noteworthy that the posture of this case is distinguishable from *Eureka I*. In *Eureka I*, the protestants demonstrated a conflict with existing rights on two valley floor springs, yet the applications were approved on the condition of the submission and approval of a 3M plan that would adequately and fully mitigate the conflicts. No 3M plan had been submitted prior to the approval of the applications, but was created and approved after the water rights were permitted. Hence, the court held the opportunity to challenge the plan in the context of challenging the approval of the applications was lost. *Eureka County v. State Engineer*, 131 Nev. Adv. Op. 84, 14, 359 P.3d 1114, 1120 (2015). Here, the State Engineer previously denied Applications 54016, 54017, 54018 and 54021, which Protestants' demonstrated conflicted with existing rights. The proposed 3M plans submitted into evidence by the Applicant, provided the protestants an opportunity to review, provide criticisms and challenges to the plans, and cross-examine the principal authors of the plans. Accordingly, the plans were not submitted as an after-the-fact remedy for known conflicts, but as a cautionary, prophylactic requirement by the State Engineer to protect existing rights, secure environmental soundness, and manage the water resources in the source basins from any unknown deleterious effects.

[184] Exhibit No. SNWA_592, p.1-3; Exhibit No. SNWA_593, p. 1-3; Exhibit No. SNWA_507 p.4-1 – 4-5.

[185] Exhibit No. SNWA_507, p. 4-1 – 4-4; 2017 Transcript, Vol. 2 pp. 359-364 (Marshall).

[186] Exhibit No. SNWA_507, p. 4-1 – 4-4; 2017 Transcript, Vol. 2 pp. 359-364 (Marshall).

[187] Exhibit No. SNWA_507, pp. 4-4 – 4-5.

The State Engineer further finds that the analysis area used in the Technical Analysis Report and 3M Plans is sound, based on the likelihood of interbasin flow and the potential effects from GDP pumping.

a. Water Resources

The water resources that were analyzed by the Applicant to develop the 3M Plans were selected using the following objective criteria: (1) occurrence within the analysis area, (2) water right seniority, and (3) likelihood of hydraulic connection with the producing aquifer where GDP production wells will be installed.[188] As discussed in the Technical Analysis Report and the testimony of Mr. Prieur, water rights and domestic wells within the analysis area were identified using NDWR and Utah Division of Water Rights on-line databases.[189] The Applicant applied the above criteria to determine which of the compiled water rights to include in the 3M Plan analysis. Based on extensive analysis conducted to date, the Applicant concluded that hydrologic resources in the mountain block are not hydraulically connected to the producing aquifer or susceptible to GDP pumping effects.[190] The Protestants did not challenge this conclusion. The Applicant also concluded that reservoir water rights are associated with impoundments that collect intermittent precipitation runoff are not hydraulically connected to the producing aquifer, and therefore not susceptible to GDP pumping effects.[191] The State Engineer finds that the Applicant appropriately excluded those water rights from the 3M Plan analysis.

The 3M Plans include all other water rights that are senior to the Applicant's applications because they have an application filing date prior to October 17, 1989.[192] But the Applicant's Technical Analysis Report also recognizes that "[i]n the event it is determined that SNWA is responsible for mitigation to junior water rights [i.e., rights with post-October 17, 1989 filing dates], those rights may be included in the 3M Plans…."[193]

Based on the Applicant's approach and the lack of competing evidence from Protestants, the State Engineer finds that the 3M Plans include the proper water rights.

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[188] Exhibit No. SNWA_507, p.4-5.
[189] Exhibit No. SNWA_507, p. 4-7; 2017 Transcript pp. 397:15 – 398:8.
[190] Exhibit No. SNWA_507, p. 4-5 – 4-6.
[191] Exhibit No. SNWA_507, p. 4-5.
[192] Exhibit No. SNWA_507, p. 4-5 (These include certificated, decreed, permitted, vested, and reserved water rights and domestic wells (Exhibit 507 p 4-7)).
[193] Exhibit No. SNWA_507, p. 4-5 at Footnote 1.

The inclusion and consideration of these rights in the 3M Plans will ensure that they are protected from unreasonable effects of the Applicant's GDP pumping.

b. Environmental Resources

Environmental resources within the analysis area were identified using a variety of sources.[194] The Applicant also applied the above criteria to determine which of the identified environmental resources to include in their 3M analysis. Based on the analysis conducted to date, the Applicant concluded that environmental resources outside the area where plants utilize groundwater (groundwater discharge areas) are not hydraulically connected to the producing aquifers and are not susceptible to GDP pumping effects.[195] The Protestants did not provide any evidence challenging this conclusion. The State Engineer finds it appropriate that the Applicant excluded the environmental resources outside the groundwater discharge areas from their analysis. Environmental resources located within the groundwater discharge areas were included in the analysis, because they may be hydraulically connected to the producing aquifers and could potentially be affected by GDP pumping.[196] The State Engineer finds the Applicant's selection of those environmental resources to include in their analysis for the development of the 3M plans was sound, appropriate, and thorough.

2. Method for Developing 3M Plans

The Technical Analysis Report and testimony of Mr. Prieur and Mr. Marshall explain the methodology that was used to develop the 3M Plans. The goal was to develop a 3M plan that avoids unreasonable effects from GDP pumping by setting objective standards and thresholds, quantitative triggers, and specific mitigation actions to avoid those unreasonable effects.[197] The 3M Plans use a systematic process to define unreasonable effects and establish thresholds, triggers, and monitoring, management, and mitigation actions.[198] Section 3.1 of the Technical Analysis Report describes the process for defining and including in the 3M Plans the following: unreasonable effects, objective thresholds, buffers above the unreasonable effects, preemptive action, mitigation triggers, mandated mitigation actions, proactive investigation triggers, discretionary management

[194] Exhibit No. SNWA_507, p. 4-7.
[195] Exhibit No. SNWA_507, p. 4-6.
[196] Exhibit No. SNWA_507, pp. 4-5 – 4-6.
[197] Exhibit No. SNWA_507, p. 1-1; Exhibit No. SNWA_592, p. 1-1; Exhibit No. SNWA_593, p. 1-1; 2017 Transcript, Vol. 2 pp. 336:17-337:22 (Prieur); 2017 Transcript, Vol. 2 pp. 337:24-340:8 (Marshall).
[198] Exhibit No. SNWA_507, pp. 3-1 – 3-2.

actions, and monitoring activities.[199] The State Engineer finds that this process, with the exception of ongoing stakeholder involvement discussed below, is consistent with Nevada Supreme Court guidance, recent literature regarding responsible development of groundwater resources, and global 3M plans and groundwater management programs.[200] While the State Engineer finds that the methodology is sound, this finding does not preclude the State Engineer from exercising any authority to modify the 3M Plans or to protect existing rights as established by law.

Mr. Prieur and Mr. Marshall provided testimony that the 3M Plans are resource-based, meaning that they are based on the characteristics of, and empirical data from, the hydrologic and environmental resources themselves instead of model simulations that have limitations and uncertainty.[201] The hydrologic investigation triggers are based on the empirical data of water elevations in wells and flow data in springs and streams, and hydrologic mitigation triggers are based on each water right's permitted diversion rate. The environmental investigation and mitigation triggers are based on these same hydrologic triggers, as well as empirical data from the environmental resources themselves. Mr. Prieur testified that because the 3M Plans are based upon the characteristics of the resources, they are more responsive to the changes in conditions that could impact a resource.[202]

Protestants claimed a basin-specific groundwater model should have been used to establish standards when mitigation would occur.[203] The Protestants provided testimony that a numerical model should be required to create mitigation triggers.[204]

The State Engineer finds that the resource-based approach in the 3M Plans focuses management and mitigation efforts to locations where such actions may be required, rather than relying upon model predictions.[205] The 3M Plans are more responsive when based upon the characteristics of the resource itself.[206] The 3M Plans will be effective, even if change applications are approved for points of diversion in the GDP because the Applicant's approach, and objective standards, triggers, and mitigation actions, are

[199] Exhibit No. SNWA_507, pp. 3-1 – 3-2.
[200] Exhibit No. SNWA_507, pp. 3-1, 3-2, 3-4, 3-7.
[201] 2017 Transcript, Vol. 2 pp. 344:24 – 345:1, 346:12 – 347:5, and 396:14 – 397:11 (Prieur); Exhibit No. SNWA_599, p. 10.
[202] 2017 Transcript, Vol. 2 p. 396:21-22 (Prieur).
[203] Exhibit No. CTGR_018, p. 17.
[204] 2017 Transcript, Vol. 6 p. 1206:4-8 (Mayo); 2017 Transcript, Vol. 7 pp. 1528:21 – 1529:4 (Reich).
[205] 2017 Transcript, Vol. 2 p. 346:12-16 (Prieur).
[206] 2017 Transcript, Vol. 2 p. 396:21-22 (Prieur); 2017 Transcript, Vol. 2 p. 372:14-16 (Marshall).

applicable regardless of where points of diversion are located. Current and future modeled drawdown predictions can inform implementation of management and mitigation actions before triggers are reached, but the triggers at specific resources will ultimately control whether mitigation actions are required.

Also, the regional groundwater model that is considered the best available modeling tool for understanding the hydrological effect of the GDP "does not have the level of accuracy required to predict absolute values at specific points in time (especially decades or centuries into the future)."[207] Mr. Prieur stated that such regional models are good tools for their purpose—assessing general, long-term drawdown—but do not reflect aquifer response data or local hydrogeologic features.[208] Site-specific locations require a level of accuracy greater than regional models. As discussed *supra*, Mr. Burns explained the limitations of regional groundwater models and how the large cell sizes average site-specific data, making regional groundwater models inapplicable for determining site-specific impacts.[209]

B. 3M Plan Components

The 3M Plans contain the following components: 1) unreasonable effects, 2) monitoring, 3) thresholds, 4) triggers, 5) investigations, 6) management actions, 7) mitigation actions, 8) mitigation action planning, 9) reporting requirements, and 10) opportunities for public input. Each component is briefly discussed below in the following sub-sections, along with further detailed analyses as they relate to specific resources.

1. Objective Standards for Unreasonable Effects

A 3M plan must define an unreasonable effect.[210] The Applicant's 3M Plans define unreasonable effects to hydrologic and environmental resources in the analysis area, and set standards, thresholds and triggers to avoid those unreasonable effects.[211] The 3M Plans define unreasonable effects, with respect to hydrologic and environmental resources, as effects that: 1) conflict with existing rights or protectable interests in existing

[207] Exhibit No. SNWA_478, p. 3.3-90.
[208] 2017 Transcript, Vol. 2 p. 396:16-20 (Prieur).
[209] 2017 Transcript, Vol. 4 pp. 994:15 – 995:24 (Burns).
[210] Exhibit No. SE_118 at 18 ("…without knowing the impacts to existing water right holders and not having a clear standard to identify impacts, conflicts or unreasonable environmental effects so that mitigation may proceed in a timely manner.").
[211] 2017 Transcript, Vol. 2 pp. 340:10-24 (Prieur) and 367:1-18 (Marshall); Exhibit No SNWA_507, p. 2-2.

domestic wells; 2) jeopardize the continued existence of federally threatened and endangered species; 3) cause extirpation of native aquatic-dependent special status animal species from a hydrographic basin's groundwater discharge area; 4) cause elimination of habitat types from a hydrographic basin's groundwater discharge area; or 5) cause excessive loss of shrub cover that results in extensive bare ground.[212]

CTGR suggests that the prior stipulations between the Applicant and the Federal Agencies concerning the withdrawal of the Agencies' protests provide guidance regarding what should be considered unreasonable effects. Considering that the District Court rejected the 2011 3M Plans as arbitrary and capricious, the State Engineer is hard-pressed to agree that the Stipulations, which are even less specific than the 2011 3M Plans, provide a solid foundation for defining what an unreasonable effect is. In the 3M Plans offered during the 2017 hearing, each definition for an unreasonable effect was described in more detail in the Technical Analysis Report and in the testimony of Mr. Marshall and Mr. Prieur.[213] For existing water rights, Mr. Prieur explained that an unreasonable effect includes "a conflict with a quantity of water that's been approved for certain beneficial use associated with that existing water right . . . a conflict with a protectable interest of a domestic well . . . [or] an unreasonable lowering of the water table that causes unreasonable increased economic cost to pump water."[214] For environmental resources, Mr. Marshall explained that avoiding jeopardy to federally threatened and endangered (listed) species avoids impairing the ability of a listed species to survive or recover consistent with the Endangered Species Act (ESA).[215] Further, avoiding extirpation of native aquatic-dependent special status animal species and avoiding elimination of habitat types (mesic, shrubland, terrestrial woodland, and lake)[216] ensures that GDP pumping does not cause loss of those species and habitats from the hydrographic basin groundwater discharge areas.[217] Avoiding excessive loss of shrub cover that results in excessive bare ground also avoids soil erosion and air quality impacts that may result from such conditions.[218]

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[212] Exhibit No. SNWA_507 p. 2-2; Exhibit No. SNWA_592, p. 1-2; Exhibit 593, p. 1-2.
[213] 2017 Transcript, Vol. 2 pp. 366-372 (Marshall); 2017 Transcript, Vol. 2 p. 340 (Prieur); Exhibit No. SNWA_507, p. 2-3, 2-4.
[214] 2017 Transcript, Vol. 2 p. 340:12-20 (Prieur).
[215] 2017 Transcript, Vol. 2 p. 367:22-368:10 (Marshall); Exhibit No. SNWA_507, p. 2-3.
[216] Exhibit No. SNWA_507 pp. 2-3 – 2-4, 5-9 – 5-10.
[217] 2017 Transcript, Vol. 2 pp. 368:15-369:16 (Marshall); Exhibit No. SNWA_507, pp. 2-3 – 2-4.
[218] 2017 Transcript, Vol. 2 pp. 369:17 –370:7 (Marshall); Exhibit No. SNWA_507, p. 2-4.

The Protestants took issue with some of the standards for unreasonable effects, but their criticisms did not consider how the various components of the 3M Plans are designed to work together. The Applicant's evidence demonstrated why the definition of unreasonable effects should not be taken in isolation.[219] Existing water rights, federally-listed species, native aquatic-dependent special status animal species, and habitats all coincide throughout the analysis area. As testified by Mr. Marshall, when it comes to the standards for unreasonable effects, "The whole is greater than the sum of the parts."[220]

The State Engineer finds that the 3M Plans define unreasonable effects in accordance with Nevada water law and as directed by the Remand Order. Specifically, the State Engineer finds that Applicant's definition of standards for unreasonable effects is consistent with statutory requirements to protect existing water rights, the protectable interests in existing domestic wells, the public interest, and the environmental soundness of the source basin as has been previously defined by the State Engineer in Rulings 6164 – 6167. The definitions specified in the 3M Plans are neither arbitrary nor capricious as they are based on sound science, standard industry practice, and objective standards that are tailored to the hydrologic and environmental characteristics of the GDP area. Importantly, the State Engineer finds that this definition of unreasonable effects may not be applicable for other water rights in other hydrographic areas in Nevada, which not only have different rights, resources, and hydrologic, geologic or climatic conditions, but also are not subject to the Remand Order.

2. <u>Monitoring Requirements</u>

The record reflects that the 3M Plans include monitoring requirements that are designed to activate triggers, conduct investigations, inform management and mitigation actions, and assess management and mitigation efficacy.[221] The record also reflects that the monitoring plans provide representative hydrologic and environmental data to (1) characterize and quantify hydrologic and environmental conditions during both the baseline period prior to and during GDP pumping, (2) detect and measure drawdown propagation from GDP pumping, (3) signal activation of investigation and mitigation triggers, (4) conduct investigations, (5) calibrate and refine predictive tools, (6) determine management and mitigation actions to be implemented given site-specific conditions, (7)

[219] 2017 Transcript, Vol. 2 p. 371:15-23 (Marshall).
[220] 2017 Transcript, Vol. 2 p. 371:23-24 (Marshall).
[221] Exhibit No. SNWA_507, p. 3-6.

assess management and mitigation efficacy, and (8) identify management and mitigation modifications needed to meet goals and requirements.[222]

The record also reflects that monitoring is focused on specific hydrologic and environmental parameters necessary to document baseline conditions and signal activation of triggers. The 3M Plans incorporate long-term hydrologic and environmental data into the monitoring program to document decades of historical baseline conditions.[223]

3. Thresholds and Triggers

The 3M Plans establish thresholds above the defined unreasonable effects to provide buffers and reduce the risk of ever reaching those unreasonable effects and mitigation triggers at the thresholds by promptly implementing mitigation actions before reaching an unreasonable effect.[224] The Applicant presented extensive testimony and evidence regarding the thresholds and triggers in the 3M Plans that are set to avoid and eliminate unreasonable effects. The 3M Plans and Technical Analysis Report define a trigger as a quantitative hydrologic or environmental parameter value that prompts action.[225] A threshold is defined as specific conditions in hydrologic or environmental resources, that when crossed, require mitigation actions.[226]

The record shows that establishing a trigger based on a specific value does not adjust for trends or reoccurring patterns, such as seasonality, in the baseline data set. However, linking quantitative triggers to the baseline dataset accounts for trends and seasonal variations, which are more responsive in accounting for variation in natural hydrologic conditions.[227] Like the thresholds, the triggers are set above an unreasonable effect, in order to avoid reaching that unreasonable effect.

The record shows that two different triggers are required in the 3M Plan: investigation triggers and mitigation triggers.[228] As a best management practice, the 3M Plans include proactive investigation triggers above mitigation triggers with the express

[222] Exhibit No. SNWA_592, p. 2-1 – 2-55; Exhibit No. SNWA_593, p. 2-1 – 2-30.
[223] Exhibit No. SNWA_507, p. 6-93; 2017 Transcript, Vol. 2 pp. 342:16 – 343:15 (Prieur).
[224] Exhibit No. SNWA_507, pp. 3-2 – 3-4.
[225] Exhibit No. SNWA_507, p. 3-4; Exhibit No. SNWA_592, p. 3-1; Exhibit No. SNWA_593, p. 3-2.
[226] Exhibit No. SNWA_507, p. 3-2.
[227] Exhibit No. SNWA_507, p. 3-5.
[228] Exhibit No. SNWA_507, p. 3-4; Exhibit No. SNWA_592, p. 3-1 –3-3; Exhibit No. SNWA_593, p. 3-2 – 3-4.

purpose of helping to avoid activating those mitigation triggers and supporting responsible groundwater development.

Investigation triggers require investigation actions and may prompt discretionary management and preemptive implementation of mitigation prior to ever reaching a mitigation trigger.[229] As described in the Technical Analysis Report, this approach provides a variety of benefits, including increased protection to sensitive resources; enhanced ability to determine cause, condition, and significance of observed changes; and provision of additional data and analyses to inform management and mitigation actions.[230] As described in Section 10.5.2 of the Technical Analysis Report and as further required by this Ruling, the Applicant will notify the State Engineer and any affected water right holder or the CTGR if investigation triggers, relevant to their interests, are activated.[231]

4. Investigations

As noted above, activating an investigation trigger prompts an investigation. The 3M Plans also state that the State Engineer may request the Applicant begin an investigation if the State Engineer deems an investigation necessary or if an existing water right holder notifies the State Engineer of an adverse impact to the water right holder's water source.[232] The 3M Plans detail investigation methodologies that will be undertaken after the activation of an investigation trigger.[233] The purpose of conducting investigations is to determine cause, condition, and significance of observed changes to inform management and mitigation actions.[234] The 3M Plans require the Applicant to report investigation findings to the State Engineer[235] and, as further required by this Ruling, to the affected water right holder.

5. Management Actions

The record shows that the 3M Plans employ discretionary management actions, which are used as best management practices.[236] The record also shows that the purpose

[229] Exhibit No. SNWA_507, p. 3-5; Exhibit No. SNWA_592, p. 3-3; Exhibit No. SNWA_593, p. 3-4.
[230] Exhibit No. SNWA_507, p. 3-4.
[231] Exhibit No. SNWA_592, p. 5-1; Exhibit No. SNWA_593, p. 5-1; Exhibit No. SNWA_507, pp. 10-34 – 10-35.
[232] Exhibit No. SNWA_507, pp. 3-12 – 3-13; Exhibit No. SNWA_592, pp. 3-7 – 3-8; Exhibit No. SNWA_593, pp. 3-8 – 3-9.
[233] Exhibit No. SNWA_592, pp. 3-7 – 3-8, 3-15 – 3-16; Exhibit No. SNWA_593, pp. 3-8 – 3-9.
[234] Exhibit No. SNWA_507, p. 3-5; Exhibit No. SNWA_592, p. 3-7; Exhibit No. SNWA_593, p. 3-8.
[235] Exhibit No. SNWA_592, p. 5-1; Exhibit No. SNWA_593, p. 5-1.
[236] Exhibit No. SNWA_507, p. 3-5; Exhibit No. SNWA_592, p. 3-3; Exhibit No. SNWA_593, p. 3-4.

of implementing management actions is to avoid or minimize the risk of activating mitigation triggers and support responsible groundwater development.[237] Management actions may be implemented based on investigation findings or as a regular part of Applicant's GDP operations. Numerous management actions for hydrologic and environmental resources that are known to be effective and available are provided within the 3M Plans.[238] The State Engineer finds that inclusion of discretionary management actions in the 3M Plans demonstrates that the 3M Plans will assure responsible groundwater development.

Mr. Prieur testified and the record reflects that adaptive management is a key element in the 3M Plans.[239] The Technical Analysis Report notes that adaptive management does not mean trial and error, hypothesis testing, or delayed decision making, or that the triggers and actions established in the 3M Plans will change. Instead, adaptive management reduces uncertainty, increases responsiveness to changing conditions, and enhances management and mitigation efficacy.[240]

The Protestants criticized the management actions by claiming that the 3M Plans place management actions solely under the Applicant's control. The State Engineer finds that this criticism is not sound because once approved, the 3M Plans are under the supervision and jurisdiction of the State Engineer. Except for management actions that involve preemptive mitigation, the State Engineer finds that the Applicant should have latitude over its management of the GDP. The 3M Plans include management actions before any unreasonable effect has occurred. Additionally, management actions in the 3M Plans are discretionary, and actions that are part of the Applicant's regular GDP operations should be within the Applicant's control. If a management action requires preparing mitigation actions for implementation, including purchasing equipment, establishing contracts, and obtaining necessary landowner permissions and permits, through this Ruling, the State Engineer is adding a requirement that the Office of the State Engineer will promptly convene a mandatory meeting between the State Engineer or his designee, the Applicant, and legally interested parties, to review the mitigation strategies included in the 3M Plans. If management actions entail preemptive implementation of

[237] Exhibit No. SNWA_507, p. 3-5; Exhibit No. SNWA_592, p. 3-3; Exhibit No. SNWA_593, p. 3-4.
[238] Exhibit No. SNWA_507, p. 3-5; Exhibit No. SNWA_592, pp. 3-8 – 3-9; Exhibit No. SNWA_593, pp. 3-9 – 3-10.
[239] 2017 Transcript, Vol. 2 pp. 345:16 – 346:11 (Prieur).
[240] Exhibit No. SNWA_507, p. 3-6.

mitigation actions, the Applicant will need to follow the process outlined for mitigation implementation as discussed in Section 3.2.4 in the Technical Analysis Report. Further, the State Engineer finds that nothing in the 3M Plans prohibit the State Engineer from ordering necessary actions as authorized and mandated by water law regardless of specific triggers or management actions.

6. Mitigation Actions

The 3M Plans require the Applicant to implement mitigation actions within 30 days of the activation of a mitigation trigger that is caused by the Applicant's groundwater pumping.[241] The record further shows that mitigation actions may be implemented preemptively if data trends indicate that the activation of a mitigation trigger is imminent, or to avoid or minimize the risk of activating hydrologic and environmental mitigation triggers.[242]

For instance, the record shows that mitigation actions may be implemented preemptively prior to pumping operations for resources close to the GDP PODs or for highly sensitive resources.[243] The decision to preemptively implement mitigation actions for an existing water right prior to pumping will be dependent upon the results of a water resource assessment, the probability of effects, the sensitivity of the resource, and the hydrologic setting.[244] Numerous effective and available mitigation actions are required in the 3M Plans for each specified hydrologic and environmental resource.[245]

7. Mitigation Action Planning

Mitigation planning is required by the 3M Plans before any mitigation trigger is activated. In advance of the activation of a mitigation trigger, mitigation planning requires purchasing equipment, establishing contracts, and obtaining landowner permissions and permits.[246] The State Engineer finds that the 3M Plans' requirement for mitigation planning will ensure that mitigation is implemented no later than 30 days after a mitigation trigger is activated. The mitigation planning will also ensure that the

[241] Exhibit No. SNWA_507, p. 3-21; Exhibit No. SNWA_592, p. 3-14; Exhibit No. SNWA_593, p. 3-13.
[242] Exhibit No. SNWA_507, p. 3-5; Exhibit No. SNWA_592, p. 3-3; Exhibit No. SNWA_593, p. 3-4.
[243] Exhibit No. SNWA_507, pp. 3-5 – 3-6; Exhibit No. SNWA_592, p. 3-3; Exhibit No. SNWA_593, p. 3-4.
[244] Exhibit No. SNWA_507, p. 6-9; Exhibit No. SNWA_592, p. 3-17.
[245] Exhibit No. SNWA_507, p. 3-6.
[246] Exhibit No. SNWA_592, p. 5-1; Exhibit No. SNWA_593, p. 5-1.

mitigation is carried out in a way that is neither arbitrary nor capricious, as the planning will ensure the best mitigation action is taken given specific circumstances.

The State Engineer understands the concerns of water right holders regarding mitigation actions that may be conducted for their water rights. The primary concern conveyed during the hearing was that water right holders want to know and have input into what mitigation actions may be planned or conducted for their water rights.[247] As Mr. Prieur testified, multiple mitigation actions are identified in the 3M Plans because there are a number of different actions that can provide the quantity of water authorized for beneficial use under a water right. Implementation of individual mitigation actions for a specific water right will depend upon the conditions and characteristics of the water right and location.[248] The State Engineer finds that the 3M Plans are strengthened by including a number of different mitigation actions that are effective and available to the Applicant. The State Engineer further finds that the Nevada Supreme Court's pronouncements in *Eureka* were not likely intended to shackle a party to a single mitigation option, but provides latitude for multiple options, subject to evidence that the mitigation strategy will be effective.

The record also shows that the 3M Plans properly address the logistics of implementing mitigation actions directly associated with water rights. First, the 3M Plans purposely include adaptive and proactive management of GDP pumping to minimize the risk of activating mitigation triggers at existing water right locations. Second, as discussed above, prior to any mitigation trigger activation, the Applicant must request landowner permissions and permits which will necessitate landowner and water right holder involvement.[249] The 3M Plans state that the Applicant must initiate temporary and long-term mitigation actions with access agreements with existing water right holders.[250] Third, the Applicant is required to submit mitigation plans in three different ways to ensure communication and transparency: 1) investigation findings that inform management and mitigation plans will be included in the annual data reports, 2) management and mitigation actions planned for each year will be included in the annual operation plans, and 3) planned mitigation actions will be described in the memoranda

[247] 2017 Transcript, Vol. 10 pp. 2022:21-24, 2023:1-3 (Hejmanowski).
[248] 2017 Transcript, Vol. 4 pp. 853:3-16, 854:14-21 (Prieur).
[249] Exhibit No. SNWA_592, p. 5-1; Exhibit No. SNWA_593, p. 5-1.
[250] Exhibit No. SNWA_592, p. 3-14; Exhibit No. SNWA_593, p. 3-15.

notifications of mitigation trigger activation.[251] Finally, the 3M Plans make the State Engineer the final decision maker regarding mitigation.[252] The State Engineer finds that the processes required in the 3M Plans provide an effective approach to implementing mitigation actions either preemptively or if a mitigation trigger is activated.

8. Reporting Requirements

The 3M Plans require the Applicant to report to the State Engineer at specific points throughout each year and during various GDP operational phases.[253] Reporting includes: quarterly hydrologic monitoring data submittals, including notification of any hydrologic investigation trigger activation; annual environmental monitoring data submittals, including notification of any environmental investigation trigger activation; annual monitoring data reports that describe data and activities performed over the past year, investigation findings, implemented management and mitigation actions, and mitigation efficacy assessments; and operation plans that describe activities planned for the next year, including anticipated pumping distribution and any planned management and mitigation actions. Groundwater flow model output will also be provided when the model is updated every 5-8 years or as requested by the State Engineer. If a mitigation trigger is activated, a memorandum will be submitted within 30 days to the State Engineer, and the affected water right holder or the CTGR, which describes the mitigation trigger and corresponding planned mitigation action(s). The State Engineer finds that these reporting requirements are sufficient to keep the State Engineer informed as to the status of the Applicant's GDP.

Protestants argued that the Applicant should be required to share monitoring data with water right holders whose water rights are listed in the 3M Plans, and notify water right holders if an investigation or mitigation trigger associated with their water right is activated. With respect to the activation of an investigation or mitigation trigger, the State Engineer agrees. The 3M Plans state that once the Applicant submits the monitoring data, annual reports, and trigger notifications to the State Engineer, the State Engineer will distribute information among parties as needed.[254] The State Engineer finds that notification to the State Engineer of trigger activation is not inadequate; however, the

[251] Exhibit No. SNWA_592, p. 5-1; Exhibit No. SNWA_593, p. 5-1.
[252] Exhibit No. SNWA_507, p. 1-2; 2017 Transcript, Vol. 4 p. 854:1-4 (Prieur).
[253] Exhibit No. SNWA_592, p.5-1; Exhibit No. SNWA_593, p. 5-1; Exhibit No. SNWA_507 pp.10-34 – 10-35; Exhibit No. SNWA_599, p.14.
[254] Exhibit No. SNWA_592, p. 5-1; Exhibit No. SNWA_593, p 5-1.

State Engineer finds that modifying the 3M Plans to require the Applicant to also provide direct notification to water right holders or CTGR if an investigation trigger or mitigation trigger is activated at their water right or a proxy monitor well specifically associated with their water right, provides greater assurances to those parties that they will receive critical information concerning their water rights or important resources.

9. Opportunities for Public Input

Protestants claim that the opportunities for public input are not adequate in the 3M Plans and that the 3M Plans failed to adhere to established standards for stakeholder involvement where adaptive management is concerned. The Protestants also criticized the 3M Plans because water right holders and property owners are not notified of an investigation,[255] nor do they receive the investigation report.[256] Mr. Prieur testified that the State Engineer has the option to notify a water right holder that an investigation trigger has been activated.[257] Furthermore, Mr. Prieur testified that the Applicant is not averse to notifying the water right holders of investigation triggers, even though the State Engineer ultimately controls the 3M Plans.[258] Mr. Prieur also indicated that the Applicant will initially contact a water right holder to assess the condition of the water source.[259] Mr. Marshall testified that if the Applicant requires access to a water right holder's property, the property owner would be notified.[260]

CPB used the U.S. Department of the Interior's Adaptive Management Technical Guide to argue that without stakeholder involvement, an adaptive management process is unlikely to be effective.[261] The court in *Eureka* explained that those who protest an application to appropriate or change existing water rights must have a full opportunity to be heard, a right that includes the ability to challenge the evidence upon which the State Engineer's decision may be based.[262] The State Engineer finds that for purposes of approval of the 3M Plans, the Protestants had a full opportunity, through the application protests, water right hearings, and public comments, to challenge the evidence upon

[255] 2017 Transcript, Vol. 4 pp. 839:20 – 840:20, 841:9-14 (Prieur).
[256] 2017 Transcript, Vol. 4 p. 847:6-11 (Marshall).
[257] 2017 Transcript, Vol. 4 pp. 839:24 – 840:5 (Prieur).
[258] 2017 Transcript, Vol. 4 p. 840:16-20 (Prieur).
[259] 2017 Transcript, Vol. 4 p. 840:12-13 (Prieur).
[260] 2017 Transcript, Vol. 4 p. 850:9-10 (Marshall).
[261] Exhibit No. SNWA_541, p. iv; 2017 Transcript, Vol. 4 pp. 860:14 – 862:8 (Marshall).
[262] 131 Nev. Adv. Op. 84, ___, 359 P.3d 1114, 1120 (2015) (citing *Revert v. Ray*, 95 Nev. 782, 787, 603 P.2d 262, 264 (1979)).

which the 3M Plans are based. Evidence presented shows that there has been past public input, there is current public input, and there will be future public input.[263] Although the State Engineer finds that substantial evidence supports the approval of the 3M Plans, the State Engineer has identified areas of the 3M Plans that are enhanced through additional public input as ordered herein.

Future opportunities would occur during change applications for any of the Applicant's wells through the statutory process in NRS Chapters 533 and 534. All reported information that is required by the 3M Plan will be submitted to the State Engineer and will be made publicly available through means such as a website and at an annual public meeting required by the State Engineer for the Applicant's annual report. As added above in Section IV.B.8, the State Engineer will require the Applicant to directly notify any water right holder or CTGR if any investigation or mitigation trigger is activated.

Public input opportunities are also provided as part of the federal environmental compliance processes. Ms. Luptowitz testified that public input is a key requirement of the National Environmental Policy Act (NEPA) process, as federal agencies are required to solicit public input as they develop the NEPA documents.[264] The NEPA process that has been conducted for the BLM's FEIS included public scoping. Public meetings and comments on the Draft EIS were substantial, and 16 federal, state, and local agencies served as cooperating agencies for the EIS.[265] The NEPA process also included government-to-government consultation with 28 Indian tribes and bands.[266] Additional NEPA compliance will be conducted in the future, as specific well sites are identified.[267] Ms. Luptowitz testified that some of the water right protestants are also cooperating agencies for the NEPA process, and thus have an opportunity to participate in the development of those compliance documents as well.[268]

The State Engineer finds that public input is properly included in the 3M Plans. Nevertheless, the State Engineer includes additional requirements for even greater public

[263] 2017 Transcript, Vol. 2 p. 385:10-20 (Luptowitz); 2017 Transcript, Vol. 4 p. 862:3-11 (Marshall); Exhibit No. SNWA_599, p. 8, 12 – 14.
[264] 2017 Transcript, Vol. 2 p. 385:1-20 (Luptowitz).
[265] Exhibit No. GBWN_298, p. 1-11, 1-16, 1-19.
[266] 2017 Transcript, Vol. 3 pp. 637:18 – 639:15(Luptowitz); Exhibit No. GBWN_298, p. 1-11.
[267] 2017 Transcript, Vol. 2 pp. 383:20-24 (Luptowitz).
[268] 2017 Transcript, Vol. 2 p. 385:17-20 (Luptowitz).

input; however, the State Engineer's additions should not suggest that the 3M Plans, as submitted, are flawed in this respect. The Applicant considered previous public input when developing the 3M Plans. For example, the Cleveland Ranch monitoring sites were selected in consensus with the State Engineer and Protestant CPB—the Cleveland Ranch owner.[269] The Swamp Cedar Area of Critical Environmental Concern (ACEC) was selected as an area of focus in the Spring Valley 3M Plan in part due to Tribal concerns identified during the 2011 water rights hearing.[270] The record reflects that CTGR recommended public review of data reports[271] and that the Applicant was receptive of this recommendation.[272] The State Engineer finds that the 3M Plans, if implemented in the future, must require public comment periods for reports submitted by the Applicant and that the 3M Plans require sufficient opportunities for public input.

C. Standards, Thresholds and Triggers to Protect Existing Water Rights

The 3M Plans include requirements to protect existing water rights by avoiding or eliminating conflicts with senior water rights or with protectable interests in existing domestic wells.[273]

1. Management Blocks and Categories

Spring Valley was divided into five Management Blocks to provide a useful structure for developing triggers and monitoring, management and mitigation in the basin.[274] The Management Blocks are based on distribution of senior water rights, the Applicant's water rights, environmental resources, and the Applicant's GDP points of diversion.

Additionally, both the Spring Valley and Cave, Dry Lake and Delamar Valley 3M Plans establish Management Categories that group water rights based on the distance to the nearest Applicant well, and hydraulic connection with the producing aquifer.[275] Category A is for water rights within 3 miles of the nearest Applicant well. Drawdown will be greatest close to the production well and will decrease exponentially with distance from the well.[276] Also, the change in rate of drawdown is greatest when pumping first

[269] Exhibit No. SNWA_507 pp. 6-34 – 6-35.
[270] 2017 Transcript, Vol. 4 pp. 893:22 – 894:17 (Marshall).
[271] Exhibit No. CTGR_018, p. 26.
[272] Exhibit No. SNWA_599, p. 13.
[273] 2017 Transcript, Vol. 2 pp. 397:12 – 398:8 (Prieur).
[274] Exhibit No. SNWA_592, p. 1-4, Figure 1-1.
[275] 2017 Transcript, Vol. 2 p. 398:16-21 (Prieur); Exhibit No. SNWA_507, pp. 3-15 – 3-20.
[276] 2017 Transcript, Vol. 2 p. 399:5-9 (Prieur).

starts and then it decreases with time.[277] Due to the relative proximity of Category A water rights to a proposed point of diversion, the 3M Plans require that for Category A water rights a mitigation plan be in place before pumping by the Applicant begins or that mitigation be preemptively implemented prior to pumping as a proactive measure.[278] Category B is for the water rights that are further than 3 miles but less than 10 miles from the nearest Applicant well. A Category B water right will either be monitored directly at the water right's point of diversion or at a proxy monitor well in the vicinity of the existing rights which can detect propagation of drawdown.[279] Category C is for water rights greater than 10 miles away from the nearest Applicant well within the same hydrographic basin.[280] Category D is for water rights in an adjacent basin. For Management Categories C and D water rights, the 3M Plan requires an intermediate well located between the existing water right and the Applicant's well to detect and measure propagation of any possible drawdown.[281] Finally, Category E is for water rights that are not hydraulically connected with the producing aquifer in which the Applicant's wells will be installed.[282]

Protestants argue that the distances used to identify the Management Categories are arbitrary. However, the Protestants did not provide a reasonable alternative management program or classification like the 3M Plans' Management Category approach. The State Engineer finds that using 3 and 10 miles to separate the Management Categories is a reasonable approach to manage existing water rights over a large area because it follows that the rights located closer to points of diversion where a hydrologic connection exists may experience effects more quickly than rights located farther away or which may not have any hydrologic connection to the points of diversion.

2. <u>Predevelopment Baseline</u>

The 3M Plans require the Applicant to collect data from specific locations within and in the vicinity of the project basins and incorporate that data into a baseline dataset

[277] 2017 Transcript, Vol. 2 p. 399:9-11 (Prieur).
[278] Exhibit No. SNWA_592, p. 3-14; Exhibit No. SNWA_593, p. 3-15; 2017 Transcript, Vol. 2 p. 399:12-17 (Prieur).
[279] Exhibit No. SNWA_507, pp. 3-16 – 3-17; Exhibit No. SNWA_592, pp. 2-11 – 2-12; Exhibit No. SNWA_593, pp. 2-7 – 2-8; 2017 Transcript, Vol. 2 pp. 400:24 – 401:1 3 (Prieur).
[280] 2017 Transcript, Vol. 2 p. 401:23-24 (Prieur).
[281] Exhibit No. SNWA_507, pp. 3-16 and 3-18; Exhibit No. SNWA_592, pp. 2-11 and 2-13; Exhibit No. SNWA_593, pp. 2-7 and 2-9; 2017 Transcript, Vol. 2 pp. 401:23-24, 402:5-10, and 403:12-17 (Prieur).
[282] Exhibit No. SNWA_507, p. 3-18; Exhibit No. SNWA_592, p. 2-13; Exhibit No. SNWA_593, p. 2-9; 2017 Transcript, Vol. 2 p. 405:1-4 (Prieur).

to characterize the variability in natural conditions.[283] Data has been collected by the Applicant since 2006.[284] The data from monitoring has been sent to the State Engineer in annual reports which have been incorporated into a baseline dataset.[285] Mr. Prieur testified that the current baseline will be long enough to establish triggers if the period of time between now and when the project pumping begins is taken into account.[286]

The Protestants raised concerns over whether the baseline adequately represented the natural conditions upon which investigation triggers are based.[287] CPB argues that the baseline hydrographs in the Technical Analysis Report and 3M Plans exhibit a decreasing trend because the baseline utilized is too short.[288] CPB presented the Palmer Hydrologic Drought Index (PHDI) as a tool to show drought and wet cycle framework.[289] CPB noted that data acquisition at some locations began at the end of a very wet year but was followed by numerous abnormally dry years, the result of which is a downward trend in most of the hydrographs.[290] Mr. Prieur testified that local, long-term monitoring of specific reference sites within the project basins provide data that directly reflects local conditions better than the PHDI.[291] Mr. Prieur stated that the final baseline would also take into account climate variability, estimating that the final baseline would span 30 years, and concluded that the proposed baseline is better at determining local climatic conditions than the PHDI.[292]

The State Engineer finds that the 3M Plans utilize sound methods in formulating a baseline record. The State Engineer finds that the combination of existing data and data collected until nearing the start of pumping will be incorporated into the baseline, showing the natural variations within the project basins and creating a sufficient baseline.

3. Investigation Triggers

Triggers are based on a specific value linked to the behavior of the baseline record. Types of triggers for hydrologic resources are (1) a quantitative fixed trigger which is related to a specific value, such as a permitted water right diversion rate; or (2) a

[283] 2017 Transcript, Vol. 2 p. 354:14-17 (Prieur).
[284] 2017 Transcript, Vol. 2 p. 354:20-24 (Prieur).
[285] 2017 Transcript, Vol. 2 p. 353:12-18 (Prieur); *See* Exhibit Nos. SNWA_516 – 527.
[286] 2017 Transcript, Vol. 2 pp. 409:23 – 410:1 (Prieur).
[287] Exhibit No. CPB_Exh_025, p. 22.
[288] Exhibit No. CPB_Exh_025, p. 22.
[289] Exhibit No. CPB_Exh_025, p. 22.
[290] Exhibit No. CPB_Exh_025, p. 22.
[291] 2017 Transcript, Vol. 2 p. 412:4-12 (Prieur).
[292] 2017 Transcript, Vol. 2 p. 412:13-15 (Prieur).

quantitative trigger linked to the behavior of the baseline data record, which accounts for variation in natural hydrologic conditions.[293] Similarly, CTGR states that triggers should be "based on hydrologic parameters that may be indirectly related to changes in the environmental system."[294] Mr. Prieur testified that every water right or proxy well has a defined, objective investigation trigger.[295] The Applicant presented Dr. Singh, an expert in statistical analyses, to explain the method used for identifying investigation triggers.[296] Dr. Singh assisted in developing triggers using the Seasonally Adjusted Linear Regression (SALR) method, which creates a lower control limit based on values three standard deviations below the SALR model.[297] The method identifies whether a water level dataset contains seasonal variations and applies those variations to the lower control limit. An investigation trigger is activated when the real-time data is below the lower control limit calculated by the SALR for six continuous months.[298] Mr. Prieur testified that the six-month timeframe was chosen to identify whether a change is meaningful or if there is a seasonal aberration that occurs for several months but then returns to baseline conditions.[299] Mr. Prieur also testified and the record shows that USGS data usually takes about six months to finalize.[300] The record shows that an investigation trigger does not rise to the level of an unreasonable effect, nor does it necessarily equal a mitigation trigger. Investigation triggers are management tools used to avoid mitigation triggers and unreasonable effects.

Testifying on behalf of GBWN, Dr. Myers testified that the SALR is problematic because it only accounts for average seasonality over the period of record. If the period of baseline data is during a span of dry years, water levels naturally trend downward and the SALR-derived trigger extends downward into the future which makes the trigger less likely to be met. Dr. Myers referred to Masbruch (2000) to show that water levels in this region have responded upward to just a few major recharge events over a period of several decades, and by excluding these periods the SALR is problematic and is biased

[293] Exhibit No. SNWA_507, p. 3-5; Exhibit No. SNWA_592, pp. 3-1 – 3-3; Exhibit No. SNWA_593, pp. 3-2 – 3-3.
[294] Exhibit No. CTGR_018, p. 20.
[295] 2017 Transcript, Vol. 2 p. 422:15-18 (Prieur).
[296] 2017 Transcript, Vol. 1 p. 236:4-5 (Singh).
[297] 2017 Transcript, Vol. 1 p. 241:20-23 (Singh).
[298] Exhibit No. SNWA_507, p. 3-10; Exhibit No. SNWA_592, p. 3-5; Exhibit No. SNWA_593, p. 3-6.
[299] 2017 Transcript, Vol. 2 pp. 418:24 – 419:6 (Prieur).
[300] Exhibit No. SNWA_507, p. 3-11; 2017 Transcript, Vol. 2 p. 419:7-10 (Prieur).

downward. [301] Although he indicated that the SALR method is reasonable, he testified that some form of correlation is needed to account for wet and dry periods.[302] This was based on his review of the Technical Analysis Report, which shows a downward trend for many of the Applicant's hydrographs.

The State Engineer finds that the SALR method is statistically sound, repeatable, and in accordance with industry standards for setting investigation triggers. By applying the SALR method, the investigation triggers identified in the 3M Plans are based upon substantial evidence and in accordance with industry standards, and therefore are neither arbitrary nor capricious. The State Engineer finds that the SALR method is a scientifically sound method to determine investigation triggers at locations that have a baseline dataset long enough to represent wet and dry cycles. The 3M Plans do not preclude the State Engineer from requesting an investigation regardless of the SALR-defined trigger.

The Protestants also questioned the six-month time frame and instead proposed six weeks or even six days.[303] Mr. Prieur indicated that for wells that have quarterly monitoring, a six month timeframe will yield three data points, which is generally needed to determine if a trend is present.[304] Mr. Prieur also testified that the investigation process and implementation of management actions can be shortened if data shows that impacts are imminent.[305] The record shows that some 3M Plans require one year before taking any action.[306] The State Engineer finds a six month observation period to determine whether an investigation trigger is activated is reasonable, due to the data acquisition requirements and seasonal variables described above, and because the exclusive activation of an investigation trigger is not an indication that immediate mitigation would occur or that an unreasonable effect is imminent. However, the State Engineer reserves the right to take action at any time he deems appropriate to initiate an investigation or take any other action the State Engineer is authorized by law.

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[301] 2017 Transcript, Vol. 8 p. 1761:8 – 1762:17 (Myers).
[302] 2017 Transcript, Vol. 8 p. 1762:18 – 1763:2 (Myers).
[303] 2017 Transcript, Vol. 4 p. 842:5-6 (CPB cross examination by Hejmanowski).
[304] 2017 Transcript, Vol. 4 p. 842:22-24 (Prieur).
[305] Exhibit No. SNWA_507, p. 3-5; Exhibit No. SNWA_592, p. 3-3; Exhibit No. SNWA_593, p. 3-4; 2017 Transcript, Vol. 4 p. 843:10-16 (Prieur).
[306] Exhibit No. SNWA_507, p. 3-11.

4. Investigations

Investigations are required after the activation of an investigation trigger or at the request of the State Engineer. An investigation will be conducted by the Applicant with the involvement of the State Engineer, to determine the cause, significance, and condition of the location with an activated investigation trigger.[307] Once an investigation is completed, the findings are presented at the end of each quarter to the State Engineer[308] and the parties who received notice of the investigation trigger.

The Protestants argued that there is no time limit for the Applicant to complete an investigation and because of this, harm will come to existing water rights and environmental resources.[309] The State Engineer does not agree. The Applicant is required to present quarterly reports to the State Engineer and other noticed parties detailing when an investigation trigger has been activated and what findings were made from the investigation. The time to complete an investigation may vary depending on the resource and situation. Management actions that may result from investigation findings are discretionary, and unless a mitigation trigger has been activated under the 3M Plans, no unreasonable effect should have occurred.

The State Engineer finds that investigations are best management practices that provide data on the cause of the investigation trigger and on the condition of the resource. The State Engineer finds that the investigation methodology is acceptable to determine departures from baseline conditions and keeps the State Engineer's office adequately informed as to the status of the GDP project.

5. Management Actions

The record demonstrates that the 3M Plans contain management actions for the applicable existing water rights. As discussed in the Technical Analysis Report, the purpose of implementing management actions is to avoid or minimize the risk of the activation of mitigation triggers and support responsible groundwater development.[310] Specific management actions are dependent upon the risk of impact, the significance of the change, the potential of the mitigation trigger being reached, and the sensitivity of the

[307] 2017 Transcript, Vol. 2 p. 404:8-13 (Prieur).
[308] Exhibit No. SNWA_507, p. 10-35.
[309] 2017 Transcript, Vol. 10, p. 2022:2-16 (Hejmanowski).
[310] Exhibit No. SNWA_507, pp. 3-6 to 3-7.

resource.[311] Several examples are provided in the 3M Plans of particular management actions that may be utilized to avoid reaching a mitigation trigger for a specific existing water right.[312]

Mr. Prieur explained that preemptive mitigation is included as a management action to deal with uncertainty if there is a potential influence from pumping on a nearby or sensitive water resource.[313] The 3M Plans require the design and installation of a preemptive mitigation action prior to the initiation of project pumping for specific rights.[314] General examples, as described by Mr. Prieur, include installing a pump in an artesian well, installing a shallow well equipped with a solar panel near a spring, or having temporary water ready at the water resource.[315] The State Engineer questioned Mr. Prieur about a reserved right and a stockwater right which are within a mile of one of the Applicant's wells.[316] Mr. Prieur testified that due to the proximity of these rights to the Applicant's wells, monitoring occurs directly at these sites and a plan for preemptive implementation of mitigation would be in place prior to initiation of GPD pumping operations beginning as identified for Management Category A water rights in the Spring Valley 3M Plan.[317] The State Engineer finds that management actions specified in the 3M Plan will be effective to avoid an unreasonable effect. The State Engineer further finds that the management actions conform to best management practices and industry standards.

6. Mitigation Triggers

Mitigation triggers are required to signal that thresholds have been crossed, and require mitigation actions to avoid unreasonable effects and comply with Nevada water law.[318] The 3M Plans establish specific mitigation triggers for hydrologic resources to ensure that the triggers are neither arbitrary nor capricious. For existing water rights, the mitigation trigger is set in reference to the ability of an existing water right to receive the

[311] Exhibit No. SNWA_507, p. 3-13.
[312] Exhibit No. SNWA_507, pp. 3-5 and 3-13 – 3-14; Exhibit No. SNWA_592, pp. 3-8 – 3-9; Exhibit No. SNWA_593, pp. 3-9 – 3-10.
[313] 2017 Transcript, Vol. 2 p. 438:10-12 (Prieur).
[314] 2017 Transcript, Vol. 2 p. 438:12-15 (Prieur).
[315] 2017 Transcript, Vol. 2 p. 438:16-21 (Prieur).
[316] 2017 Transcript, Vol. 4 p. 938:19-940:4 (Prieur).
[317] 2017 Transcript, Vol. 4 p. 939:3-10 (Prieur).
[318] Exhibit No. SNWA_507, p. 3-4; Exhibit SNWA_592, p 3-1; Exhibit SNWA_593, p 3-2.

permitted diversion rate and/or annual duty and is designated to protect the volume of water committed to a beneficial use.[319]

a. Water Resource Assessment

Because the mitigation trigger is resource-based, the 3M Plans require the Applicant to conduct a Water Resource Assessment before the groundwater pumping project begins. Mr. Prieur explained that the Water Resource Assessment provides the Applicant with the ability to have a snapshot of the conditions of the infrastructure and construction associated with each water right at a time close to beginning project operations.[320] The Water Resource Assessment would be conducted at least three years prior to the initiation of the project.[321] Mr. Prieur also testified that access to a water resource would be required in order to perform the assessment, and if the existing water right holder did not provide access, the Applicant would request that the State Engineer facilitate entry or conduct the Water Resource Assessment with staff of the State Engineer's Office.[322] If the Applicant is unable to gain access and gather the necessary information, the 3M Plans set the mitigation trigger to be associated with the diversion rate until other data are available.[323]

The Applicant has experience conducting studies similar to the Water Resource Assessment. The Applicant provided an exhibit entitled *Field Guide to Spring Valley Monitoring Program Springs*, which details many of the springs present in Spring Valley.[324] This exhibit provides substantial information for each spring and the State Engineer finds that the Applicant will add to the already-existing information after conducting the Water Resource Assessment.

The Protestants questioned why the Water Resource Assessment is not completed already.[325] Mr. Prieur testified that the goal of the Water Resource Assessment is to determine the conditions of a particular resource immediately prior to pumping.[326] Performing the Water Resource Assessment now would not provide the Applicant with

[319] Exhibit No. SNWA_507, p. 3-21.
[320] 2017 Transcript, Vol. 2 pp. 449:22 – 450:2 (Prieur).
[321] 2017 Transcript, Vol. 2 p. 450:3-4 (Prieur).
[322] 2017 Transcript, Vol. 2 p. 451:3-8 (Prieur).
[323] 2017 Transcript, Vol. 4 p. 910:5-20 (Prieur).
[324] Exhibit No. SNWA_601.
[325] Exhibit No. CTGR_022, p. 16.
[326] 2017 Transcript, Vol. 2 p. 450:18-23 (Prieur).

the necessary representative data that is required under the 3M Plans.[327] The Protestants also claim that triggers are not actually created because the Water Resource Assessment has not been completed.[328] Mr. Prieur testified that the mitigation triggers are linked to the resource itself via the water right appropriating a particular resource.[329] Likewise, the investigation triggers are linked to the baseline data, not the physical conditions of a particular site.[330] The State Engineer agrees with the Applicant that the Water Resource Assessment is a tool to characterize conditions of resource sites prior to groundwater pumping and this Assessment need not be conducted to inform the decisions the State Engineer is making herein.

b. Groundwater Rights

Mr. Prieur initially identified two types of underground existing water rights: those where the well and pumping system have the capacity to produce more than the permitted diversion rate; and those where the well and pumping system cannot produce the permitted diversion rate.[331] Primarily, the specific capacity of the well is used to make this distinction.[332]

Mr. Prieur explained that the mitigation trigger for a well producing at or above its permitted diversion rate is the static water level needed to produce the water right at its diversion rate, plus either a 10 percent or 10-foot buffer, whichever is greater.[333] Mr. Prieur then identified the mitigation trigger for a well producing less than the permitted diversion rate as being the same as the investigation trigger.[334] Activating these mitigation triggers requires the Applicant to implement mitigation actions to ensure the existing water right holder is made whole.[335]

The 3M Plans also establish a mitigation trigger based on power usage for an existing underground water right. This occurs where a lowering of the static water level is caused by the Applicant and results in an unreasonable increase in the economic costs

[327] 2017 Transcript, Vol. 2 p. 450:22-23 (Prieur).
[328] Exhibit No. CTGR_022, p. 16.
[329] 2017 Transcript, Vol. 2 p. 451:14-18 (Prieur).
[330] 2017 Transcript, Vol. 2 p. 451:19-21 (Prieur).
[331] Exhibit No. SNWA_507, p. 3-22; Exhibit No. SNWA_592, p. 3-11; Exhibit No. SNWA_593, p. 3-12; 2017 Transcript, Vol. 2 p. 428:9-13 (Prieur).
[332] 2017 Transcript, Vol. 2 pp. 429:19 – 430:3 (Prieur).
[333] Exhibit No. SNWA_507, p. 3-24; 2017 Transcript, Vol. 2 p. 431:14-16 (Prieur).
[334] 2017 Transcript, Vol. 2 p. 432:179-19 (Prieur); Exhibit SNWA_507 p. 3-25.
[335] 2017 Transcript, Vol. 2 pp. 432:20 – 433:1 (Prieur).

associated with increased power usage.[336] The Applicant presented evidence that if power usage increases more than 25 percent over that of the base period before the Applicant began pumping, the existing underground water user would be compensated for the increase in power costs.[337]

Dr. Myers criticized the 3M Plans for drawing a distinction between a well that can produce more than the permitted diversion rate and one that produces less than the permitted diversion rate, claiming that such a distinction is discriminatory.[338] However, after the Applicant questioned Dr. Myers' understanding of the reasoning behind this distinction, Dr. Myers conceded that there is a legitimate reason to treat these two types of wells differently.[339] The State Engineer finds that the 3M Plans create a reasonable and logical distinction between the ability of various wells to produce different quantities of water for the 3M Plans' purposes.

The Protestants presented a report, entitled *Drawdown "Triggers": A Misguided Strategy for Protecting Groundwater-Fed Streams and Springs* by M.J. Currell, which criticizes using drawdown as a trigger.[340] Mr. Prieur identified a letter to the editor providing a technical review of the Currell article by Mr. Harrington,[341] in which Mr. Harrington provided a framework arguing that drawdown triggers are an appropriate management strategy if deployed correctly.[342] Mr. Currell responded, conceding that if baseline data is established with which drawdown can be compared, then establishing triggers based on drawdown is appropriate.[343] The State Engineer finds that drawdown triggers can be used and the 3M Plans correctly employ the use of drawdown triggers utilizing the best science available. The drawdown triggers specified in the 3M Plans are defined and objective triggers will be able to be monitored in a non-arbitrary fashion. Therefore, these triggers will be effective in ensuring that the mitigation of unreasonable effects are neither arbitrary nor capricious.

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[336] NRS 534.110(4) – "In determining a reasonable lowering of the static water level in a particular area, the State Engineer shall consider the economics of pumping water for the general type of crops growing and may also consider the effect of using water on the economy of the area in general." 2017 Transcript, Vol. 2 p. 436:13-18 (Prieur).
[337] 2017 Transcript, Vol. 2 p. 436:19-23 (Prieur) Exhibit No.SNWA_507, pp. 3-10-11.
[338] Exhibit No. GBWN_297, p. 44; 2017 Transcript, Vol. 9 p. 1954:11-15 (Myers).
[339] 2017 Transcript, Vol. 9 p. 1955:8-14 (Myers).
[340] Exhibit No. GBWN_289; 2017 Transcript, Vol. 2 p. 433:10-13 (Prieur).
[341] 2017 Transcript, Vol. 2 p. 434:17-20 (Prieur).
[342] Exhibit No. SNWA_602; 2017 Transcript, Vol. 2 pp. 434:14 – 435:7 (Prieur).
[343] Exhibit No. SNWA_603; 2017 Transcript, Vol. 2 p. 435:14-19 (Prieur).

Dr. Myers commented that the Applicant should be responsible for any and all additional costs due to a lowering of the static water level.[344] The State Engineer finds this argument unpersuasive because groundwater appropriations *must* allow for a reasonable lowering of the static water level as directed in NRS 534.110(4). The State Engineer finds that the 3M Plans provide a standard whereby the Applicant will mitigate an existing groundwater right holder in a manner that is neither arbitrary nor capricious in accordance with the defined triggers and thresholds set by the 3M Plans.

c. Spring / Stream Rights

Mr. Prieur testified that the 3M Plans require investigation and mitigation triggers for spring and stream rights in the same manner as was done for underground rights. He identified that the categories were based on whether the spring or stream flow is consistently above the permitted diversion rate or if it is consistently below the permitted diversion rate.[345] For springs and streams that are consistently above the permitted diversion rate, the mitigation trigger is set at a flow of 10 percent above the permitted diversion rate.[346] For springs and streams that are consistently below the permitted diversion rate, as with under-producing groundwater wells described above, the investigation trigger is the mitigation trigger.[347] If a mitigation trigger is activated, the 3M Plans require the Applicant to ensure the existing spring or stream water right holder is made whole.[348]

The 3M Plans also have mitigation triggers in place for springs and streams that exhibit intermittent flow. Mr. Prieur testified that intermittent water sources are dry over long periods of time and because of that, are difficult to quantify.[349] However, the 3M Plans state that these intermittent water sources would be compared to proximal regional hydrologic conditions.[350] By doing this, the 3M Plans establish a method by which mitigation actions would ensure that a water right holder is made whole when regional conditions are such that the spring or stream should be able to flow but it is not flowing due to Applicant's pumping.[351] The State Engineer finds that the 3M Plans have

[344] Exhibit No. GBWN_297, p. 44.
[345] 2017 Transcript, Vol. 2 p. 443:4-9 (Prieur).
[346] 2017 Transcript, Vol. 2 p. 444:4-10 (Prieur).
[347] 2017 Transcript, Vol. 2 p. 445:12-19 (Prieur).
[348] 2017 Transcript, Vol. 2 p. 445:18-19 (Prieur).
[349] 2017 Transcript, Vol. 2 p. 446:1-4 (Prieur).
[350] 2017 Transcript, Vol. 2 p. 446:5-8 (Prieur).
[351] 2017 Transcript, Vol. 2 p. 446:9-18 (Prieur).

established defined mitigation triggers for spring and stream rights that are neither arbitrary nor capricious. These mitigation triggers and thresholds will allow the Applicant to avoid unreasonable effects to existing water rights in a systematic and scientifically acceptable fashion.

The State Engineer finds that activation of an investigation or mitigation trigger does not signify that an unreasonable effect has occurred. The purpose of the triggers is to avoid unreasonable effects. The State Engineer therefore finds that the Applicant's approach to triggers is responsive to changed conditions and will avoid unreasonable effects and ensure compliance with Nevada law and the Remand Order. The State Engineer also finds that by using both investigation and mitigation triggers, there will be a reduced risk of approaching, let alone causing, unreasonable effects.

7. Mitigation Actions

The 3M Plans require the Applicant to implement mitigation within 30 days of mitigation trigger activation.[352] The 3M Plans provide numerous mitigation actions that are known to be effective and available to the Applicant.[353] The mitigation actions will ensure that existing water right holders have continued access to their permitted water or will ensure that the existing water right holder is made whole.

The record reflects that the Applicant owns a substantial number of water rights and other resources that may be used for mitigation.[354] Dr. Myers criticized the mitigation effectiveness by stating that providing mitigation water would only add to the drawdown and the only way to properly mitigate would be to transfer mitigation water from another basin.[355] The testimony of Mr. Prieur shows that the Spring Valley 3M Plan requires other means of mitigating rights beyond simply delivering mitigation water to an existing water right holder.[356] Mr. Prieur explained that redevelopment or rehabilitation of a well could be used to increase the effectiveness and efficiency of the well.[357] This action would utilize the existing water right holder's water right, but would make the means of

[352] Exhibit No. SNWA_592, p. 5-1; Exhibit No. SNWA_593, p. 5-1.
[353] Exhibit No. SNWA_507, pp. 3-28 – 3-30.
[354] Exhibit No. SNWA_507 pp. 6-10 to 6-11, 6-21 to 6-22, 6-39 to 6-40, 6-47, 6-53, 7-23, 8-22 to 8-23, 9-9, 9-21 to 9-22.
[355] Exhibit No. GBWN_281, p. 67.
[356] 2017 Transcript, Vol. 2 p. 453:17-19 (Prieur).
[357] 2017 Transcript, Vol. 2 pp. 453:20 – 454:1 (Prieur).

delivery more efficient.[358] Dr. Myers agreed that this use of replacement water would not increase the discharge from the aquifer through wells.[359]

Mr. Prieur testified about the Applicant's experience in mitigating for large water development projects in southern Nevada.[360] Mr. Prieur specifically identified one such program for the Town of Blue Diamond, Nevada, which was very susceptible to drought conditions.[361] There, the Applicant established triggers that signal management actions such as well rehabilitation or lowering of pumps to maintain a continuous water supply to the town.[362] Mr. Prieur further testified that the Applicant delivers the daily water needed to the more than 2 million inhabitants and visitors of Las Vegas in a reliable and consistent manner.[363] Mr. Prieur also testified that the Applicant has a long history of stewardship and dedication to long-term sustainable use of the aquifer system in southern Nevada.[364]

Through testimony and review of the record, the State Engineer finds that the Applicant has presented substantial evidence of its ability to implement effective mitigation. The State Engineer finds that the 3M Plans include effective and specific mitigation actions for water rights that will be taken if a mitigation trigger is activated. Also, the State Engineer finds that taking action within 30 days of a mitigation trigger activation is a reasonable and responsive time frame. Further, the State Engineer finds that the 3M Plans properly include or require the necessary data to establish representative baselines for hydrologic resources, determine departure from the baseline conditions, signal activation of triggers, and inform adaptive management and mitigation. Finally, the State Engineer finds that the presently known substantial evidence of its ability to implement effective mitigation complies with the principles in *Eureka*.

D. Spring Valley

1. Protection of Existing Water Rights in Spring Valley

The Spring Valley 3M Plan protects senior water rights based on the standards, thresholds and triggers described above. The Spring Valley 3M Plan contains a

[358] 2017 Transcript, Vol. 2 p. 454:1-3 (Prieur).
[359] 2017 Transcript, Vol. 9 p. 1954:8-10 (Myers).
[360] 2017 Transcript, Vol. 2 p. 347:10-15 (Prieur).
[361] 2017 Transcript, Vol. 2 p. 348:4-7 (Prieur).
[362] 2017 Transcript, Vol. 2 p. 348:8-12, 440:6-8 (Prieur).
[363] 2017 Transcript, Vol. 2 pp. 348:23 – 349:2 (Prieur).
[364] 2017 Transcript, Vol. 2 p. 348:14-16 (Prieur).

monitoring network for wells, springs and streams.[365] The Spring Valley 3M Plan uses numerous monitoring devices to monitor 134 existing water rights and 18 domestic wells and further requires that each of these existing rights be protected.[366] The Protestants did not contest that all senior water rights are included in the plan. The State Engineer finds that all senior water rights are properly protected by the Spring Valley 3M Plan because defined standards, threshold and triggers apply to each water right, which will guarantee that mitigation of unreasonable effects from the Applicant's GDP pumping are neither arbitrary nor capricious.

2. 3M Plan Requirements at Cleveland Ranch

The 3M Plan requires monitoring at Cleveland Ranch to address the potential for impacts from the propagation of drawdown from Applicant's wells. Cleve Creek has a USGS gage, which provides ongoing monitoring of creek flows.[367] Additional monitoring is required at two springs.[368] A spring on the Cleveland Ranch South Unit has a required flume-measurement that measures continuous discharge.[369] Additional monitor wells are located between the South Unit and the northernmost Applicant well. At Rogers Ranch, South Millick Spring is continuously monitored with a piezometer and a flume is installed.[370]

Monitoring is required between the Applicant's wells and Cleveland Ranch. Bastian South well is located approximately six miles south of Cleveland Ranch and one mile north of the closest Applicant well.[371] Bastian North is located about two miles from that well and provides static water levels during the non-irrigation season.[372] The BLM Cleve Creek Well is located approximately five and one-half miles from the Applicant's well.[373] Two of the Applicant's monitoring wells, SPR7029M and SPR7029M2, were completed at different depths to measure the vertical flow paths on the alluvial fan.[374] The record reflects that these two wells are located approximately six miles from the

[365] Exhibit No. SNWA_507, p. 10-8 – 10-13; Exhibit No. SNWA_592, p. 2-3 – 2-9.
[366] Exhibit No. SNWA_592, p. 2-10.
[367] 2017 Transcript, Vol. 2 p. 494:8-20 (Prieur).
[368] 2017 Transcript, Vol. 2 p. 496:4-8 (Prieur).
[369] 2017 Transcript, Vol. 2 p. 496:17-21 (Prieur).
[370] 2017 Transcript, Vol. 2 p. 492:10-16 (Prieur).
[371] 2017 Transcript, Vol. 2 p. 498:20-22 (Prieur).
[372] 2017 Transcript, Vol. 2 pp. 498:22 – 499:4 (Prieur).
[373] 2017 Transcript, Vol. 2 p. 499:4-5 (Prieur).
[374] 2017 Transcript, Vol. 2 p. 495:2-23 (Prieur).

Applicant's closest well.[375] The Applicant also has sentinel monitor wells SPR7030M and SPR7030M2, which are located on the Cleveland South Unit, roughly six and one-half miles from the Applicant's closest well.[376] Finally, SPR7031Z is a piezometer located next to the spring on the South Unit about seven miles from the Applicant's closest well.[377] The State Engineer finds that these monitoring devices can effectively monitor drawdown from the Applicant's GDP and aid in ensuring that unreasonable effects are avoided.

Mr. Prieur testified that a small amount of drawdown at Bastian South well would signal a divergence or departure from baseline and activate an investigation trigger.[378] Next, static water levels at Bastian North well could be compared to see if there is a significant drawdown or change from season to season.[379] After drawdown is observed at a distance of five and one-half miles, the other monitor wells would be monitored to detect departure from the baseline data.[380] The State Engineer finds that due to the distance between the Applicant's wells and Protestant CPB's property and grazing allotments, sufficient monitoring locations are present that will detect propagation of potential drawdown with sufficient time to implement the Spring Valley 3M Plan.

The 3M Plan contains specific thresholds and triggers to protect CPB water rights based on this monitoring. The 3M Plan requires numerous mitigation actions if drawdowns from the GDP affect existing water rights on Cleveland Ranch. These mitigation actions include lining the creek and ditch beds,[381] piping water directly onto the ranch from other sources,[382] using portions of Cleve Creek that the Applicant owns,[383] or placing production wells along the alluvial fan to pump groundwater to the ranch.[384]

The 3M Plan requires mitigation actions to replace water to the springs on Cleveland Ranch. Specifically, the plan requires the Applicant to line Cleve Creek and deliver more water to Cleveland Ranch to mitigate the conflict. In addition to lining Cleve Creek, the Applicant is required to take other actions to ensure CPB receives its

[375] Exhibit No. SNWA_597, p. 15.
[376] 2017 Transcript, Vol. 2 p. 499:9-12 (Prieur).
[377] 2017 Transcript, Vol. 2 p. 499:13-16 (Prieur).
[378] 2017 Transcript, Vol. 2 p. 501:11-17 (Prieur).
[379] 2017 Transcript, Vol. 2 p. 501:18-21 (Prieur).
[380] 2017 Transcript, Vol. 2 p. 502:6-14 (Prieur).
[381] 2017 Transcript, Vol. 3 p. 555:8-17 (Prieur).
[382] 2017 Transcript, Vol. 3 p. 558:19-39 (Prieur).
[383] Exhibit No. SNWA_507, p. 6-39; 2017 Transcript, Vol. 3 pp. 555:23 – 556:9 (Prieur).
[384] 2017 Transcript, Vol. 3 p. 559:7-10 (Prieur).

water right at Cleveland Ranch. Accordingly, the State Engineer finds that these actions would be effective in ensuring that any conflict with CPB's existing water rights caused by GDP pumping can be mitigated.

3. Shoshone Ponds and Pahrump Poolfish

In Spring Valley, there is one federally listed endangered species called the Pahrump Poolfish, which is located at Shoshone Ponds. Mr. Marshall testified that the Pahrump Poolfish habitat at Shoshone Ponds is managed by the BLM and NDOW, and very little active management has occurred since the ponds were constructed decades ago.[385] While the Spring Valley 3M Plan requires the Applicant to avoid an unreasonable effect to the species from GDP pumping, neither the State Engineer nor the Applicant have control over habitat management or population numbers.

Mr. Prieur testified that the area underlain by the ponds is comprised of interbedded clay and sand deposits,[386] and the ponds are constructed on clay materials in the upper strata with very low vertical hydraulic conductivity.[387] Mr. Prieur provided his opinion that groundwater pumping would not have a direct effect on the ponds themselves.[388] The only effects, if any, would be to the artesian flow coming from the wells.[389]

The unreasonable effect is jeopardizing the continued existence of the Pahrump Poolfish species.[390] The 3M Plan's approach is to protect the existing water rights, which in turn protects the Pahrump Poolfish habitat at Shoshone Ponds.[391] The Technical Analysis Report postulates that a stable Pahrump Poolfish population of sufficient size to help downlist the species under the Endangered Species Act can be maintained at Shoshone Ponds from a discharge of 3.3 gallons per minute (gpm).[392] The existing water right at the Shoshone NDOW Well (Permit Number 27768) (12.39 gpm) is over three times the flow necessary to maintain a stable Pahrump Poolfish population at the Shoshone Ponds. The investigation trigger is activated if artesian flow rate of the Shoshone NDOW Well is less than 15 gpm with no flow valve restrictions for a

[385] 2017 Transcript, Vol. 2 pp.473:14-17 (Marshall); Exhibit No. SNWA_507 p. 6-60.
[386] 2017 Transcript, Vol. 2 p. 482:11-14 (Prieur).
[387] 2017 Transcript, Vol. 2 p. 483:3-5 (Prieur).
[388] 2017 Transcript, Vol. 2 p. 484:8-9 (Prieur).
[389] 2017 Transcript, Vol. 2 p. 484:9-10 (Prieur).
[390] Exhibit No. SNWA_592, p. 3-28.
[391] Exhibit No. SNWA_592, p. 3-28.
[392] Exhibit No. SNWA_507, p 6-65.

continuous period of 6 months.[393] In the event that the Applicant cannot install instrumentation in the Shoshone NDOW Well, Shoshone Well #2 is located 100 feet away, has a similar completion depth, and will be used as a monitoring site.[394] If the investigation trigger is activated, the 3M Plan requires the Applicant to conduct an investigation, and management actions to protect the existing water right and/or Pahrump Poolfish as specified in the Spring Valley 3M Plan.[395]

The 3M Plan mitigation trigger is activated if the artesian flow rate of the Shoshone NDOW Well is less than 13.5 gpm with no flow valve restrictions for a continuous period of six months.[396] The 13.5 gpm trigger provides a 10 percent buffer above the existing water right of 12.39 gpm and allows time to implement mitigation actions to avoid an unreasonable effect.[397] If a mitigation trigger is activated, the 3M Plan requires that within 30 days the Applicant will implement existing water right mitigation as well as Pahrump Poolfish mitigation actions as specified in the Spring Valley 3M Plan. The mitigation actions will ensure that the water supply is available at Shoshone Ponds to continue to support a Pahrump Poolfish population of sufficient size to help recover the species.[398] The Spring Valley 3M Plan also details that the Applicant will contribute to other Pahrump Poolfish habitat or population management efforts in collaboration with BLM, NDOW, and USFWS if deemed necessary by the State Engineer.[399] The Technical Analysis Report provides evidence that the mitigation actions will be effective, and Mr. Marshall testified that the mitigation actions will be effective, partially based on previous actions that have been successful at this location. Mr. Marshall's testimony also demonstrated the Applicant's commitment to collaborate with the BLM and NDOW in order to ensure the habitats are maintained for the Pahrump Poolfish.[400]

Protestants criticized the Spring Valley 3M Plan because it did not evaluate the water chemistry, and that replacing flows with mitigation water from elsewhere may not be successful if the fish depend on specific water chemistry.[401] Mr. Marshall testified

[393] Exhibit No. SNWA_592, p. 3-30.
[394] Exhibit No. SNWA_507, p. 6-76; Exhibit No. SNWA_592, p. 3-30.
[395] Exhibit No. SNWA_592, p. 3-30.
[396] Exhibit No. SNWA_592, p. 3-30.
[397] Exhibit No. SNWA_507, p. 6-79.
[398] Exhibit No. SNWA_592, pp. 3-29 – 3-30.
[399] Exhibit No. SNWA_592, p. 3-29 – 3-30.
[400] 2017 Transcript, Vol. 2 p. 490:14-21 (Marshall); Exhibit No. SNWA_507 p. 6-82.
[401] Exhibit No. GBWN_297, pp. 46-47.

that the Protestants' criticism is mistaken, because the 3M Plan calls for providing the same water, via pump, rather than artesian pressure, if necessary.[402] Furthermore, the Technical Analysis Report provides extensive information and references indicating that the species is hardy, having survived and reproduced in habitats that vary widely in their environmental characteristics, including water chemistry.[403]

The State Engineer finds that protecting this water right will protect the resource because the evidence shows that the Pahrump Poolfish will continue to survive in this location so long as the habitats are supplied with water. The 3M Plan has adequately defined standards, thresholds, and triggers so that unreasonable effects to the Pahrump Poolfish from the GDP pumping can be mitigated or avoided. The State Engineer finds that these triggers are neither arbitrary nor capricious as the triggers are defined, objective and easily observable. The State Engineer further finds that the 3M Plan will be successful in protecting the existing water rights in this area, which in turn will protect the Pahrump Poolfish habitat. The State Engineer finds that the Spring Valley 3M Plan has identified effective mitigation actions that will avoid or eliminate unreasonable effects to the federally listed endangered Pahrump Poolfish because similar actions have been successful in the past.

4. Mesic Habitat and Native Aquatic-Dependent Special Status Animal Species

The Technical Analysis Report and 3M Plan describe mesic habitat as being composed of spring, seep, pond, wetland/meadow, marsh, and stream components that are often intermixed to form complexes.[404] The Technical Analysis Report further states that mesic habitats in the Spring Valley groundwater discharge area are maintained by "a variety of natural and human-made factors, . . . [including] spring discharge, surface-water runoff from surrounding areas and mountains, subsurface inflow from the mountains, shallow groundwater, precipitation, water diversions, well outflow, and irrigation."[405] Mr. Marshall testified that the mesic habitat has frequently been enhanced by human activities like diversion works, ditches, and sub-irrigation for ranching.[406] The

[402] 2017 Transcript, Vol. 2 p. 481:11-15 (Marshall).
[403] Exhibit No. SNWA_507, pp. 6-58 and 6-65.
[404] Exhibit No. SNWA_507, p 5-4; Exhibit No. SNWA_592, p. 2-44.
[405] Exhibit No. SNWA_507, p. 5-4.
[406] 2017 Transcript, Vol. 3 pp. 572:23 – 573:4 (Marshall).

northern leopard frog, a native aquatic-dependent special status animal species, inhabits mesic habitat in the Spring Valley groundwater discharge area.[407] The Spring Valley 3M Plan manages mesic habitat and northern leopard frogs together. The State Engineer finds this to be a logical and reasonable approach for this habitat and species, based on the co-occurrence of the species and the habitat.

The Technical Analysis Report, Spring Valley 3M Plan, and Mr. Marshall's testimony reflect that the mesic habitat and northern leopard frog strategy focuses on Management Block 3, Applicant's McCoy Creek Property, and existing water rights. Management Block 3 is a focus because approximately half of the mesic habitat in the Spring Valley groundwater discharge area is located there, and the Management Block 3 habitat provides seasonal and long-term needs for the northern leopard frog.[408] The McCoy Creek Property is crucial because it encompasses over 900 acres of mesic habitat, supports all life stages and large numbers of northern leopard frogs, and together with associated Applicant water rights, provides the Applicant with substantial integrated resource management opportunities.[409] As explained by Mr. Marshall, this approach "is consistent with the approach that Fish and Wildlife Service takes under Section Ten of the [ESA] in habitat conservation planning . . . to insure the protection of a block of habitat for listed species or sensitive species while allowing some impact in other areas."[410] In addition to these areas, mesic habitat and northern leopard frogs occur in various locations within the Spring Valley groundwater discharge area where existing water rights occur.[411] The State Engineer finds that based on environmental and hydrologic data, the 3M Plan's strategy of focusing on Management Block 3, the Applicant's McCoy Creek Property, and existing water rights is a rational and logical scope for monitoring to avoid unreasonable effects to mesic habitat and northern leopard frogs.

The unreasonable effects that the 3M Plan avoids for mesic habitat and northern leopard frog are the elimination of the habitat type and the extirpation of the native aquatic-dependent special status animal species from the Spring Valley groundwater

[407] 2017 Transcript, Vol. 3 p. 576:24 – 577:2 (Marshall); Exhibit No. SNWA_592, p. 3-31.
[408] Exhibit No. SNWA_507, pp. 6-82 to 6-83.
[409] Exhibit No. SNWA_507, p. 6-84.
[410] 2017 Transcript, Vol. 3 p. 579:15-21 (Marshall).
[411] Exhibit No. SNWA_507, pp. 5-13 to 5-14.

discharge area.[412] The Spring Valley 3M Plan establishes quantitative investigation and mitigation triggers for mesic habitat and northern leopard frogs. Investigation triggers are established at sentinel monitor wells SPR7029M, SPR7029M2, SPR7030M, SPR7030M2, and SPR7044M, which detect change in water levels near the south end of Management Block 3.[413] The investigation trigger is activated if the water level falls outside of the baseline. If an investigation trigger is activated at one of the sentinel wells, the 3M Plan requires the Applicant to conduct an investigation, and management actions may be implemented for existing water rights and/or mesic habitat and northern leopard frogs at McCoy Creek Property as specified in the 3M Plan.[414] If a mitigation trigger is activated at any existing water right in Management Block 3, the 3M Plan requires that within 30 days the Applicant will implement existing water right mitigation as well as mesic habitat and the northern leopard frogs' mitigation in Management Block 3 and McCoy Creek Property.[415]

The State Engineer finds that the number of existing water rights that support mesic habitat and northern leopard frogs in Management Block 3 and other areas in Spring Valley, and the Applicant's ownership of McCoy Creek Property and associated water rights, make this approach feasible. The State Engineer finds that the water right mitigation described above will ensure that the water is available to continue to support mesic habitat and northern leopard frogs, and the environmental mitigation will enhance mesic habitat for the benefit of northern leopard frogs and other wildlife species. The Technical Analysis Report provides evidence that the various mitigation actions will be effective, and Mr. Marshall testified that the detailed mitigation actions in the Spring Valley 3M Plan will be effective.[416]

Protestant CTGR claimed that the Spring Valley 3M Plan improperly uses the northern leopard frog "as an indicator species for mesic habitat ecosystem viability."[417] On cross-examination, Protestant CTGR's expert witness, Dr. Reich, stated that he did not know whether the Spring Valley 3M plan did in fact use the northern leopard frog as

[412] Exhibit No. SNWA_592, p. 3-31.
[413] Exhibit No. SNWA_592, p. 3-33.
[414] Exhibit No. SNWA_592, p. 3-23, 3-31, and 3-33.
[415] Exhibit No. SNWA_592, p. 3-24, 3-33.
[416] 2017 Transcript, Vol. 2 p. 372:10-16 (Marshall); 2017 Transcript, Vol. 3 p. 579:15-21 (Marshall); Exhibit SNWA_507 p. 6-90.
[417] Exhibit No. CTGR_022, p. 11.

an indicator species.[418] Mr. Marshall testified that this critique is a misrepresentation of the plan.[419] Mr. Marshall stated that the northern leopard frog is included in the 3M Plan because it is a native aquatic-dependent special status animal species, and the plan focuses on conserving the habitat where there are known locations of the northern leopard frog – but the northern leopard frog is not an indicator species.[420] The rebuttal report by Protestant CPB's expert Dr. Roundy states that "the main concerns are that [Applicant] pumping will reduce forage production and stock water availability on spring-fed localized areas within their BLM allotments."[421] CPB's mesic habitat will be protected to the extent that spring flow is supplied excess surface water by irrigation and that existing rights to spring flow are protected.

Protestants also criticized that the 3M Plan could allow the Applicant to dry up the valley as long as the McCoy Creek Property remains for the northern leopard frog.[422] Specifically, Protestant CTGR stated that "what occurs to mesic habitat and native aquatic dependent special species outside of the Applicant's owned McCoy Creek Property becomes irrelevant," and "the Applicant's [Technical Analysis Report] anticipates that only the McCoy Creek Property remains viable."[423] The State Engineer finds this argument to be inconsistent with the Spring Valley 3M Plan. Mr. Marshall responded to that critique, stating that "mesic habitat across the valley have multiple supplies of water, [including] mountain front runoff, precipitation, and that the critique doesn't contemplate the protection of existing water rights across the valley and the protection they provide for springs and surface waters that supports mesic habitat."[424]

Protestant CPB was also concerned that GDP pumping could "dewater" mesic habitat on Cleveland Ranch, and claimed a six-month continuous deficit would result in a major loss of forage, stock water, and wildlife habitat. The Spring Valley 3M Plan's triggers and actions avoid or eliminate conflict with the existing spring water rights on Cleveland Ranch, thereby providing protection for the mesic habitat which relies on this water. The Applicant's rebuttal report to Dr. Roundy states that "protection of the

[418] 2017 Transcript, Vol. 7 p. 1581:15-16 (Reich).
[419] 2017 Transcript, Vol. 3 p. 577:13-14 (Marshall).
[420] 2017 Transcript, Vol. 3 pp. 577:18 – 578:1 (Marshall).
[421] Exhibit No. CPB_026 p. 5.
[422] Exhibit No. CTGR_022, p.12.
[423] Exhibit No. CTGR_022, pp. 12-13.
[424] 2017 Transcript, Vol. 3 p. 580:15-22 (Marshall).

existing water rights under the 3M Plan ensures that the mesic habitat supported by those water rights can be maintained, provided CPB continues suitable irrigation and grazing practices that support the habitat."[425] Protestant CPB's expert, Dr. Roundy, stated in his report that "if [groundwater] withdrawal does not reduce water availability . . . then impacts to wetlands, meadows, and obligate phreatophytes should be limited."[426] Protestant CPB's expert also agreed during the hearing that if there are no impacts to Cleveland Ranch existing water rights, "you don't have a problem."[427]

The State Engineer finds that the concerns regarding mesic habitat on CPB ranchlands are resolved by the Spring Valley 3M Plan, in part because the stream irrigation water rights will not be affected by the Applicant's GDP pumping. The State Engineer further finds that the Spring Valley 3M Plan established quantitative triggers and identified mitigation actions that will avoid the defined unreasonable effects to mesic habitat and the native aquatic-depended special status animal species northern leopard frog.

5. <u>Shrubland Habitat</u>

The Technical Analysis Report and Spring Valley 3M Plan describe shrubland habitat in the Spring Valley groundwater discharge area as being composed of facultative phreatophytic shrub species (which typically use groundwater as a secondary water source after precipitation) as well as shrub species that rely solely on precipitation.[428] During the 2011 hearing, there was much evidence and discussion about facultative phreatophytic shrubs and the shrubland plant transitions that may occur from GDP pumping.[429] That evidence remains in the record and is incorporated into this opinion.

At the remand hearing, Mr. Marshall testified that if facultative phreatophytes lose access to groundwater, it is expected that they will "reduce in their total cover and [be] replaced over time by plants that are more advantaged in their ecology and are able to do better just on precipitation."[430] Protestant CPB's expert Dr. Roundy agreed that "transitions can happen in a healthy fashion."[431] Mr. Marshall explained that this plant

[425]Exhibit SNWA_598, p. 11.
[426] Exhibit No. CPB_022, p. 7.
[427] 2017 Transcript, Vol. 7 1443:19-1444:9 (Roundy); Exhibit No. CPB_022, p.7.
[428] Exhibit No. SNWA_507 p. 5-8; Exhibit No. SNWA_592, p. 3-34.
[429] Exhibit No. SE_140, pp. 187 and 191.
[430] 2017 Transcript, Vol. 3 p. 588:1-5 (Marshall); Exhibit No. SNWA_507 p. 6-90.
[431] 2017 Transcript, Vol 7 p. 1448:8-10 (Roundy).

transition concept is counter to the notion that all phreatophytes will die off, as had been stated by Protestants.[432] Protestants confirmed that the idea that all shrubs will die as a result from the Applicant's GDP pumping, is erroneous.[433]

Importantly, an average of 90,000 acre feet of precipitation reaches the Spring Valley groundwater discharge area annually, which is utilized by shrubs in addition to other sources of water such as surface water runoff.[434] The record reflects that viable shrubland communities exist in areas where groundwater is naturally deep, as well as in areas where groundwater depth has increased due to pumping. As testified by Mr. Marshall, shrubland habitat occurs throughout Delamar and Dry Lake valleys where depth to groundwater is greater than the maximum plant rooting depth.[435] Additionally, Dr. McLendon testified in 2011 that "throughout the Great Basin . . . greasewood [is found] on sites where the water table is relatively near the surface, [as well as on sites where] depth to water is beyond the rooting zone . . . [where they] receive most of their supplemental moisture from surface flow that puddles in a depression . . . [which] can be fairly large [such as a greasewood] flat."[436] The Applicant's expert Dr. Huntington testified that "in many basins [in Nevada] that have been pumped for decades," he has continued to see "healthy shrub communit[ies]."[437] The State Engineer's finding in Ruling 6164 that "viable plant and wildlife communities will remain" stands.[438]

The Spring Valley 3M Plan focuses on shrubland habitat in Management Blocks 1 and 2, which encompass the GDP wells. Management Block 3 is managed to avoid conflicts with existing water rights while preserving mesic habitat as discussed above, which also protects the intertwining shrubland habitat.[439]

Mr. Prieur testified that Management Blocks 4 and 5 are over 20 miles away from the closest proposed production wells.[440] The 3M Plan states that unreasonable effects to shrubland habitat in Management Block 4 are unlikely due to the distance from GDP wells and triggers and actions in Management Blocks 1-3. However, the 3M Plan's

[432] 2017 Transcript, Vol. 3 pp. 615:14 – 616:17 (Marshall).
[433] 2017 Transcript, Vol. 7 pp. 1463-1465 (Roundy); 2017 Transcript, Vol. 9 pp. 1876:18-21 (Myers); 2017.
[434] 2017 Transcript, Vol. 3 pp. 616:20 – 617:2 (Marshall).
[435] Exhibit SNWA_598 pp. 5-6; 2017 Transcript, Vol. 3 p. 588:18-24 (Marshall).
[436] 2011 Transcript, Vol. 8 p. 1660:6-14 (McLendon).
[437] 2017 Transcript, Vol. 1 pp. 225:15 – 226:2 (Huntington).
[438] Exhibit No. SE_140, p. 191.
[439] Exhibit No. SNWA_507 p. 6-92; Exhibit No. SNWA_592, p. 3-35.
[440] 2017 Transcript, Vol. 3 pp. 661:21 – 662:16 (Prieur).

approach to shrubland applies to Management Block 4 if a specified hydrologic investigation trigger in Management Block 2 or 3 respectively signals propagation of drawdown due to GDP pumping.[441] The Protestants criticized the Spring Valley 3M Plan for not having enough monitor wells, specifically in Management Block 3, to detect propagation of drawdown moving north. Dr. Myers proposes to have a transect of monitoring wells extending across Spring Valley spaced at no more than about a mile.[442] He bases this on his conclusion that there are a lot of heterogeneities that may create the potential for preferential flows.[443] Mr. Prieur testified that there are sufficient monitor wells to protect senior water rights in Spring Valley.[444] Dr. Myers agreed that a monitoring well would detect propagation of drawdown if the well is located on the proper flow path.[445]

The State Engineer finds that focusing on Management Blocks 1 and 2 and extending the approach to Management Block 4 in the event of drawdown propagation is a sound approach to avoiding unreasonable effects to shrubland habitat as drawdown will be noticed in Management Blocks 1 and 2 long before it ever reaches Block 4. This finding is based on environmental data and the location of the GDP wells, and the distance and time available to implement baseline monitoring for Management Block 4 if necessary. Importantly, the State Engineer retains authority to require additional monitoring wells if future conditions demonstrate that additional monitoring wells are necessary.

The unreasonable effects which the 3M Plan avoids for shrubland habitat are the elimination of the habitat type from the Spring Valley groundwater discharge area, and excessive loss of shrub cover that results in extensive bare ground.[446] The Technical Analysis Report, 3M Plan, and Mr. Marshall's testimony reflect that the strategy is to maintain shrubland habitat within the baseline range of variation for shrub cover.[447] The Applicant used over 30 years of remotely-sensed Normalized Difference Vegetation Index data (NDVI, a proxy for vegetation cover) to determine the baseline threshold. The

[441] Exhibit No. SNWA_507 p. 6-92; Exhibit No. SNWA_592, pp.2-48 and 3-34 – 3-35.
[442] 2017 Transcript, Vol. 8 p. 1745:20-24 (Myers).
[443] 2017 Transcript, Vol. 8 p. 1746:2-5 (Myers).
[444] 2017 Transcript, Vol. 2 p. 467:8-10 (Prieur).
[445] 2017 Transcript, Vol. 9 p. 1938:17 (Myers).
[446] 2017 Transcript, Vol. 3 pp. 592:20 – 593:2 (Marshall); Exhibit No. SNWA_592, p. 3-34.
[447] Exhibit No. SNWA_507 p. 6-103; Exhibit No. SNWA_592, p. 3-35.

State Engineer finds that establishing the threshold within the baseline range of variation is a sound approach to avoiding unreasonable effects to shrubland habitat.

Mr. Marshall testified the 3M Plan's use of two trigger parameters at different spatial scales (NDVI at a landscape scale; percent live shrub cover at a local scale) "makes the plan very robust in terms of understanding the changes that are occurring in the plant community."[448] Detailed testimony was given by Mr. Marshall, Dr. Huntington, and Ms. Brandt, and detailed documentary evidence was submitted, regarding the monitoring sample design and the process to derive the necessary data and quantify shrub cover in the groundwater discharge area.[449] The 3M Plan also includes installation of piezometers to monitor shallow groundwater conditions in shrubland habitat.[450] The State Engineer finds the complimentary use of remotely-sensed data and ground vegetation data, and the use of shrubland piezometer data, to be an effective approach for monitoring and managing shrubland habitat in the groundwater discharge area.

The Spring Valley 3M Plan establishes quantitative investigation and mitigation triggers for shrubland habitat using a prediction interval formula.[451] An investigation trigger is activated if (1) the mean annual NDVI for medium-density shrubland or low-density shrubland falls below the medium-density or low-density shrubland 95 percent lower control limit of the prediction interval for NDVI, respectively, or (2) the mean percent live shrub cover falls below the medium-density or low-density shrubland 95 percent lower control limit for percent live shrub cover.[452] If an investigation trigger is activated, the 3M Plan requires the Applicant to conduct an investigation, and based on findings may implement management actions for shrubland habitat as specified in the 3M Plan.[453]

A mitigation trigger is activated if (1) the mean annual NDVI falls below the low-density shrubland 95 percent lower control limit for NDVI for 5 years, or (2) if mean percent live shrub cover falls below the low-density shrubland 95 percent lower control limit for percent live shrub cover for five years.[454] The 3M Plan's five-year time frame

[448] 2017 Transcript, Vol. 3 pp. 609:24 – 610:2 (Marshall).
[449] 2017 Transcript, Vol. 3 pp. 593:17 – 601:15.
[450] Exhibit No. SNWA_592, pp. 2-20, 2-23.
[451] Exhibit No. SNWA_592, pp. 3-35 to 3-37.
[452] Exhibit No. SNWA_592, p. 3-39.
[453] Exhibit No. SNWA_592, pp. 3-39 - 3-40.
[454] Exhibit No. SNWA_592, p. 3-39.

allows for the natural variability in shrub reproduction, germination, establishment, and growth rates, provides time for the plants to respond to changes in the environment, and is used by Federal land managers in their revegetation and restoration activities.[455] If a mitigation trigger is activated, the 3M Plan requires that within 30 days the Applicant will implement shrubland habitat mitigation as specified in the 3M Plan.[456] Mitigation actions include appropriate implementation of vegetation restoration techniques, assessment of mitigation efficacy, and continued implementation as necessary to achieve successful mitigation.[457] The Technical Analysis Report describes how the Applicant has experience and a record of environmental restoration, and Mr. Marshall testified that the mitigation actions will be effective.[458] The State Engineer finds that the substantial evidence presented demonstrates that the specific actions outlined in the 3M Plan and the supporting testimony will be effective to avoid any unreasonable effects to the shrubland habitats.

CPB's expert report concedes that for shrubland habitat, "the overall forage production across [Cleveland Ranch's Bastian Creek Allotment] is very low."[459] The Applicant presented evidence that the forage value in shrubland habitat is largely derived from precipitation dependent plants, which are not affected by an increase in depth to water.[460] As stated in Protestant CPB's expert witness Dr. Roundy's testimony, "for the plants that grow on precipitation only, groundwater pumping should not affect them."[461] During cross examination of Protestant CPB's expert witness, the expert admitted that he had not reviewed protestant's grazing permits for forage values before making his conclusions.[462] The witness also stated that in some instances, improvement of forage value of grazing allotments is possible.[463] As such, the State Engineer finds that the Applicant's GDP will not adversely affect the forage value of plants in the groundwater discharge area.

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[455] Exhibit No. SNWA_507, pp. 6-108 – 6-109; 2017 Transcript, Vol. 3 pp. 604:13 – 605:1 (Marshall).
[456] Exhibit No. SNWA_592, p. 3-40.
[457] 2017 Transcript, Vol. 3 pp. 610:9 – 612:24 (Marshall); Exhibit No. SNWA_507 pp. 6-109 – 6-113; Exhibit No. SNWA_592, p.3-40; Exhibit No. SNWA_598 p. 10.
[458] Exhibit No. SNWA_507 pp. 6-109 – 6-113; 2017 Transcript, Vol. 3 p. 614:11-15 (Marshall).
[459] Exhibit No. CPB_26 p. 4.
[460] 2017 Transcript, Vol. 3 p. 591:17-22 (Marshall); Exhibit No. SNWA_598 pp. 5-8.
[461] 2017 Transcript, Vol. 7 p. 1469:16-17 (Roundy).
[462] 2017 Transcript, Vol. 7 p. 1467:2-5 (Roundy).
[463] 2017 Transcript, Vol. 7 p. 1468:16-18 (Roundy).

Regarding shrubland mitigation, Protestant CPB's expert stated that shrubland restoration is difficult, but possible, depending upon environmental constraints.[464] Mr. Marshall testified to the Applicant's successful track record of vegetation restoration, citing restoration activities conducted after significant disturbance in the Las Vegas Valley and Coyote Spring Valley, Nevada.[465] The State Engineer finds that the Applicant has organizational experience in implementing shrubland mitigation actions. The State Engineer also finds that the Spring Valley 3M Plan established quantitative triggers and identified mitigation actions that will effectively avoid unreasonable effects to shrubland habitat.

6. Terrestrial Woodlands Habitat

The terrestrial woodland habitat in the Spring Valley groundwater discharge area is also referred to as swamp cedars. As discussed in the Technical Analysis Report and Spring Valley 3M Plan, swamp cedars is a name with historical and cultural significance, but biologically speaking the habitat is not a true swamp and the trees are predominantly Rocky Mountain Juniper, not cedars.[466] The Spring Valley 3M Plan focuses specifically on the Swamp Cedar ACEC because approximately 40 percent (1,500 acres) of the terrestrial woodland habitat in the Spring Valley groundwater discharge area is located in the ACEC. In addition to the ACEC, the terrestrial woodland habitat occurs in various locations within the Spring Valley groundwater discharge area where existing water rights exist.[467] The unreasonable effect that the 3M Plan avoids for terrestrial woodland habitat is the elimination of the habitat type from the Spring Valley groundwater discharge area.[468]

The BLM has designated the swamp cedars an ACEC due to the cultural resources and its unique plant community.[469] CTGR does not own any existing senior water rights within the Swamp Cedar ACEC;[470] however, the Swamp Cedar ACEC is an area of special cultural significance to Tribal Protestants: Confederated Tribes of the Goshute

[464] 2017 Transcript, Vol. 7 p. 1470 (Roundy).
[465] 2017 Transcript, Vol. 3 p. 612:5-14 (Marshall).
[466] Exhibit No. SNWA_507 p. 6-114; Exhibit No. SNWA_592, p. 2-48.
[467] Exhibit No. SNWA_507, p. 5-3 and 6-87.
[468] Exhibit No. SNWA_507, p. 2-2.
[469] *See* Exhibit No. SNWA_478, p. 3.14-19, Table 3.14-9.
[470] In fact, there are no existing water rights within the Swamp Cedar ACEC.

Reservation, Duckwater Shoshone Tribe, and Ely Shoshone Tribe, as presented by CTGR in the 2011 and 2017 water rights hearings.[471]

The Swamp Cedar ACEC is a subset of the larger (14,175 acres) swamp cedar Traditional Cultural Property (TCP), also named *Bahsahwahbee*. In the 2017 hearing, evidence was presented that the TCP, which includes the Swamp Cedar ACEC, has been listed on the National Register of Historic Places.[472]

The Spring Valley 3M Plan establishes quantitative investigation and mitigation triggers for terrestrial woodland habitat within the Swamp Cedar ACEC. The 3M Plan requires the Applicant to maintain the terrestrial woodland habitat within the baseline range of variation for tree cover, and the plan requires remote sensing and collection of ground vegetation data to monitor the tree cover in the Swamp Cedar ACEC.[473] The 3M Plan's monitoring network for the ACEC includes three existing monitoring wells and one precipitation station, which are used to evaluate the relationship between precipitation, shallow groundwater, and the underlying groundwater pumping aquifer.[474]

The investigation trigger is activated if annual tree cover area for the Swamp Cedar ACEC, compared to the baseline maximum tree cover area, falls within five percent of the lower limit of the baseline percent range in cover.[475] If the investigation trigger is activated, the 3M Plan requires the Applicant to conduct an investigation, and based on the findings, management actions may be implemented for terrestrial woodland habitat as specified in the 3M Plan.[476] These management actions include preemptive implementation of mitigation to avoid activating the mitigation trigger.[477]

The mitigation trigger is activated if annual tree cover area for the Swamp Cedar ACEC, compared to the baseline maximum tree cover area, falls below the lower limit of the baseline percent range in cover for a period of five consecutive years as a result of GDP pumping.[478] The baseline maximum tree cover area is 44 acres while the lower limit of the baseline percent range in cover is 25%.[479] On cross-examination of Mr.

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[471] Exhibit No. SNWA_507, pp. 6-114 – 6-115; Exhibit No. SNWA_592, p. 3-41; 2017 Transcript, Vol. 3 p. 618:18-22 (Marshall); 2017 Transcript, Vol. 7 pp. 1588:12-14 (Steele).
[472] Exhibit No. CTGR_021.
[473] Exhibit No. SNWA_592, pp. 2-49.
[474] Exhibit No. SNWA_592, p. 2-22.
[475] Exhibit No. SNWA_592, p. 3-45.
[476] Exhibit No. SNWA_592, p. 3-45.
[477] Exhibit No. SNWA_592, pp. 3-42 and 3-46.
[478] Exhibit No. SNWA_592, p. 3-45.
[479] Exhibit No. SNWA_592, p. 3-42 and Fig. 3-8.

Marshall by CTGR, Mr. Marshall conceded that if annual tree cover in the swamp cedar woodland habitat dropped 25% for four consecutive years, then that is a 100% loss and the unreasonable effect will have occurred.[480] Consequently, CTGR argued that the swamp cedar woodland habitat could be eliminated before the investigation trigger was activated, and before SNWA would be required to implement mitigation in the fifth consecutive year, as required by the 3M Plan.

Dr. Monte Sanford testified on behalf of CTGR that the Swamp Cedars is a Native American ceremonial gathering area and tribal cultural use area and is a site of three Native American massacres at times of their ceremonial gatherings, and is a site where the swamp cedar trees are the spiritual embodiment of their slain ancestors. [481] Additionally, the Swamp Cedars is a place where the spring water is used for special medicine and healing, and also a site listed on the National Register of Historic Places. Goshute Tribal elder Rupert Steele testified that the die-off of swamp cedars from SNWA pumping would have an "adverse effect on our way of life. The effects are the trees' ability to heal, the affects [sic] of plants [sic] ability to heal. It . . . does not have that vigor and life to provide that healing. Healing proper[ties] that we call upon when we use those in our medicinal use and ceremonies. It would have an adverse effect on, on our way of living."[482] Similarly, Goshute Tribal Chairman Virgil Johnson testified that the die-off of swamp cedar trees from groundwater pumping would be catastrophic to the Tribe.[483]

According to the argument of CTGR, the Applicant would not be required to mitigate, according to the 3M Plan, unless after the fifth year there were still no swamp cedar trees and SNWA found that the loss of the swamp cedars was caused by GDP pumping. The five-year time frame, which is based partially on BLM guidelines, is intended to allow for the natural variability in tree reproduction, germination, establishment, and growth rates, and provide time for the trees to respond to changes in the environment.[484]

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[480] Transcript, Vol. 4 pp. 889:3 – 890:3.
[481] Exhibit No. CTGR_21; Exhibit No. CTGR_22, Appendix A; Transcript, Vol. 7 pp. 1486:10 – 1498:17.
[482] Transcript, Vol. 7 pp. 1608:23 – 1609:6.
[483] Transcript, Vol. 7 p. 1609:9.
[484] Exhibit No. SNWA_507, pp. 6-123; 2017 Transcript, Vol. 3 p. 626:7-18 (Marshall).

The Technical Analysis Report and Mr. Marshall's testimony describe Rocky Mountain Juniper as a species with a broad ecological range that typically does not rely on groundwater, but does tend to occur in places like canyons or drainages where it gets some supplemental moisture from groundwater.[485] Mr. Prieur acknowledged that Rocky Mountain Juniper do not typically occur where they have access to groundwater year round,[486] and the swamp cedar communities in Spring Valley are unique to the low elevation landscape that occurs in seasonally flooded valley bottoms.[487] While quantitative research has not been conducted on these populations to determine the factors that allow them to exist at the low elevation sites, it is hypothesized that their occurrence is the result of more water being available to the trees than is available solely from precipitation.[488] Evidence was presented on the soil composition and hydrogeology of the areas near the Swamp Cedar ACEC. Mr. Prieur testified regarding lithologic logs from a well and an exploratory borehole east of the ACEC that indicate the presence of a clay layer approximately 30 to 60 feet thick.[489] In addition, a shallow hand auger test on the adjacent Osceola Property showed a lithology of clay and silty clay sediments observed to be saturated at approximately 8 feet.[490] From this information, the Applicant expected that the Swamp Cedar ACEC was expected to be underlain by clayey lake deposits.[491] Mr. Prieur also testified that the tighter soils in the area have a high water retention ability, meaning precipitation or surface water would be held much better than in a coarse sand that would drain the area, and the underlying tight clay soils would retard or prevent the influence of groundwater drawdown from the producing aquifer.[492] Mr. Marshall testified that the white soils in the Swamp Cedar ACEC area reflect a drainage area that is collecting precipitation and surface water runoff, which could be the source of supplemental moisture for the trees.[493]

The Protestant CPB's expert Dr. Roundy recognized that the Applicant used 30 years of data to determine the threshold limit and trigger, which he opined was "good

[485] Exhibit No. SNWA_507, p. 5-8; 2017 Transcript, Vol. 3 pp. 619:11 – 620:9 (Marshall).
[486] 2017 Transcript, Vol. 3 p. 620:8-9 (Marshall).
[487] Exhibit No. SNWA_478, p. 3.5-14.
[488] Exhibit No. SNWA_478, p. 3.5-14.
[489] 2017 Transcript, Vol. 3 p. 621:18 – 622:11 (Prieur).
[490] Exhibit No. SNWA_507, p. 6-115.
[491] Exhibit No. SNWA_507, p. 6-115.
[492] 2017 Transcript, Vol. 3 p. 624:4-11 (Prieur).
[493] 2017 Transcript, Vol. 3 pp. 631:2 – 630:18 (Marshall).

science," and that they should be able to monitor tree cover "quite well with their approach."[494] However, Dr. Roundy opined that the BLM DEIS and Dr. McLendon recognized that supplemental water supported the population, but it is not known how reliant on groundwater the population is.[495] Because of this uncertainty, it is not known how the swamp cedars can get by with less water or how long they will live if the supplemental source is affected.[496] Dr. Roundy opined that the swamp cedars do not just simply survive on precipitation and that there is a concern of tree mortality by depleting water they rely upon in the discharge area.[497] While he agreed that correlating changes in water levels and change in the NDVI in the area could be used to better understand how to resolve the uncertainty in the reliance of the trees on groundwater,[498] he cited the example of the One Seeded and Utah Juniper that die quickly once they run out of water.[499] Accordingly, he testified that there was a potential for loss of the woodland habitat if water levels quickly declined.[500]

The State Engineer finds that given the local hydrologic characteristics of the area, it is likely that groundwater pumping will affect the supplemental groundwater utilized by the swamp cedars, and it is uncertain that the habitat can be maintained from surface runoff and precipitation alone.

The State Engineer finds that it is in the public interest to protect important cultural resources. The Swamp Cedars, a designated ACEC that is within the TCP, which is listed on the National Register of Historic Places, is an example of such an important cultural resource. Applications 54014 and 54015 each request to divert 6.0 cfs (4,343.82 afa) and have proposed points of diversion that are located closest to the Swamp Cedar ACEC. Application 54014 is on the northern border of the ACEC, and Application 54015 is approximately one-half mile north of the northern border of the ACEC.[501]

The State Engineer finds that focusing on the swamp cedar ACEC and existing water rights is a sound approach to avoiding unreasonable effects to terrestrial woodland habitat. However, in light of Dr. Roundy's testimony highlighting the uncertainty of the

[494] 2017 Transcript, Vol. 7 pp. 1425:9-11 and 1425:24 – 1426:1 (Roundy).
[495] 2017 Transcript, Vol. 7 pp. 1476:23 – 1477:4 (Roundy).
[496] 2017 Transcript, Vol. 7 p. 1458:6-3 (Roundy).
[497] 2017 Transcript, Vol. 7 p. 1426:11-20 (Roundy).
[498] 2017 Transcript, Vol. 7 pp. 1456:15 – 1457:3 (Roundy).
[499] 2017 Transcript, Vol. 7 p. 1427:11-15 (Roundy).
[500] 2017 Transcript, Vol. 7 pp. 1427:24 –1428:1 (Roundy).
[501] Exhibit No. SNWA_592, Fig. 2-6.

dependency of the trees on groundwater and concerning the effects that may be seen from groundwater pumping, it is possible that an unreasonable effect may occur prior to the investigation trigger being activated, posing a threat of loss to the Swamp Cedar ACEC. To that end, the State Engineer finds that the 3M Plan is inadequate in this regard to protect against such risk. To guard against the potential loss of the swamp cedar ACEC prior to the investigation trigger being activated, the State Engineer finds the public interest compels the denial of Applications 54014 and 54015, as these applications pose the greatest potential for immediate groundwater drawdown and risk of loss of the swamp cedars in the ACEC.

For water rights located further away from the ACEC, the State Engineer finds the use of remotely-sensed NDVI data and ground vegetation data, along with hydrologic data, to be a rational and effective approach for monitoring and managing terrestrial woodland habitat in the groundwater discharge area. The State Engineer finds that this approach defines triggers for the environmental resources in an objective and scientifically-founded way, and will ensure that any mitigation of unreasonable effects will be systematically employed and scientifically based. The concerns of effects to woodland habitat posed by Applications 54014 and 54015 aside, the State Engineer finds the Applicant has committed to take mitigation actions to ensure that the tree stand stays within the historical range of variation by adding trees to the population or enhancing the vigor of the existing trees. In areas where terrestrial woodland habitat is influenced by springs, streams or irrigation, the habitat is protected by the triggers and management and mitigation actions for existing water rights.

7. <u>Cultural Resources</u>

The Swamp Cedar ACEC has a cultural significance to Tribal Protestants: Confederated Tribes of the Goshute Reservation, Duckwater Shoshone Tribe, and Ely Shoshone Tribe.[502] In addition to the swamp cedars, the Tribal Protestants identified other locations within Spring Valley that have cultural significance, including village sites and "Tribal Cultural Areas" used for traditional hunting and fishing grounds, ceremonies, gathering areas, and other cultural uses.[503] Not all of these culturally significant areas are within the GDP's groundwater discharge area.[504]

[502] 2017 Transcript, Vol. 7 pp. 1588:11-14 (Steele).
[503] 2017 Transcript, Vol. 7 pp. 1496:3-16 (Sanford); Exhibit No. CTGR_22.
[504] Exhibit No. CTGR_22; Exhibit No. SNWA_599.

In Ruling 6164, the State Engineer determined that "Federal permitting processes protect tribal cultural interests that relate to Spring Valley and adjacent basins," and found that the State Engineer "does not have jurisdiction to review the actions of the BLM or [Bureau of Indian Affairs] in complying with" federal law, including the National Historic Preservation Act.[505] Like the findings that the Applicant's GDP would not adversely affect the Tribal Protestants' existing water rights, the State Engineer finds that these determinations regarding Federal responsibility and oversight regarding "protect[ing] tribal cultural interests" were not disturbed by the Remand Order.[506] Therefore, these determinations from Ruling 6164 are also still valid and controlling, and they are incorporated herein by reference.

Nevertheless, the State Engineer finds that the record from the 2017 hearing contains additional evidence regarding the federal statutes, regulations, and executive orders relevant to protecting cultural resources.[507] The State Engineer understands that the Federal regulatory and statutory schemes to protect tribal cultural resources include, for example, the NEPA and the National Historic Preservation Act (NHPA).[508] The Applicant presented evidence that it had entered into a Programmatic Agreement among the Department of Interior, BLM, Nevada, the Nevada State Historic Preservation Officer, the Advisory Council on Historic Preservation, and the Applicant (hereinafter Programmatic Agreement), under which the Applicant and the BLM have ongoing duties in accordance with federal statutes and regulations to continue to monitor and mitigate or avoid unreasonable effects to properties of religious or cultural significance.[509] Specifically, the Programmatic Agreement details the processes through which the BLM and Applicant will comply with tiered NEPA and NHPA with regard to culturally significant resources.[510]

The Tribal Protestants similarly provided evidence regarding culturally significant resources and the Tribal Protestants' efforts under the federal processes designed to protect such resources.[511] The Tribal Protestants' consultant, Dr. Sanford,

[505] Exhibit No. SE_140, p. 161.
[506] Exhibit No. SE_118, p. 23.
[507] 2017 Transcript, Vol. 3 pp. 634:8-24; 635:24 – 636:5 (Luptowitz).
[508] 42 U.S.C. § 4321 et seq. (NEPA); 54 U.S.C. § 300101 et seq. (NHPA).
[509] Exhibit No. SNWA_481.
[510] Exhibit No. SNWA_481; 2017 Transcript, Vol. 2 pp. 383:3-6, Vol. 3 pp. 635:24 – 636:1, 636:9 – 639:15 (Luptowitz).
[511] 2017 Transcript, Vol. 7 pp. 1483:16-1485:4 (Sanford).

testified that he prepared documents to nominate an area in Spring Valley surrounding a grove of swamp cedars as a TCP for listing on the National Register of Historic Places and that the TCP was listed on the National Register.[512] Dr. Sanford further testified that the Tribal Protestants were continuing to seek additional federal recognition for culturally significant areas.[513]

The State Engineer acknowledges the BLM's authority with respect to protecting cultural resources in connection with the GDP as part of the right-of-way it approved for the GDP in 2013.[514] Dr. Sanford also testified that his efforts to have the TCP listed on the National Register required BLM involvement.[515] The BLM is the lead Federal agency that evaluated the GDP for environmental compliance and issued and prepared an EIS.[516] The BLM also established the Swamp Cedar ACEC on the federal lands it is responsible for managing.[517]

The State Engineer defers to the primary jurisdiction of federal agencies to determine whether the Federal scheme in place and those processes to which Applicant has agreed, pursuant to including the Programmatic Agreement, are sufficient to address the Tribal Protestants' concerns for cultural resources under Federal law. Still, the evidence presented by the Tribal Protestants and the Applicant supports the State Engineer's 2011 findings that Federal processes are in place to protect tribal cultural interests, and as evidenced by the Tribal Protestants' success with the 2017 National Register listing of the TCP indicates that the Federal processes are working.[518] To the extent cultural resource preservation can be managed at the State level, the Nevada State Historic Preservation Officer is a signatory to the Programmatic Agreement.[519] The State Engineer finds that parallel timelines for the Federal environmental compliance and the state water rights processes are reasonable and acceptable given the varying requirements and protections of both processes. Finally, the State Engineer finds that the Federal compliance processes, although distinct from the State water rights process, when

[512] 2017 Transcript, Vol. 7 pp. 1485:11-13, 1494:7-9 (Sanford).
[513] 2017 Transcript, Vol. 7 pp. 1494:10-20 (Sanford).
[514] Exhibit No. SNWA_481.
[515] 2017 Transcript, Vol. 7 pp. 1489:16-22 (Sanford).
[516] Exhibit No. SNWA_478.
[517] 2017 Transcript, Vol. 3 617:18-618:19 (Marshall).
[518] 2017 Transcript, Vol. 7 pp. 1489-1490, 1493; Exhibit No. CTGR_21.
[519] Exhibit No. SNWA_481.

employed in conjunction with the 3M Plan and the denial of Applications 54014 and 54015, sufficiently address Tribal Protestants' concerns for cultural resources.

E. Northern Hamlin/Southern Snake

1. Conceptual Flow Model

In Ruling 6164, the State Engineer found that the amount of interbasin flow from southern Spring Valley through Limestone Hills into northern Hamlin Valley ranges from 4,000 to 12,000 afa.[520] Mr. Prieur established that the primary flow path for groundwater movement from Spring Valley into Hamlin Valley is through the Limestone Hills.[521] The faulting present in the Limestone Hills allows water to move through secondary features preferentially and at a faster rate than in the core block itself.[522]

Mr. Prieur relied upon two reports in creating his conceptual interbasin flow model.[523] Prior estimates of flow moving through the faulted structures of the Limestone Hills were 4,000 to 12,000 afa.[524] The groundwater flow then meets the groundwater flow-path from southern Hamlin Valley and moves towards Snake Valley.[525] This water flows towards and discharges in part at Dearden Springs, but not Big Springs.[526] The GDP may still affect Big Springs by lowering the head in Hamlin Valley and diverting some water that would otherwise discharge to Big Springs.[527] The State Engineer finds that the Applicant has provided a reasonable conceptual flow model of the flow path from southern Spring Valley into Hamlin and Snake Valley.

2. Monitoring

Mr. Prieur testified that the 3M Plan includes fifteen monitoring locations in the interbasin monitoring zone.[528] Mr. Prieur explained how the Applicant received input from the State Engineer, the Department of the Interior, and the USGS to identify the optimal location to place five monitoring wells in the Limestone Hills.[529] Mr. Prieur identified the locations of three current monitoring wells, and two planned monitoring

[520] Exhibit No. SE_140, pp. 84-85.
[521] 2017 Transcript, Vol. 3 p. 665:16-20 (Prieur).
[522] 2017 Transcript, Vol. 3 p. 676:13-19 (Prieur).
[523] Exhibit No. SNWA_545; Exhibit No. SNWA_552.
[524] 2017 Transcript, Vol. 3 p. 668:15-20 (Prieur).
[525] 2017 Transcript, Vol. 3 pp. 669:4-13 – 668:5 (Prieur).
[526] 2017 Transcript, Vol. 3 p. 66:16-20 (Prieur).
[527] 2017 Transcript, Vol 4 p. 923:18-20 (Prieur).
[528] 2017 Transcript, Vol. 3 p. 672:10-13 (Prieur).
[529] 2017 Transcript, Vol. 3 pp. 672:18 – 673:1 (Prieur).

wells located between a carbonate well and basin-fill well.[530] The three current monitoring wells located in the Limestone Hills are used as sentinel wells to detect and signal propagation of drawdown.[531]

Dr. Myers argued that in order to properly identify drawdown occurring in distinct aquifer layers and to measure changes in vertical gradient, more monitoring wells with shorter screened intervals should be used. He opined that the Applicant's monitoring design will only show a single average flow gradient over a very large area, which would be inadequate to warn of actual drawdown that could affect downgradient spring flows.[532] Mr. Prieur disagreed with this criticism and testified a longer screen provides a higher likelihood of the well intersecting a flow path as opposed to smaller screens at different intervals.[533] Additionally, it is better to have a longer screen the further the monitoring well is from pumping for the same reason that the well is more likely to intersect a transmissive zone or fracture through which a change in the aquifer propagates.[534]

Mr. Prieur discussed further monitoring associated with Granite Peak Ranch. He testified that a monitoring well upgradient of the Ranch would differentiate any influence from the Applicant's pumping operation versus drawdown created by the Ranch's irrigation operation.[535] This well, HAM1008M, will act as a mitigation trigger to either change pumping activities or take action to prevent additional drawdown from moving beyond that point.[536]

The State Engineer finds that the consensus-based sites of the monitoring wells in the interbasin monitoring zone is sound, due to the involvement of the various parties in determining the monitoring locations. The State Engineer finds that for the purpose of interbasin monitoring, monitoring primary flow paths of water is a logical way to monitor drawdown. The State Engineer further finds that the Spring Valley 3M Plan's use of a long well screen to monitor the primary flow path is a prudent choice and provides the required monitoring criteria to quantify interbasin flow.

[530] 2017 Transcript, Vol. 3 pp. 679:21 – 680:2 (Prieur).
[531] 2017 Transcript, Vol. 3 pp. 680:23 – 681:2 (Prieur).
[532] Exhibit No. GBWN_281, pp. 71-74.
[533] 2017 Transcript, Vol. 3 p. 678:9-14 (Prieur).
[534] 2017 Transcript, Vol. 3 p. 678:14-21 (Prieur).
[535] 2017 Transcript, Vol. 3 p. 684:11-15 (Prieur).
[536] 2017 Transcript, Vol. 3 p. 684:15-18 (Prieur).

3. Big Springs and Dearden Springs

Mr. Prieur testified about the monitoring at Big Springs and Dearden Springs. For Big Springs, he identified a joint funding agreement with the USGS that has continuously monitored the two channels for ten years,[537] and two wells that provide background information to verify flow conditions with Big Springs.[538] The Applicant further performed a synoptic discharge study at Big Springs with staff from the State Engineer's office, the National Park Service, and Utah Geological Survey.[539] The study was performed during both the irrigation and non-irrigation seasons to identify specific discharge areas.[540] Mr. Prieur testified that the study will be repeated every five years after the Applicant's groundwater project begins to monitor for changes.[541] State Engineer staff questioned whether groundwater pumping in Spring Valley could impact flows at Big Springs, and Mr. Prieur stated that if there was a noticeable effect, the monitoring in place would provide early detection of the propagation of drawdown.[542]

4. Millard and Juab Counties, Snake Valley (Remand Issue Number 1)

In accordance with the Remand Order, Millard and Juab Counties were considered and included in the Spring Valley 3M Plan with respect to water basins in Utah that may potentially be affected by GDP groundwater pumping in Spring Valley. Mr. Prieur testified that the monitoring that is performed and the mitigation and management actions required by the Spring Valley 3M Plan prevents propagation of drawdown extending into Snake Valley.[543] Mr. Prieur identified a third party groundwater monitoring network in Snake Valley, Utah, as consisting of border monitoring performed by the Utah Geological Survey (UGS) and a USGS monitoring program which monitors 73 wells in both Millard and Juab counties.[544] Mr. Prieur also testified that spring monitoring occurs in Snake Valley, Utah, where the Applicant works with the USGS and UGS to collect data.[545] The Spring Valley 3M Plan incorporates this

[537] 2017 Transcript, Vol. 3 p. 670:5-9 (Prieur).
[538] 2017 Transcript, Vol. 3 pp. 681:23 – 682:1 (Prieur).
[539] 2017 Transcript, Vol. 3 p. 690:6-13 (Prieur).
[540] 2017 Transcript, Vol. 3 p. 690:13-14 (Prieur).
[541] 2017 Transcript, Vol. 3 p. 690:22-23 (Prieur).
[542] 2017 Transcript, Vol. 4 p. 923:18-22 (Prieur).
[543] 2017 Transcript, Vol. 3 p. 694:8-16 (Prieur).
[544] 2017 Transcript, Vol. 3 p. 756:8-14 (Prieur).
[545] 2017 Transcript, Vol. 3 p. 757:9-16 (Prieur).

USGS and UGS data to gain a better understanding of how the Applicant's network fits in with the wider regional network and hydrologic conditions.[546]

The Spring Valley 3M Plan identifies Dearden Spring, Clay Spring, and Pruess Lake as being located within Millard County.[547] Mr. Prieur testified that impacts from the GDP at a distance in Millard County would be impossible due to the management actions in place.[548] For locations north of the analysis area in Utah, Mr. Prieur testified that effects will not be observed there from a hydrogeological standpoint.[549] Mr. Prieur identified that Juab County is north of Millard County and with all the monitoring in place over a large distance, impacts to Juab County are extremely unlikely.[550]

5. Protection of Existing Water Rights in Millard and Juab Counties, Utah

The 3M Plan addresses water rights in Millard and Juab Counties. Mr. Prieur identified the quantitative, objective investigation trigger using Figure 7-2 of the Technical Analysis Report. The hydrographs of these wells are represented in Figures 7-5 and 7-6.[551] A further investigation trigger is established at Monument Well, which is shown by Figure 7-7.[552] The quantitative mitigation triggers are established from the characteristics of the water rights associated with these wells.[553] Because the mitigation trigger is based on the existing water right itself, the Spring Valley 3M Plan requires the Applicant to adhere to the legalities applicable to the State of Utah in implementing mitigation actions.[554] The State Engineer finds that the Spring Valley 3M Plan defines quantitative, objective investigation and mitigation triggers and thresholds. These defined thresholds and triggers ensure that unreasonable effects will not occur. Further, the defined triggers will ensure any necessary mitigation of unreasonable effects is not applied in an arbitrary or capricious way.

Millard and Juab Counties are properly included within the Spring Valley 3M Plan, and the 3M Plan has established investigation and mitigation triggers in Utah.[555]

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[546] 2017 Transcript, Vol. 3 p. 759:10-17 (Prieur).
[547] 2017 Transcript, Vol. 3 p. 707:2-7 (Prieur).
[548] 2017 Transcript, Vol. 3 p. 707:10-13 (Prieur).
[549] 2017 Transcript, Vol. 3 p. 780:10-13 (Prieur).
[550] 2017 Transcript, Vol. 3 p. 706:20-23 (Prieur).
[551] 2017 Transcript, Vol. 3 p. 686:12-24 (Prieur).
[552] 2017 Transcript, Vol. 3 pp. 687:24 – 688:5 (Prieur).
[553] 2017 Transcript, Vol. 3 p. 688:9-15 (Prieur).
[554] 2017 Transcript, Vol. 3 p. 774:8-10, 18-20 (Prieur).
[555] 2017 Transcript, Vol. 3 p. 763:19-21 (Prieur).

The Spring Valley 3M Plan has established investigation and mitigation triggers, which apply to all existing water rights in Utah that may be affected by GDP pumping.[556] Mr. Prieur stated that the outside influences from irrigation pumping already present would be taken into account in any investigation.[557] He identified that southern Spring Valley has limited outside pumping whereas pumping from Granite Peak Ranch, Baker, Garrison, and Eskdale, Utah have much more effect on Utah water rights than the Applicant's POD, which is about 50 miles away.[558] The State Engineer agrees. Mr. Prieur testified that the monitoring wells in Spring and Hamlin Valleys would first see a response in drawdown before any amount of drawdown in Snake Valley would occur.[559] Mr. Prieur concluded that due to the sound plan for investigation triggers being established along the known flow path, signaling propagation of drawdown would protect potentially affected communities in Utah.[560]

The State Engineer agrees that notwithstanding the unlikely potential for impacts in Utah, monitoring is in place to sufficiently detect the propagation of drawdown early enough to protect existing water rights in Millard and Juab Counties. The baseline data and investigation triggers provide early detection of drawdown in Hamlin Valley. The State Engineer finds this 3M process properly protects existing water rights in Hamlin and Snake Valley. The State Engineer further finds that Millard and Juab counties are properly included in the Spring Valley 3M Plan in accordance with the Remand Order.

6. <u>Environmental Resources</u>

There are no native aquatic-dependent special status animal species in northern Hamlin Valley. Three native aquatic-dependent special status animal species occur in the southern Snake Valley groundwater discharge area, the bifid duct pyrg (a springsnail), the California floater (a muscle), and the longitudinal gland pyrg (a springsnail).[561] The bifid duct pyrg occurs in a spring that is sourced from local recharge and is not located along the primary groundwater flow path. The California floater occurs in the Pruess Lake, which is a highly managed irrigation reservoir at the end of the Big Springs

[556] 2017 Transcript, Vol. 3 pp. 763:22 – 764:1 (Prieur).
[557] 2017 Transcript, Vol. 3 p. 781:4-12 (Prieur).
[558] 2017 Transcript, Vol. 3 p. 782:2-9 (Prieur).
[559] 2017 Transcript, Vol. 3 p. 783:6-1 (Prieur).
[560] 2017 Transcript, Vol. 3 pp. 784:22 – 786:5 (Prieur).
[561] Exhibit No. SNWA_507 p. 7-25.

Creek/Lake Creek system.[562] Dearden (a.k.a. Stateline) Spring is the only spring in the groundwater flow path from Spring to Snake Valley that is home to the longitudinal gland pyrg.[563] The Protestants did not offer any evidence disputing this conclusion, and the State Engineer agrees with the Technical Analysis Report's assessment. The longitudinal gland pyrg also occurs at Big Springs and Clay Spring North, and may be endemic to southern Snake Valley.[564] Therefore, the 3M Plan includes triggers and actions for the longitudinal gland pyrg. The State Engineer finds this to be a logical and reasonable approach to ensure effects are avoided.

The Spring Valley 3M Plan states that the unreasonable effect to avoid for longitudinal gland pyrg is extirpation of the native aquatic-dependent special status animal species from the Snake Valley groundwater discharge area.[565] The strategy for protecting the species primarily relies on avoiding unreasonable effects to existing water rights, as described above.[566] Additional hydrologic triggers and environmental mitigation actions are specified for the longitudinal gland pyrg to ensure that the unreasonable effect to the species is avoided. The investigation trigger for the species is established at Hamlin Valley monitor well 383533114102901. If the investigation trigger is activated, the Spring Valley 3M Plan requires the Applicant to conduct an investigation and begin annual presence/absence monitoring of the longitudinal gland pyrg at Dearden Springs, Big Springs, and Clay Spring North.[567] These triggers and actions for existing water rights and longitudinal gland pyrg in northern Hamlin and southern Snake Valleys also protect mesic habitat in these areas.[568]

The mitigation trigger for the species is established at Hamlin Valley monitor well HAM1008M. If the mitigation trigger is activated, the Spring Valley 3M Plan requires that within 30 days the Applicant will implement existing water right mitigation as well as longitudinal gland pyrg mitigation as specified in the 3M Plan.[569] The mitigation trigger at HAM1008M would be activated prior to drawdown propagation reaching Snake Valley, and it is a "special mitigation trigger . . . to avoid unreasonable effects in Snake

[562] Exhibit No. SNWA_507 pp. 7-27 – 7-28.
[563] Exhibit No. SNWA_507 p. 7-25.
[564] Exhibit No. SNWA_507 p. 7-25.
[565] Exhibit No. SNWA_592, p. 3-49.
[566] Exhibit No. SNWA_592, pp. 3-51 – 3-53.
[567] Exhibit No. SNWA_592, p. 3-52.
[568] Exhibit No. SNWA_507, p. 7-28.
[569] Exhibit No. SNWA_592, pp. 3-49 to 3-53.

Valley."[570] The mitigation actions will ensure that the water is available to continue to support the longitudinal gland pyrg and mesic habitat, as well as the California floater and lake habitat, and environmental mitigation will contribute to other longitudinal gland pyrg habitat or population management efforts.[571]

The State Engineer finds that the Spring Valley 3M Plan established quantitative defined triggers and identified mitigation actions that will avoid unreasonable effects to mesic habitat, lake habitat, and the native aquatic-dependent special status animal species and mesic and lake habitats in northern Hamlin and southern Snake valleys. The State Engineer also finds that the co-location of the existing water rights, species and habitats, and the use of a special mitigation trigger at an intermediate well in Hamlin Valley, reduces the risk of approaching unreasonable effects to these resources.

The 3M Plan also addresses shrubland habitat in northern Hamlin and southern Snake valleys. The unreasonable effects which the 3M Plan avoids for shrubland habitat include excessive loss of shrub cover that results in extensive bare ground. Similar to the Spring Valley Management Block 4, the approach to avoid unreasonable effects to shrubland habitat in northern Hamlin and southern Snake valleys is applied if specified hydrologic investigation triggers signal propagation of drawdown due to GDP pumping. The investigation trigger for shrublands in northern Hamlin Valley is established at Hamlin Valley monitor well HAM1007M, and the investigation trigger for shrublands in northern Snake Valley is established at Hamlin Valley monitor well HAM1008M. If the HAM1007M or HAM1008M investigation trigger is activated as a result of the Applicant's GDP pumping, the 3M Plan requires that the Applicant conduct an investigation and begin shrubland monitoring in the northern Hamlin Valley or southern Snake Valley groundwater discharge area, respectively.[572]

In addition, management actions may be implemented for shrubland habitat as specified in the 3M Plan.[573] If a mitigation trigger is activated, the 3M Plan requires that within 30 days the Applicant must implement shrubland habitat mitigation as specified in the 3M Plan.[574] Mitigation includes appropriate implementation of vegetation restoration techniques, assessment of mitigation efficacy, and continued implementation

[570] Exhibit No. SNWA_592, pp. 3-47 and 3-53.
[571] Exhibit No. SNWA_592, p. 3-55.
[572] Exhibit No. SNWA_592, pp. 3-49 to 3-50.
[573] Exhibit No. SNWA_592, p. 3-52.
[574] Exhibit No. SNWA_592, p. 3-55.

as necessary to achieve successful mitigation. The mitigation actions and their effectiveness are detailed in the Spring Valley 3M Plan. This mitigation plan will ensure that the shrublands located in Millard and Juab Counties are protected from unreasonable effects.

Protestant GBWN argued that the Applicant should preemptively set up the shrubland monitoring in these valleys so that a baseline can be established. Testimony was given by Mr. Marshall that the remote data used to derive the historical baseline data is readily available, and the investigation triggers that initiate monitoring will afford sufficient time to acquire, process, and set up the monitoring program and collect additional baseline data if necessary.[575] The State Engineer finds that based on the distance and time available to implement baseline monitoring, extending the approach used in Spring Valley to northern Hamlin and southern Snake Valleys in the event of drawdown propagation is sound. The State Engineer also finds that the Spring Valley 3M Plan established quantitative triggers and identified mitigation actions that will avoid unreasonable effects to shrubland habitat in northern Hamlin and southern Snake Valleys. Lastly, the State Engineer finds that the 3M Plan adequately addresses Millard and Juab counties to the extent that environmental resources in those counties may be affected by the GDP pumping because the monitoring network will detect any propagation prior to affecting the resources in this area.

Finally, the Utah Counties requested that the area of monitoring correspond with the "area of interest" defined by the Federal Stipulations. However, as explained by the Applicant during the hearing, and as discussed in greater detail in Section G below, the Federal Stipulations are still in effect along with the 2017 3M Plans. Because the processes are proceeding simultaneously under both sets of 3M plans, it is not necessary to modify the Spring Valley 3M Plan monitoring area to mirror the Federal Stipulations. In addition, the Utah Counties requested that monitoring continue for decades if GDP pumping ceases because the full extent of impacts may not be fully known for tens of years after pumping commences.[576] At this point, the State Engineer cannot state that continued monitoring "for decades" is an appropriate time period; however, it is appropriate that monitoring continue as long as impacts from GDP pumping are

[575] 2017 Transcript, Vol. 3 700:5-10 (Marshall).
[576] Utah Counties' Closing Br., pp. 2, 5.

detectable.[577] Accordingly, through this Ruling, the 3M Plans are modified to require continued monitoring as long as impacts from GDP pumping are detectable.

F. Dry Lake, Delamar and Cave Valleys

The Applicant has applications in Cave Valley, Delamar Valley and Dry Lake Valley (CDD), Nevada. These basins and the neighboring basins as identified above are included in the CDD 3M Plan. Mr. Prieur and Mr. Marshall testified regarding the CDD 3M Plan in these areas and how the Plan protects existing water rights and environmental resources.

1. Cave Valley and southern White River Valley

a. Conceptual Flow Model

In the 2017 hearing, Mr. Prieur described the geographic location and the hydrogeologic conditions of the existing water rights in Cave Valley.[578] The CDD 3M Plan describes how those rights are monitored and protected.[579]

Mr. Prieur also testified to the conceptual flow model of Cave Valley and how groundwater flows to southern White River Valley through Shingle Pass.[580] In Ruling 6165, the State Engineer evaluated the hydrogeologic data for this interbasin zone and reserved 7,300 afa from the perennial yield of Cave Valley for the flows at Flag Springs and Butterfield Springs in southern White River Valley.[581]

b. Existing Water Rights in Cave Valley and southern White River Valley

Monitoring the flow path from Cave Valley into southern White River Valley is done through sentinel wells.[582] Dr. Myers critiqued the CDD 3M Plan's monitoring locations, calling them "grossly insufficient" due to spacing and the lack of multiport monitoring.[583] Dr. Myers proposes that spacing should be determined with detailed local

[577] For example, throughout the 3M Plans, the Applicant agrees to perform certain activities, which will "continue as long as SNWA pumps groundwater under the . . . GDP permits." This phrase could be construed as permitting the Applicant to cease all commitments made under the 3M Plans as soon as pumping ceases. If the cause of the cessation in pumping is due to impacts from GDP pumping, then it is particularly important to continue monitoring the recovery from any such impacts, and the State Engineer agrees with the Utah Counties that continued monitoring should be required.
[578] 2017 Transcript, Vol. 3 pp. 710:19 – 711:3 (Prieur).
[579] 2017 Transcript, Vol. 3 p. 711:4-6 (Prieur).
[580] 2017 Transcript, Vol. 3 p. 711:19-21 (Prieur).
[581] 2017 Transcript, Vol. 3 pp. 711:22 – 712:2 (Prieur).
[582] Exhibit No. SNWA_593, pp. 2-13 – 2-17.
[583] Exhibit No. GBWN_281, p. 77; Exhibit No. GBWN_297, p. 49.

modeling, but the ultimate spacing should not be any less dense than one sentinel well per square mile.[584]

The CDD 3M Plan uses multiple monitoring well locations with investigation triggers established at all of them.[585] Mr. Prieur identified two intermediate monitoring wells located north of POD 53988, one located in the carbonate aquifer and the other located in basin fill alluvium.[586] Two other monitoring wells establish the investigation triggers for existing water rights in southern White River Valley.[587] Mr. Prieur also identified another monitoring well that is proposed for Shingle Pass in White River Valley to help understand the hydrologic relationship between Cave Valley outflow to eastern White River Valley.[588]

The State Engineer finds that the CDD 3M Plan presents an effective network of monitoring propagation of drawdown from Cave Valley to White River Valley. The CDD 3M Plan requires monitoring where known flows from Cave Valley exist and also requires monitoring in areas where flow is possible but uncertain.

c. Environmental Resources

The Applicant found that "no groundwater dependent species or ecosystems in Cave Valley . . . are connected to the producing aquifer," and thus the CDD 3M Plan does not address Cave Valley environmental resources.[589] Protestants did not challenge these findings. The State Engineer, based on the evidence presented and testimony given, agrees with these findings.

Environmental resources in southern White River Valley that are addressed in the CDD 3M Plan include the federally listed endangered White River spinedace (a fish), and a suite of native aquatic-dependent special status animal species.[590] These species occurs in the Flag Spring Complex, Butterfield Spring, and Sunnyside Creek.[591] Quantitative triggers and specific management and mitigation actions are established in the CDD 3M

[584] Exhibit No. GBWN_297, p. 51.
[585] 2017 Transcript, Vol. 3 pp. 715:18 – 716:4 (Prieur).
[586] 2017 Transcript, Vol. 3 pp. 714:13 – 715:2 (Prieur).
[587] 2017 Transcript, Vol. 3 p. 712:3-16 (Prieur).
[588] 2017 Transcript, Vol. 3 pp. 712:21 – 713:2 (Prieur).
[589] 2017 Transcript, Vol. 3 p. 718:15-18 (Marshall).
[590] 2017 Transcript, Vol. 3 pp. 716:22 – 717:5 (Marshall); Exhibit No. SNWA_593, p. 3-19.
[591] 2017 Transcript, Vol. 3 p. 717:4-5 (Marshall); Exhibit No. SNWA_593, p. 3-18 to 3-20.

Plan to ensure that unreasonable effects to environmental resources in southern White River Valley are avoided.[592]

The strategy for protecting the species primarily relies on avoiding unreasonable effects to existing water rights, which includes the hydrologic monitoring, triggers, and mitigation discussed above. Mr. Marshall testified that "the protection of senior water rights at Butterfield Spring and Flag Spring also protect[s] the habitat for the native fishes, the Hubbs pyrg, and the White River spinedace."[593] In addition, hydrologic triggers and environmental mitigation actions are specified to ensure that the unreasonable effects to the species are avoided.

The unreasonable effects, which the 3M Plan avoids for these environmental resources are jeopardizing the continued existence of federally listed species, and the extirpation of native aquatic-dependent special status animal species from the White River Valley groundwater discharge area.[594] Investigation triggers for the species are established at White River Valley monitor wells WRV1012M and WRV1013M.[595] If an investigation trigger is activated as a result of GDP pumping, the CDD 3M Plan requires the Applicant to conduct an investigation, and support NDOW with native fish surveys at Flag and Butterfield Springs and Sunnyside Creek.[596] The mitigation trigger for the species is established at Flag Spring No. 2, and is activated if the investigation determines that the cause of the change in flow is attributed to GDP pumping.[597] If the mitigation trigger is activated, the CDD 3M Plan requires that within 30 days, the Applicant will implement existing water right mitigation as well as species mitigation.[598] The mitigation actions will ensure that water is available to continue to support the species and their habitat and species, and will contribute to other habitat or population management efforts.

The State Engineer finds that the CDD 3M Plan establishes quantitative triggers and identified mitigation actions that will avoid unreasonable effects to federally listed endangered species and native aquatic-dependent special status animal species in

[592] 2017 Transcript, Vol. 3 pp. 717:15 – 718:10 (Marshall); Exhibit No. SNWA_593, p. 3-18.
[593] 2017 Transcript, Vol. 3 p. 732:15-20 (Marshall).
[594] Exhibit No. SNWA_593, p. 3-18.
[595] Exhibit No. SNWA_593, p. 2-26.
[596] Exhibit No. SNWA_593, p. 3-21.
[597] Exhibit No. SNWA_539, p. 3-22.
[598] Exhibit No. SNWA_593, pp. 3-22 – 3-24.

southern White River Valley. The State Engineer also finds that the co-location of the existing water rights and species reduces the risk of unreasonable effects to the species.

2. Dry Lake and Delamar Valley

Mr. Prieur testified that the existing water rights in Delamar Valley are classified in Management Category E, meaning that there is no hydraulic connection between the existing water rights and the aquifer from which the Applicant will be pumping.[599] Further, some existing water rights in Dry Lake Valley are classified in Management Category C because they are more than ten miles from the Applicant's wells, while senior spring rights and vested claims are not in hydrologic connection with the producing aquifer.[600] Even with no hydraulic connection and the large distance from a well, the CDD 3M Plan protects existing water rights in Dry Lake and Delamar Valleys.[601]

Based on the evidence presented, there are no groundwater-dependent environmental resources in Dry Lake or Delamar Valleys.[602] The Protestants did not present any evidence to counter this fact.

3. Pahranagat Valley

The hydrogeologic characterization of Pahranagat Valley in context of the White River Flow System was evaluated at length in State Engineer's Rulings 6166 and 6167. In the 2017 hearing, Mr. Prieur testified regarding the Applicant's conceptual flow model for Pahranagat Valley and the hydrogeologic characterization described in Ruling 6167. The primary flow path in Dry Lake and Delamar Valleys is from north to south along the range fronts.[603] Mr. Prieur noted that a minor flow path to Pahranagat Valley could be present in the Timpahute transverse zone and a detailed monitoring network was in place to detect propagation of drawdown through that zone.[604] The CDD 3M Plan also includes southern Pahranagat Valley through a series of monitoring wells.

a. Existing Water Rights

The CDD 3M Plan ensures that Hiko, Crystal, and Ash springs are protected.[605] Mr. Prieur described the monitoring program the CDD 3M Plan uses to detect

[599] 2017 Transcript, Vol. 3 p. 724:18-20 (Prieur).
[600] Exhibit No. SNWA_593, p. 3-25.
[601] 2017 Transcript, Vol. 3 pp. 724:24 – 725:1 (Prieur).
[602] Exhibit No. SNWA_593, p. 3-30.
[603] 2017 Transcript, Vol. 3 p. 727:16-18 (Prieur).
[604] 2017 Transcript, Vol. 3 pp. 727:19 – 728:8 (Prieur).
[605] Exhibit No. SNWA_593, p. 2-20 and Table 2-3.

propagation of drawdown through the Timpahute transverse zone using Figure 9-4 in the Technical Analysis Report.[606] Mr. Prieur testified that the 3M Plan uses well 209M-1 as a sentinel well, there are two other basin fill wells located closer to Hiko Spring, and there is a planned carbonate monitoring well (PAH1010M), which is already sited.[607] If drawdown is observed at the sentinel well, the CDD 3M Plan could institute management actions in order to avoid activating a mitigation trigger at the planned well location.[608] Furthermore, three monitoring wells are in place to detect propagation of drawdown towards southern Pahranagat Valley.[609]

b. Environmental Resources in Pahranagat Valley

The CDD 3M Plan establishes environmental triggers and management and mitigation actions to ensure that unreasonable effects to environmental resources in Pahranagat Valley are avoided. Environmental resources in Pahranagat Valley that are addressed in the CDD 3M Plan include the federally listed endangered White River springfish and Hiko White River springfish, and a suite of native aquatic-dependent special status animal species.[610] These species occur in, Hiko, Crystal, and Ash Springs, which are highly modified by man.[611] The strategy for protecting the species primarily relies on avoiding unreasonable effects to existing water rights, and includes hydrologic monitoring, investigation triggers at intermediate wells, preemptive management actions, mitigation triggers, and mitigation actions. In addition, hydrologic triggers and environmental mitigation actions are specified to ensure that unreasonable effects to the species are avoided.[612]

The unreasonable effects that the 3M Plan avoids for these environmental resources are jeopardizing the continued existence of federally listed species, and the extirpation of native aquatic-dependent special status animal species from the Pahranagat Valley groundwater discharge area.[613] The investigation trigger for the species is established at Pahranagat Valley monitor well 373803115050501. If the investigation trigger is activated as a result of GDP pumping, the CDD 3M Plan requires that the

[606] Exhibit No. SNWA_507, p. 9-17.
[607] 2017 Transcript, Vol. 3 p. 729:5-13 (Prieur).
[608] 2017 Transcript, Vol. 3 p. 729:17-21 (Prieur).
[609] Exhibit No. SNWA_593, pp. 2-20 – 2-21.
[610] Exhibit No. SNWA_593, pp. 3-30 – 3-31.
[611] Exhibit No. SNWA_593, pp. 3-30 – 3-31.
[612] Exhibit No. SNWA_593, pp. 3-29 – 3-30, Table 3-4.
[613] Exhibit No. SNWA_593, p. 3-30.

Applicant conduct an investigation, support NDOW with native fish surveys at Hiko, Crystal, and Ash springs, incorporate presence/absence surveys of the other native aquatic-dependent special status animal species at the sites, and continue to participate on the Pahranagat Valley Native Fishes Recovery Implementation Team.[614] The mitigation trigger is established at Pahranagat Valley monitor well PAH1010M. If the mitigation trigger is activated, the CDD 3M Plan requires that within 30 days the Applicant will implement existing-water-right mitigation as well as species mitigation as specified in the CDD 3M Plan.[615] The mitigation actions will ensure that the water is available to continue to support the species and their habitat, and will contribute to other habitat or population management efforts. This approach also protects other wildlife, which occur in downstream habitats supported by the regional spring discharge, including the federally listed Pahranagat roundtail chub, southwestern willow flycatcher, and western yellow-billed cuckoo.[616]

The State Engineer finds that that the CDD 3M Plan established quantitative triggers and specified effective mitigation actions that will avoid unreasonable effects to federally listed endangered species and native aquatic-dependent special status animal species in Pahranagat Valley. These triggers and mitigation actions are established in such a way that any necessary mitigation will not be applied arbitrarily or capriciously because the triggers are defined, based in science, and substantial credible evidence was presented as to the setting of the triggers. The State Engineer also finds that the co-location of the existing water rights and species reduces the risk of approaching unreasonable effects to the species.

G. The 3M Plans Between the Applicant and the Federal Agencies Remain in Effect, While the 3M Plans Approved at the 2011 Hearing are Replaced by the 2017 3M Plans

On September 8, 2006, the Las Vegas Valley Water District, the Applicant's predecessor, and the Federal Agencies executed a Stipulation for Withdrawal of Protests.[617] The goal of the Stipulation was to 1) manage the development of groundwater in Spring Valley without causing injury to Federal Water rights and/or adverse effects to Federal Resources in the area of interest, 2) accurately characterize the groundwater

[614] Exhibit No. SNWA_593, p. 3-32.
[615] Exhibit No. SNWA_593, p. 3-33 – 3-35.
[616] Exhibit No. SNWA_593, p. 3-31.
[617] Exhibit No. SE_041.

gradient from Spring Valley to Snake Valley via Hamlin Valley, and 3) to avoid any effects on Federal Resources located in the Great Basin National Park. To do this, the parties agreed that the Applicant could pursue development of the groundwater resources in conjunction with the implementation of 3M Plans that were attached as exhibits to the Stipulation.[618] To facilitate the implementation of 3M Plans, a Technical Review Panel (TRP), a Biological Working Group (BWG) and an Executive Committee were created. The establishment, membership, conduct and responsibilities of the TRP, BWG and Executive Committee were set forth in the 3M Plans incorporated as exhibits to the Stipulation.[619]

On January 7, 2008, the Applicant and the Federal Agencies executed an additional Stipulation for Withdrawal of Protests.[620] The Stipulation provided that the Parties desired to expand the processes included in the Spring Valley Stipulation, to Cave, Dry Lake and Delamar Valleys. The 2008 Stipulation set forth the common goal of the parties, which likewise provided that the Applicant could pursue groundwater development in the CDD basins without causing injury or unreasonable effects to Federal Water Rights or Federal Resources. Accordingly, the CDD Stipulation incorporated a 3M Plan specific to the CDD basins.[621] Pursuant to the terms of the Stipulations, the Federal Agencies withdrew their protests to the applications; consequently, the Federal Agencies did not participate in the 2011 or 2017 hearings.

CTGR argues that the 2017 3M Plans violate the Federal Stipulations because there was no input by the Federal Agencies into the 2017 3M Plans, nor was there written assent by the Federal Agencies to substitute the 3M Plans incorporated into the Stipulations with the 2017 3M Plans that were presented at the hearing. Additionally, CTGR argues that the TRP, the BWG and the Executive Committee are not part of the 2017 3M Plans, and this also violates the terms of Stipulations. The numerous references to 3M Plans in these proceedings merits clarification as to what plans are in force. During the 2017 hearing, the Applicant stated that the prior 3M Plans were not being replaced by the 2017 3M Plans. The State Engineer takes this to mean the 3M Plans attached as exhibits to the Stipulations. On the other hand, the State Engineer finds the 3M Plans

[618] Exhibit No. SE_041 at Exhibits A and B.
[619] Exhibit No. SE_041 at Exhibits A and B.
[620] Exhibit No. SE_080.
[621] Exhibit No. SE_080 at Exhibit A.

submitted during the 2011 hearing (Exhibit Nos. 148, 149, 365 and 366) are substituted on remand by Exhibit Nos. 592 and 593 (as supported by Exhibit 507), which the Applicant requested again be made a condition of any permits following the hearing.[622]

The Applicant affirmed that the prior 3M Plans (Federal Agency) would remain in effect, despite any approval of the 2017 3M Plans by the State Engineer. The Applicant confirmed during the hearing that there is overlap between the 2017 3M Plans and the Federal Agency Stipulation 3M Plans, but that the Applicant intended to implement both sets of 3M Plans as separate programs.[623]

The State Engineer finds that the Stipulations between the Applicant and Federal Agencies are in effect unless and until the Applicant and the Federal Agencies modify the Stipulations or the exhibits thereto, in writing pursuant to the terms of the Stipulations.[624] The State Engineer previously addressed many of the CTGR's arguments that asserted the Stipulations were being violated.[625] The State Engineer reaffirms his prior ruling where he determined that he was not a party to the Stipulations between the Applicant and the Federal Agencies, and that amendment of the Stipulations (which include their own 3M Plans as exhibits) may be warranted, but that is an issue to be resolved by the parties to the Stipulations.[626]

CONCLUSIONS OF LAW

I. JURISDICTION

The State Engineer has jurisdiction over the parties and the subject matter of this action and determination.[627]

II. STATUTORY STANDARD TO DENY

The State Engineer is prohibited by law from granting an application to appropriate the public waters where:[628]

A. there is no unappropriated water at the proposed source;
B. the proposed use or change conflicts with existing rights;

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[622] Exhibit No. SNWA_592, p. at 1-2; Exhibit No. SNWA_593, p 1-2.
[623] 2017 Transcript, Vol. 3 p. 740:7-16 (Prieur).
[624] Notably, the continuing validity of the Stipulations and the 3M Plans under the Stipulations are contingent upon the grant of any water under the Applications. *See, e.g.*, Exhibit No. SE_041 at p. 6 ¶ 2.
[625] Exhibit No. SE_133, pp. 3-6.
[626] Exhibit No. SE_133.
[627] NRS Chapters 533 and 534.
[628] NRS 533.370(2).

C. the proposed use or change conflicts with protectable interests in existing domestic wells as set forth in NRS 533.024; or
D. the proposed use or change threatens to prove detrimental to the public interest.

III. ET CAPTURE RESULTING IN TIMED EQUILIBRIUM

The State Engineer concludes that the Applicant failed to present any evidence that water withdrawn at the points of diversion under the applications before the State Engineer will have some prospect of reaching equilibrium within a reasonable time, as required by the Remand Order. Therefore, Applications 54003 through 54015 and 54019 and 54020 must be denied.

IV. RECALCULATION OF WATER AVAILABLE IN CDD

The Remand Order requires the State Engineer to determine a recalculation of the appropriations from Cave Valley, Dry Lake Valley and Delamar Valley to avoid overappropriation or conflicts with down gradient, existing water rights. Based upon the State Engineer's prior findings that great uncertainty exists concerning the timing and exact location of the flow paths within CDD, the State Engineer believes that there is water available for appropriation within CDD; however, based upon the Remand Order, the Applicant's methodology failed to provide satisfactory proof that any groundwater appropriated to the Applicant in the CDD basins would not conflict with down-gradient, existing water rights. Consequently, the State Engineer concludes that Applications 53987 through 53992 must be denied.

V. THE SWAMP CEDAR ACEC

The swamp cedar ACEC is within an area designated as a Traditional Cultural Property that is listed on the National Register of Historic Places. Having found that the protection of cultural resources within a registered historic place is in the public interest, and that the Applicant's 3M Plan is not adequate where the unreasonable result may occur prior to the investigation trigger being reached, the State Engineer concludes that approval of Applications 54014 and 54015 threatens to prove detrimental to the public interest and must be denied.

VI. MONITORING, MANAGEMENT AND MITIGATION

The State Engineer concludes the Applicant provided substantial evidence that the 3M Plans are in accordance with Nevada water law, the Remand Order, and the

requirements set out in *Eureka*. The 3M Plans adhered to the Remand Order by defining objective standards, thresholds and triggers so that mitigation of unreasonable effects from pumping of water are neither arbitrary nor capricious in the project basins and adjacent basins that may be affected by project pumping. Except as to Applications 54014 and 54015, the 3M Plans adhere to statutory requirements to protect existing water rights, the protectable interest in existing domestic wells, the public interest, and environmental soundness under Nevada water law. The State Engineer makes the following conclusions on presently-known, substantial evidence in the record.

A. Baseline

The State Engineer concludes the Applicant currently has sufficient baseline data to appropriately establish defined quantitative triggers and that between now and the time when any pumping may begin, additional data will make the baseline more robust. The State Engineer concludes the 3M Plans' methodology is reasonable and acceptable for establishing triggers from the baseline.

B. Defined Triggers and Thresholds

The State Engineer concludes the 3M Plans will ensure that existing water rights will not be conflicted with, as holders of existing water rights will have the appropriate amount of water at their point of diversion, in sufficient quality, to continue their permitted beneficial use. Substantial evidence supports the finding that the proper water rights were considered and included in the plan. The State Engineer further concludes that so long as an existing water right holder has access to their allocated amount of water via the same or substantially the same delivery method, there is no conflict under Nevada water law.

The 3M Plans also ensure environmental resources are protected during the Applicant's GDP pumping. The State Engineer concludes the 3M Plans meet the requirements of environmental soundness under the Nevada law. Additionally, the State Engineer concludes that groundwater-dependent environmental resources have been adequately delineated in the plan. The 3M Plans include specific actions that will be required by the State Engineer depending on the particular circumstances, which will be effective to mitigate any impacts, including unforeseen impacts, if necessary and appropriate. The 3M Plans' holistic approach to avoiding all defined hydrologic and environmentally unreasonable effects outlined therein will effectively avoid unreasonable effects to senior water rights and the public interest.

In summary, the State Engineer concludes that the 3M Plans meet the requirements outlined in the Remand Order and in *Eureka County v. State Engineer*. As required by the Remand Order, the 3M Plans define standards, thresholds, and triggers so that mitigation of unreasonable effects from the Applicant's GDP pumping is not arbitrary or capricious. The triggers established in the 3M Plans for both existing water rights and environmental resources are defined, quantitative and objective triggers that are currently established, and based upon substantial evidence and sound science. The 3M Plans and evidence presented further identify specific mitigation actions for the various resources, including why the mitigation actions will be effective to avoid, or if necessary, mitigate, the defined unreasonable effects.

C. Public Input

The State Engineer concludes ongoing public input is paramount for a successful 3M Plan. The State Engineer determines that hydrologic monitoring data (*i.e.*, quarterly reports), environmental monitoring data, and water chemistry data will be made publicly available through the Division of Water Resources' website.

In addition, public comment will be accepted for the following reports:

1. The following year's operation plan will be available for 30 days for public comment before finalization; and,
2. Annual monitoring data reports and groundwater flow model output reports will be available for 90 days of public comment before finalization.

In addition to these reporting requirements, the State Engineer has, through this Ruling, required the following additional requirements to enhance public input and monitoring (new language underlined):

1. The Applicant shall notify the State Engineer and any affected water right holder or CTGR if an investigation trigger is reached (pp. 48-49, 53);
2. If a management action involves preparing for mitigation actions, including procuring equipment contracts or landowner approvals, the State Engineer will convene a mandatory meeting to review mitigation strategies included in the 3M Plans (pp. 49-50);
3. The Applicant shall notify the State Engineer and any affected water right holder or CTGR if a mitigation trigger is reached; or alternatively, if preemptive mitigation is implemented as a management option. The Applicant is required to

submit a memorandum within 30 days to the State Engineer that describes the mitigation trigger and corresponding actions.[629] (pp. 52-53);

4. The State Engineer will be involved in an investigation if an investigation trigger is reached (p. 60);
5. Once the investigation has concluded, the Applicant will provide the findings to the State Engineer and the parties who received notice of the investigation trigger at the end of each quarter (p. 60);
6. The Applicant is required to submit quarterly reports to the State Engineer and other noticed parties (p. 60); and,
7. The 3M Plans are modified to require that monitoring under the Plans continue as long as impacts from GDP pumping are detectable through said monitoring (p. 97).

D. State Engineer Control

The State Engineer concludes that because of the large area and the nature of the GDP, the Applicant must supply the resources to implement the 3M Plans. The State Engineer hereby approves the 3M Plans, which, if implemented, will be under the jurisdiction and authority of the State Engineer to make adjustments, including, but not limited to requiring additional monitoring wells as deemed necessary, subject to notification to the Applicant and Protestants.

VII. INCLUSION OF MILLARD AND JUAB COUNTIES, UTAH

The State Engineer concludes the Applicant adhered to the Remand Order by providing for the inclusion of Millard and Juab Counties, Utah, in the Spring Valley 3M Plan insofar as water basins in Utah may be affected by pumping groundwater from Spring Valley, Nevada. The State Engineer concludes that the Spring Valley 3M Plan establishes effective monitoring of flow paths that will detect propagation of drawdown prior to the propagation reaching Millard and Juab Counties, Utah. The 3M Plan also establishes new defined triggers specific to Millard and Juab Counties' resources that will ensure that mitigation of unreasonable effects are neither arbitrary nor capricious. The State Engineer concludes the Spring Valley 3M Plan methodology will protect, and if

[629] As to investigation or mitigation triggers, the State Engineer has not identified that every protesting party be served, as information submitted to the State Engineer by the Applicant would be available to a requesting party pursuant to the Nevada Public Records Act, NRS 239.001, *et seq*.

necessary, provide appropriate mitigation for, existing water rights and environmental resources in Millard and Juab Counties, Utah.

SUMMARY OF DECISION

This section succinctly summarizes the salient points in this complicated and lengthy Ruling. The Ruling addresses the District Court's four remand issues:

1. The addition of Millard and Juab counties, Utah in the mitigation plan so far as water basins in Utah are affected by pumping of water from Spring Valley Basin, Nevada;

2. A recalculation of water available from Spring Valley assuring that the basin will reach equilibrium between discharge and recharge in a reasonable time;

3. [To define] standards, thresholds or triggers so that mitigation of unreasonable effects from pumping of water are neither arbitrary nor capricious in Spring Valley, Cave Valley, Dry Lake Valley and Delamar Valley, and;

4. Recalculation of the appropriations from Cave Valley, Dry Lake and Delamar Valley to avoid over appropriation or conflicts with down-gradient, existing water rights.

All water right applications subject to this Ruling are denied as a result of the analysis mandated by the District Court pursuant to Remand Issues Numbered 2 and 4. In denying the applications, the State Engineer requests that any future judicial proceeding consider an exception to the *Law of the Case Doctrine* that would allow for a reconsideration of those two remand issues (*see* pages 18 and 38 of this ruling). The State Engineer respects the District Court's remand order and has ruled accordingly. However, it is the State Engineer's statutory duty to conserve, protect and enhance the water resources of the state in accordance with Chapters 532, 533 and 534 of the Nevada Revised Statutes, and it is his belief that these two remand instructions run counter to those duties and represent poor water policy for all Nevadans. Although the State Engineer believes there is water to appropriate in the four subject groundwater basins (*see* previous Rulings 5726, 5875 and 6164-6167), he is precluded from doing so as a result of the scope of those remand issues, which imposes new water policy into the science of water appropriation in Nevada.

Because review under an exception to the *Law of the Case Doctrine* is being requested on Remand Issues Numbered 2 and 4, instead of simply denying the applications and *not* ruling on Remand Issues Numbered 1 and 3, the State Engineer has considered the evidence and testimony, has made finding of facts, conclusions of law, and issued his ruling on those matters. In doing so, the State Engineer has found that the Spring Valley 3M Plan and the Cave Valley, Dry Lake Valley and Delamar Valley 3M Plan are approved with enhancements set forth in this ruling and any other such amendments required by the State Engineer at a later date pursuant to his authority under Nevada law. Likewise, the State Engineer concludes that the Applicant has adhered to the Remand Order by providing for the inclusion of Millard and Juab Counties, Utah, in the Spring Valley 3M Plan insofar as water basins in Utah may be affected by pumping groundwater from Spring Valley, Nevada.

Lastly, regardless of whether any of the denied water right applications are reinstated as a result of any future judicial process, Applications 54014 and 54015 cannot be approved and are denied because they threaten to prove detrimental to the public interest as it relates to protecting the Swamp Cedars ACEC.

RULING

1. Applications 54003 through 54015 and Applications 54019 and 54020 are hereby denied on the ground that the Applicant has failed to demonstrate a reduced award based on evapotranspiration (ET) capture that has some prospect of reaching equilibrium within a reasonable time.
2. The protests to Applications 54014 and 54015 are upheld in part, and the Applications are hereby denied on the ground that granting the applications would threaten to prove detrimental to the public interest.
3. Applications 53987 through 53992 are hereby denied on the ground that the Applicant's methodology failed to provide satisfactory proof that any groundwater appropriated to the Applicant in the Cave, Dry Lake and Delamar Valleys would not conflict with down-gradient, existing water rights.
4. The Spring Valley 3M Plan and the Cave Valley, Dry Lake Valley and Delamar Valley 3M Plan are approved, subject to reinstatement of any water appropriated under Applications 53987 through 53992; Applications 54003 through 54013; or Applications 54019 and 54020; and such Applications are conditioned upon the

Applicant's compliance with the plans, the requirements added through this Ruling, and any amendments the State Engineer requires at a later date pursuant to his authority under Nevada law.

Respectfully submitted,

JASON KING, P.E.
State Engineer

Dated this 17th day of August, 2018.