

*In the Supreme Court of Nevada*

CORPORATION OF THE PRESIDING BISHOP OF THE )  
CHURCH OF JESUS CHRIST OF LATTER-DAY SAINTS, )  
ON BEHALF OF CLEVELAND RANCH, )

Petitioners, )

vs. )

THE SEVENTH JUDICIAL DISTRICT COURT of the )  
State of Nevada, in and for the County of White )  
Pine; and THE HONORABLE ROBERT E. ESTES, )  
Senior District Judge, )

Respondents, )

and, )

JASON KING, P.E., in his official capacity as the )  
NEVADA STATE ENGINEER, and the NEVADA )  
DEPARTMENT OF CONSERVATION AND NATURAL )  
RESOURCES, DIVISION OF WATER RESOURCES, and )  
SOUTHERN NEVADA WATER AUTHORITY, )

Real Parties in Interest. )

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**APPENDIX TO ANSWER TO PETITION**

District Court Case Nos. CV-1204050, CV-1204051, CV-1204052,  
CV-1204053, CV-1204054, CV-1204055, CV-0418012, CV-0419012

DANIEL F. POLSENBERG  
Nevada Bar No. 2376

JOEL D. HENRIOD  
Nevada Bar No. 8492

JUSTIN J. HENDERSON  
Nevada Bar No. 13349

LEWIS ROCA ROTHGERBER LLP  
3993 Howard Hughes Parkway, Suite 600  
Las Vegas, Nevada 89169  
(702) 949-8200

[DPolsenberg@LRRLaw.com](mailto:DPolsenberg@LRRLaw.com)  
[JHenriod@LRRLaw.com](mailto:JHenriod@LRRLaw.com)

PAUL G. TAGGART  
Nevada Bar No. 6136

GREGORY H. MORRISON  
Nevada Bar No. 12454

TAGGART & TAGGART, LTD.  
108 North Minnesota Street  
Carson City, Nevada 89703  
(775) 882-9900

[Paul@LegalTNT.com](mailto:Paul@LegalTNT.com)  
[Greg@LegalTNT.com](mailto:Greg@LegalTNT.com)

GREGORY J. WALCH  
Nevada Bar No. 4780

DANA R. WALSH  
Nevada Bar No. 10228

SOUTHERN NEVADA WATER AUTHORITY  
1001 South Valley View Boulevard  
Las Vegas, Nevada 89153  
(702) 258-7166

[Greg.Walch@lvvwd.com](mailto:Greg.Walch@lvvwd.com)  
[Dana.Walsh@lvvwd.com](mailto:Dana.Walsh@lvvwd.com)

*Attorneys for Southern Nevada Water Authority*

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TAB 1

1

1

**Certified Transcript**

STATE OF NEVADA

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

DIVISION OF WATER RESOURCES

BEFORE SUSAN JOSEPH-TAYLOR, HEARING OFFICER

IN THE MATTER OF APPLICATION 53987  
THROUGH 53992, INCLUSIVE, AND 54003  
THROUGH 54021, INCLUSIVE, FILED TO  
APPROPRIATE THE UNDERGROUND WATERS  
OF SPRING VALLEY, CAVE VALLEY,  
DELAMAR VALLEY AND DRY LAKE VALLEY  
HYDROGRAPHIC BASINS (184, 180, 182  
AND 181), LINCOLN COUNTY AND WHITE  
PINE COUNTY, NEVADA.

Volume 1

Pages 1 - 242

/

TRANSCRIPT OF PROCEEDINGS

PUBLIC HEARING

MONDAY, SEPTEMBER 26, 2011

Reported by:

CAPITOL REPORTERS  
Certified Court Reporters  
BY: CARRIE HEWERDINE, RDR  
Nevada CCR #820  
515 West Fourth Street, Suite B  
Carson City, Nevada 89703  
(775) 882-5322

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(775) 882-5322

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## 1 PANEL MEMBERS:

2 SUSAN JOSEPH-TAYLOR, Chief Hearing Officer  
3 Section of the Division of Water Resources

4 TIM WILSON, Hearing Officer  
5 JASON KING, State Engineer  
6 KEVIN HICKENBOTTOM, Deputy State Engineer  
7 RICK FELLING, Chief Hydrologist

## 8 APPEARANCES OF COUNSEL/PARTIES:

9 For the Applicant: Taggart & Taggart, Ltd.  
10 By: Paul G. Taggart, Esq.  
11 So. Nevada Water Authority  
12 By: Dana Walsh, Esq.  
13 Laxalt & Nomura, Ltd.  
14 By: Robert Dotson, Esq.  
15 Brownstein, Hyatt,  
16 Farber, Schreck  
17 By: Steven O. Sims, Esq.

18 For Protestant (GBWN): Simeon Herskovits, Esq.  
19 Iris Thorngon, Esq.

20 For Protestant Long Now  
21 Foundation: (No Appearances)

22 For Protestant Millard  
23 County & Juab County: John Rhodes, Esq.  
24 Mark Ward, Esq.

25 For Protestant Confederated  
Tribes of the Goshute  
Reservation, Duckwater  
Shoshone Tribe, Ely Shoshone  
Tribe: Aaron M. Waite, Esq.  
Paul C. EchoHawk, Esq.  
V. Aaron Contreras, Esq.

For EskDale Center: Jerald Anderson

For Protestant Corporation  
of the Presiding Bishop of  
the Church of Jesus Christ  
of Latter-Day Saints: Kaempfer Crowell  
By: Severin Carlson

For Protestant Nye County: George Benesch, Esq.

For Protestant Henry Vogler: (No Appearance)

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1 communities, talking about people who don't live in  
2 Nevada, talking about the opposers living in a dream  
3 world.

4 The Tribes do not live in a dream world. They  
5 live in a real world that they've inhabited since time  
6 immemorial.

7 At the conclusion of these hearings, we hope  
8 that the State Engineer will find that the proposed  
9 pumping is not environmentally sound; that it is not an  
10 appropriate long-term use which will not unduly limit  
11 future growth and development; that the proposed pumping  
12 will exceed the perennial and safe field of the water  
13 resource; and that it does in fact conflict with existing  
14 rights and is detrimental to the public interest, which  
15 includes the Tribal interest.

16 Thank you.

17 HEARING OFFICER JOSEPH-TAYLOR: Thank you,  
18 Mr. EchoHawk.

19 One quick question. You mentioned a 1976 case  
20 that protected reservation -- reservation rights from  
21 off-reservation pumping, but you didn't provide the case  
22 name.

23 MR. ECHOHAWK: That is Cappaert versus United  
24 States, and the cite is 426 U.S. 128.

25 Cappaert is spelled C-A-P-P-A-E-R-T.  
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1 HEARING OFFICER JOSEPH-TAYLOR: Thank you,  
2 Mr. EchoHawk.

3 MR. ECHOHAWK: Thank you.

4 HEARING OFFICER JOSEPH-TAYLOR: Mr. Hejmanowsk  
5 i for the Corporation of Presiding Bishops.

6 Did I pronounce it correctly?

7 MR. HEJMANOWSKI: Yes, you did.

8 HEARING OFFICER JOSEPH-TAYLOR: Thank you.  
9 There's a lot of names to follow here.

10 MR. HEJMANOWSKI: Indeed you do, and mine  
11 might be one of the tougher ones.

12 For the benefit of everyone else, I'm Paul  
13 Hejmanowski. I'm from Lionel Sawyer & Collins. I  
14 represent the Corporation of the Presiding Bishop on  
15 behalf the Cleveland Rogers Ranch in Spring Valley.

16 I want to be clear from the outset that our  
17 position is concerning the ranch and only the ranch.  
18 There are a number of issues that will come up here that  
19 we will not be taking the position on; for example, we  
20 will not take a position on the Water Authority's  
21 financial ability to construct the project. Will not take  
22 a position on the Water Authority's conservation efforts  
23 in Las Vegas.

24 We do not take a position on the Water  
25 Authority's justification of need except to the extent  
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1 that something they may say or propose will impact pumping  
2 rates in Spring Valley.

3 We do not take the position on the economic  
4 benefits of this project to Southern Nevada.

5 We do reserve a great concern about the  
6 economic detriment to Spring Valley; but otherwise, that's  
7 not our issue, either.

8 And on the issue of interbasin transfer, to  
9 us, that's a matter of state public policy and not a point  
10 on which we're going to take a position, again, except to  
11 the limited extent that it impacts our ranch.

12 Now, our ranch is, as you know, in the  
13 northern part of Spring Valley. And in that area, the  
14 Water Authority has applied for 19 wells. We have  
15 protested 12 of those wells because they will conflict  
16 with our water rights, and they will cause substantial  
17 problem under the other standards that we and they have to  
18 meet for water appropriation.

19 Of the 12 that we protest, four have already  
20 been denied by the State Engineer. Four of those wells  
21 were the subject of the 2007 ruling where it was found  
22 that they conflict with existing rights and would not be  
23 in the public interest. And yet those same 12 wells --  
24 same four wells are a part of the current application once  
25 again.

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1           Even though the one of the witnesses for the  
2 Water Authority, John Entsminger, was quoted in the paper  
3 just yesterday as saying that he expects much of the  
4 evidence to be similar, if not exactly like what was  
5 produced in 2007. He was quoted as saying, "There are  
6 definitely big parts we expect to be the same. The  
7 geology, the rocks, hasn't moved anywhere in the past five  
8 years."

9           Why are those four wells here again? Well,  
10 our objection to the wells, the four wells and the other  
11 12, are based not on some of the issues that were  
12 described by Mr. Taggart; they're based on science.

13           The easiest way to express this is to say that  
14 we took the information provided by the Water Authority  
15 through their model, the Modflow Program, and we took  
16 their data and we subjected it to careful analysis. And  
17 we found that using their data and using their model, we  
18 wind up with some real problems with their applications  
19 for the ranch in the Spring Valley.

20           Giving you one example: When they prepared  
21 their model, they set for their standards they would only  
22 report when there was a drawdown affecting springs of  
23 50 feet. And they said if the flow of the springs was  
24 more than 15 percent, they would be concerned about it,  
25 but they didn't dig down deeper into the data.

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1 Well, when we did, we discovered that the  
2 drawdowns around many of these wells were not 50 feet.  
3 They were 100, 180, in some cases over 200 feet.

4 The impact is this: Under our other analysis  
5 of their data and their models, every single spring in  
6 Spring Valley will go dry. Every one. And that's not  
7 conjecture, and that's not based on my iPad or my modern  
8 conveniences. It's based on the experts who have looked  
9 at their data and concluded that because they didn't dig  
10 deeply enough, we're going to have catastrophe.

11 We find that when we look at their program  
12 which, as you know, is an ET salvage program, they start  
13 with the idea that there's a perennial yield and that  
14 they're going to be able to measure that by ET and that  
15 they can salvage that amount without hurting the system.  
16 And in theory, that's right.

17 But there are a whole host of problems. First  
18 of all, we differ with them greatly on the amount of water  
19 that's available. They've applied in our area for  
20 92,000 acre-feet. And in 2007, the State Engineer  
21 concluded that the perennial yield in this part of the  
22 valley was 80,000 acre-feet.

23 And if we take the Engineer's inventory of  
24 committed resources and we look at the reservation for  
25 domestic use and for future use as the Engineer suggested,

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1 we tell you that, yes, we agree with the Water Authority;  
2 there is unappropriated water available in Spring Valley.

3 There is water available to the Authority  
4 there, but not nearly as much as they claim. They've  
5 asked for 92,000 acre-feet. Our calculation shows that  
6 the unappropriated water is 54,000 acre-feet, and that's  
7 without making provision for future expansion of the  
8 ranch.

9 I heard it said a moment ago that there was no  
10 indication that there was the capital or the ability to  
11 economically expand operations in Spring Valley. I can  
12 assure this panel and the Water Authority that my client  
13 is well capable of expanding operations on the Cleveland  
14 Ranch and can and will do so if economics dictate. We  
15 have the capacity to do that.

16 The problem with the presentations going to be  
17 made by the Water Authority is, in large measure, they're  
18 going to have to try to walk away from their own science  
19 because of the flaws, the fundamental flaws we pointed out  
20 in our reports.

21 They will retreat to an entirely different  
22 standard. That's the one called "manage, monitor, and  
23 mitigate," which we see across all their reports.

24 The idea is even if we don't know quite what's  
25 happening underground, even if we don't know what the  
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1 damage is that we're doing, what we'll do is we'll manage  
2 the damage that we're doing. We'll monitor it. And after  
3 we see how bad it is, we'll try to do something to fix it.  
4 That's the "mitigation" part.

5 Well, a lot of this can't be fixed. They  
6 will, under this program, have to engage in substantial  
7 ground water mining, permanently and perpetually.

8 The aquifer will shrink. The land will  
9 subside. As the aquifer shrinks, it will lose its  
10 elasticity, and you cannot fix that. You can't restore  
11 the water-carrying capacity that's lost. You can monitor  
12 it, you can observe it, and in the end you can lament it,  
13 but you can't fix it. When those springs go dry, every  
14 animal that lives in them will die, every plant that lives  
15 in them will die, and they won't come back.

16 All the wildlife that depends upon those  
17 springs will have to do something different. The birds,  
18 maybe they can fly to another source of water. The  
19 others, they can learn to drink dust. The livestock,  
20 we'll either have to reduce herds greatly, or we'll have  
21 to engage in very expensive pumping if there's any water  
22 left. Or maybe the ranch will become no longer  
23 economically viable without that water.

24 The first thing that will happen under this  
25 program will be the destruction of the subirrigated lands.

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1 They'll go, and they'll go quickly because that's the --  
2 the water just immediately below the surface.

3 And then the springs will go, every one of  
4 them. And then the wells as the drawdown increases and  
5 the water table drops.

6 Well, perhaps we could put in more and deeper  
7 wells, then. We could drill down and try to get our water  
8 back by going much deeper in the ground. The problem here  
9 is the Water Authority forgot to make allowances for those  
10 replacement wells in their model. It will only exacerbate  
11 the problem. It will only create still greater problems  
12 for this water system.

13 We are not here to argue against progress or  
14 water for Las Vegas. I live in Las Vegas. I drink water.  
15 I live right by the Water Authority, and they do a fine  
16 job. I have a lot of respect for the matters given to the  
17 Water Authority and the people who are putting forward  
18 this program, and I do not intend in any way to impugn  
19 their integrity or their motives.

20 But that's not enough. Good intentions are no  
21 substitute for good science. Even though they stand  
22 before us and say in all sincerity that they intend to  
23 manage, to monitor, and mitigate zealously, I can't be so  
24 confident in what their grandchildren will do because this  
25 is a long-term project. A very long-term project.

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TAB 2

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## Certified Transcript

1  
2 STATE OF NEVADA

3 DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

4 DIVISION OF WATER RESOURCES

5 BEFORE SUSAN JOSEPH-TAYLOR, HEARING OFFICER

6  
7 IN THE MATTER OF APPLICATION 53987 Volume 29  
8 THROUGH 53992, INCLUSIVE, AND 54003  
9 THROUGH 54021, INCLUSIVE, FILED TO Pages 6423 - 6508  
10 APPROPRIATE THE UNDERGROUND WATERS  
11 OF SPRING VALLEY, CAVE VALLEY,  
12 DELAMAR VALLEY AND DRY LAKE VALLEY  
13 HYDROGRAPHIC BASINS (184, 180, 182  
14 AND 181), LINCOLN COUNTY AND WHITE  
15 PINE COUNTY, NEVADA.  
16 /

17  
18 TRANSCRIPT OF PROCEEDINGS

19 PUBLIC HEARING

20 FRIDAY, NOVEMBER 18, 2011

21  
22 Reported by: CAPITOL REPORTERS  
23 Certified Court Reporters  
24 BY: CARRIE HEWERDINE, RDR  
25 Nevada CCR #820  
515 West Fourth Street, Suite B  
Carson City, Nevada 89703  
(775) 882-5322

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6423

## Certified Transcript

## 1 PANEL MEMBERS:

2 SUSAN JOSEPH-TAYLOR, Chief Hearing Officer  
3 Section of the Division of Water Resources

4 TIM WILSON, Hearing Officer  
5 JASON KING, State Engineer  
6 KEVIN HICKENBOTTOM, Deputy State Engineer  
7 RICK FELLING, Chief Hydrologist

## 8 APPEARANCES OF COUNSEL/PARTIES:

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14 By: Robert Dotson, Esq.  
15 Brownstein, Hyatt,  
16 Farber, Schreck  
17 By: Steven O. Sims, Esq.

18 For Protestant (GBWN): Simeon Herskovits, Esq.

19 For Protestant Long Now  
20 Foundation: Stephen B. Reich, P.E.

21 For Protestant Millard  
22 County & Juab County: John Rhodes, Esq.  
Mark Ward, Esq.

23 For Protestant Confederated  
24 Tribes of the Goshute  
25 Reservation, Duckwater  
Shoshone Tribe, Ely Shoshone  
Tribe: Paul C. EchoHawk, Esq.

For EskDale Center: Jerald Anderson

For Protestant Corporation  
of the Presiding Bishop of  
the Church of Jesus Christ  
of Latter-Day Saints: Paul Hejmanowski, Esq.  
Kaempfer Crowell  
By: Severin Carlson

For Protestant Nye County: (No Appearance)

For Protestant Henry Vogler: (No Appearance)

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## Certified Transcript

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## I N D E X

## MILL EXHIBITS MARKED/RECEIVED: PAGE

33 GBCAAS Appendix 04 6428

34 GBCAAS Appendix 05 6428

38 GBCAAS Chapter A 6428

## GBWN EXHIBITS MARKED/RECEIVED: PAGE

64 Stringham, T.K., W.C. Krueger, and D.R. 6429  
Thomas. 2001. Application of nonequi-  
librium ecology equilibrium to rangeland  
riparian zones. Journal of Range Management  
54:210-217. (Spring Valley\_Exh\_2020)

## CLOSING ARGUMENTS: PAGE

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MR. ECHOHAWK 6443

MR. REICH 6455

MR. ANDERSON 6459

MR. HERSKOVITS 6468

MR. TAGGART 6489

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## Certified Transcript

1 CARSON CITY, NEVADA,

2 FRIDAY, NOVEMBER 18, 2011, 9:03 A.M.

3 -o0o-

4  
5 HEARING OFFICER JOSEPH-TAYLOR: Good morning.

6 Before we start closing arguments, I have a few  
7 evidentiary issues to take care of.

8 The Southern Nevada Water Authority has  
9 reviewed the exhibit list for me. Mr. EchoHawk and  
10 Mr. Hejmanowski -- Mr. Herskovits, you have not had time  
11 to look through the exhibit list, have you?

12 MR. HERSKOVITS: No, I have.

13 HEARING OFFICER JOSEPH-TAYLOR: And  
14 Mr. Hejmanowski, have you had time to go through the  
15 exhibit list --

16 MR. HEJMANOWSKI: No, ma'am, I have not.

17 HEARING OFFICER JOSEPH-TAYLOR: -- in your  
18 spare time here?

19 We've gone back and forth with three exhibits  
20 that I believe I had originally marked as Millard 33, 34,  
21 and 38, and then I was instructed that they should be  
22 EskDale. Now I'm being told they're Millard.

23 So I'm going to, right now, make sure that  
24 Millard 33, 34, and 38 are in. I show they were discussed  
25 during Dr. Myers' testimony on November 3rd.

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1 I hadn't showed them moved into Evidence. I  
2 believe, Mr. Taggart, that was probably your Cross-  
3 Examination. They were GBCAAS documents.

4 MR. TAGGART: I can't be sure because they  
5 were in the original Direct exam, too. There was a couple  
6 slides from that, from some of those Millard documents,  
7 but I -- I do recall those documents being discussed.

8 HEARING OFFICER JOSEPH-TAYLOR: Oh, I show  
9 them being discussed. I just don't show them being moved  
10 into Evidence. So I want to make sure that everything is  
11 in that anybody wanted in.

12 So, Mr. Herskovits, any objection to those  
13 three GBCAAS documents coming in for clarity?

14 MR. HERSKOVITS: No. And though I haven't had  
15 a chance to review it, Madam Hearing Officer, we were  
16 under the impression that we had, in fact, moved to have  
17 them admitted. We were just a little bit careless about  
18 that.

19 HEARING OFFICER JOSEPH-TAYLOR: We went  
20 through a lot of documents, Mr. Herskovits. I'm surprised  
21 there's this few.

22 So I'm going to make sure Mill 33, 34, and 38  
23 are in Evidence, and neither side seems to object because  
24 everybody talked about them.

25 So we took care of that one.  
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1 (Mill Exhibit Nos. 33, 34, and 38  
2 received into Evidence)

3 HEARING OFFICER JOSEPH-TAYLOR: This e-mail  
4 says that Mill 38 was -- that's the same thing. Never  
5 mind. They mentioned it twice.

6 Then, Mr. Herskovits, under Great Basin Water  
7 Network's documents -- I know you don't have your exhibit  
8 list in front of you, but I want this record clean today.

9 Great Basin 64 was a document, I believe,  
10 Dr. Patten might have relied on. It was at the time where  
11 you were going through all the exhibits for Dr. Patten,  
12 and this one seems to have been skipped over.

13 It was testimony on November 3rd. The  
14 document's called "Application of Nonequilibrium Ecology  
15 Equilibrium to Rangeland Riparian Zones."

16 It doesn't look like that was moved into  
17 Evidence, and I'm not sure if that was one -- it was -- I  
18 noted it during the time of Dr. Patten's testimony.

19 MR. HERSKOVITS: If I could just have a  
20 moment. Did you say it was 64?

21 HEARING OFFICER JOSEPH-TAYLOR: Yes, sir.

22 MR. HERSKOVITS: Yes, I see it. I think that,  
23 too, is probably an oversight.

24 HEARING OFFICER JOSEPH-TAYLOR: Thank you.

25 The SNWA e-mail says it was referenced in the  
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1 transcript but not offered.

2 Do you want to offer it at this time?

3 MR. HERSKOVITS: Yes, we would offer this  
4 exhibit for admission.

5 MR. SIMS: No objection.

6 HEARING OFFICER JOSEPH-TAYLOR: Thank you,  
7 Mr. Sims.

8 GBWN 64 will be admitted.

9 (GBWN Exhibit No. 64 received into  
10 Evidence)

11 HEARING OFFICER JOSEPH-TAYLOR: And one more,  
12 Mr. Herskovits. GBWN 71, it's the CV of Heather Cooley.

13 MR. HERSKOVITS: We did not offer that because  
14 Ms. Cooley did not come and testify.

15 HEARING OFFICER JOSEPH-TAYLOR: Correct.

16 MR. HERSKOVITS: She is a colleague of  
17 Dr. Gleick's who worked with him on the reports for this  
18 hearing. And at the time we -- we submitted those during  
19 the evidentiary exchanges, we did not know which or both  
20 of them might attend and testify. So we submitted her CV.

21 But there's no need. We're not offering it  
22 for admission.

23 HEARING OFFICER JOSEPH-TAYLOR: I suspect  
24 that's my mistake, going down columns quickly putting in  
25 X's as offered, but that's why I wanted you all to check  
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1 it.

2 Okay. With that, let's proceed to closing  
3 argument.

4 Mr. Hejmanowski, you're up first, please.

5 CLOSING ARGUMENT BY MR. HEJMANOWSKI

6 MR. HEJMANOWSKI: Good morning.

7 Six weeks ago I sat here and said the springs  
8 will go dry on the ranch, and after six weeks of evidence  
9 the facts remain the same. Those springs are going to go  
10 dry if these applications are granted.

11 Doctors Jones and Mayo made it quite clear how  
12 these applications will drastically affect the existing  
13 water rights held by the ranch.

14 They base their conclusions on the model  
15 prepared by the Water Authority, using the data from the  
16 Water Authority without change. What they did differently  
17 was they analyzed it in greater depth.

18 Now, the Water Authority says: That's wrong.  
19 It's unfair for us to use their model that way, striking  
20 that, because that's what they did.

21 Exhibit 337, their conflicts analysis, uses  
22 the model to predict the impact on our springs. If you  
23 look at Table 6.2, where they take 18 of the springs and  
24 list them, and show the impact as they estimate by the  
25 drawdown, they use the model the same way we did.

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1           When Mr. Watrus was on the stand, on October  
2 10th, we had this exchange.

3           I said to him, question:

4           "Now those conflicts, with existing rights,  
5 that's the subject of your report?"

6           Answer: "It is."

7           Question: "And you went through, right by  
8 right, and calculated what you think the impact would be?"

9           Answer: "I attempted to do just that."

10          Question: "Site-specific work?"

11          Answer: "Yes, site-specific work," close  
12 quote.

13          That was Mr. Watrus, the author of the report.

14          They used it for site-specific work, as did  
15 we. But when Jones and Mayo did so they took pains in  
16 their report to say that because of the grid size, because  
17 of the regional nature of the model, there is uncertainty,  
18 necessarily, about when any given spring will go dry, but  
19 no doubt that they will all go dry over time.

20          And not surprisingly there's a lot of  
21 agreement between the Water Authority report and Jones and  
22 Mayo. After all, it's based on the same -- same model.

23          In fact, let's consider the size of the cone  
24 of depression, the aggregate cone. The Water Authority  
25 actually presented a drawdown map, very similar to the one

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1 presented by Jones and Mayo, but it's a little hard to  
2 find, and it's very hard to read.

3 It's at the back, the last page of their  
4 report, and we have these thumbnails. I've put them up  
5 here on the screen to show you what I'm talking about.

6 And the interesting one for us -- and this is  
7 Plate 2 from 337 -- on the right-hand side they've  
8 predicted drawdown in the year 2117. That's 75 years  
9 after build-out. And the bottom map, which I've blown up  
10 here, shows you the aggregate cone of depression in Basin  
11 Number 184. And it's in green, and if you look at the  
12 plate, the green indicates a drawdown of 100 to 150 feet.

13 Sef, could you zero in on that closer, please?

14 Okay. This is a -- we're telescoping in on  
15 that same map to show, in this green, the cone of  
16 depression.

17 Let me compare this now to Jones and Mayo  
18 Figure 12.

19 Same contours. The only thing that's changed  
20 is our colors were a little different. The drawdown's the  
21 same. Sef, would you go back and forth a time or two,  
22 please?

23 It's the same thing. It's the same cone of  
24 depression, 100 to 150 feet after 75 years. They stopped  
25 there. We went further. We took a look at it at 200

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1 years. That's our Figure 13.

2 Could you show that?

3 Figure 13, same model, same data, it just  
4 tells us that after 200 years the drawdown, in that  
5 massive cone of depression, is approaching 200 feet. No  
6 wonder all the springs go dry. That's a very deep, very  
7 large aggregate cone of depression.

8 Now, these 19 wells that are proposed are  
9 supposed to be an ET salvage project. What we know,  
10 however, is that they're not going to capture very much of  
11 the ET with this design.

12 That means that when you're evaluating this  
13 application, you have to be able to assess how much is the  
14 uncaptured ET, and we have to subtract it from what's  
15 available to -- from the Water Authority, because if they  
16 don't capture it, it's going to be lost in the air and  
17 they don't get to also pump it out of the ground.

18 That's why Jones and Mayo said this is a  
19 hopelessly flawed concept that needs to be replaced by a  
20 widely distributed well field of many, many shallow wells.

21 Although they did not emphasize any of that in  
22 their reports, the Water Authority essentially  
23 acknowledged that. When Mr. Prieur testified before you  
24 and said, "We need at least another 50 to 100 wells" --  
25 it's quite a range, but they -- they do need that. You

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1 need that and maybe more in order to capture the ET.

2 If you don't capture all the ET, on which your  
3 calculations are based, what's the result? Ground water  
4 mining. That's the point that I think they have skipped  
5 over so often in what they're looking at in these  
6 applications.

7 Now, in fairness to the people from the Water  
8 Authority, they inherited these applications. They're 22  
9 years old. They're not an ET salvage design.

10 There are the wrong wells, in the wrong  
11 places, and in the wrong numbers to achieve ET salvage.  
12 They can pump a lot of water, but they won't achieve ET  
13 salvage, and necessarily that means they're going to be  
14 ground water mining. It's going to deplete the aquifers.  
15 It has to. There'll be subsidence, and with that there  
16 will be permanent loss of storage capacity, and that ought  
17 not happen on our watch.

18 Now, along the way of this case the Water  
19 Authority has said, "Well, that's not what we're really  
20 going to do. We're not going to pump that much." And we  
21 are -- as you heard, we're going to have different wells.  
22 And all of that may be true. In fact, I think it's  
23 necessary.

24 But that's not the application that we have to  
25 deal with. State law requires us to address the  
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1 applications they filed. That's the applications that I  
2 have to address. That's the applications the Engineer has  
3 to address. That's what the Water Authority has to  
4 address. We don't get to indulge in what if we change  
5 this, that, and the other thing some time in the future.

6 So what about the available water? How much  
7 is available for pumping?

8 The State Engineer decided in 2007 the safe  
9 annual perennial yield was 80,000 afa. The Water  
10 Authority has come back several times with different  
11 calculations of what they think perennial yield should be.  
12 Currently they're at 94,800 for the valley. The great  
13 bulk of that's down at the southern end where our ranch is  
14 located.

15 And they come to that in their Exhibit 258,  
16 that Mr. Burns testified about so well. And he  
17 acknowledged, when he testified, that his work was  
18 premised upon the work of Doctors Thomas, Rowley, and  
19 Fenstermaker.

20 I have no comment on Dr. Thomas' work. It  
21 sounded good, and I did not understand it.

22 But I have a sense about the others.  
23 Dr. Rowley advanced the theory that these faults, deep in  
24 the ground, provide high transmissivity along their length  
25 but act as barriers to water transmission perpendicular to

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1 the faults.

2 He acknowledged, however, that his theory has  
3 not been tested, has not been measured, and consequently  
4 in a scientific sense it's not proven. It's attractive,  
5 but it's not proven.

6 And he acknowledged, when I asked him, that  
7 reasonable, professional geologists can and do disagree  
8 with his theories. Now, his theories may or may not have  
9 weight, but unproven is a slender reed on which to base  
10 decisions this important.

11 Dr. Fenstermaker testified at length about the  
12 calculations she made of ET based upon remote sensing and  
13 a variety of other techniques. And I'm sure it's good  
14 work. I was impressed by it. But there's not near enough  
15 of it.

16 The Water Authority likes to tell us it was  
17 based on five years of data. It is not.

18 In the valley that I'm concerned about they  
19 have seven stations. If you were to look at their report  
20 and the table where they set them forth, you'll find that  
21 of those seven stations, one of them had five years' data.

22 Two of them had four years' data. Four of  
23 them have three years' data. And even Dr. Fenstermaker  
24 agreed this is not enough to predict 200 years of  
25 performance.

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1 But it's not five years of data. They need to  
2 have a great deal more.

3 And consider, please, the accuracy rate.  
4 Dr. Fenstermaker testified, on September 29th, that her  
5 accuracy rate was about 68 percent. In my high school  
6 that was a D.

7 If you take that factor, that kind of error  
8 rate, and you applied it against the estimates of  
9 available ET, you'd wind up with a range of between 62,000  
10 on the low end to 120,000 afa on the high end. That's a  
11 terribly wide range on which to try to make momentous  
12 decisions such as this.

13 Now, the better way is, as the engineer said  
14 in Ruling 5726, we took the 80,000 and made deductions.  
15 The only change I would make to that is to reflect the  
16 effect of the recent inventory where the committed rights  
17 went from 10,000 and change to 14,000. After you make  
18 those deductions you wind up with available and  
19 unappropriated water of 56,532 acre-feet, maximum, but  
20 that has to be adjusted.

21 On October 10th Mr. Prieur acknowledged, in  
22 testimony on Cross-Examination, that you have to deduct  
23 from that the ET lost from the phreatophytes that are left  
24 in place, the uncaptured ET.

25 And he further acknowledged we have to deduct  
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1 the water consumed by any replacement wells. So from  
2 that, that's the number we have to jog down from those  
3 other calculations. The record is not clear for us as to  
4 what they'd be, because we don't have a precise number on  
5 what the uncaptured ET would be.

6 I'd note in passing, as you look at the ET  
7 capture, which is the subject of Report 363, that when  
8 they were doing the ET map, in Figures 19 and 20, they  
9 included within that area the Cleveland Ranch, and we were  
10 hoping we could stay in business.

11 Okay. Let me switch over to the -- one of the  
12 other responses to the criticisms we have: The management  
13 issue. There's that superficially soothing mantra of  
14 "manage, monitor, and mitigate," which I suggest is just a  
15 cotton candy of good intentions with nothing more at its  
16 core. It doesn't provide any protection for my client or  
17 the other Protestants.

18 Consider that stipulation they entered into  
19 with the federal agencies. And I'm very much aware that  
20 the stipulation was approved by the Engineer's office, and  
21 I should be very reluctant to criticize it, but I have to  
22 criticize it, because it doesn't provide the protection my  
23 client must have.

24 It's important to notice at the beginning,  
25 that stipulation has no standards, no thresholds, no

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1 trigger points at all. Under that stipulation, if  
2 Mr. Marshall noticed a disaster looming, he can't stop the  
3 pumping.

4 All he can do is refer it to a committee,  
5 where they will talk about it. And if they don't reach a  
6 consensus, they'll refer it to the Executive Committee,  
7 where they'll talk about it. And if they can't reach a  
8 consensus there, they'll go to a neutral third party, if  
9 the Water Authority doesn't exercise its veto.

10 And when they get before that neutral third  
11 party, there's no provision that anybody is bound by his  
12 decision. There's no enforcement mechanism. There's no  
13 penalty. There's nothing. They're merely going to talk  
14 about it.

15 Now, maybe -- maybe we'd get lucky and it  
16 would come before the Engineer's office, but there's no  
17 obligation to present any of this to the Engineer's  
18 office. In fact, the whole process takes place behind  
19 closed doors. There's no transparency. There's no  
20 participation by the ranch. There's no participation by  
21 any of the Protestants.

22 There's no guarantee that we can avoid harm  
23 before this somehow becomes public. And let's remember  
24 that the tragic story that Mr. Marshall related. Remember  
25 the manage and monitor program for the Devils Hole

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1 pupfish, where despite the program, despite the very best  
2 intentions of all the researchers involved, the tragic  
3 mistake was made, and roughly 50 percent of the world's  
4 population of the Devils Hole pupfish was killed?  
5 Mistakes can happen. Where's our protection? There  
6 was -- there's much missing here.

7           Let me talk briefly about the impacts to the  
8 ranch. Jones and Mayo described at length the impacts on  
9 the water. You saw that video. You saw how green that  
10 property is. Remember those cattle standing in forage up  
11 to their bellies, because they have water there?

12           Compare that to the southern unit that John  
13 Sanders described, the Desert Ranch, where the  
14 productivity was so much lower, the reduction rates were  
15 lower, the gain in weight lower.

16           And what was the difference? I mean, it's the  
17 same cattle, the same management, moving cattle back and  
18 forth between the two units. What's the difference? The  
19 availability of water. It's no accident this is called  
20 Spring Valley.

21           You know, if the program suggested by the  
22 Water Authority goes forward, we face cheatgrass. You saw  
23 the photographs, acres and acres and acres of cheatgrass  
24 right up to the edge of the ranch, on the west side, on  
25 the north side. John Sanders described it up on the

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1 northeast side. All of that represents big banks of seed  
2 waiting for an opportunity, the opportunity that will be  
3 provided by lowering the water table.

4 And when that happens the cheatgrass comes in,  
5 and that's not a good thing. And I suppose it's  
6 particularly poynant in a day like today that we recognize  
7 that cheatgrass represents a huge fire threat. It's  
8 burned up there several times. It will burn again.

9 Okay. The conclusions we draw from this: If  
10 these applications are granted, there will be a huge  
11 aggregate cone of depression that's going to dewater a  
12 substantial part of the valley and its aquifers. The  
13 springs will all go dry. I don't know what year each one  
14 will go dry, but I know they will all go dry, and this  
15 project will cause ground water mining on an unprecedented  
16 scale.

17 So what should we do? It's not enough to just  
18 say it's bad. What are we going to do to fix it? These  
19 applications need to be denied for the reasons we  
20 discussed.

21 They're not in the public interest. They're  
22 going to interfere with our rights. They're  
23 environmentally unsound, and they're got going to achieve  
24 their function.

25 But there is available water. I agree. I  
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1 said that from the very beginning. If we're going to  
2 capture it, we have to do it right. The Water Authority  
3 needs to go back and develop a proper local hydrologic  
4 model. They need to focus on Spring Valley and give us a  
5 local hydrologic model.

6 They need to redesign the well field with the  
7 many, many shallow wells they need to achieve ET  
8 recapture. Then they need to test that well field design  
9 against their new model and check for interference with  
10 existing rights, including ours. Then and only then are  
11 we ready to engage in any pumping.

12 Now, the Water Authority has done a lot of  
13 good science, and they've presented a lot of good reports  
14 with good people. I acknowledge that, but they're  
15 handicapped by having an inherited a bad well field  
16 design, and they need to go back to the drawing board and  
17 make it right.

18 I'd like to take just a moment, a personal  
19 moment if I might. I want to thank my colleagues over  
20 here, and the staff for the patience and courtesy you've  
21 shown me in these proceedings, and I'd like say happy  
22 anniversary to my wife.

23 Thank you.

24 HEARING OFFICER JOSEPH-TAYLOR: Thank you,  
25 Mr. Hejmanowski.

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3

TAB 3

3

3

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1  
2 STATE OF NEVADA

3 DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

4 DIVISION OF WATER RESOURCES

5 BEFORE SUSAN JOSEPH-TAYLOR, HEARING OFFICER

6  
7 IN THE MATTER OF APPLICATION 53987 Volume 11  
8 THROUGH 53992, INCLUSIVE, AND 54003  
9 THROUGH 54021, INCLUSIVE, FILED TO Pages 2324 - 2597  
10 APPROPRIATE THE UNDERGROUND WATERS  
11 OF SPRING VALLEY, CAVE VALLEY,  
12 DELAMAR VALLEY AND DRY LAKE VALLEY  
13 HYDROGRAPHIC BASINS (184, 180, 182  
14 AND 181), LINCOLN COUNTY AND WHITE  
15 PINE COUNTY, NEVADA.  
16 /

17  
18 TRANSCRIPT OF PROCEEDINGS

19 PUBLIC HEARING

20 MONDAY, OCTOBER 10, 2011

21  
22 Reported by: CAPITOL REPORTERS  
23 Certified Court Reporters  
24 BY: CARRIE HEWERDINE, RDR  
25 Nevada CCR #820  
515 West Fourth Street, Suite B  
Carson City, Nevada 89703  
(775) 882-5322

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## 1 PANEL MEMBERS:

2 SUSAN JOSEPH-TAYLOR, Chief Hearing Officer  
3 Section of the Division of Water Resources

4 TIM WILSON, Hearing Officer  
5 JASON KING, State Engineer  
6 KEVIN HICKENBOTTOM, Deputy State Engineer  
7 RICK FELLING, Chief Hydrologist

## 8 APPEARANCES OF COUNSEL/PARTIES:

9 For the Applicant: Taggart & Taggart, Ltd.  
10 By: Paul G. Taggart, Esq.  
11 -and-  
12 Dana Walsh, Esq.  
13 Robert Dotson, Esq.

14 Brownstein, Hyatt,  
15 Farber, Schreck  
16 (Not in Appearance) BY: Steven O. Sims, Esq.

17 For Protestant (GBWN): Simeon Herskovits, Esq.  
18 Greg James, Esq.

19 For Protestant Long Now  
20 Foundation: (No Appearances)

21 For Protestant Millard  
22 County & Juab County: (No Appearances)

23 For Protestant Confederated  
24 Tribes of the Goshute  
25 Reservation, Duckwater  
Shoshone Tribe, Ely Shoshone  
Tribe: Paul C. EchoHawk, Esq.

For EskDale Center: Jerald Anderson, Esq.

For Protestant Corporation  
of the Presiding Bishop of  
the Church of Jesus Christ  
of Latter-Day Saints: Paul Hejmanowski, Esq.  
Kaempfer Crowell  
By: Severin Carlson

For Protestant Nye County: (No Appearance)

For Protestant Henry Vogler: (No Appearance)

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## I N D E X

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Cross-Examination by Mr. Herkovits 2409

Cross-Examination (Continued) by Mr. Herkovits 2441

Cross-Examination by Mr. Hejmanowski 2502

Cross-Examination by Mr. Anderson 2513

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## ZANE MARSHALL

Cross-Examination by Mr. Herkovits 2407

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## JOHN ENTSMINGER

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## JAMES WATRUS

Direct Examination by Mr. Taggart 2538

## SWNA EXHIBITS MARKED AND ADMITTED: EVIDENCE

88 Southern Nevada Water Authority, 2009, 2544

Conceptual model of groundwater flow for  
the Central Carbonate-Rock Province -  
Clark, Lincoln, and White Pine Counties  
Groundwater Development Project...

90 Southern Nevada Water Authority, 2010, 2544

Addendum to the groundwater flow model  
for the Central Carbonate-Rock Province -  
Clark, Lincoln, and White Pine Counties  
Groundwater Development Project...

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1     signatory to the stipulation.

2                   And it doesn't waive any authorities of the  
3     State Engineer. What the stipulation does is, it requires  
4     monitoring and a process for mitigation that informs  
5     decision-making for the federal agencies and for the State  
6     Engineer's Office.

7                   There is -- there's a significant amount of  
8     information that is generated from the monitoring efforts  
9     to inform other processes.

10            Q     What rights does a rancher or one of the  
11     Tribes have under the stipulation?

12            A     They're not specifically addressed in the  
13     stipulation.

14            Q     And there's no provision in the stipulation  
15     for someone like a rancher to recover damages for injury  
16     from the program, is there?

17            A     Well, again, what the stipulations do is, they  
18     generate a very large amount of information that is  
19     provided to the federal agencies, to the State Engineer's  
20     Office, and made available to the public.

21                   And that information could be used by a  
22     priority water right holder to raise a concern through the  
23     State Engineer's Office.

24                   HEARING OFFICER JOSEPH-TAYLOR: Hold on,  
25     Mr. Hejmanowski.

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1 MR. KING: If you don't mind, Mr. Hejmanowski.

2 MR. HEJMANOWSKI: Oh, no, not at all.

3 MR. KING: I'm just going to interrupt here,  
4 and I understand your -- I understand, you know, you're  
5 asking questions about the stipulation and perhaps what  
6 kind of teeth it has, how it works.

7 I just want to make it clear, obviously, that,  
8 you know, our office -- I mean, this -- if permits are  
9 ever issued, there's permit terms, the regulation of these  
10 water rights are within our purview. If there's adverse  
11 impacts to existing rights, you're not suggesting this,  
12 but we're not going to be sitting on our hands. I mean,  
13 we're going to out there being proactive. And we can  
14 assess penalties, we can require to cease and desist,  
15 curtailment of pumping, et cetera.

16 I just want the record clear that regardless  
17 of what's going on with the stipulation, if permits are  
18 ever issued on this -- and we'll have monitoring plans as  
19 well -- you can be sure that we're going to be looking at  
20 that very closely and responding to anybody, ranchers,  
21 farmers, any water user's assertions that may be, you  
22 know, some impacts are being felt.

23 MR. HEJMANOWSKI: I appreciate that, Mr. King,  
24 and I don't mean to suggest that I thought it would be  
25 otherwise; but, of course, I do have a record that I have



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1 to make for further proceedings.

2 MR. KING: Yes.

3 HEARING OFFICER JOSEPH-TAYLOR: I understand,  
4 that too, Mr. Hejmanowski, but it's a stipulated  
5 settlement between particular parties. The Tribe didn't  
6 settle. The ranch didn't settle.

7 So I don't know really your point. So I don't  
8 know how much farther I'm going to let you go, but go  
9 ahead.

10 BY MR. HEJMANOWSKI:

11 Q My point, if I may, is simply that my  
12 colleagues presented a lengthy discussion about that  
13 stipulation at the beginning of this testimony, and I'm  
14 simply responding to that.

15 And, by the way, I'm at the end of it.

16 HEARING OFFICER JOSEPH-TAYLOR: Okay. Told  
17 you I wasn't going to let you go much further.

18 BY MR. HEJMANOWSKI:

19 Q Mr. Marshall, I noticed in your resume that  
20 you are a member of the Devil's Hole Dive Team, which is  
21 pretty neat, and you've been a member of that team since  
22 2001?

23 A (Marshall) Yes, sir.

24 Q Is that another Manage Monitor and Mitigate  
25 Program?

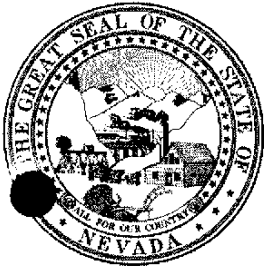
4

4

TAB 4

4

4



Permit No. 64692

**THE STATE OF NEVADA****PERMIT TO APPROPRIATE WATER**

**Name of applicant:** LINCOLN COUNTY WATER DISTRICT  
AND VIDLER WATER COMPANY, INC.

**Source:** UNDERGROUND

**Basin:** TULE DESERT

**Manner of Use:** MUNICIPAL

**Period of Use:** January 1st to December 31st

**Priority Date:** 12/11/1998

\*\*\*\*\*

**APPROVAL OF STATE ENGINEER**

This is to certify that I have examined the foregoing application, and do hereby grant the same, subject to the following limitations and conditions:

This permit is issued subject to existing rights. It is understood that the amount of water herein granted is only a temporary allowance and that the final water right obtained under this permit will be dependent upon the amount of water actually placed to beneficial use. It is also understood that this right must allow for a reasonable lowering of the static water level. This well shall be equipped with a two (2) inch opening for measuring depth to water. If the well is flowing, a valve must be installed and maintained to prevent waste. A totalizing meter must be installed and maintained in the discharge pipeline near the point of diversion and accurate measurements must be kept of water placed to beneficial use. The totalizing meter must be installed before any use of water begins or before the Proof of Completion of Work is filed.

This permit is issued pursuant to the Settlement Agreement dated April 1, 2010 between the State Engineer and Lincoln County Water District and Vidler Water Company.

The initial amount of water granted under this permit is limited to 2,900 acre-feet annually with the initial total combined duty of water under this permit and Permit 66932 not to exceed 5,000 acre-feet annually. The District and Vidler shall implement a staged aquifer pumping test that shall consist of a minimum of eight consecutive years whereby pumping must average at least 2,500 acre feet annually, and in no year shall pumping be less than 2,000 acre feet annually. Additional water under this permit may be granted conditioned upon a favorable analysis by the State Engineer of the aquifer test results, ground water model predictions and associated hydrologic study data as outlined in the Settlement Agreement.

The permittees shall submit a revised Monitoring Plan which updates the June 2005 Monitoring Plan approved by the State Engineer in the matter of Permit 66932, to include pumping under this Permit.

This permit does not extend the permittee the right of ingress and egress on public, private or corporate lands.

The issuance of this permit does not waive the requirements that the permit holder obtain other permits from State, Federal and local agencies.

The point of diversion and place of use are as described on the submitted application to support this permit.

(Continued on Page 2)

Permit No. 64692

The amount of water to be appropriated shall be limited to the amount which can be applied to beneficial use, **and not to exceed 10.0 cubic feet per second or 7,240.0 acre-feet annually.**

Work must be prosecuted with reasonable diligence and proof of completion of work shall be filed on or before:

July 14 2015

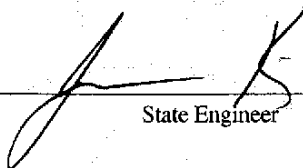
Water must be placed to beneficial use and proof of the application of water to beneficial use shall be filed on or before:

July 14 2020  
N/A

Map in support of proof of beneficial use shall be filed on or before:

IN TESTIMONY WHEREOF, I, JASON KING, P.E.,

State Engineer of Nevada, have hereunto set my hand and the seal of my office, this 14th day of July, A.D. 2010

 P.E.  
State Engineer

Completion of work filed \_\_\_\_\_

Proof of beneficial use filed \_\_\_\_\_

Cultural map filed \_\_\_\_\_

Certificate No. \_\_\_\_\_ Issued \_\_\_\_\_

**ASSIGNED**  
**NO. 64692**

**A M E E N D E D**  
**APPLICATION FOR PERMIT**  
**TO APPROPRIATE THE PUBLIC WATERS OF THE STATE OF**  
**NEVADA**

Date of filing in State Engineer's Office DEC 11 1998  
 Returned to applicant for correction FEB 04 1999  
 Corrected application filed APR 05 1999  
 Map filed APR 05 1999

\*\*\*\*\*

The applicant Lincoln County and Vidler Water Company, Inc., hereby makes application for permission to appropriate the public waters of the State of Nevada, as hereinafter stated.

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1. The source of the proposed appropriation is **Underground**
2. The amount of water applied for is 10.0 c.f.s. second-feet
  - (a) If stored in reservoir give number of acre-feet
3. The water to be used for **Municipal**
4. If use is for:
  - (a) Irrigation, state number of acres to be irrigated
  - (b) Stockwater, state number and kinds of animals to be watered
  - (c) Other use (describe fully under No. 12. "Remarks")
  - (d) Power:
    - (1) Horsepower developed
    - (2) Point of return of water to stream
5. The water is to be diverted from its source at the following point **SE $\frac{1}{4}$ SE $\frac{1}{4}$  Section 2, T.9S., R.69E., MDM, or at a point from which the SE corner of said Section 2 bears South 47° 45' East, a distance of 462 feet. Located within Tule Desert.**
6. Place of Use All of T.12S., R.71E., Sections 1,2,11,12,13,14,23,24, 25,26,35, and 36, T.12S., R.70E.,MDM.
7. Use will begin about January 1 and end about December 31, of each year.
8. Description of proposed works drilled well, pump and motor, and irrigation distribution system
9. Estimated cost of works **\$100,000**
10. Estimated time required to construct works **5 years**
11. Estimated time required to complete the application of water to beneficial use **10 years**
12. Remarks: **The use of water under this application is proposed for future growth and development, of the Mesquite area, within Lincoln County.**

Bruce R. Scott, Resource Concepts, Inc.  
 By s/ Bruce R. Scott  
 340 North Minnesota Street  
 Carson City, Nevada 89703

Compared gkl/cms

Protested on 6/18/99 by US National Park Service; on 6/18/99 by Virgin Valley  
 Water District  
 Pro. Overruled 4-29-09 See Ruling #5986

64692

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\_\_\_\_\_ OF STATE ENGINEER

This is to certify that I have examined the foregoing application, and do hereby grant the same, subject to the following limitations and conditions:

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TAB 5

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

IN THE MATTER OF APPLICATIONS 72296, )  
 72297, 72298, 72299, 72300, 72301, 72302, 72303, )  
 72304, 72305, 72306, 72308, 72309, 72310, 72311, )  
 72312, 72313, 72314, 72315, 72316, 72317, 72318, )  
 72319, 72320, 72321, 72322, 72323, 72324, 72325, )  
 72326, 72327, 72328, 72329, 72330, 72331, 72332, )  
 72333, 72334, 72335, 72336, 72337, 72338, 72339, )  
 72340, 72341, 72342, 72343, 72344, 72345, 72346, )  
 72347, 72348, AND 72349 FILED TO CHANGE )  
 THE POINT OF DIVERSION, PLACE OF USE )  
 AND MANNER OF USE OF THE PUBLIC )  
 WATERS OF AN UNDERGROUND SOURCE )  
 PREVIOUSLY APPROPRIATED WITHIN THE )  
 LAKE VALLEY HYDROGRAPHIC BASIN (183), )  
 LINCOLN COUNTY, NEVADA. )

**RULING**

**# 5918**

**GENERAL**

**I.**

Application 72296 was filed on March 4, 2005, by Tuffy Ranch Properties, LLC, to change the place of use and manner of use of 5.4 cubic feet per second (cfs), not to exceed 1,280 acre-feet annually (afa), of underground water previously permitted for appropriation under Permit 22557, Certificate 7555. A review of records on file in the Office of the State Engineer show approximately 869.12 afa is available for change under Permit 22557, Certificate 7555. The existing manner and place of use are described as being for irrigation and domestic purposes within the W½ NW¼ of Section 28 and the E½ NW¼, NE¼ of Section 29, T.6N., R.66E., M.D.B.&M. The proposed manner of use and place of use are described as being for municipal and domestic purposes within all of Sections 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 32, 33, 34, and 35, the S½ of Section 13, the W½ of Section 36, and Sections 19, 30, and 31 except those portions lying west of the centerline of U.S. Highway 93, all in T.11S., R.63E., M.D.B.&M., and all of Sections 2, 3, 4, 5, 8, 9, 10, 11, 14, 15, 16, 17, 20, 21, 22, 23, 25, 26, 27, 28, 33, 34, 35, and 36, the W½ of Section 1, the W½ of Section 13, the W½ of Section 24, the W½ W½ of Section 12, and Sections 6, 7, 18, 19, 29, 30, and 32 except those portions lying west of the centerline of U.S. Highway 93, all in T.12S., R.63E., M.D.B.&M., and the W½ SW¼ of



Ruling  
Page 2

Section 31, T.12S., R.64E., M.D.B.&M. The point of diversion is described as being located within the SE¼ NW¼ of Section 29, T.6N., R.66E., M.D.B.&M.<sup>1</sup>

## II.

Application 72297 was filed on March 4, 2005, by Tuffy Ranch Properties, LLC, to change the place of use and manner of use of 5.4 cfs, not to exceed 1,280 afa, of underground water previously permitted for appropriation under Permit 21616, Certificate 7809. A review of records on file in the Office of the State Engineer show approximately 1,048.56 afa is available for change under Permit 21616, Certificate 7809. The existing manner and place of use are described as being for irrigation and domestic purposes within the S½ SW¼, SE¼ of Section 27 and the S½ SE¼ of Section 28, T.6N., R.66E., M.D.B.&M. The proposed manner of use and place of use are the same as described in Application 72296. The point of diversion is described as being located within the SE¼ SE¼ of Section 27, T.6N., R.66E., M.D.B.&M.<sup>2</sup>

## III.

Application 72298 was filed on March 4, 2005, by Tuffy Ranch Properties, LLC, to change the place of use and manner of use of 2.15 cfs, not to exceed 339.68 afa, of underground water previously permitted for appropriation under Permit 63111, Certificate 16179. The existing manner and place of use are described as being for irrigation and domestic purposes within portions of the NW¼ NW¼, NE¼ NW¼, SW¼ NW¼, SE¼ NW¼ of Section 35, T.6N., R.66E., M.D.B.&M. The proposed manner of use and place of use are the same as described in Application 72296. The point of diversion is described as being located within the NW¼ NW¼ of Section 35, T.6N., R.66E., M.D.B.&M.<sup>3</sup>

## IV.

Application 72299 was filed on March 4, 2005, by Tuffy Ranch Properties, LLC, to change the place of use and manner of use of 1.15 cfs, not to exceed 503.088 afa, of underground water previously permitted for appropriation under Permit 59114, Certificate 15797. The existing manner and place of use are described as being for irrigation and domestic purposes within portions of the NW¼ SW¼, NE¼ SW¼, SW¼ SW¼, SE¼ SW¼ of Section 10, T.5N., R.66E., M.D.B.&M. The proposed manner of

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<sup>1</sup> File No. 72296, official records in the Office of the State Engineer.

<sup>2</sup> File No. 72297, official records in the Office of the State Engineer.

<sup>3</sup> File No. 72298, official records in the Office of the State Engineer.

Ruling  
Page 3

use and place of use are the same as described in Application 72296. The point of diversion is described as being located within the NE $\frac{1}{4}$  SW $\frac{1}{4}$  of Section 10, T.5N., R.66E., M.D.B.&M.<sup>4</sup>

#### V.

Application 72300 was filed on March 4, 2005, by Tuffy Ranch Properties, LLC, to change the place of use and manner of use of 4.0 cfs, not to exceed 960 afa, of underground water previously permitted for appropriation under Permit 23103, Certificate 7705. The existing manner and place of use are described as being for irrigation and domestic purposes within portions of the SE $\frac{1}{4}$  SE $\frac{1}{4}$  of Section 19, S $\frac{1}{2}$  SW $\frac{1}{4}$ , SW $\frac{1}{4}$  SE $\frac{1}{4}$  of Section 20, NW $\frac{1}{4}$  NW $\frac{1}{4}$  of Section 29, NE $\frac{1}{4}$  NE $\frac{1}{4}$  of Section 30, T.6N., R.66E., M.D.B.&M. The proposed manner of use and place of use are the same as described in Application 72296. The point of diversion is described as being located within the NW $\frac{1}{4}$  NW $\frac{1}{4}$  of Section 29, T.6N., R.66E., M.D.B.&M.<sup>5</sup>

#### VI.

Application 72301 was filed on March 4, 2005, by Tuffy Ranch Properties, LLC, to change the place of use and manner of use of 3.31 cfs, not to exceed 994.5 afa, of underground water previously permitted for appropriation under Permit 19473, Certificate 6125. The existing manner and place of use are described as being for irrigation purposes within the NE $\frac{1}{4}$  SE $\frac{1}{4}$ , SE $\frac{1}{4}$  SE $\frac{1}{4}$  of Section 21, SE $\frac{1}{4}$  NW $\frac{1}{4}$ , NE $\frac{1}{4}$  SW $\frac{1}{4}$ , NW $\frac{1}{4}$  SW $\frac{1}{4}$ , SE $\frac{1}{4}$  SW $\frac{1}{4}$ , SW $\frac{1}{4}$  SW $\frac{1}{4}$  of Section 22, NE $\frac{1}{4}$  NW $\frac{1}{4}$  of Section 27, T.6N., R.66E., M.D.B.&M. The proposed manner of use and place of use are the same as described in Application 72296. The point of diversion is described as being located within the SE $\frac{1}{4}$  NW $\frac{1}{4}$  of Section 22, T.6N., R.66E., M.D.B.&M.<sup>6</sup>

#### VII.

Application 72302 was filed on March 4, 2005, by Tuffy Ranch Properties, LLC, to change the place of use and manner of use of 1.93 cfs, not to exceed 623.2 afa, of underground water previously permitted for appropriation under Permit 19545, Certificate 6126. The existing manner and place of use are described as being for irrigation purposes within the SE $\frac{1}{4}$  SW $\frac{1}{4}$ , SW $\frac{1}{4}$  SW $\frac{1}{4}$  of Section 15, SE $\frac{1}{4}$  SE $\frac{1}{4}$ , of Section 16, NE $\frac{1}{4}$  NE $\frac{1}{4}$ , SE $\frac{1}{4}$  NE $\frac{1}{4}$  of Section 21, NE $\frac{1}{4}$  NW $\frac{1}{4}$ , NW $\frac{1}{4}$  NW $\frac{1}{4}$ , SW $\frac{1}{4}$  NW $\frac{1}{4}$

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<sup>4</sup> File No. 72299, official records in the Office of the State Engineer.

<sup>5</sup> File No. 72300, official records in the Office of the State Engineer.

<sup>6</sup> File No. 72301, official records in the Office of the State Engineer.

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of Section 22, T.6N., R.66E., M.D.B.&M. The proposed manner of use and place of use are the same as described in Application 72296. The point of diversion is described as being located within the NE $\frac{1}{4}$  NW $\frac{1}{4}$  of Section 22, T.6N., R.66E., M.D.B.&M.<sup>7</sup>

#### VIII.

Application 72303 was filed on March 4, 2005, by Tuffy Ranch Properties, LLC, to change the place of use and manner of use of 3.10 cfs, not to exceed 640 afa, of underground water previously permitted for appropriation under Permit 21611, Certificate 7377. The existing manner and place of use are described as being for irrigation and domestic purposes within the SW $\frac{1}{4}$  SE $\frac{1}{4}$ , SE $\frac{1}{4}$  SE $\frac{1}{4}$  of Section 19, NW $\frac{1}{4}$  NE $\frac{1}{4}$ , NE $\frac{1}{4}$  NE $\frac{1}{4}$  of Section 30, T.6N., R.66E., M.D.B.&M. The proposed manner of use and place of use are the same as described in Application 72296. The point of diversion is described as being located within the NW $\frac{1}{4}$  NE $\frac{1}{4}$  of Section 30, T.6N., R.66E., M.D.B.&M.<sup>8</sup>

#### IX.

Application 72304 was filed on March 4, 2005, by Tuffy Ranch Properties, LLC, to change the place of use and manner of use of 1.072 cfs, not to exceed 430.388 afa, of underground water previously permitted for appropriation under Permit 59110, Certificate 15907. The existing manner and place of use are described as being for irrigation and domestic purposes within the SW $\frac{1}{4}$  NE $\frac{1}{4}$ , SE $\frac{1}{4}$  NE $\frac{1}{4}$ , NW $\frac{1}{4}$  SE $\frac{1}{4}$ , NE $\frac{1}{4}$  SE $\frac{1}{4}$  of Section 10, T.5N., R.66E., M.D.B.&M. The proposed manner of use and place of use are the same as described in Application 72296. The point of diversion is described as being located within the SE $\frac{1}{4}$  NE $\frac{1}{4}$  of Section 10, T.5N., R.66E., M.D.B.&M.<sup>9</sup>

#### X.

Application 72305 was filed on March 4, 2005, by Tuffy Ranch Properties, LLC, to change the place of use and manner of use of 0.1236 cfs, not to exceed 49.612 afa, of underground water previously permitted for appropriation under Permit 63115, Certificate 15908. The existing manner and place of use are described as being for irrigation purposes within the SW $\frac{1}{4}$  NE $\frac{1}{4}$ , SE $\frac{1}{4}$  NE $\frac{1}{4}$ , NW $\frac{1}{4}$  NE $\frac{1}{4}$ , NE $\frac{1}{4}$  NE $\frac{1}{4}$  of Section 10, T.5N., R.66E., M.D.B.&M. The proposed manner of use and place of use are the

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<sup>7</sup> File No. 72302, official records in the Office of the State Engineer.

<sup>8</sup> File No. 72303, official records in the Office of the State Engineer.

<sup>9</sup> File No. 72304, official records in the Office of the State Engineer.

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same as described in Application 72296. The point of diversion is described as being located within the SE $\frac{1}{4}$  NE $\frac{1}{4}$  of Section 10, T.5N., R.66E., M.D.B.&M.<sup>10</sup>

#### **XI.**

Application 72306 was filed on March 4, 2005, by Tuffy Ranch Properties, LLC, to change the place of use and manner of use of 0.0632 cfs, not to exceed 25.40 afa, of underground water previously permitted for appropriation under Permit 63343, Certificate 15909. The existing manner and place of use are described as being for irrigation purposes within the SW $\frac{1}{4}$  NE $\frac{1}{4}$ , SE $\frac{1}{4}$  NE $\frac{1}{4}$ , NW $\frac{1}{4}$  NE $\frac{1}{4}$ , NE $\frac{1}{4}$  NE $\frac{1}{4}$  of Section 10, T.5N., R.66E., M.D.B.&M. The proposed manner of use and place of use are the same as described in Application 72296. The point of diversion is described as being located within the SE $\frac{1}{4}$  NE $\frac{1}{4}$  of Section 10, T.5N., R.66E., M.D.B.&M.<sup>11</sup>

#### **XII.**

Application 72308 was filed on March 4, 2005, by Tuffy Ranch Properties, LLC, to change the place of use and manner of use of 2.0 cfs, not to exceed 501.268 afa, of underground water previously permitted for appropriation under Permit 57109, Certificate 14274. The existing manner and place of use are described as being for irrigation and domestic purposes within the SW $\frac{1}{4}$  NW $\frac{1}{4}$ , SE $\frac{1}{4}$  NW $\frac{1}{4}$ , NW $\frac{1}{4}$  SW $\frac{1}{4}$ , NE $\frac{1}{4}$  SW $\frac{1}{4}$  of Section 27, T.6N., R.66E., M.D.B.&M. The proposed manner of use and place of use are the same as described in Application 72296. The point of diversion is described as being located within the NE $\frac{1}{4}$  SW $\frac{1}{4}$  of Section 27, T.6N., R.66E., M.D.B.&M.<sup>12</sup>

#### **XIII.**

Application 72309 was filed on March 4, 2005, by Tuffy Ranch Properties, LLC, to change the place of use and manner of use of 1.075 cfs, not to exceed 240 afa, of underground water previously permitted for appropriation under Permit 63110, Certificate 15919. The existing manner and place of use are described as being for irrigation purposes within the SW $\frac{1}{4}$  SE $\frac{1}{4}$ , SE $\frac{1}{4}$  SE $\frac{1}{4}$ , S $\frac{1}{2}$  NW $\frac{1}{4}$  SE $\frac{1}{4}$ , S $\frac{1}{2}$  NE $\frac{1}{4}$  SE $\frac{1}{4}$  of Section 10, T.5N., R.66E., M.D.B.&M. The proposed manner of use and place of use are

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<sup>10</sup> File No. 72305, official records in the Office of the State Engineer.

<sup>11</sup> File No. 72306, official records in the Office of the State Engineer.

<sup>12</sup> File No. 72308, official records in the Office of the State Engineer.

Ruling  
Page 6

the same as described in Application 72296. The point of diversion is described as being located within the SE $\frac{1}{4}$  SE $\frac{1}{4}$  of Section 10, T.5N., R.66E., M.D.B.&M.<sup>13</sup>

**XIV.**

Application 72310 was filed on March 4, 2005, by Tuffy Ranch Properties, LLC, to change the place of use and manner of use of 0.2705 cfs, not to exceed 64.12 afa, of underground water previously permitted for appropriation under Permit 63340, Certificate 15920. The existing manner and place of use are described as being for irrigation purposes within the SW $\frac{1}{4}$  SE $\frac{1}{4}$ , SE $\frac{1}{4}$  SE $\frac{1}{4}$ , S $\frac{1}{2}$  NW $\frac{1}{4}$  SE $\frac{1}{4}$ , S $\frac{1}{2}$  NE $\frac{1}{4}$  SE $\frac{1}{4}$  of Section 10, T.5N., R.66E., M.D.B.&M. The proposed manner of use and place of use are the same as described in Application 72296. The point of diversion is described as being located within the SE $\frac{1}{4}$  SE $\frac{1}{4}$  of Section 10, T.5N., R.66E., M.D.B.&M.<sup>14</sup>

**XV.**

Application 72311 was filed on March 4, 2005, by Tuffy Ranch Properties, LLC, to change the place of use and manner of use of 0.8622 cfs, not to exceed 304.78 afa, of underground water previously permitted for appropriation under Permit 63113, Certificate 15924. The existing manner and place of use are described as being for irrigation purposes within the SW $\frac{1}{4}$  NW $\frac{1}{4}$ , SE $\frac{1}{4}$  NW $\frac{1}{4}$ , NW $\frac{1}{4}$  NW $\frac{1}{4}$ , NE $\frac{1}{4}$  NW $\frac{1}{4}$  of Section 11, T.5N., R.66E., M.D.B.&M. The proposed manner of use and place of use are the same as described in Application 72296. The point of diversion is described as being located within the NW $\frac{1}{4}$  NW $\frac{1}{4}$  of Section 11, T.5N., R.66E., M.D.B.&M.<sup>15</sup>

**XVI.**

Application 72312 was filed on March 4, 2005, by Tuffy Ranch Properties, LLC, to change the place of use and manner of use of 0.3309 cfs, not to exceed 175.22 afa, of underground water previously permitted for appropriation under Permit 63117, Certificate 15925. The existing manner and place of use are described as being for irrigation purposes within the SW $\frac{1}{4}$  NW $\frac{1}{4}$ , SE $\frac{1}{4}$  NW $\frac{1}{4}$ , NW $\frac{1}{4}$  SW $\frac{1}{4}$ , NE $\frac{1}{4}$  SW $\frac{1}{4}$  of Section 11, T.5N., R.66E., M.D.B.&M. The proposed manner of use and place of use are the same as described in Application 72296. The point of diversion is described as being located within the NW $\frac{1}{4}$  NW $\frac{1}{4}$  of Section 11, T.5N., R.66E., M.D.B.&M.<sup>16</sup>

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<sup>13</sup> File No. 72309, official records in the Office of the State Engineer.

<sup>14</sup> File No. 72310, official records in the Office of the State Engineer.

<sup>15</sup> File No. 72311, official records in the Office of the State Engineer.

<sup>16</sup> File No. 72312, official records in the Office of the State Engineer.

Ruling  
Page 7

#### **XVII.**

Application 72313 was filed on March 4, 2005, by Tuffy Ranch Properties, LLC, to change the place of use and manner of use of 0.0657 cfs, not to exceed 23.24 afa, of underground water previously permitted for appropriation under Permit 63341, Certificate 15926. The existing manner and place of use are described as being for irrigation purposes within the SW $\frac{1}{4}$  NW $\frac{1}{4}$ , SE $\frac{1}{4}$  NW $\frac{1}{4}$ , NW $\frac{1}{4}$  SW $\frac{1}{4}$ , NE $\frac{1}{4}$  SW $\frac{1}{4}$  of Section 11, T.5N., R.66E., M.D.B.&M. The proposed manner of use and place of use are the same as described in Application 72296. The point of diversion is described as being located within the NW $\frac{1}{4}$  NW $\frac{1}{4}$  of Section 11, T.5N., R.66E., M.D.B.&M.<sup>17</sup>

#### **XVIII.**

Application 72314 was filed on March 4, 2005, by Tuffy Ranch Properties, LLC, to change the place of use and manner of use of 1.92 cfs, not to exceed 478.71 afa, of underground water previously permitted for appropriation under Permit 63112, Certificate 15915. The existing manner and place of use are described as being for irrigation purposes within the S $\frac{1}{2}$  SW $\frac{1}{4}$  NW $\frac{1}{4}$ , S $\frac{1}{2}$  SE $\frac{1}{4}$  NW $\frac{1}{4}$ , NW $\frac{1}{4}$  SW $\frac{1}{4}$ , NE $\frac{1}{4}$  SW $\frac{1}{4}$ , SW $\frac{1}{4}$  SW $\frac{1}{4}$ , SE $\frac{1}{4}$  SW $\frac{1}{4}$  of Section 35, T.6N., R.66E., M.D.B.&M. The proposed manner of use and place of use are the same as described in Application 72296. The point of diversion is described as being located within the NW $\frac{1}{4}$  SW $\frac{1}{4}$  of Section 35, T.6N., R.66E., M.D.B.&M.<sup>18</sup>

#### **XIX.**

Application 72315 was filed on March 4, 2005, by Tuffy Ranch Properties, LLC, to change the place of use and manner of use of 0.11 cfs, not to exceed 26.17 afa, of underground water previously permitted for appropriation under Permit 63344, Certificate 15916. The existing manner and place of use are described as being for irrigation purposes within the S $\frac{1}{2}$  SW $\frac{1}{4}$  NW $\frac{1}{4}$ , S $\frac{1}{2}$  SE $\frac{1}{4}$  NW $\frac{1}{4}$ , NW $\frac{1}{4}$  SW $\frac{1}{4}$ , NE $\frac{1}{4}$  SW $\frac{1}{4}$ , SW $\frac{1}{4}$  SW $\frac{1}{4}$ , SE $\frac{1}{4}$  SW $\frac{1}{4}$  of Section 35, T.6N., R.66E., M.D.B.&M. The proposed manner of use and place of use are the same as described in Application 72296. The point of diversion is described as being located within the NW $\frac{1}{4}$  SW $\frac{1}{4}$  of Section 35, T.6N., R.66E., M.D.B.&M.<sup>19</sup>

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<sup>17</sup> File No. 72313, official records in the Office of the State Engineer.

<sup>18</sup> File No. 72314, official records in the Office of the State Engineer.

<sup>19</sup> File No. 72315, official records in the Office of the State Engineer.

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**XX.**

Application 72316 was filed on March 4, 2005, by Tuffy Ranch Properties, LLC, to change the place of use and manner of use of 0.486 cfs, not to exceed 159.2 afa, of underground water previously permitted for appropriation under Permit 59119, Certificate 15819. The existing manner and place of use are described as being for irrigation and domestic purposes within the SW $\frac{1}{4}$  NE $\frac{1}{4}$ , SE $\frac{1}{4}$  NE $\frac{1}{4}$ , NW $\frac{1}{4}$  NE $\frac{1}{4}$ , NE $\frac{1}{4}$  NE $\frac{1}{4}$  of Section 27, T.6N., R.66E., M.D.B.&M. The proposed manner of use and place of use are the same as described in Application 72296. The point of diversion is described as being located within the SW $\frac{1}{4}$  NE $\frac{1}{4}$  of Section 27, T.6N., R.66E., M.D.B.&M.<sup>20</sup>

**XXI.**

Application 72317 was filed on March 4, 2005, by Tuffy Ranch Properties, LLC, to change the place of use and manner of use of 0.056 cfs, not to exceed 40.55 afa, of underground water previously permitted for appropriation under Permit 60018, Certificate 15820. The existing manner and place of use are described as being for irrigation purposes within the SW $\frac{1}{4}$  NE $\frac{1}{4}$ , SE $\frac{1}{4}$  NE $\frac{1}{4}$ , NW $\frac{1}{4}$  NE $\frac{1}{4}$ , NE $\frac{1}{4}$  NE $\frac{1}{4}$  of Section 27, T.6N., R.66E., M.D.B.&M. The proposed manner of use and place of use are the same as described in Application 72296. The point of diversion is described as being located within the SW $\frac{1}{4}$  NE $\frac{1}{4}$  of Section 27, T.6N., R.66E., M.D.B.&M.<sup>21</sup>

**XXII.**

Application 72318 was filed on March 4, 2005, by Tuffy Ranch Properties, LLC, to change the place of use and manner of use of 0.752 cfs, not to exceed 246.244 afa, of underground water previously permitted for appropriation under Permit 60019, Certificate 15821. The existing manner and place of use are described as being for irrigation purposes within the SW $\frac{1}{4}$  NE $\frac{1}{4}$ , SE $\frac{1}{4}$  NE $\frac{1}{4}$ , NW $\frac{1}{4}$  NE $\frac{1}{4}$ , NE $\frac{1}{4}$  NE $\frac{1}{4}$  of Section 27, T.6N., R.66E., M.D.B.&M. The proposed manner of use and place of use are the same as described in Application 72296. The point of diversion is described as being located within the SW $\frac{1}{4}$  NE $\frac{1}{4}$  of Section 27, T.6N., R.66E., M.D.B.&M.<sup>22</sup>

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<sup>20</sup> File No. 72316, official records in the Office of the State Engineer.

<sup>21</sup> File No. 72317, official records in the Office of the State Engineer.

<sup>22</sup> File No. 72318, official records in the Office of the State Engineer.

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### XXIII.

Application 72319 was filed on March 4, 2005, by Tuffy Ranch Properties, LLC, to change the place of use and manner of use of 0.165 cfs, not to exceed 54.16 afa, of underground water previously permitted for appropriation under Permit 63332, Certificate 15822. The existing manner and place of use are described as being for irrigation purposes within the SW $\frac{1}{4}$  NE $\frac{1}{4}$ , SE $\frac{1}{4}$  NE $\frac{1}{4}$ , NW $\frac{1}{4}$  NE $\frac{1}{4}$ , NE $\frac{1}{4}$  NE $\frac{1}{4}$  of Section 27, T.6N., R.66E., M.D.B.&M. The proposed manner of use and place of use are the same as described in Application 72296. The point of diversion is described as being located within the SW $\frac{1}{4}$  NE $\frac{1}{4}$  of Section 27, T.6N., R.66E., M.D.B.&M.<sup>23</sup>

### XXIV.

Application 72320 was filed on March 4, 2005, by Tuffy Ranch Properties, LLC, to change the place of use and manner of use of 1.136 cfs, not to exceed 480 afa, of underground water previously permitted for appropriation under Permit 59116, Certificate 15903. The existing manner and place of use are described as being for irrigation and domestic purposes within the SW $\frac{1}{4}$  NE $\frac{1}{4}$ , SE $\frac{1}{4}$  NE $\frac{1}{4}$ , NW $\frac{1}{4}$  NE $\frac{1}{4}$ , NE $\frac{1}{4}$  NE $\frac{1}{4}$  of Section 2, T.5., R.66E., M.D.B.&M., SW $\frac{1}{4}$  SW $\frac{1}{4}$ , SE $\frac{1}{4}$  SW $\frac{1}{4}$  of Section 35, T.6N., R.66E., M.D.B.&M. The proposed manner of use and place of use are the same as described in Application 72296. The point of diversion is described as being located within Lot 6 of Section 2, T.5N., R.66E., M.D.B.&M.<sup>24</sup>

### XXV.

Application 72321 was filed on March 4, 2005, by Tuffy Ranch Properties, LLC, to change the place of use and manner of use of 0.0671 cfs, not to exceed 28.32 afa, of underground water previously permitted for appropriation under Permit 63336, Certificate 15904. The existing manner and place of use are described as being for irrigation purposes within the SW $\frac{1}{4}$  NE $\frac{1}{4}$ , SE $\frac{1}{4}$  NE $\frac{1}{4}$ , NW $\frac{1}{4}$  NE $\frac{1}{4}$ , NE $\frac{1}{4}$  NE $\frac{1}{4}$  of Section 2, T.5N., R.66E., M.D.B.&M., SW $\frac{1}{4}$  SW $\frac{1}{4}$ , SE $\frac{1}{4}$  SW $\frac{1}{4}$  of Section 35, T.6N., R.66E., M.D.B.&M. The proposed manner of use and place of use are the same as described in Application 72296. The point of diversion is described as being located within Lot 6 of Section 2, T.5N., R.66E., M.D.B.&M.<sup>25</sup>

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<sup>23</sup> File No. 72319, official records in the Office of the State Engineer.

<sup>24</sup> File No. 72320, official records in the Office of the State Engineer.

<sup>25</sup> File No. 72321, official records in the Office of the State Engineer.



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#### XXVI.

Application 72322 was filed on March 4, 2005, by Tuffy Ranch Properties, LLC, to change the place of use and manner of use of 0.8179 cfs, not to exceed 480 afa, of underground water previously permitted for appropriation under Permit 59112, Certificate 15898. The existing manner and place of use are described as being for irrigation and domestic purposes within the SW $\frac{1}{4}$  NW $\frac{1}{4}$ , SE $\frac{1}{4}$  NW $\frac{1}{4}$ , NW $\frac{1}{4}$  NW $\frac{1}{4}$ , NE $\frac{1}{4}$  NW $\frac{1}{4}$  of Section 33, T.6N., R.66E., M.D.B.&M. The proposed manner of use and place of use are the same as described in Application 72296. The point of diversion is described as being located within the NE $\frac{1}{4}$  NW $\frac{1}{4}$  of Section 33, T.6N., R.66E., M.D.B.&M.<sup>26</sup>

#### XXVII.

Application 72323 was filed on March 4, 2005, by Tuffy Ranch Properties, LLC, to change the place of use and manner of use of 0.0399 cfs, not to exceed 23.44 afa, of underground water previously permitted for appropriation under Permit 63337, Certificate 15899. The existing manner and place of use are described as being for irrigation purposes within the SW $\frac{1}{4}$  NW $\frac{1}{4}$ , SE $\frac{1}{4}$  NW $\frac{1}{4}$ , NW $\frac{1}{4}$  NW $\frac{1}{4}$ , NE $\frac{1}{4}$  NW $\frac{1}{4}$  of Section 33, T.6N., R.66E., M.D.B.&M. The proposed manner of use and place of use are the same as described in Application 72296. The point of diversion is described as being located within the NE $\frac{1}{4}$  NW $\frac{1}{4}$  of Section 33, T.6N., R.66E., M.D.B.&M.<sup>27</sup>

#### XXVIII.

Application 72324 was filed on March 4, 2005, by Tuffy Ranch Properties, LLC, to change the place of use and manner of use of 5.4 cfs, not to exceed 1,208 afa, of underground water previously permitted for appropriation under Permit 27096, Certificate 10541. The existing manner and place of use are described as being for irrigation purposes within the Lot 7, Lot 8, SW $\frac{1}{4}$  NW $\frac{1}{4}$ , SE $\frac{1}{4}$  NW $\frac{1}{4}$ , NW $\frac{1}{4}$  SW $\frac{1}{4}$ , NE $\frac{1}{4}$  SW $\frac{1}{4}$ , SW $\frac{1}{4}$  SW $\frac{1}{4}$ , SE $\frac{1}{4}$  SW $\frac{1}{4}$  of Section 2, T.5N., R.66E., M.D.B.&M. The proposed manner of use and place of use are the same as described in Application 72296. The point of diversion is described as being located within the SE $\frac{1}{4}$  NW $\frac{1}{4}$  of Section 2, T.5N., R.66E., M.D.B.&M.<sup>28</sup>

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<sup>26</sup> File No. 72322, official records in the Office of the State Engineer.

<sup>27</sup> File No. 72323, official records in the Office of the State Engineer.

<sup>28</sup> File No. 72324, official records in the Office of the State Engineer.

**XXIX.**

Application 72325 was filed on March 4, 2005, by Tuffy Ranch Properties, LLC, to change the place of use and manner of use of 1.87 cfs, not to exceed 504.5 afa, of underground water previously permitted for appropriation under Permit 54367, Certificate 14273. The existing manner and place of use are described as being for irrigation purposes within the NW $\frac{1}{4}$  SW $\frac{1}{4}$ , NE $\frac{1}{4}$  SW $\frac{1}{4}$ , SW $\frac{1}{4}$  SW $\frac{1}{4}$ , SE $\frac{1}{4}$  SW $\frac{1}{4}$  of Section 2, T.5N., R.66E., M.D.B.&M. The proposed manner of use and place of use are the same as described in Application 72296. The point of diversion is described as being located within the NW $\frac{1}{4}$  SW $\frac{1}{4}$  of Section 2, T.5N., R.66E., M.D.B.&M.<sup>29</sup>

**XXX.**

Application 72326 was filed on March 4, 2005, by Tuffy Ranch Properties, LLC, to change the place of use and manner of use of 0.6995 cfs, not to exceed 319 afa, of underground water previously permitted for appropriation under Permit 59109, Certificate 15912. The existing manner and place of use are described as being for irrigation and domestic purposes within the NW $\frac{1}{4}$  SW $\frac{1}{4}$ , NE $\frac{1}{4}$  SW $\frac{1}{4}$ , SW $\frac{1}{4}$  SW $\frac{1}{4}$ , SE $\frac{1}{4}$  SW $\frac{1}{4}$  of Section 3, T.5N., R.66E., M.D.B.&M. The proposed manner of use and place of use are the same as described in Application 72296. The point of diversion is described as being located within the NE $\frac{1}{4}$  SW $\frac{1}{4}$  of Section 3, T.5N., R.66E., M.D.B.&M.<sup>30</sup>

**XXXI.**

Application 72327 was filed on March 4, 2005, by Tuffy Ranch Properties, LLC, to change the place of use and manner of use of 0.3530 cfs, not to exceed 161.036 afa, of underground water previously permitted for appropriation under Permit 60014, Certificate 15913. The existing manner and place of use are described as being for irrigation purposes within the NW $\frac{1}{4}$  SW $\frac{1}{4}$ , NE $\frac{1}{4}$  SW $\frac{1}{4}$ , SW $\frac{1}{4}$  SW $\frac{1}{4}$ , SE $\frac{1}{4}$  SW $\frac{1}{4}$  of Section 3, T.5N., R.66E., M.D.B.&M. The proposed manner of use and place of use are the same as described in Application 72296. The point of diversion is described as being located within the NE $\frac{1}{4}$  SW $\frac{1}{4}$  of Section 3, T.5N., R.66E., M.D.B.&M.<sup>31</sup>

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<sup>29</sup> File No. 72325, official records in the Office of the State Engineer.

<sup>30</sup> File No. 72326, official records in the Office of the State Engineer.

<sup>31</sup> File No. 72327, official records in the Office of the State Engineer.

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**XXXII.**

Application 72328 was filed on March 4, 2005, by Tuffy Ranch Properties, LLC, to change the place of use and manner of use of 0.0504 cfs, not to exceed 23 afa, of underground water previously permitted for appropriation under Permit 63334, Certificate 15914. The existing manner and place of use are described as being for irrigation purposes within the NW $\frac{1}{4}$  SW $\frac{1}{4}$ , NE $\frac{1}{4}$  SW $\frac{1}{4}$ , SW $\frac{1}{4}$  SW $\frac{1}{4}$ , SE $\frac{1}{4}$  SW $\frac{1}{4}$  of Section 3, T.5N., R.66E., M.D.B.&M. The proposed manner of use and place of use are the same as described in Application 72296. The point of diversion is described as being located within the NE $\frac{1}{4}$  SW $\frac{1}{4}$  of Section 3, T.5N., R.66E., M.D.B.&M.<sup>32</sup>

**XXXIII.**

Application 72329 was filed on March 4, 2005, by Tuffy Ranch Properties, LLC, to change the place of use and manner of use of 0.663 cfs, not to exceed 480 afa, of underground water previously permitted for appropriation under Permit 59120, Certificate 15905. The existing manner and place of use are described as being for irrigation and domestic purposes within the NW $\frac{1}{4}$  SE $\frac{1}{4}$ , NE $\frac{1}{4}$  SE $\frac{1}{4}$ , SW $\frac{1}{4}$  SE $\frac{1}{4}$ , SE $\frac{1}{4}$  SE $\frac{1}{4}$  of Section 22, T.6N., R.66E., M.D.B.&M. The proposed manner of use and place of use are the same as described in Application 72296. The point of diversion is described as being located within the SW $\frac{1}{4}$  SE $\frac{1}{4}$  of Section 22, T.6N., R.66E., M.D.B.&M.<sup>33</sup>

**XXXIV.**

Application 72330 was filed on March 4, 2005, by Tuffy Ranch Properties, LLC, to change the place of use and manner of use of 0.0986 cfs, not to exceed 23.36 afa, of underground water previously permitted for appropriation under Permit 63333, Certificate 15906. The existing manner and place of use are described as being for irrigation purposes within the NW $\frac{1}{4}$  SE $\frac{1}{4}$ , NE $\frac{1}{4}$  SE $\frac{1}{4}$ , SW $\frac{1}{4}$  SE $\frac{1}{4}$ , SE $\frac{1}{4}$  SE $\frac{1}{4}$  of Section 22, T.6N., R.66E., M.D.B.&M. The proposed manner of use and place of use are the same as described in Application 72296. The point of diversion is described as being located within the SW $\frac{1}{4}$  SE $\frac{1}{4}$  of Section 22, T.6N., R.66E., M.D.B.&M.<sup>34</sup>

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<sup>32</sup> File No. 72328, official records in the Office of the State Engineer.

<sup>33</sup> File No. 72329, official records in the Office of the State Engineer.

<sup>34</sup> File No. 72330, official records in the Office of the State Engineer.

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**XXXV.**

Application 72331 was filed on March 4, 2005, by Tuffy Ranch Properties, LLC, to change the place of use and manner of use of 5.4 cfs, not to exceed 1,280 afa, of underground water previously permitted for appropriation under Permit 21612, Certificate 7223. The existing manner and place of use are described as being for irrigation and domestic purposes within the W½ of Section 34, T.6N., R.66E., M.D.B.&M. The proposed manner of use and place of use are the same as described in Application 72296. The point of diversion is described as being located within the SE¼ SW¼ of Section 34, T.6N., R.66E., M.D.B.&M.<sup>35</sup>

**XXXVI.**

Application 72332 was filed on March 4, 2005, by Tuffy Ranch Properties, LLC, to change the place of use and manner of use of 1.94 cfs, not to exceed 500.884 afa, of underground water previously permitted for appropriation under Permit 54366, Certificate 14272. The existing manner and place of use are described as being for irrigation purposes within the NW¼ NW¼, NE¼ NW¼, SW¼ NW¼, SE¼ NW¼ of Section 34, T.6N., R.66E., M.D.B.&M. The proposed manner of use and place of use are the same as described in Application 72296. The point of diversion is described as being located within the NE¼ NW¼ of Section 34, T.6N., R.66E., M.D.B.&M.<sup>36</sup>

**XXXVII.**

Application 72333 was filed on March 4, 2005, by Tuffy Ranch Properties, LLC, to change the place of use and manner of use of 0.909 cfs, not to exceed 319.29 afa, of underground water previously permitted for appropriation under Permit 63114, Certificate 15927. The existing manner and place of use are described as being for irrigation purposes within the NW¼ NE¼, NE¼ NE¼, SW¼ NE¼, SE¼ NE¼ of Section 11, SW¼ SE¼, SE¼ SE¼ of Section 2, T.5N., R.66E., M.D.B.&M. The proposed manner of use and place of use are the same as described in Application 72296. The point of diversion is described as being located within the NW¼ NE¼ of Section 11, T.5N., R.66E., M.D.B.&M.<sup>37</sup>

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<sup>35</sup> File No. 72331, official records in the Office of the State Engineer.

<sup>36</sup> File No. 72332, official records in the Office of the State Engineer.

<sup>37</sup> File No. 72333, official records in the Office of the State Engineer.

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### XXXVIII.

Application 72334 was filed on March 4, 2005, by Tuffy Ranch Properties, LLC, to change the place of use and manner of use of 0.221 cfs, not to exceed 159.65 afa, of underground water previously permitted for appropriation under Permit 63118, Certificate 15928. The existing manner and place of use are described as being for irrigation purposes within the NW $\frac{1}{4}$  NE $\frac{1}{4}$ , NE $\frac{1}{4}$  NE $\frac{1}{4}$ , SW $\frac{1}{4}$  NE $\frac{1}{4}$ , SE $\frac{1}{4}$  NE $\frac{1}{4}$  of Section 11, SW $\frac{1}{4}$  SE $\frac{1}{4}$ , SE $\frac{1}{4}$  SE $\frac{1}{4}$  of Section 2, T.5N., R.66E., M.D.B.&M. The proposed manner of use and place of use are the same as described in Application 72296. The point of diversion is described as being located within the NW $\frac{1}{4}$  NE $\frac{1}{4}$  of Section 11, T.5N., R.66E., M.D.B.&M.<sup>38</sup>

### XXXIX.

Application 72335 was filed on March 4, 2005, by Tuffy Ranch Properties, LLC, to change the place of use and manner of use of 0.073 cfs, not to exceed 25.7 afa, of underground water previously permitted for appropriation under Permit 63342, Certificate 15929. The existing manner and place of use are described as being for irrigation purposes within the NW $\frac{1}{4}$  NE $\frac{1}{4}$ , NE $\frac{1}{4}$  NE $\frac{1}{4}$ , SW $\frac{1}{4}$  NE $\frac{1}{4}$ , SE $\frac{1}{4}$  NE $\frac{1}{4}$  of Section 11, SW $\frac{1}{4}$  SE $\frac{1}{4}$ , SE $\frac{1}{4}$  SE $\frac{1}{4}$  of Section 2, T.5N., R.66E., M.D.B.&M. The proposed manner of use and place of use are the same as described in Application 72296. The point of diversion is described as being located within the NW $\frac{1}{4}$  NE $\frac{1}{4}$  of Section 11, T.5N., R.66E., M.D.B.&M.<sup>39</sup>

### XL.

Application 72336 was filed on March 4, 2005, by Tuffy Ranch Properties, LLC, to change the place of use and manner of use of 5.3 cfs, not to exceed 1,264 afa, of underground water previously permitted for appropriation under Permit 22558, Certificate 7247. The existing manner and place of use are described as being for irrigation and domestic purposes within the NE $\frac{1}{4}$ , N $\frac{1}{2}$  SE $\frac{1}{4}$ , SW $\frac{1}{4}$  SE $\frac{1}{4}$ , SE $\frac{1}{4}$  SE $\frac{1}{4}$  of Section 34, T.6N., R.66E., M.D.B.&M. The proposed manner of use and place of use are the same as described in Application 72296. The point of diversion is described as being located within the NE $\frac{1}{4}$  SE $\frac{1}{4}$  of Section 34, T.6N., R.66E., M.D.B.&M.<sup>40</sup>

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<sup>38</sup> File No. 72334, official records in the Office of the State Engineer.

<sup>39</sup> File No. 72335, official records in the Office of the State Engineer.

<sup>40</sup> File No. 72336, official records in the Office of the State Engineer.

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**XLI.**

Application 72337 was filed on March 4 , 2005, by Tuffy Ranch Properties, LLC, to change the place of use and manner of use of 1.89 cfs, not to exceed 501.44 afa, of underground water previously permitted for appropriation under Permit 54365, Certificate 14271. The existing manner and place of use are described as being for irrigation and domestic purposes within the NW $\frac{1}{4}$  NE $\frac{1}{4}$ , NE $\frac{1}{4}$  NE $\frac{1}{4}$ , SW $\frac{1}{4}$  NE $\frac{1}{4}$ , SE $\frac{1}{4}$  NE $\frac{1}{4}$  of Section 34, T.6N., R.66E., M.D.B.&M. The proposed manner of use and place of use are the same as described in Application 72296. The point of diversion is described as being located within the SW $\frac{1}{4}$  NE $\frac{1}{4}$  of Section 34, T.6N., R.66E., M.D.B.&M.<sup>41</sup>

**XLII.**

Application 72338 was filed on March 4 , 2005, by Tuffy Ranch Properties, LLC, to change the place of use and manner of use of 1.2068 cfs, not to exceed 480 afa, of underground water previously permitted for appropriation under Permit 59113, Certificate 15917. The existing manner and place of use are described as being for irrigation and domestic purposes within the NW $\frac{1}{4}$  NW $\frac{1}{4}$ , NE $\frac{1}{4}$  NW $\frac{1}{4}$ , SW $\frac{1}{4}$  NW $\frac{1}{4}$ , SE $\frac{1}{4}$  NW $\frac{1}{4}$  of Section 10, T.5N., R.66E., M.D.B.&M. The proposed manner of use and place of use are the same as described in Application 72296. The point of diversion is described as being located within the NE $\frac{1}{4}$  NW $\frac{1}{4}$  of Section 10, T.5N., R.66E., M.D.B.&M.<sup>42</sup>

**XLIII.**

Application 72339 was filed on March 4 , 2005, by Tuffy Ranch Properties, LLC, to change the place of use and manner of use of 0.052 cfs, not to exceed 20.68 afa, of underground water previously permitted for appropriation under Permit 63331, Certificate 15918. The existing manner and place of use are described as being for irrigation purposes within the NW $\frac{1}{4}$  NW $\frac{1}{4}$ , NE $\frac{1}{4}$  NW $\frac{1}{4}$ , SW $\frac{1}{4}$  NW $\frac{1}{4}$ , SE $\frac{1}{4}$  NW $\frac{1}{4}$  of Section 10, T.5N., R.66E., M.D.B.&M. The proposed manner of use and place of use are the same as described in Application 72296. The point of diversion is described as being located within the NE $\frac{1}{4}$  NW $\frac{1}{4}$  of Section 10, T.5N., R.66E., M.D.B.&M.<sup>43</sup>

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<sup>41</sup> File No. 72337, official records in the Office of the State Engineer.

<sup>42</sup> File No. 72338, official records in the Office of the State Engineer.

<sup>43</sup> File No. 72339, official records in the Office of the State Engineer.

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#### XLIV.

Application 72340 was filed on March 4 , 2005, by Tuffy Ranch Properties, LLC, to change the place of use and manner of use of 0.3127 cfs, not to exceed 226.4 afa, of underground water previously permitted for appropriation under Permit 59123, Certificate 15900. The existing manner and place of use are described as being for irrigation and domestic purposes within the NW $\frac{1}{4}$  NE $\frac{1}{4}$ , NE $\frac{1}{4}$  NE $\frac{1}{4}$ , SW $\frac{1}{4}$  NE $\frac{1}{4}$ , SE $\frac{1}{4}$  NE $\frac{1}{4}$  of Section 33, T.6N., R.66E., M.D.B.&M. The proposed manner of use and place of use are the same as described in Application 72296. The point of diversion is described as being located within the NE $\frac{1}{4}$  NE $\frac{1}{4}$  of Section 33, T.6N., R.66E., M.D.B.&M.<sup>44</sup>

#### XLV.

Application 72341 was filed on March 4 , 2005, by Tuffy Ranch Properties, LLC, to change the place of use and manner of use of 1.1359 cfs, not to exceed 253.6 afa, of underground water previously permitted for appropriation under Permit 60016, Certificate 15901. The existing manner and place of use are described as being for irrigation purposes within the NW $\frac{1}{4}$  NE $\frac{1}{4}$ , NE $\frac{1}{4}$  NE $\frac{1}{4}$ , SW $\frac{1}{4}$  NE $\frac{1}{4}$ , SE $\frac{1}{4}$  NE $\frac{1}{4}$  of Section 33, T.6N., R.66E., M.D.B.&M. The proposed manner of use and place of use are the same as described in Application 72296. The point of diversion is described as being located within the NE $\frac{1}{4}$  NE $\frac{1}{4}$  of Section 33, T.6N., R.66E., M.D.B.&M.<sup>45</sup>

#### XLVI.

Application 72342 was filed on March 4 , 2005, by Tuffy Ranch Properties, LLC, to change the place of use and manner of use of 0.1021 cfs, not to exceed 24.20 afa, of underground water previously permitted for appropriation under Permit 63338, Certificate 15902. The existing manner and place of use are described as being for irrigation purposes within the NW $\frac{1}{4}$  NE $\frac{1}{4}$ , NE $\frac{1}{4}$  NE $\frac{1}{4}$ , SW $\frac{1}{4}$  NE $\frac{1}{4}$ , SE $\frac{1}{4}$  NE $\frac{1}{4}$  of Section 33, T.6N., R.66E., M.D.B.&M. The proposed manner of use and place of use are the same as described in Application 72296. The point of diversion is described as being located within the NE $\frac{1}{4}$  NE $\frac{1}{4}$  of Section 33, T.6N., R.66E., M.D.B.&M.<sup>46</sup>

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<sup>44</sup> File No. 72340, official records in the Office of the State Engineer.

<sup>45</sup> File No. 72341, official records in the Office of the State Engineer.

<sup>46</sup> File No. 72342, official records in the Office of the State Engineer.

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#### **XLVII.**

Application 72343 was filed on March 4 , 2005, by Tuffy Ranch Properties, LLC, to change the place of use and manner of use of 0.7761 cfs, not to exceed 325.792 afa, of underground water previously permitted for appropriation under Permit 59115, Certificate 15921. The existing manner and place of use are described as being for irrigation and domestic purposes within the NW $\frac{1}{4}$  SE $\frac{1}{4}$ , NE $\frac{1}{4}$  SE $\frac{1}{4}$ , SW $\frac{1}{4}$  SE $\frac{1}{4}$ , SE $\frac{1}{4}$  SE $\frac{1}{4}$  of Section 2, T.5N., R.66E., M.D.B.&M. The proposed manner of use and place of use are the same as described in Application 72296. The point of diversion is described as being located within the NW $\frac{1}{4}$  SE $\frac{1}{4}$  of Section 2, T.5N., R.66E., M.D.B.&M.<sup>47</sup>

#### **XLVIII.**

Application 72344 was filed on March 4 , 2005, by Tuffy Ranch Properties, LLC, to change the place of use and manner of use of 0.3674 cfs, not to exceed 154.208 afa, of underground water previously permitted for appropriation under Permit 63116, Certificate 15922. The existing manner and place of use are described as being for irrigation purposes within the S $\frac{1}{2}$  SW $\frac{1}{4}$  NE $\frac{1}{4}$ , S $\frac{1}{2}$  SE $\frac{1}{4}$  NE $\frac{1}{4}$ , NW $\frac{1}{4}$  SE $\frac{1}{4}$ , NE $\frac{1}{4}$  SE $\frac{1}{4}$  of Section 2, T.5N., R.66E., M.D.B.&M. The proposed manner of use and place of use are the same as described in Application 72296. The point of diversion is described as being located within the NW $\frac{1}{4}$  SE $\frac{1}{4}$  of Section 2, T.5N., R.66E., M.D.B.&M.<sup>48</sup>

#### **XLIX.**

Application 72345 was filed on March 4 , 2005, by Tuffy Ranch Properties, LLC, to change the place of use and manner of use of 0.0596 cfs, not to exceed 25.04 afa, of underground water previously permitted for appropriation under Permit 63339, Certificate 15923. The existing manner and place of use are described as being for irrigation and domestic purposes within the S $\frac{1}{2}$  SW $\frac{1}{4}$  NE $\frac{1}{4}$ , S $\frac{1}{2}$  SE $\frac{1}{4}$  NE $\frac{1}{4}$ , NW $\frac{1}{4}$  SE $\frac{1}{4}$ , NE $\frac{1}{4}$  SE $\frac{1}{4}$  of Section 2, T.5N., R.66E., M.D.B.&M. The proposed manner of use and place of use are the same as described in Application 72296. The point of diversion is described as being located within the NW $\frac{1}{4}$  SE $\frac{1}{4}$  of Section 2, T.5N., R.66E., M.D.B.&M.<sup>49</sup>

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<sup>47</sup> File No. 72343, official records in the Office of the State Engineer.

<sup>48</sup> File No. 72344, official records in the Office of the State Engineer.

<sup>49</sup> File No. 72345, official records in the Office of the State Engineer.



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**L.**

Application 72346 was filed on March 4 , 2005, by Tuffy Ranch Properties, LLC, to change the place of use and manner of use of 5.23 cfs, not to exceed 1,240 afa, of underground water previously permitted for appropriation under Permit 22754, Certificate 7365. A review of records on file in the Office of the State Engineer show approximately 838.17 afa is available for change under Permit 22754, Certificate 7365. The existing manner and place of use are described as being for irrigation and domestic purposes within the NW¼ NE¼, NE¼ NE¼, SW¼ NE¼, SE¼ NE¼, SE¼ of Section 3, T.5N., R.66E., M.D.B.&M. The proposed manner of use and place of use are the same as described in Application 72296. The point of diversion is described as being located within the SE¼ NE¼ of Section 3, T.5N., R.66E., M.D.B.&M.<sup>50</sup>

**LI.**

Application 72347 was filed on March 4 , 2005, by Tuffy Ranch Properties, LLC, to change the place of use and manner of use of 1.883 cfs, not to exceed 297.928 afa, of underground water previously permitted for appropriation under Permit 57110, Certificate 14275. The existing manner and place of use are described as being for irrigation and domestic purposes within the NW¼ SE¼, NE¼ SE¼, SW¼ SE¼, SE¼ SE¼ of Section 3, T.5N., R.66E., M.D.B.&M. The proposed manner of use and place of use are the same as described in Application 72296. The point of diversion is described as being located within the SE¼ SE¼ of Section 3, T.5N., R.66E., M.D.B.&M.<sup>51</sup>

**LII.**

Application 72348 was filed on March 4 , 2005, by Tuffy Ranch Properties, LLC, to change the place of use and manner of use of 1.199 cfs, not to exceed 480 afa, of underground water previously permitted for appropriation under Permit 59108, Certificate 15910. The existing manner and place of use are described as being for irrigation and domestic purposes within the NW¼ SE¼, NE¼ SE¼, SW¼ SE¼, SE¼ SE¼ of Section 4, T.5N., R.66E., M.D.B.&M. The proposed manner of use and place of use are the same as described in Application 72296. The point of diversion is described as being located within the NE¼ SE¼ of Section 4, T.5N., R.66E., M.D.B.&M.<sup>52</sup>

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<sup>50</sup> File No. 72346, official records in the Office of the State Engineer.

<sup>51</sup> File No. 72347, official records in the Office of the State Engineer.

<sup>52</sup> File No. 72348, official records in the Office of the State Engineer.

### **LIII.**

Application 72349 was filed on March 4 , 2005, by Tuffy Ranch Properties, LLC, to change the place of use and manner of use of 0.0598 cfs, not to exceed 23.92 afa, of underground water previously permitted for appropriation under Permit 63335, Certificate 15911. The existing manner and place of use are described as being for irrigation purposes within the NW $\frac{1}{4}$  SE $\frac{1}{4}$ , NE $\frac{1}{4}$  SE $\frac{1}{4}$ , SW $\frac{1}{4}$  SE $\frac{1}{4}$ , SE $\frac{1}{4}$  SE $\frac{1}{4}$  of Section 4, T.5N., R.66E., M.D.B.&M. The proposed manner of use and place of use are the same as described in Application 72296. The point of diversion is described as being located within the NE $\frac{1}{4}$  SE $\frac{1}{4}$  of Section 4, T.5N., R.66E., M.D.B.&M.<sup>53</sup>

### **LIV.**

Review by the Office of the State Engineer of the above Applications determined that several of the Applications attempt to change an annual duty in excess of the duty available for change under the existing base right. Several of the discrepancies were noted by the Applicant via letter dated October 2, 2007, and the Applicant has requested that the excess amounts be withdrawn.<sup>2</sup> Listed below in Table 1 is a summary of the gross annual duty of the certificated base rights pertaining to this ruling prior to adjustment for supplemental uses. The corresponding priority dates of the existing water rights are also listed.

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<sup>53</sup> File No. 72349, official records in the Office of the State Engineer.

Table 1. Base rights of existing Permits subject to Change Applications in this ruling.

<i>Application Number</i>	<i>Base Right Permit</i>	<i>Duty (Acre-Feet)</i>	<i>Priority Date</i>
72296	22557	869.12	11/4/1963
72297	21616	1048.56	11/4/1963
72298	63111	339.68	12/27/1963
72299	59114	503.09	12/27/1963
72300	23103	960.00	4/21/1966
72301	19473	994.50	1/23/1961
72302	19545	623.20	2/9/1961
72303	21611	640.00	11/4/1963
72304	59110	430.39	12/27/1963
72305	63115	49.61	4/3/1974
72306	63343	25.40	11/4/1963
72308	57109	501.27	2/23/1961
72309	63110	240.00	4/3/1974
72310	63340	64.12	11/4/1963
72311	63113	304.78	12/27/1963
72312	63117	175.22	4/3/1974
72313	63341	23.24	11/4/1963
72314	63112	478.71	12/27/1963
72315	63344	26.17	11/4/1963
72316	59119	159.20	5/11/1964
72317	60018	40.55	8/16/1954
72318	60019	246.24	4/3/1974
72319	63332	54.16	11/4/1963
72320	59116	480.00	12/27/1963
72321	63336	28.32	11/4/1963
72322	59112	480.00	12/27/1963
72323	63337	23.44	11/4/1963
72324	27096	1208.00	11/1/1972
72325	54367	504.50	11/1/1972
72326	59109	319.00	12/27/1963
72327	60014	161.04	4/3/1974
72328	63334	23.00	11/4/1963
72329	59120	480.00	8/16/1954
72330	63333	23.36	11/4/1963
72331	21612	1280.00	11/4/1963
72332	54366	500.88	11/4/1963
72333	63114	319.29	12/27/1963
72334	63118	159.65	4/3/1974
72335	63342	25.70	11/4/1963
72336	22558	1264.00	11/4/1963
72337	54365	501.44	11/4/1963
72338	59113	480.00	12/27/1963
72339	63331	20.68	11/4/1963
72340	59123	226.40	12/27/1963
72341	60016	253.60	4/3/1974
72342	63338	24.20	11/4/1963
72343	59115	325.79	12/27/1963
72344	63116	154.21	4/3/1974
72345	63339	25.04	11/4/1963
72346	22754	838.17	9/2/1965
72347	57110	297.93	9/2/1965
72348	59108	480.00	12/27/1963
72349	63335	23.92	11/4/1963

#### LV.

Applications 72296, 72297, 72298, 72299, 72300, 72301, 72302, 72303, 72304, 72305, 72306, 72308, 72309, 72310, 72311, 72312, 72313, 72314, 72315, 72316, 72317, 72318, 72319, 72320, 72321, 72322, 72323, 72324, 72325, 72326, 72327, 72328, 72329, 72330, 72331, 72332, 72333, 72334, 72335, 72336, 72337, 72338, 72339, 72340, 72341, 72342, 72343, 72344, 72345, 72346, 72347, 72348, and 72349 were timely protested by White Pine County on the following grounds:<sup>1-53</sup>

1. It is unknown what effect these withdrawals will have on White Pine County aquifers.
2. The applicants cannot put the water to beneficial use. The applicants do not possess a Right of Way or an easement to transport water from the underground source to a municipality.
3. The point of diversion for the underground water source is not within the proximity of a municipality.
4. The applications appear to be speculative, which is not within the guidelines of Nevada water law.
5. The applications are not in the best public interest for the Basin. Public land resources in the basin which are dependent on the present hydrologic balance would be negatively impacted.
6. The hydrologic balance of the basin would be altered. The applicants would need to transport the water outside of Basin to put it to beneficial use as stated, creating conditions whereby surface waters, including the alluvial aquifer would be depleted to provide a deeper recharge.

#### LVI.

Application 72296 was timely protested by Louis Benezet on the following grounds:<sup>54</sup>

This Application is the first of 54 applications, numbers 72296 through 72349, to change the manner of use and place of use of waters heretofore appropriated. Applicant seeks to change the manner of use from agricultural to municipal, and to transfer the water from Lake Valley in northern Lincoln County to Coyote Springs Valley, a distance of over 100 miles.

These applications are speculative in nature. The applicant cannot put the water to beneficial use. Applicant does not possess a right of way to transfer the water. The amount of water he proposes to transfer is far in excess of the amount applicant has stated he will require to develop his land in Coyote Springs Valley. Applicant has other water rights near the proposed place of use. Applicant has stated that he will not use his own water to develop this property, but will buy water from Lincoln County

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<sup>54</sup> Exhibit No. 58.

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Water District. Lincoln County Water District is in process of developing adequate water in the Coyote Springs area to serve applicants projected development. For all these reasons the applications must be considered speculative, and not within State guidelines.

The applications are not in the public interest, and would be harmful to other water rights holders and to the environment and socio-economic conditions of the basin of origin. Transfer of agricultural water out of the basin would reduce recharge to the aquifer. The basin is designated fully appropriated by the state. Transfer of the water would negatively affect the hydrologic balance. Effects to the environment would include loss of springs and riparian areas, affecting wildlife and plant communities. Water transfers would impact neighboring ranchers. Municipalities like the town of Pioche would suffer from loss of water supply. Socio-economic impacts would result from the loss of agriculture, which would affect the economy in northern Lincoln County, with loss of employment and increased per capita costs for government services.

#### LVII.

Application 72296 was timely protested by Jo Anne Garrett on the following grounds:<sup>55</sup>

This Application is the first of 54 applications, numbers 72296 through 72349, to change the manner of use and place of use of waters heretofore appropriated. Applicant seeks to change the manner of use from agricultural to municipal, and to transfer the water from Lake Valley in northern Lincoln County to Coyote Springs Valley, a distance of over 100 miles.

No municipality exists in the vicinity of this appropriation, and applicant does not possess a right of way to transfer the water. The amount of water he proposes to transfer is far in excess of the amount the applicant has stated he will require to develop his land in Coyote Springs Valley. Applicant has other water rights near the proposed place of use. Applicant has stated that he will not use his own water to develop this property, but will buy water from Lincoln County Water District. Lincoln County Water District is in the process of developing adequate water in the Coyote Springs area to serve applicant's projected development. For all these reasons the applications must be considered speculative, and not within State guidelines.

The quantity of water applied for is more than is available. The applications are not in the public interest, and would be harmful to other water rights holders and to the environment and socio-economic conditions of the basin of origin. Transfer of agricultural water out of the basin would reduce recharge to the aquifer. The basin is designated fully

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<sup>55</sup> Exhibit No. 59.

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appropriated by the state. Transfer of the water would negatively affect the hydrologic balance. Effects to the environment would include loss of springs and riparian areas, affecting wildlife and plant communities. Water transfers would impact neighboring ranchers, including those in White Pine County to the north. Municipalities like the town of Pioche would suffer from loss of water supply. Socio-economic impacts would result from the loss of agriculture in both counties, as well as from the loss of a rapidly expanding tourism and recreation industry in White Pine County.

#### **LVIII.**

After all parties were duly noticed by certified mail, a public administrative hearing was held on March 31, 2008, regarding Applications 72296, 72297, 72298, 72299, 72300, 72301, 72302, 72303, 72304, 72305, 72306, 72308, 72309, 72310, 72311, 72312, 72313, 72314, 72315, 72316, 72317, 72318, 72319, 72320, 72321, 72322, 72323, 72324, 72325, 72326, 72327, 72328, 72329, 72330, 72331, 72332, 72333, 72334, 72335, 72336, 72337, 72338, 72339, 72340, 72341, 72342, 72343, 72344, 72345, 72346, 72347, 72348, and 72349 in Carson City, Nevada, before representatives of the Office of the State Engineer.<sup>56</sup>

#### **LIX.**

The Applicant (Tuffy Ranch) intends to sell the water rights to Coyote Springs Investment who in turn will dedicate the water to the Lincoln County General Improvement District for water service to the Coyote Springs Development. The Wingfield Nevada Group is the parent of Tuffy Ranch and Coyote Springs Investment, LLC.

### **FINDINGS OF FACT**

#### **I.**

#### **STATUTORY STANDARD TO GRANT**

The State Engineer finds that NRS § 533.370(1) provides that the State Engineer shall approve an application submitted in the proper form which contemplates the application of water to beneficial use if the applicant provides proof satisfactory of his intention in good faith to construct any work necessary to apply the water to the intended beneficial use with reasonable diligence, and his financial ability and reasonable expectation actually to construct the work and apply the water to the intended beneficial use with reasonable diligence.

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<sup>56</sup> Exhibits and Transcripts, public administrative hearing before the State Engineer, March 31, 2008, official records in the Office of the State Engineer (Hereafter, "Transcript" and "Exhibits").

## II.

### STATUTORY STANDARD TO DENY

The State Engineer finds that NRS § 533.370(5) provides that the State Engineer shall reject an application and refuse to issue the permit where there is no unappropriated water in the proposed source of supply, or where the proposed use conflicts with existing rights or with protectable interests in existing domestic wells as set forth in NRS § 533.024, or where the proposed use threatens to prove detrimental to the public interest.

## III.

### STATUTORY STANDARD FOR INTERBASIN TRANSFERS

The State Engineer finds that NRS § 533.370(6) provides that in determining whether an application for an interbasin transfer of ground water must be rejected, the State Engineer shall consider: (a) whether the applicant has justified the need to import the water from another basin; (b) if the State Engineer determines a plan for conservation is advisable for the basin into which the water is imported, whether the applicant has demonstrated that such a plan has been adopted and is being effectively carried out; (c) whether the proposed action is environmentally sound as it relates to the basin from which the water is exported; (d) whether the proposed action is an appropriate long-term use which will not unduly limit the future growth and development in the basin from which the water is exported; and (e) any other factor the State Engineer determines to be relevant.

## IV.

### BENEFICIAL USE AND REASONABLE DILIGENCE

Testimony was provided that the Coyote Springs development is progressing and the Applicant, through its association with Coyote Springs Investment, has continued to pursue development. Aerial photographs, as recent as January 2008, were provided to show the pace of construction. The Applicant indicated that the first model home complex is scheduled to be completed no later than 2009 and the championship golf course is currently open for VIP play. Also, development plans with respect to Lincoln County have not changed and that ultimately at build-out they would like to develop up to 100,000 homes in Lincoln County depending on the availability of natural resources. The economic viability of the project was also confirmed.<sup>57</sup>

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<sup>57</sup> Transcript, pp. 129-131; Exhibit Nos. 66, 101, 102.

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The State Engineer finds the Applicant provided proof satisfactory to the State Engineer of an intention in good faith to construct any work necessary to apply the water to the intended beneficial use with reasonable diligence and a reasonable expectation to actually construct the work and apply the water to the intended beneficial use with reasonable diligence.

**V.**

**PROTECTIBLE INTEREST IN EXISTING DOMESTIC WELLS**

Nevada Revised Statute § 533.370(5) provides that the State Engineer shall reject an application and refuse to issue the permit where the proposed use of the water will conflict with the protectible interests in existing domestic wells as set forth in NRS § 533.024. Nevada Revised Statute § 533.024 provides that it is the policy of this State to recognize the importance of domestic wells as appurtenances to private homes, to create a protectable interest in such wells and to protect their supply of water from unreasonable effects which are caused by municipal, quasi-municipal or industrial uses and which cannot be reasonably mitigated. The State Engineer finds that no evidence was presented that demonstrated with any certainty there would be unreasonable adverse effects to any specifically identified domestic well and it is not possible in this case to know in advance with any certainty that such impacts will occur and could not be reasonably mitigated. The State Engineer finds that if the project is developed and unreasonable adverse effects are seen in any domestic well the Applicant may be required to mitigate the impacts in a timely manner.

**VI.**

**LOCATIONS OF EXISTING PLACES OF USE AND  
PROPOSED PLACE OF USE**

State Engineer's Order No. 726, issued June 11, 1976, described and designated the Lake Valley Hydrographic Basin as a ground-water basin in need of additional administration under the provisions of NRS § 534.030.<sup>58</sup> The applications are seeking to change the place of use and manner of use of existing water rights and the points of diversion are unchanged. The majority of the Lake Valley Hydrographic Basin is located within Lincoln County; with the northern tip extending into White Pine County.

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<sup>58</sup> State Engineer's Order No. 726, June 11, 1979, official record in the Office of the State Engineer.



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The State Engineer finds that Applications 72296, 72297, 72298, 72299, 72300, 72301, 72302, 72303, 72304, 72305, 72306, 72308, 72309, 72310, 72311, 72312, 72313, 72314, 72315, 72316, 72317, 72318, 72319, 72320, 72321, 72322, 72323, 72324, 72325, 72326, 72327, 72328, 72329, 72330, 72331, 72332, 72333, 72334, 72335, 72336, 72337, 72338, 72339, 72340, 72341, 72342, 72343, 72344, 72345, 72346, 72347, 72348, and 72349 have points of diversion that are located within the Lake Valley Hydrographic Basin and the points of diversion, existing places of use and proposed place of use are located entirely within Lincoln County.

## VII.

### CONSUMPTIVE USE

The State Engineer defines the consumptive use of a crop as that portion of the annual volume of water diverted under a water right that is transpired by growing vegetation, evaporated from soils, converted to non-recoverable water vapor, or otherwise does not return to the waters of the State. Consumptive use does not include any water that falls as precipitation directly on the place of use nor does it include irrigation inefficiencies or waste. The consumptive use of a crop is equal to the crop evapotranspiration less the amount of precipitation available for evapotranspiration by the crop.

The State Engineer's consumptive use estimate for the Lake Valley Hydrographic Basin is based on the Penman-Monteith short reference evapotranspiration and dual-crop coefficient approach for estimating crop evapotranspiration, similar to methods described by the American Society of Civil Engineers,<sup>59</sup> Food and Agriculture Organization of the United Nations,<sup>60</sup> and Allen et al., (2005).<sup>61</sup> For the Lake Valley Hydrographic Basin a crop of alfalfa is simulated for the estimation of consumptive use. Weather data used for the analysis were obtained for Lake Valley from the National Weather Service (NWS) Geyser Ranch weather station, which has been in operation intermittently from 1904 to 2002, with 19 years of complete data. Using these methods, the State Engineer estimates the alfalfa crop evapotranspiration during the growing season in the Lake Valley Hydrographic Basin to be 3.1 acre-feet per acre per year.

<sup>59</sup> State Engineer's Office, The ASCE Standardized Reference Evapotranspiration Equation, 2005.

<sup>60</sup> State Engineer's Office, Crop Evapotranspiration: Guidelines for Computing Crop Water Requirements, FAO Irrigation and Drainage Paper No. 56, 1998.

<sup>61</sup> State Engineer's Office, Allen, R.G., Pereira, L.S., Smith, M., Raes, D., and Wright, J.L., FAO-56 Dual Crop Coefficient Method for Estimating Evaporation from Soil and Application Extensions, Journal of Irrigation and Drainage Engineering, 2005, pp. 131(1), 2-13.

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Effective precipitation as defined by the Natural Resource Conservation Service (NRCS) is the part of precipitation that can be used to meet the evapotranspiration of growing crops. Precipitation that falls during the growing season and non-growing season that is stored in the soil column reduce the irrigation water requirement and therefore must be considered when calculating consumptive use. By maintaining a daily soil water balance following methods of Allen et al., (2005),<sup>60</sup> which accounts for the daily precipitation, crop evapotranspiration, runoff, and deep percolation, the State Engineer finds that the effective precipitation in Lake Valley averages 0.2 acre-feet per acre per year. Therefore, the State Engineer finds the annual consumptive use for alfalfa in the Lake Valley Hydrographic Basin is 2.9 acre-feet per acre.

The Applicant presented evidence and testimony regarding the consumptive use rate and their expert witness opined that the rate should be 3.15 acre-feet per acre using a variety of different techniques.<sup>62</sup> The witness specifically referred to a BARCASS-related USGS report where Priestley-Taylor reference ET was computed for a nearby location in Spring Valley.<sup>63</sup> The witness tabulated the Priestley-Taylor reference ET from the bar graph to be 37.8 inches per year (3.15 feet).<sup>64</sup> The witness further explained that he did not agree with the practice of including effective precipitation in computing crop consumptive use. However, in the BARCASS report effective precipitation is clearly considered and is subtracted from the crop ET in the computation of application rate,<sup>65</sup> which is simply consumptive use divided by application efficiency. The net consumptive use as computed in the BARCASS report from appendix A is 2.4 acre-feet per acre. The State Engineer does not accept the Applicants estimate of consumptive use of 3.15 acre-feet per acre and does not accept the BARCASS estimate of 2.4 acre-feet per acre. Instead, as described in the section above, the State Engineer estimates the net consumptive use in Lake Valley to be 2.9 acre-feet per acre. It should be noted that the difference between net consumptive use computations in BARCASS and by the State Engineer are due to the estimated effective precipitation. The State Engineer estimates only 0.2 feet of effective precipitation while BARCASS estimated 0.7 feet, otherwise the two estimates of net consumptive use would be the same.

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<sup>62</sup> Transcript, pp. 270-277.

<sup>63</sup> Moreo, M.T., Lacznia, R.J., and Stannard, D.I., Evapotranspiration Rate Measurements of Vegetation Typical of Ground-Water Discharge in Areas of the Basin and Range Carbonate-Rock Aquifer System, Nevada and Utah, September 2005-August 2006, USGS SIR 2007-5078, 2007.

<sup>64</sup> Transcript, p. 272.

<sup>65</sup> BARCAS Study, USGS SIR 2007-5261, p. 63, Equation 2, p. 63.

## VIII.

### EVALUATION OF EXISTING WATER RIGHTS

By statute, the consumptive use of existing water rights may be used to determine the amount of water that may be changed from irrigation to municipal use.<sup>66</sup> As described in the section above, the State Engineer has determined the annual consumptive use value to be 2.9 acre-feet per acre. Under the change applications, the Applicant is requesting to export 12,000 afa of ground water from the Lake Valley Hydrographic Basin. An analysis of the Applicant's existing water rights was performed to determine whether sufficient existing water rights, based on the consumptive use of said water rights, support the requested change of 12,000 afa.

The Applicant presented evidence that the existing water rights sought for change total 20,230± afa.<sup>67</sup> An independent evaluation by the State Engineer's staff, utilizing the available records in the Office of the State Engineer, indicates that the actual duty of the Applicant's existing water rights when supplementally adjusted is about 17,925± afa for the irrigation of approximately 4,351 acres of land. The State Engineer finds the amount of water that may be available for transfer under all of the pending change applications is about 12,619 acre-feet annually, when the consumptive use factor of 2.9 acre-feet per acre is applied.

## IX.

### NEED TO IMPORT WATER

The State Engineer specifically adopts and incorporates that finding in State Engineer's Ruling No. 5712, which held that this same project justified the need to import water from another basin. Testimony was also provided on the need to import water from Lake Valley. Specifically, the Lincoln County side of the development is planned for up to one hundred thousand homes.<sup>68</sup> Testimony indicated that there is not sufficient water in the Coyote Spring Hydrographic Basin to support full development of the project and additional water is necessary.<sup>69</sup> The remaining requirements of NRS § 533.370(6) along with other statutory criteria are addressed in the following sections.

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<sup>66</sup> NRS § 533.370(5).

<sup>67</sup> Exhibit No. 107.

<sup>68</sup> Transcript, p. 131.

<sup>69</sup> Transcript, pp. 155-156.

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## **X.**

### **PLAN FOR CONSERVATION OF WATER**

The Applicant showed that conservation measures were part of a development agreement and a cooperative agreement and they require, for example, water conservation restrictive covenants and the reuse of effluent for golf course irrigation or ground-water recharge.<sup>70</sup> Additional testimony regarding the agreements stated the County wanted to make sure that they put the requirements on the developer to put in reuse programs, to have as strict conservation as possible, to make sure that the limited water resources in the county would be used as to the maximum extent.<sup>71</sup>

## **XI.**

### **ENVIRONMENTALLY SOUND**

The interbasin transfer statute requires a determination of whether the proposed change applications are environmentally sound as it relates to the basin from which the water is exported. In State Engineer's Ruling No. 5726, the meaning of this statutory language was reviewed:

The words environmentally sound have intuitive appeal, but the public record and discussion leading up to the enactment of NRS § 533.370(6)(c) do not specify any operational or measureable criteria for use as the basis for a quantitative definition. This provision of the water law provides the State Engineer with no guidance as to what constitutes the parameters of "environmentally sound;" therefore, . . . it has been left to the State Engineer's discretion to interpret the meaning of environmentally sound.

The legislative history of NRS § 533.370(6)(c) shows that there was minimal discussion regarding the term environmentally sound. However, the State Engineer at that time indicated to the Subcommittee on Natural Resources that he did not consider the State Engineer to be the guardian of the environment, but rather the guardian of the state ground water and surface water. The State Engineer noted that he was not a range manager or environmental scientist. [Citation omitted.] Senator James pointed out that by the language "environmentally sound" it was not his intention to create an environmental impact statement process for every interbasin water transfer application and that the State Engineer's responsibility should be for the hydrologic environmental impact in the basin of export. [Citation omitted.]<sup>72</sup>

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<sup>70</sup> Transcript, pp. 149-151; Exhibit Nos. 63 and 64.

<sup>71</sup> Transcript, p. 216.

<sup>72</sup> Exhibit No. 100, pp. 46-48.

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Also in State Engineer's Ruling No. 5726, the State Engineer found that "environmentally sound" must be within the parameters of Nevada water law and found this means that whether the use of the water is sustainable over the long-term without unreasonable impacts to the water resources and the hydrologic-related natural resources that are dependent on those water resources. The State Engineer found that in consideration of whether a proposed project is environmentally sound there can be a reasonable impact on the hydrologic related natural resources in the basin of origin.

The water at issue is currently pumped for irrigation purposes at the Atlanta Farms property owned by the Applicant. The Applicant's witness testified that there has been minimal effect on water levels as a result of this concentrated pumping for irrigation purposes, with only a slight drawdown indicated in one well. Testimony indicated that the longest term monitor well in the basin, the Pony Springs Well, has only declined 20 feet over a period from 1965 to 2008.<sup>73</sup> There are additional long-term water level data in the Office of the State Engineer for several other wells in the Atlanta Farms area. Those data show that water levels in the Atlanta Farms area have declined 20 to 30 feet since the mid-1960s, or a rate of 1/2 to 3/4 feet per year on average.<sup>74</sup> Under the proposed applications, the water would be pumped for municipal purposes but only the consumptive portion of the water heretofore pumped for irrigation would be available for export. Therefore, the net impact on the Lake Valley Hydrographic Basin would not change from present conditions.

The Protestants raised the issue of existing water rights exceeding the perennial yield of the basin and the environmental soundness of exporting the full perennial yield of the basin. The State Engineer finds that to export an amount of water in excess of the perennial yield from a basin would not be environmentally sound. The most recent estimate of in-basin natural recharge and discharge in Lake Valley is 13,000 afa and 6,100 afa, respectively.<sup>75</sup> On this basis, the perennial yield would be between 6,100 and 13,000 af. On the basis of the moderate observed drawdown due to Tuffy Ranch pumping, the State Engineer finds the perennial yield of the Lake Valley Hydrographic Basin is at least 13,000 af. Present non-supplemental ground-water appropriations in the

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<sup>73</sup> Transcript, p. 236; Exhibit Nos. 77, 78, 79, 80, and 81.

<sup>74</sup> Nevada Division of Water Resources' Water Level Database, official records in the Office of the State Engineer.

<sup>75</sup> BARCAS Study, USGS SIR 2007-5261, pp. 43 - 63.

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basin are about 21,000 afa, and the consumptive use portion is approximately 15,000 afa; therefore, the basin may be over appropriated.

In considering whether the basin is over appropriated, the State Engineer is going to consider observed pumping effects and the uncertainty in the estimate of the perennial yield. Water levels in the center of the Tuffy Ranch pumping center are currently declining at a moderate rate, and no unreasonable effects have been observed. It has not been demonstrated that there is a need to regulate this basin to bring the amount of existing appropriations back in line with the estimated perennial yield; however, it is also recognized that the long-term effects of pumping are often slow to develop. Therefore, in order to assure that the water exportation project is environmentally sound, while at the same time allowing continued pumping of the certificated and permitted water rights, the amount available for export must allow for a margin of safety. Therefore, the State Engineer finds that staged development of the exportation project is warranted. The remainder of the appropriated water will remain in the basin to maintain this margin of safety. To ensure there are no unreasonable impacts on the hydrologic related natural resources in the basin due to continued pumping and exporting of water, the State Engineer finds the Applicant will be required to submit and comply with a monitoring, management, and mitigation plan.

## **XII.**

### **LONG-TERM USE OF THE WATER AND FUTURE GROWTH AND DEVELOPMENT IN THE BASIN OF ORIGIN**

The State Engineer has issued several recent rulings on large water importation requests.<sup>76</sup> The applications involved in those rulings sought to appropriate additional ground water within each basin and a case-by-case approach was used to determine the amount of water that could be exported without unduly limiting future growth and development in the basin of origin, in accordance with NRS § 533.370(6)(d).

In Kane Springs, it was determined that there was no private land within the basin. The entire basin was public land managed by the U.S. Bureau of Land Management (BLM) and there was no recognized potential for future growth within the basin. In addition, there were no existing water rights within the basin. It was ultimately

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<sup>76</sup> State Engineer Ruling Nos. 5712, 5726 and 5785, February 2, 2007, April 16, 2007, July 9, 2008, official records in the Office of the State Engineer.

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determined that the full perennial yield could be appropriated and exported from the basin without unduly limiting future growth and development.<sup>77</sup>

In Cave Valley, the evidence indicated that there was about 4,692 acres of potentially developable land. If the land was divided into 5-acre lots, there would be 938 lots for possible development; however, the evidence indicated the type of development would be mostly seasonal homes or cabins. A total of 275 afa was left in the basin of origin for future growth and development, including 40 afa for stock watering and commercial uses.<sup>78</sup>

In Dry Lake Valley, there are only 35 individual parcels encompassing 1,117 acres of private land. There was no evidence that anyone lives within the valley on a year-round or temporary basis and no evidence was provided of any future development within the basin. The State Engineer found that a minimal quantity of water, being 50 afa, should be left in the basin of origin for future growth and development.<sup>78</sup>

In Delamar Valley, there is no private land and there was no indication that anyone lives in the valley on a year-round or temporary basis. The State Engineer found that a minimal quantity of water, being 50 afa, should be left in the basin of origin for future growth and development.<sup>78</sup>

In Spring Valley, there were both existing water rights and private property within the basin. The perennial yield was estimated at 80,000 afa and the amount of water available for export was limited to a maximum of 60,000 afa. It was determined that there was the potential for future growth within the basin and leaving the existing water rights (11,000+ afa consumptive) would not be sufficient; therefore, 10% of the perennial yield was also left in the basin (8,000 afa).<sup>79</sup>

The applications in Spring, Cave, Delamar, Dry Lake and Kane Springs Valleys, all sought to appropriate and export the entire perennial yield, excepting existing water rights, if any, and in Spring, Cave, Delamar and Dry Lake Valleys, a portion of the unappropriated perennial yield was left in the basins. The applications considered in this ruling seek to change existing water rights. There is no unappropriated water in the basin to leave for future growth and development and the evidence indicates that the basin may be over-appropriated based on current estimates of the perennial yield. The State

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<sup>77</sup> Exhibit No. 99.

<sup>78</sup> State Engineer's Ruling No. 5875.

<sup>79</sup> Exhibit No. 100.

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Engineer finds that the water needed for future growth and development within the Lake Valley Hydrographic Basin will come from existing water rights within the Lake Valley Hydrographic Basin and within the perennial yield of the Lake Valley Hydrographic Basin.

Regarding whether the proposed water exportation project in Lake Valley is an appropriate long-term use, which will not unduly limit the future growth and development in the basin from which the water is exported, testimony was provided that less than 5% (4.8%) of the land in the basin is privately held, with the remaining 95% being public land managed by the BLM. Of the 5% of private lands, Tuffy Ranch holds or has a controlling interest in about 83%, or 17,126 acres, primarily the Atlanta Farms and Geyser Ranch properties.<sup>80</sup> Private lands not controlled by Tuffy Ranch total about 3,049 acres.<sup>81</sup> If this land were divided into 5-acre parcels, there would be 610 lots. The estimated potential water use for the private lands at 1.0 afa per lot is equal to 610 afa for future growth and development. Existing water rights not controlled by the Applicant or its related entities are about 294 afa. Subtracting the 610 afa and the 294 afa from the perennial yield leaves about 12,100 afa available.

For the Atlanta Farms property, the Applicant indicated that they intend to develop land removed from cultivation at Atlanta Farms by subdividing the property into 40-acre or 100-acre lots; essentially converting the former agricultural property to mini-ranches.<sup>82</sup> The Applicant further indicated that water remaining on Atlanta Farms, subsequent to these transfers, would be used to support the 40-acre or 100-acre lots, which may include horses and pasture, but did not specify how much water would be reserved for these mini-ranches.<sup>83</sup> The Applicant further stated that the water on Geyser Ranch would remain appurtenant to the property as there is no intent to move those water rights at this time.<sup>84</sup> To account for the potential development of the Atlanta Farms properties as land is fallowed, the State Engineer has chosen to use a minimum lot size of 5 acres. For each 5 acres fallowed, the State Engineer has determined a consumptive amount of 1 acre-foot would be required. Since the consumptive use rate is 2.9 acre-feet per acre, for every 5 acres fallowed there are 14.5 acre-feet are available for export, and 1

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<sup>80</sup> Transcript, pp. 123-125.

<sup>81</sup> Exhibits Nos. 110 and 111.

<sup>82</sup> Transcript, pp. 172-173.

<sup>83</sup> Transcript, pp. 140-141.

<sup>84</sup> Transcript, pp. 141-142.



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acre-foot must remain in the basin for use on that future 5-acre parcel. The amount of water that can be exported under this scenario can be easily calculated using the following formula and solving for X:

$$12,100 = X + (X / 2.9*5)$$

$$12,100 = X * (1 + (1 / 2.9*5))$$

$$X = 12,100 / (1 + (1 / 14.5))$$

$$X = 11,320 \text{ afa}$$

The equation yields 11,320 afa that can be exported. Rounding to the nearest 100, the amount of water that can be exported is **11,300 afa**. If this full amount is exported, 3,897 acres will be fallowed, creating 779 potential 5-acre lots. All remaining water in the basin beyond the export limitation of 11,300 afa shall remain in the basin and will be available for the future growth and development in the Lake Valley Hydrographic Basin.

The State Engineer finds that the export of the reduced amount of water is an appropriate long-term use, which will not unduly limit the future growth and development in the basin from which the water is exported.

### **XIII.**

#### **OTHER RELAVANT FACTORS**

In considering interbasin transfers of water, the State Engineer may consider “any other factor the State Engineer determines to be relevant.”<sup>85</sup> As noted, in the preceding section, there have been several recent decisions regarding the interbasin transfer of ground water. In each of these decisions, there was unappropriated water available within the ground-water basin. The exportation of water from Lake Valley is unique in that the Applicant is not requesting an additional appropriation of water. Not only is there no unappropriated water available in Lake Valley, the State Engineer has found in this ruling that the basin may be over appropriated even if the highest estimate of perennial yield is utilized (13,000 afa). If the entire perennial yield of the basin is exported and the existing water rights remaining within the basin are exercised, the basin will be over-pumped and the estimated perennial yield will be exceeded. The Applicant has asked that the State Engineer approve its applications to export the entire perennial yield of the basin, which it estimates at 12,000 afa. The State Engineer has found that, in order for the project to be considered environmentally sound, a maximum of 11,300 afa

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<sup>85</sup> NRS § 533.370(6)(e).

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may be exported and only under strict monitoring. In calculating the consumptive use of the existing water rights, the State Engineer used a calculation that assumes a pristine crop and optimal growing conditions considering the local climate. However, actual pumpage and consumptive use are unknown. The Applicant declined to provide any documentation on historical pumpage, stating that accurate pumpage records were not available,<sup>86</sup> even though accurate measurements of water placed to beneficial use were required as a condition of the permits. Due primarily to the uncertainties in actual pumpage and consumptive use, a conservative approach to this exportation project is warranted. The State Engineer finds the initial export will be limited to 9,000 afa; the remaining 2,300 afa may be allowed only after an evaluation of the initial staged development. The State Engineer has also found that existing water rights in the basin in excess of the 11,300 afa must remain in the basin to satisfy the requirements of NRS § 533.370 (6)(d), regarding future growth and development.

Despite the limitation on exportation to 11,300 afa, the monitoring, management and mitigation program may show that ground-water pumping unreasonably impacts other water rights or creates environmentally unsound conditions. If this occurs, it may be necessary to regulate the basin back to the perennial yield on a priority basis. The priority of a water right is tied to its filing date and under the prior appropriation doctrine, the earliest or senior water rights would be allowed to pump and the newest or junior water rights would be out of priority and would not be allowed to pump. Since the exportation project is being limited to a possible 11,300 afa, the changes of the earliest priority base rights will be considered for approval and the changes of some of the latest priority base rights will be considered for denial. If the circumstances were such that the basin needed to be regulated back to the perennial yield, the municipal exported water rights would not be affected.

The State Engineer finds that the pending applications will be approved on the basis of the priority of the existing water rights that form the basis for the change applications with the senior water rights transferred, such that the junior water rights remain in the basin, up to the 11,300 afa limitation.

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<sup>86</sup> Transcripts, pp. 256 - 257 and 263 - 266.

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#### **XIV.**

##### **WHITE PINE COUNTY PROTEST**

In support of its protest, Protestant White Pine County read a statement into the record.<sup>87</sup> The statement asks the State Engineer to consider the negative economic impacts to White Pine County, a consumptive use limitation, and impact to the surrounding basins including cumulative impacts. The statement indicated that there are 669 acres of private land taxed as agricultural property in Lake Valley, and the White Pine County portion of agricultural land generates approximately \$40,000 in economic activity each year. Also mentioned is economic activity related to hunting and cattle ranching. As noted in the above section, the irrigated land sought for change under these applications is located entirely within Lincoln County. It is unclear, and the Protestant failed to provide any evidence, how these applications would negatively affect cattle and wildlife or otherwise negatively impact the economy of White Pine County.

The second issue is whether a consumptive use reduction should be applied to the Applicant's proposed conversion of irrigation water rights to municipal water rights. A review of the applications and existing rights indicates that such a reduction will be necessary prior to any approval of the applications; therefore, this protest issue is affirmed.

The final issue is the impact to surrounding basins and the cumulative impact of all the plans to export water from White Pine County. First, no water is being exported from White Pine County as the existing place of use of the water is within Lincoln County. Second, with a consumptive use limitation only the amount of water currently consumed under existing irrigation water rights will be considered for export to Coyote Spring Valley.

The State Engineer finds that Protestant White Pine County failed to provide substantial evidence to support its protest.

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<sup>87</sup> Exhibit No. 120.

## **XV.**

### **BENEZET AND GARRETT PROTESTS**

Protestants Benezet and Garrett protested on similar grounds and presented a joint effort at the administrative hearing, however, both Protestants did speak on their own behalf.<sup>88</sup> The parties offered expert testimony through their hydrogeologist Dr. Meyers. The protest issues center around claims that the applications are speculative and that the applications are not in the public interest. In addition, Protestant Garrett also mentions a loss of tourism and recreation in White Pine County.<sup>89</sup>

Testimony was received that the perennial yield of the Lake Valley Hydrographic Basin cannot be adequately captured from pumping at the Atlanta Farms property without significant long-term drawdown of two to three hundred feet, before steady-state can be reached. It was also opined that the State Engineer should limit the transfer to the consumptive use of the water rights and that the consumptive use should be the same rate as applied in the Spring Valley ruling, about 3.2 feet per year. The expert witness testified that pumping at the Atlanta Farms would capture discharge of ground-water flow to Patterson Valley and would not capture discharge from the northern part of Lake Valley, near the Geyser Ranch. The witness also stated that existing rights in the southern portion of Lake Valley exceed the natural discharge in that area. Additionally, it was estimated that the existing water rights covered 4,100 acres of land and if a duty of only 4.0 acre-feet per acre were applied, it would only equate to 16,000 acre-feet as opposed to the Applicant's assertion of over 20,000 acre-feet sought for change. The supplemental nature or comingling of many of the existing rights was also mentioned as a confounding issue in determining an accurate depiction of the quantity of water sought for transfer.<sup>90</sup>

As discussed in preceding sections, the State Engineer has determined that only the consumptive use portion of the existing water rights may be considered for export from Lake Valley and the annual consumptive use rate is calculated at 2.9 acre-feet per acre. The existing water rights are currently, and have in the past, been pumped for irrigation purposes at the Atlanta Farms and there should be no increase in the water use if only the consumptive use portion of the water right is exported from the basin.

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<sup>88</sup> Transcript, p. 26.

<sup>89</sup> Exhibit Nos. 58 and 59.

<sup>90</sup> General summary of direct examination of Dr. Meyers, Transcript, pp. 34-58; Exhibit Nos. 90 and 100.

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The protests assert that the applications are speculative because the Applicant does not have a right of way to deliver the water, the amount of water requested is in excess of that needed, and the Lincoln County Water District is developing water for service to this project; therefore, it is implied that the water from Lake Valley is not needed. A review of the testimony and evidence show little support for this protest claim. The Applicant testified that the current plan is to move the water through the proposed Southern Nevada Water Authority (SNWA) pipeline<sup>91</sup> and, if it turns out that the SNWA pipeline does not receive all of its approvals, a private pipeline would be used.<sup>92</sup> Testimony and evidence was also received regarding the justification and demand for the water in order to continue the Coyote Springs development.<sup>93</sup> The Lincoln County Water District and the associated General Improvement District were created, at least in part, to deliver water to the Lincoln County side of the Coyote Springs development. The protest issue regarding the Lincoln County Water District is unclear and there was no testimony or evidence offered by the Protestants to clarify this claim. The State Engineer finds that the Protestants failed to prove the applications were filed for speculative purposes.

The protests assert that approval of the applications would not be in the public interest because it would reduce recharge to the aquifer, the basin is fully appropriated, there would be a loss of springs and riparian areas, impact to neighboring ranches, loss of water supply to the Town of Pioche, socio-economic impacts and loss of tourism and recreation in White Pine County.

The first claim is that the applications would reduce recharge to the aquifer. If the entire duty of water under the existing rights were transferred, this claim might have merit. However, by limiting the change applications to the consumptive use portion of the water right, the loss of recharge from the irrigation to the aquifer is nullified. For example, consider one acre of land irrigated at an application rate of 4 feet per acre. Under irrigation, 4 feet of water would be pumped but only 2.9 feet would be consumed with the remaining 1.1 feet recharging the aquifer. By limiting the pumping and export of water for municipal purposes to 2.9 feet per acre, 1.1 acre-feet will still remain in the aquifer and the net amount of water removed from the aquifer will be unchanged.

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<sup>91</sup> Transcript, p. 134; Exhibit No. 66.

<sup>92</sup> Transcript, p. 157.

<sup>93</sup> Transcript, pp. 130, 154-155; Exhibit Nos. 98 and 99.

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The second claim is that the basin is fully appropriated. The applications at issue are not requesting a new appropriation of water, rather they seek to change existing water rights previously approved for the appropriation of water from the Lake Valley Hydrographic Basin for irrigation purposes. The State Engineer finds that the protest grounds that the basin is fully appropriated are insufficient for denial of an application to export water from a basin, and the protest is overruled.

The third claim is a loss of springs and riparian areas will occur. The record lacks substantial evidence to support this claim; however, the State Engineer finds a conservative approach is best and any permits approved under these change applications will be subject to an approved monitoring, management, and mitigation plan to ensure no unreasonable adverse affects occur as a result of this water exportation project.

The fourth claim is that there will be an impact to neighboring ranchers. There was no testimony or evidence that quantified, documented or even identified which ranchers are being referenced in this protest claim. However, as noted above, a conservative approach will be taken and any permits approved under these change applications will be subject to an approved monitoring, management, and mitigation plan.

The fifth claim is that there will be a loss of water supply to the Town of Pioche. In reviewing the Protestants testimony, it is implied that this protest claim refers to the future need for water in the rural communities of Pioche, Panaca, Caliente, Rachel and Alamo. The Protestants provided testimony that if the federal government disposes some of the public land near these communities water will be needed to develop the additional land and if the water in Lake Valley is sent to the Coyote Springs development that water will be potentially lost to these communities, ergo there will be a loss of water supply.<sup>94</sup> It should be mentioned that none of the communities are within the Lake Valley Hydrographic Basin and there are no cities or towns within Lake Valley. The protest issue appears to be that the water should be preserved for growth in the towns mentioned above rather than for growth in Coyote Spring Valley. There is no basis for a finding that existing water rights should be exported to any specific location in preference to another location, and that protest issue is overruled. The State Engineer also finds that there will be no loss of water supply to Pioche, as defined by the Protestant, as the Town of Pioche does not have any claim or ownership interest to the existing water rights of the

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<sup>94</sup> Transcript, p. 105.

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Applicant nor is the community threatened with an imminent or foreseeable water shortage.

The final issue is the socio-economic impacts and the loss of tourism and recreation in White Pine County. The water rights at issue are existing water rights appurtenant to property that is wholly contained in Lincoln County. The change applications seek to move the water to the Lincoln County side of the Coyote Springs development. The water will remain in Lincoln County, whether it is used at Atlanta Farms or for the Coyote Springs development. The Applicant provided testimony and evidence indicating that the transfer of this water from an agricultural use to a municipal use would create a net economic benefit to Lincoln County.<sup>95</sup> The State Engineer finds that the Protestants claims are unsubstantiated by the record.

## **XVI.**

### **WATER RESOURCE MANAGEMENT**

Ground water exportation projects present numerous water resource management challenges. The State Engineer has found that there exists an uncertainty with such projects such that a cautious water management approach is warranted.<sup>96</sup> The State Engineer finds, in order to gather the necessary information to more accurately predict the effects of pumping, the staged development of water will occur in conjunction with a monitoring, management, and mitigation plan. The State Engineer finds that prior to the Applicant exporting any ground-water resources from the Lake Valley Hydrographic Basin, hydrologic baseline studies shall be completed and approved by the State Engineer.

The State Engineer finds that the export of ground water from the Lake Valley Hydrographic Basin will be as follows:

- A hydrologic monitoring, management, and mitigation plan shall be submitted and approved by the State Engineer.
- A minimum of five years of hydrologic data shall be collected by the Applicant subsequent to the approval of the monitoring, management, and mitigation plan and submitted to the State Engineer prior to the Applicant exporting any ground-water resources from Lake Valley.

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<sup>95</sup> Transcript, pp. 191-192; Exhibit No. 102.

<sup>96</sup> Exhibit No. 100, p. 53.

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- The Applicant will be limited to exporting a maximum of 9,000 afa during the initial staged development period. During the staged development, the Applicant must export at least 8,000 afa and not more than 9,000 afa for a period of ten consecutive years. The Applicant must demonstrate through pumpage records and water-level monitoring over the same ten-year period that the Tuffy Ranch area and the Lake Valley Hydrographic Basin can sustain the export of 11,300 acre feet without substantially increasing the current rate of water-level decline.
- The Applicant shall file an annual report with the State Engineer by March 15<sup>th</sup> of each year detailing the findings of the monitoring, management, and mitigation plan.

### **CONCLUSIONS**

#### **I.**

The State Engineer has jurisdiction over the parties and the subject matter of this action and determination.<sup>97</sup>

#### **II.**

The State Engineer is prohibited by law from granting an application to appropriate or change the public waters where:<sup>98</sup>

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

#### **III.**

The State Engineer concludes, based on the findings and limiting the export of water to 11,300 afa, there is water available for export from the basin, there is no substantial evidence the proposed changes will conflict with existing rights, there is no substantial evidence the proposed use will conflict with the protectable interests in existing domestic wells, or that the use of the water will threaten to prove detrimental to the public interest; thus, under NRS § 533.370(5), the law mandates the granting of the water rights.

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<sup>97</sup> NRS chapters 533 and 534.

<sup>98</sup> NRS § 533.370(5).



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#### IV.

The State Engineer concludes the Applicant provided proof satisfactory of its intention in good faith to construct any work necessary to apply the water to the intended beneficial use with reasonable diligence, and its financial ability and reasonable expectation actually to construct the work and apply the water to the intended beneficial use with reasonable diligence.

#### V.

The State Engineer concludes that based on the findings the Applicant meets the additional statutory criteria required for an interbasin transfer of water under NRS § 533.370(6) and therefore, the applications can be considered for approval.

#### VI.

To comply with the export limitation of 11,300 afa and to ensure the export of senior water rights, it has been determined that Applications 72327, 72341, and 72344, which seek to change base rights with a 1974 priority, are subject to denial. The base rights associated with these change applications have a common priority date of April 3, 1974, which is the junior-most priority of the water sought for change. Due to comingling, associated change Applications 72326, 72328, 72340, 72342, 72343, and 72345 are also subject to denial. In addition, the duty of water requested for change under Application 72334 (1974 priority), and associated Applications 72333 and 72335, must be reduced in order for Applications 72333, 72334, and 72335 to be considered for approval. The State Engineer concludes that with the preceding limitations the remaining applications can be considered for approval.


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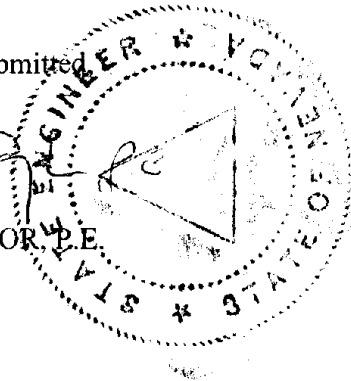
### RULING

Applications 72326, 72327, 72328, 72340, 72341, 72342, 72343, 72344, and 72345 are hereby denied. The protests to Applications 72296, 72297, 72298, 72299, 72300, 72301, 72302, 72303, 72304, 72305, 72306, 72308, 72309, 72310, 72311, 72312, 72313, 72314, 72315, 72316, 72317, 72318, 72319, 72320, 72321, 72322, 72323, 72324, 72325, 72329, 72330, 72331, 72332, 72333, 72334, 72335, 72336, 72337, 72338, 72339, 72346, 72347, 72348, and 72349 are upheld in part and the applications are hereby granted subject to:

1. Existing rights;
2. Payment of the statutory permit fees;
3. A consumptive use limitation of 2.9 acre-feet per acre.
4. A monitoring, management, and mitigation plan approved by the State Engineer that shall, at a minimum, include the collection of five years of baseline data prior to the export of any water from the basin;
5. A staged development with an initial maximum export of 9,000 acre-feet annually.
6. The total combined duty under Permits 72296, 72297, 72298, 72299, 72300, 72301, 72302, 72303, 72304, 72305, 72306, 72308, 72309, 72310, 72311, 72312, 72313, 72314, 72315, 72316, 72317, 72318, 72319, 72320, 72321, 72322, 72323, 72324, 72325, 72329, 72330, 72331, 72332, 72333, 72334, 72335, 72336, 72337, 72338, 72339, 72346, 72347, 72348, and 72349 shall be limited to 11,300 acre-feet annually.
7. If pumpage impacts existing rights, conflicts with the protectible interest in existing domestic wells as set forth in NRS § 533.024, threatens to prove detrimental to the public interest or is found to not be environmentally sound, the Applicant will be required to curtail pumpage and/or mitigate the impacts to the satisfaction of the State Engineer.

Respectfully submitted

  
TRACY TAYLOR, P.E.  
State Engineer



TT/TW/jm

Dated this 3rd day of  
December, 2008

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TAB 6

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

IN THE MATTER OF APPLICATIONS 73960, )  
73961, 73962, 73963, 73965, 73966 AND 74368 )  
FILED TO APPROPRIATE OR CHANGE THE )  
PUBLIC WATERS OF AN UNDERGROUND )  
SOURCE WITHIN THE RED ROCK VALLEY )  
HYDROGRAPHIC BASIN (99), WASHOE )  
COUNTY, NEVADA. )

**RULING**

**# 5816**

**GENERAL**

**I.**

Application 73960 was filed on March 3, 2006, by Red Rock Valley Ranch, LLC, to change the place of use and manner of use of 2.236 cubic feet per second (cfs), not to exceed 598.40 acre-feet annually (afa), a portion of underground water previously appropriated under Permit 29181, Certificate 11619. The existing manner and place of use is for irrigation and domestic purposes described as being located within the SE $\frac{1}{4}$  NE $\frac{1}{4}$ , NE $\frac{1}{4}$  SE $\frac{1}{4}$  of Section 11, SW $\frac{1}{4}$  NW $\frac{1}{4}$ , NW $\frac{1}{4}$  SW $\frac{1}{4}$  of Section 12, T.23N., R.18E., M.D.B.&M. The proposed manner of use is for municipal and domestic purposes. The proposed place of use is described as being located in the Lemmon Valley Hydrographic Basin as further described in Exhibit "A" attached to the application. The existing and proposed point of diversion is described as being located within the NW $\frac{1}{4}$  SW $\frac{1}{4}$  of Section 12, T.23N., R.18E., M.D.B.&M.<sup>1</sup>

**II.**

Application 73961 was filed on March 3, 2006, by Red Rock Valley Ranch, LLC, to change the point of diversion, place of use and manner of use of 0.1812 cfs, not to exceed 40 afa, of underground water previously appropriated under Permit 58343. The existing manner and place of use is for irrigation and domestic purposes described as being located within the SW $\frac{1}{4}$  SW $\frac{1}{4}$ , SE $\frac{1}{4}$  SW $\frac{1}{4}$  of Section 2, NW $\frac{1}{4}$  NW $\frac{1}{4}$  of Section 11, T. 23N., R.18E., M.D.B.&M. The proposed manner of use is for municipal and domestic purposes. The proposed place of use is described as being located in the Lemmon Valley Hydrographic Basin as further described in Exhibit "A" attached to the application. The existing point of diversion is described as being located within the SW $\frac{1}{4}$

<sup>1</sup> File No. 73960, official records in the Office of the State Engineer.

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SW $\frac{1}{4}$  of Section 2, T.23N., R.18E., M.D.B.&M. The proposed point of diversion is described as being located within the NW $\frac{1}{4}$  SW $\frac{1}{4}$  of Section 12, T.23N., R.18E., M.D.B.&M.<sup>2</sup>

### III.

Application 73962 was filed on March 3, 2006, by Red Rock Valley Ranch, LLC, to change the point of diversion, place of use and manner of use of 0.1762 cfs, not to exceed 36.594 afa, of underground water previously appropriated under Permit 29683, Certificate 10522. The existing manner and place of use is for irrigation and domestic purposes described as being located within the SE $\frac{1}{4}$  SE $\frac{1}{4}$  of Section 32, T.24N., R.18E., M.D.B.&M. The proposed manner of use is for municipal and domestic purposes. The proposed place of use is described as being located in the Lemmon Valley Hydrographic Basin as further described in Exhibit "A" attached to the application. The existing point of diversion is described as being located within the SE $\frac{1}{4}$  SE $\frac{1}{4}$  of Section 32, T.24N., R.18E., M.D.B.&M. The proposed point of diversion is described as being located within the NW $\frac{1}{4}$  SW $\frac{1}{4}$  of Section 12, T.23N., R.18E., M.D.B.&M.<sup>3</sup>

### IV.

Application 73963 was filed on March 3, 2006, by Red Rock Valley Ranch, LLC, to change the point of diversion, place of use and manner of use of 640 afa of underground water previously claimed under Proof V-03111. The existing manner and place of use is for irrigation and domestic purposes described as being located within the SE $\frac{1}{4}$  NE $\frac{1}{4}$ , NE $\frac{1}{4}$  SE $\frac{1}{4}$  of Section 11, SW $\frac{1}{4}$  NW $\frac{1}{4}$ , NW $\frac{1}{4}$  SW $\frac{1}{4}$  of Section 12, T.23N., R.18E., M.D.B.&M. The proposed manner of use is for municipal and domestic purposes. The proposed place of use is described as being located in the Lemmon Valley Hydrographic Basin as further described in Exhibit "A" attached to the application. The existing point of diversion is described as being located within the NW $\frac{1}{4}$  SW $\frac{1}{4}$  of Section 12, T.23N., R.18E., M.D.B.&M. The proposed point of diversion is described as being located within the NW $\frac{1}{4}$  SW $\frac{1}{4}$  of Section 12, T.23N., R.18E., M.D.B.&M.<sup>4</sup>

### V.

Application 73965 was filed on March 3, 2006, by Red Rock Valley Ranch, LLC, to change the point of diversion, place of use and manner of use of 0.5181 cfs, not to

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<sup>2</sup> File No. 73961, official records in the Office of the State Engineer.

<sup>3</sup> File No. 73962, official records in the Office of the State Engineer.

<sup>4</sup> File No. 73963, official records in the Office of the State Engineer.

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exceed 114.40 afa, of underground water previously appropriated under Permit 30268, Certificate 10525. The existing manner and place of use is irrigation and domestic purposes described as being located within the SW $\frac{1}{4}$  SW $\frac{1}{4}$ , SE $\frac{1}{4}$  SW $\frac{1}{4}$  and the SW $\frac{1}{4}$  SE $\frac{1}{4}$  of Section 2, NE $\frac{1}{4}$  NW $\frac{1}{4}$  of Section 11, T. 23N., R.18E., M.D.B.&M. The proposed manner of use is for municipal and domestic purposes. The proposed place of use is described as the Lemmon Valley Hydrographic Basin as further described in Exhibit "A" attached to the application. The existing point of diversion is described as being located within the SE $\frac{1}{4}$  SW $\frac{1}{4}$  of Section 2, T.23N., R.18E., M.D.B.&M. The proposed point of diversion is described as being located within the NW $\frac{1}{4}$  SW $\frac{1}{4}$  of Section 12, T.23N., R.18E., M.D.B.&M.<sup>5</sup>

#### VI.

Application 73966 was filed on March 3, 2006, by Redrock Valley Ranch, LLC, to appropriate 5.0 cfs, not to exceed 500.0 afa, of underground water for municipal and domestic purposes. The proposed place of use is described as being located within the Lemmon Valley Hydrographic Basin as further described in Exhibit "A" attached to the application. The proposed point of diversion is described as being located within the NW $\frac{1}{4}$  SW $\frac{1}{4}$  of Section 12, T.23N., R.18E., M.D.B.&M.<sup>6</sup>

#### VII.

Application 74368 was filed on March 3, 2006, by Redrock Valley Ranch, LLC, to appropriate 5.0 cfs of underground water for municipal and domestic purposes. The proposed place of use is described as being located within the Lemmon Valley Hydrographic Basin as further described in Exhibit "A" attached to the application. The proposed point of diversion is described as being located within the NW $\frac{1}{4}$  SW $\frac{1}{4}$  of Section 12, T.23N., R.18E., M.D.B.&M.<sup>7</sup>

#### VIII.

Applications 73960, 73961, 73962, 73965, and 73966 were timely protested by Ron Brown, Sierra Ranchos Property Owners Association, Washoe County, Lassen County, Sandra Gail McGill, and Joseph Donohue. In addition, Applications 73963 and 73966 were timely protested by the Voters for Sensible Growth and Application 74368

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<sup>5</sup> File No. 73965, official records in the Office of the State Engineer.

<sup>6</sup> File No. 73966, official records in the Office of the State Engineer.

<sup>7</sup> File No. 74368, official records in the Office of the State Engineer.

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was timely protested by Ron Brown, Washoe County and Lassen County. The general grounds of the various protests can be summarized as:<sup>1,2,3,4,5,6,7</sup>

- Will jeopardize existing domestic wells.
- Will conflict with existing irrigation rights.
- Water should not be exported from the basin.
- Changes from irrigation to municipal should be limited to historic consumptive use and/or will change more water than historic practices.
- Exceeds perennial yield of the basin.
- Interbasin transfer criteria must be met.
- Insufficient ground water at the source.
- Additional study is necessary.
- Adverse impact to springs and seeps.
- Impact to flows of Long Valley Creek.
- Project will result in water mining and be a long-term detriment to the aquifer.
- Large claim of vested right filed but not adjudicated.

#### IX.

After all parties were duly noticed by certified mail, a public administrative hearing was held on June 12, 2007, regarding Applications 73960, 73961, 73962, 73963, 73965, 73966 and 74368 in Carson City, Nevada, before representatives of the Office of the State Engineer.<sup>8</sup>

#### **FINDINGS OF FACT**

##### I.

At the administrative hearing, appearances were taken for the record. The Applicant was present with counsel but there were no Protestants present that wished to present a full case. For the Protestants, it was indicated before the hearing that only Washoe County would be attending for the purposes of presenting evidence and testimony and to cross-examine the Applicant's witnesses. However, Washoe County reached a stipulation with the Applicant whereby a portion of its protests were withdrawn and, in conjunction with the stipulation, Protestant Washoe County withdrew from the

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<sup>8</sup> Exhibits and Transcripts, public administrative hearing before the State Engineer, June 12, 2007, official records in the Office of the State Engineer (Hereafter, "Transcript" and "Exhibits").

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hearing process and was not present on the day of the administrative hearing.<sup>9</sup> In brief, under the stipulation the Applicant will seek to export a net amount of water limited to 1,273.39 afa, will implement a monitoring and mitigation plan as approved by the State Engineer, and will request the State Engineer to defer action on Application 73963 (V-03111) and to defer action on any portion of applications that may exceed 1,273.39 afa pending further study and evaluation of the effects of the pumping related to the 1,273.39 afa.

For the remaining Protestants, some were present in the audience and added public comment at the end of the hearing. The Protestants in attendance were Ron Brown, Sierra Ranchos Property Owners Association, and Sandra Gail McGill on behalf of herself and the Voters for Sensible Growth. Protestants that did not make an appearance at the hearing were Washoe County, Lassen County, and Joseph Donohue.<sup>10</sup>

## II.

State Engineer's Order No. 718, issued August 3, 1978, described and designated the Red Rock Valley Hydrographic Area as a ground-water basin in need of additional administration under the provisions of NRS § 534.030.<sup>11</sup> The State Engineer finds that Applications 73960, 73961, 73962, 73963, 73965, 73966, and 74368 have proposed points of diversion that are located within the hydrologic boundaries of the designated Red Rock Valley Hydrographic Area.

## III.

The United States Geological Survey (USGS) estimates the perennial yield of the Red Rock Valley Hydrographic Area is approximately 1,000 afa.<sup>12</sup> It should be noted that the Applicant has also provided information regarding the perennial yield of the Red Rock Valley Hydrographic Area as discussed in later sections of this ruling.

The committed ground-water resource, in the form of permits and certificates issued by the State Engineer to appropriate underground water from the Red Rock Valley Hydrographic Area, is about 965 afa.<sup>13</sup> However, due to the consumptive use factor applied

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<sup>9</sup> Exhibit No. 60.

<sup>10</sup> Transcript, pp. 7-11.

<sup>11</sup> State Engineer's Order No. 718, issued August 3, 1978, official records in the Office of the State Engineer.

<sup>12</sup> Rush, F.E., and Glancy, P.A., (1967). Water-Resources Appraisal of the Warm Springs-Lemmon Valley Area, Washoe County, Nevada. Water Resources – Reconnaissance Series Report 43, United States Geological Survey and Nevada Division of Water Resources.

<sup>13</sup> Nevada Division of Water Resources' Water Rights Database, Hydrographic Basin Summary, Red Rock Valley Hydrographic Area (99), September 12, 2007, official records in the Office of the State Engineer.



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to irrigation water rights in the Red Rock Valley Hydrographic Area,<sup>14</sup> the actual committed resource is 610.25 afa, not including domestic wells.

Existing and future domestic well demand was estimated by the Applicant at 389 afa, assuming every eligible parcel had a domestic well.<sup>15</sup> While the Division of Water Resources (Division) does not agree fully with the techniques and values used to derive this estimated domestic well demand, the calculated value is reasonable when compared to independent analyses by the Division, albeit somewhat lower; i.e., it is a less conservative approach than typically used by the Division. The Division calculates the potential domestic demand by first reviewing available parcel information, including size, type and existing development. Based on this review and the Division's experience in estimating water usage on a domestic well parcel, it is apparent that the average domestic well water usage is less than the maximum allowed duty of 2.0 afa. However, since domestic well usage is not monitored and the domestic wells are not metered in the Red Rock Valley Hydrographic Area, a cautious approach is warranted. In consideration of all the facts and circumstances, including potential recharge from septic systems, the Division has applied a duty of 1.0 afa to each existing and potential domestic well. The resultant calculation over 695 parcels yields a potential domestic well demand of 695 afa.

The State Engineer finds that the current perennial yield as estimated by the USGS is 1,000 afa, but additional review of this reconnaissance level estimate may be warranted. The State Engineer further finds that the committed ground-water resource, including existing and future domestic well demand, is about 1,300 afa.

#### IV.

The Applicant has requested that the State Engineer approve the subject applications for 1,273.39 afa, defer action on vested claim V-03111 (Application 73963), and defer action on any application in excess of the 1,273.39 afa requested.<sup>16</sup> In addition, it was requested that if the State Engineer imposes a consumptive use reduction on the change applications that any water considered non-consumptive be re-appropriated under Application 74368 up to the requested 1,273.39 afa.<sup>17</sup> A review of each application was made to determine whether the Applicant's request can be accommodated.

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<sup>14</sup> See, Consumptive use limitation explained in Section VIII.

<sup>15</sup> Transcript, p. 65 and Exhibit No. 53.

<sup>16</sup> Exhibit No. 41, p. 3 and Exhibit No. 60, p. 2.

<sup>17</sup> Transcript, pp. 25-26 and 229-230.

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It bears reminding that Applications 73960, 73961, 73962, 73963, and 73965 seek to change existing water rights, previously approved within the Red Rock Valley Hydrographic Area and Applications 73966 and 74368 seek to appropriate new underground water within the Red Rock Valley Hydrographic Area.

For change Applications 73960 and 73963, an examination of the existing places of use sought for change shows that Permit 29181, Certificate 11619 and vested claim V-03111 are supplemental by virtue of their respective places of use. As such, action cannot be taken separately on change Applications 73960 (29181) and 73963 (V-03111). In this regard, the term supplemental irrigation refers to two ground-water rights, which have a place of use appurtenant to the same land and therefore are limited by a total combined duty of 4.0 acre-feet per acre. This is further indicated in the permit terms under which Permit 29181 was issued that state, "The amount of water to be appropriated shall be limited to the amount which can be applied to beneficial use, and not to exceed 2.7 cubic feet per second, but not to exceed a yearly duty of 4.0 acre-feet per acre of land irrigated from any and/or all sources." The summary of ownership indicates that the amount of water owned by the Applicant under both Permit 29181 and V-03111 is 598.4 afa. The validity of vested claim V-03111 can only be determined through the proper adjudication of the source and vested claim V-03111 has not been adjudicated. Typically, change applications filed against non-adjudicated claims of vested right are not acted upon until the validity of the claim has been determined through the adjudication process. In this case, the Applicant has requested that the State Engineer withhold action on change Application 73963 (V-03111). However, the circumstances of this situation are complicated by Permit 29181, which was filed and approved prior to the filing of vested claim V-03111 on the same place of use. As previously established, the maximum amount of water on the place of use is 4.0 acre-feet per acre from any and/or all sources. If Application 73960 is approved, all of the water will be stripped from the land and the land will be dry. To then withhold action on Application 73963 (V-03111) would leave the impression that water remains appurtenant to the land that could then be changed under Application 73963 at a later date or used on the place of use under V-03111. This would result in a double counting of the water. One solution to this dilemma is to require the withdrawal of the vested claim upon approval of change Application 73960 (Permit 29181, Certificate 11619). Alternatively, change Applications 73960 and 73963 can be approved simultaneously, with the knowledge that the approval of Application 73963

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does not validate the vested claim. If the vested claim is later validated through an adjudication, the priority date of the water under change Applications 73960 and 73963 would trace back to vested claim V-03111 as opposed to Permit 29181.

For change Applications 73961 and 73962, the amount of water eligible for change is correctly reflected on the applications at a duty of 40.0 afa and 36.594 afa, respectively.

For change Application 73965, the amount of water requested for change is 114.40 afa. However, a review of the summary of ownership of base right Permit 30268 shows that the Applicant owns only 98.4 afa and therefore, only this amount may be transferred.

The available water for transfer under all the change applications may be derived by adding the available water as detailed above. The total is calculated as follows:

$$598.4 + 40.0 + 36.594 + 98.40 = 773.394 \text{ afa}$$

By performing this simple calculation it is apparent where the Applicant derived its request for 1,273.39 afa. By taking the total amount requested under the change applications of 773.394 afa and adding the 500 afa requested under Application 73966, the total becomes  $773.394 + 500 = 1,273.394$  afa.

The remaining application to be considered is Application 74368. As indicated by the Applicant, this application was filed to off-set any reduction that may be necessary in transferring only the consumptive duty of the existing irrigation water rights. As such, the application specifies a diversion rate of water only with the duty of water to be determined by the amount of water to “make-up” any consumptive use reduction. Under NRS § 532.120(3.3), the State Engineer may consider the consumptive use of a water right and the consumptive use of a proposed beneficial use of water in determining whether a proposed change in the place of diversion, manner of use or place of use complies with the provisions of subsection 5 of NRS § 533.370.<sup>18</sup> As found in later sections of this ruling, the consumptive use for irrigation in the Red Rock Valley Hydrographic Area is 2.5 acre-feet per acre  $((2.5/4.0)*100 = 62.5\%)$ . By applying this consumptive use factor, the amount of water eligible for change to municipal use under the proposed change applications is 484 afa. Note that the values from this point forward

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<sup>18</sup> NRS § 533.3703(1).

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are rounded to the nearest acre-foot. The difference between the full duty and the consumptive duty totals is  $773 - 484 = 289$  afa.

The State Engineer finds that action cannot be deferred on vested claim V-03111 (Application 73963). The State Engineer finds that the amount of water that can be changed from irrigation to municipal use under Applications 73960, 73961, 73962, 73963 and 73965 is 484 afa. The State Engineer finds that the Applicant's request for 1,273 afa ( $484 + 289 + 500 = 1,273$  afa) may be considered if it can be demonstrated through the evidence that sufficient water is available at the source and all other statutory requirements are met.

#### V.

The Nevada Revised Statutes (NRS) chapters 533 and 534 and the policies developed by the Office of the State Engineer control the appropriation of water within the State of Nevada. By the provisions found under NRS § 533.370(1)(c), before an application that requests a new appropriation of underground water can be considered for approval, the Applicant must provide proof satisfactory to the State Engineer of his intention in good faith to construct any work necessary to apply the water to the intended beneficial use with reasonable diligence and his financial ability and reasonable expectation actually to construct the work and apply the water to the intended beneficial use with reasonable diligence. The answer to these questions can often be determined from the information provided on the submitted application form and associated map. However, it is not uncommon for the State Engineer to request additional information regarding the proposed project and the necessary water requirements, to ensure that the statutory criteria regarding beneficial use are satisfied.

The Applicant provided several documents regarding financial ability and of being contractually connected to the Truckee Meadows Water Authority (TMWA).<sup>19</sup> It was indicated that the Applicant would complete the project and would sell the entire completed project to TMWA under the contract submitted into evidence at this hearing.<sup>20</sup>

After a thorough review of the documents, the State Engineer finds that the Applicant has satisfied the provisions of NRS § 533.370(1)(c), and has shown through its contractual agreement with TMWA that the water will be placed to its intended beneficial use with reasonable diligence.

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<sup>19</sup> Exhibit Nos. 49 and 55.

<sup>20</sup> Transcript, pp. 39-40 and 56.

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## VI.

The subject applications are requesting an interbasin transfer of water from the Red Rock Valley Hydrographic Basin to the Lemmon Valley Hydrographic Basin. Nevada water law provides for the interbasin transfer of water; however, additional statutory criteria apply.<sup>21</sup>

The State Engineer finds that Nevada water law provides for the interbasin transfer of water. The State Engineer further finds the evidence provided at the administrative hearing indicates that the additional statutory requirements under NRS § 533.370(6) can be satisfied provided sufficient limitations and conditions are placed on the applications.

## VII.

The issue of whether a consumptive use reduction should be applied to the Applicant's proposed conversion of irrigation water rights to municipal water rights was brought up by both the Applicant and the Protestants and merits discussion.

The Applicant estimated the consumptive use at 3.5 feet per year, as derived from Division of Water Planning Report 3 from 1980.<sup>22</sup> As discussed below, the State Engineer has computed his own estimate using updated and more modern methods.

Consumptive use of a crop can be defined as that portion of the annual volume of water diverted under a water right that is transpired by growing vegetation, evaporated from soils, incorporated into products, or otherwise does not return to the waters of the state. Consumptive use does not include any water that falls as precipitation directly on the place of use or water lost due to inefficiencies or waste during the irrigation process. The consumptive use of a crop is equal to the crop evapotranspiration less the precipitation amount that is effective for evapotranspiration by the crop.

The State Engineer's consumptive use estimate for Red Rock Valley is based on the Penman-Monteith short reference evapotranspiration equation and crop coefficient approach for estimating growing season crop evapotranspiration, similar to methods of the California Irrigation Management Information System (CIMIS). The standardized methods are described by the American Society of Civil Engineers<sup>23</sup> and the Food and

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<sup>21</sup> NRS § 533.370 (6).

<sup>22</sup> Exhibit No. 53, pp. 8.

<sup>23</sup> The ASCE Standardized Reference Evapotranspiration Equation, 2005, official records in the Office of the State Engineer.

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Agriculture Organization of the United Nations,<sup>24</sup> and are for a crop of alfalfa with a growing season from the last killing frost to the first killing frost of 20° F. Daily weather data of temperature, relative humidity, wind speed, and incoming solar radiation used as input to the Penman-Monteith equation were obtained from the Washoe County Department of Water Resources (WCDWR), which maintains and operates a weather station in Red Rock Valley, approximately 0.5 mile from the Applicant's existing place of use, and has been in operation since 2003. Mean annual last and first frost dates for Red Rock Valley were estimated to be from April 10<sup>th</sup> and October 22<sup>nd</sup>, respectively, using a 50 percentile probability killing frost temperature of 20° F. Temperature data used for the analysis were obtained from the Nevada State Climatologist, in which daily minimum and maximum temperature and precipitation were recorded from 1986-2002 in Red Rock Valley at the Hesselschwerdt residence, approximately 0.75 mile from the Applicant's existing place of use. Using these methods, the State Engineer estimates the crop evapotranspiration during the growing season in Red Rock Valley to be 3.0 feet per year.

Effective precipitation, as defined by the Natural Resource Conservation Service (NRCS) National Engineering Handbook<sup>25</sup> (NEH), is the part of precipitation that can be used to meet the evapotranspiration of growing crops. The NRCS NEH outlines an empirical method for computing the effective precipitation based on 22 studies. Because the Hesselschwerdt residence precipitation record was missing numerous weeks to months, the National Weather Station (NWS) Stead weather station (267820) precipitation record from 1985-2007 was used for estimating effective precipitation. Using the mean monthly precipitation for the period of record at the NWS Stead weather station as reported by the Western Regional Climate Center, and applying the NRCS effective precipitation method during the growing season and monthly soil water balance during the non-growing season, the estimated mean annual effective precipitation is 0.5 feet per year. The State Engineer finds that by using a crop evapotranspiration rate of 3.0 feet per year with an effective precipitation rate of 0.5 feet per year, the annual consumptive use of irrigated areas in Red Rock Valley is 2.5 feet per year.

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<sup>24</sup> FAO Irrigation and Drainage Paper No. 56. Crop Evapotranspiration: Guidelines for Computing Crop Water Requirements, 1998, official records in the Office of the State Engineer.

<sup>25</sup> Irrigation Water Requirements, 2003, official records in the Office of the State Engineer.

## VIII.

The State Engineer has historically used water budget and perennial yield estimates from the reconnaissance series reports that were completed during the 1950s, 1960s and 1970s. Hydrographic basin water budgets for many basins have been updated by the USGS and private-party studies in the intervening years, and in many cases the State Engineer has updated the perennial yield. Reconnaissance Report 43 authored by Eugene Rush and Patrick Glancy originally established the perennial yield of Red Rock Valley.<sup>26</sup> Using the 1965 Hardman precipitation map,<sup>27</sup> which estimated approximately 21,500 acre-feet per year of precipitation, and applying slightly modified Maxey-Eakin recharge coefficients,<sup>28,29</sup> Rush and Glancy estimated 900 acre-feet per year of ground-water recharge from precipitation in the Red Rock Valley Hydrographic Area, which equates to approximately 4% of precipitation. In addition to the in-basin recharge, Rush and Glancy also estimated 200 acre-feet per year of ground-water recharge from the adjacent Bedell Flat Hydrographic Area, which discharges via subsurface flow to Red Rock Valley. In estimating the outflow water budget components, Rush and Glancy estimated the ground-water evapotranspiration (ET) in Red Rock Valley from mixed phreatophyte shrubs of greasewood, rabbitbrush, and saltgrass. Using published ground-water ET rates from phreatophyte shrubs of greasewood, rabbitbrush, and saltgrass,<sup>30,31,32</sup> and recognizing that the density of phreatophyte shrubs is likely related to the amount of ground-water ET, Rush and Glancy estimated the ground-water ET rate to equal 0.3 feet per year for an approximate phreatophyte density of 25%. The area of phreatophytes within Red Rock Valley was estimated to be 2,100 acres, yielding a ground-water discharge volume of 630 acre-feet per year. Consumption of spring flow from irrigation originating at the Tunnel Spring and Red Rock Valley Ranch spring complex

<sup>26</sup> Rush, F.E., and Glancy, P.A., (1967). Water-Resources Appraisal of the Warm Springs-Lemmon Valley Area, Washoe County, Nevada. Water Resources – Reconnaissance Series Report 43, United States Geological Survey and Nevada Division of Water Resources.

<sup>27</sup> Hardman, G., (1965). Nevada precipitation map, adapted from map prepared by George Hardman and others, 1936; Nevada University Agricultural Experimental Station Bulletin 185.

<sup>28</sup> Eakin, T., et al., (1951). Contribution to the Hydrology of Eastern Nevada: Nevada State Engineer, Water Resources Bulletin No. 12, United States Geological Survey and Office of the State Engineer, p. 80.

<sup>29</sup> Rush, F.E., and Glancy, P.A., (1967). Water-Resources Appraisal of the Warm Springs-Lemmon Valley Area, Washoe County, Nevada. Water Resources – Reconnaissance Series Report 43, United States Geological Survey and Nevada Division of Water Resources, p. 21.

<sup>30</sup> Lee, C. H., (1912). An intensive study of the water resources of a part of Owens Valley, California: U.S. Geological Survey Water Supply paper 294, p. 135.

<sup>31</sup> White, W. N., (1932). A method of estimating ground-water supplies based on discharge by plants and evaporation from soil: U.S. Geological Survey Water-Supply paper 659-A, p. 1-105.

<sup>32</sup> Young, A. A., and Blaney, H. G., (1942). Use of water by native vegetation: California Dept. Public Works, Div. Water Resources Bull. 50, p. 154.

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was estimated at 220 acre-feet per year, while subsurface outflow occurring to the west into the Long Valley subarea was estimated to be minor. Using a ground-water recharge estimate from precipitation and subsurface inflow of 1,100 acre-feet per year, and a ground-water outflow estimate from ground-water ET and irrigation consumption of spring flow of 850 acre-feet per year, the Red Rock Valley ground-water budget and perennial yield was estimated to be 1,000 acre-feet per year, an approximate average of the estimated inflow and outflow.

Because the State Engineer often considers the capture of natural discharge to be the basis for determining the perennial yield of a closed basin, a re-estimation of the basin discharge is commonly used by applicants for water rights where the application amount exceeds the reconnaissance report estimate of perennial yield. Two methods are commonly used. One method uses micrometeorological methods to measure ET at several representative locations in a basin and applies those measurements to similar vegetative communities within the basin, thereby deriving a new ET estimate for the entire basin. This method requires a minimum of one year of measurements in the basin of interest. A longer measurement period reduces uncertainty. A second technique is to identify and classify the vegetation communities in a basin and apply the ET rates estimated for those communities from published literature. This second technique was used by the Applicant in the Red Rock Valley Hydrographic Area. Assuming present-day steady-state conditions, the Applicant estimated ground-water ET in the basin and determined that to be the basin's perennial yield.

The State Engineer finds the most accurate and practical method of determining ground-water ET discharge in a basin such as Red Rock Valley would be through field measurement of ET with micrometeorological tools and methods. Estimating ground-water ET by comparison with published literature is a scientifically accepted practice, but the State Engineer finds the estimation of ET by such methods will have a larger uncertainty than by field measurements. The Applicant requested a hearing before the State Engineer before such measurements could be collected and analyzed, so that the State Engineer is now asked to make a revised determination of the basin's perennial yield using less certain estimates of ET.



**IX.**

The Red Rock Valley Hydrographic Area is topographically divided into eastern and western parts by the Little Valley/Porcupine foothills, a north-trending range of granitic basement rocks. Because these basement rocks will limit the flow of ground water between the eastern and western parts of the valley, the Applicant considered Red Rock Valley as two separate basins, which the Applicant refers to as sub-basin 99A and sub-basin 99B, where sub-basin 99A is the west side of Red Rock Valley and includes the Rancho Haven area, and sub-basin 99B is the east side of Red Rock Valley and includes the Sierra Ranchos area. The Applicant used both field mapping and remote sensing methods to delineate and classify the ground-water discharge areas, however, in their final analysis the areas were selected using the remote sensing technique. Phreatophyte areas contributing to ground-water discharge were estimated to be 718 and 2,289 acres for the west and east side, respectively.<sup>33,34</sup> The remainder of the analyses focused on the east side of the valley, where the pending applications are located.

The State Engineer finds that because the subject applications are all located in the eastern part of the Red Rock Valley Hydrographic Area, the Applicant's use of ground-water budget and ET estimates on the east side of the valley to determine the sustainable yield may be appropriate. The State Engineer further finds that the Applicant's estimate of ET can be used in determination of the sustainable yield, but because of concerns about the method's accuracy, other techniques and estimates will also be analyzed by the State Engineer.

**X.**

The Applicant's expert hydrologist, Ms. Carpenter, states that an unsupervised classification remote sensing method, similar to the one used in USGS WRI 2001-4195,<sup>35</sup> was used in Red Rock Valley to classify different vegetation and landform types of bare ground, scrub-shrub upland, grassland upland, seasonal wetland, perennial wetland, and open water.<sup>36</sup> From the Applicant's remote sensing analysis, the final acreages of vegetation and landform types within the ground-water discharge area were estimated for the east side of Red Rock Valley and are listed in Table 1, where the scrub-shrub and grassland upland

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<sup>33</sup> Exhibit No. 51, Attachment 2, Table 14a.

<sup>34</sup> Exhibit No. 51, p. 58.

<sup>35</sup> Exhibit No. 51, Volume 6a, Attachment 6, p. 6a-16-16.

<sup>36</sup> Exhibit No. 51, Volume 1, p. 58.

comprise 90% of the total area, making the accuracy of ground-water discharge estimates for these areas extremely important.<sup>37</sup>

Applicant's Vegetation/Landform	Acreage	Percent of Total Discharge Area
Bare Ground	50.96	2.23
Scrub-Shrub Upland	1297.94	56.70
Grassland Upland	775.60	33.88
Seasonal Wetland	109.35	4.78
Perennial Wetland	54.72	2.39
Open Water	0.67	0.03
Total Discharge Area	2289.24	100

**Table 1.** Applicant's acreage of each vegetation and landform type in the area of ground-water discharge in the eastern part of Red Rock Valley.

Based on the evidence submitted, the State Engineer finds that the Applicant's expert did not use a remote sensing approach identical to that outlined by USGS WRI 2001-4195. In USGS WRI 2001-4195, vegetation units incorporate variations such as sparse, moderate, and dense growth within a single vegetation unit such as grassland, which allows for the scaling of the assigned ET rate. In the USGS WRI 2001-4195 report, several different vegetation/landform classifications were delineated from a combination of an unsupervised classification technique, the modified adjusted soil vegetation index, and a maximum likelihood classification technique.<sup>38</sup> The Applicant simply applied an unsupervised classification approach, which resulted in gross vegetation/landform units that were not adequately delineated by taking into account the variation of vegetation density, vigor, and soil moisture within units and prohibited the ability to scale ET rates based upon those variations.

Because the Applicant did not measure ET within the ground-water discharge area, rates of ET associated with each vegetation and landform type were estimated by averaging respective ET rates that were acquired from published studies of measured ET from around the world. Geographic and climatic regions from which the published ET measurements were made varied widely and are shown in Table 2, which lists the location and number of ET rates compiled and analyzed by the Applicant.<sup>39</sup> Final ET rates for Red Rock Valley are

<sup>37</sup> Exhibit No. 51, Volume 1, Attachment 2, Table 14c.

<sup>38</sup> Exhibit No. 51, Volume 6a, Attachment 6, p. 6a-16-18.

<sup>39</sup> Exhibit No. 51, Attachment 2, Table 5a.

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shown in Table 3, where the Applicant averaged published ET rates from locations and respective vegetation and landform types shown in Table 2.

The State Engineer finds that the Applicant's compilation and subsequent averaging of ET rates from around the world is consistently biased toward higher rates of ET due to the selection of ET measurement sites and the respective climate, vegetation density, and vigor.

## XI.

As listed in Table 2, sites used in estimating ET rates for scrub-shrub and grassland, which comprise 90% of the ground-water discharge in Red Rock Valley, were almost entirely estimated from locations where there is more evaporative demand and longer growing season than that of Red Rock Valley. For example, 21 of the 23 measurements of ET used for calculating an average grassland ET rate of 2.33 feet per year were made in phreatophyte areas in southern Nevada, Owens Valley and Death Valley, CA, and southern Arizona. From observation of Figures 1 and 2 (Appendix 1), it is obvious that there are significant differences between the type, density, and vigor of grassland phreatophytes at the Fairbanks Meadows USGS ET site in Amargosa Valley, NV, and the grassland phreatophytes as classified by the Applicant in Red Rock Valley. The ET rate at the Amargosa site was 3.07 feet per year, and that rate was used for grassland phreatophytes in Red Rock Valley. It is important to note that the photos taken by State Engineer staff on September 27, 2006, as illustrated in Appendix 1, followed a near record water year precipitation amount of 20.4 inches, as recorded at the NWS Stead weather station.

The only measurement of ET used in the calculation of an average grassland ET rate for Red Rock Valley with similar temperature and precipitation was from Carson Valley, however the ET rate of 1.7 feet per year was measured over a non-irrigated pasture with a depth to ground water from 6 to 7 feet.<sup>40,41</sup> While it is apparent that the Carson Valley non-irrigated pasture grass site may be representative of some grassland areas in Red Rock Valley, the density of vegetation and the amount of bare soil and shrubs within grassland areas vary substantially.<sup>42</sup> Figure 3 (Appendix 1) illustrates the Carson Valley ET-6 site of non-irrigated pasture, where the measured ET rate of 1.7 feet per year is assumed to transfer

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<sup>40</sup> Exhibit No. 51, Attachment 2, Table 5a, p. 13.

<sup>41</sup> Exhibit No. 51, Volume 5a, Attachment 5, p. 5a-11-21.

<sup>42</sup> Exhibit No. 51, Volume 4a, Attachment 8, Appendix 3.

to the Applicant's classified grassland area in Red Rock Valley illustrated in Appendix 1, Figure 1.

Measurement sites selected for developing an average ET rate for the Applicant's scrub-shrub classification, which comprises 57% of the ground-water discharge area, also deviate significantly from the climate, density, and vigor of phreatophyte shrubs observed in Red Rock Valley. For example, 5 of the 16 ET rates used for calculating an average ET rate for Red Rock Valley were derived from Owens Valley, CA, 3 ET rates were derived from Spain, and 1 site was from Oasis Valley, NV. The ET measurement sites with highest ET rates were from Carson Valley, NV and the Carson Desert, NV. While these sites may have climate that is more representative of the climate in Red Rock Valley, the density and vigor of shrubs at these site appears to significantly exceed the density and vigor of shrubs in Red Rock Valley. For example, the ET rate of 1.9 feet per year was measured at the Carson Valley USGS ET-1 site over a stand of rabbitbrush, sagebrush, greasewood, and mixed grasses where the water table was 3 to 5 feet below and surface and plant density estimated

Location	Bare Soil	Scrub Shrub	Grassland	Seasonal Wetland	Perennial Wetland	Open Water
Gila River, AZ				1		
Havasui, AZ			2	1		
San Pedro River, AZ			1	2		1
Death Valley, CA	5		2	1		
Owens Valley, CA	4	5	5			
Everglades, FL					9	2
Orange County, FL			1			
West-Central, FL					2	
Middle Rio Grande, NM				4		
Ash Meadows, NV	1		8	2	1	
Carson Valley, NV		2	1	1		1
Oasis Valley, NV	1	1	3	1		
Ruby Valley, NV		2			1	1
Smith Creek, NV	2	1				
Soda Lake, NV	2	1				
Spain		3			6	
Escalante Valley, UT	4	1				
<b>TOTAL</b>	<b>19</b>	<b>16</b>	<b>23</b>	<b>13</b>	<b>19</b>	<b>5</b>

**Table 2.** Number of published ET rates for respective vegetation and landform types used by the Applicant for computing an average ET rate for the Red Rock Valley Hydrographic Area.

Location	Avg. Bare Soil	Avg. Scrub Shrub	Avg. Grassland	Avg. Seasonal Wetland	Avg. Perennial Wetland	Avg. Open Water
Gila River, AZ				3.23		
Havasu, AZ			2.65	3.54		
San Pedro River, AZ			3.13	4.05		3.79
Death Valley, CA	0.35		2.45	3.9		
Owens Valley, CA	0.66	1.51	2.43			
Everglades, FL					3.84	4.61
Orange County, FL			2.03			
West-Central, FL					3.16	
Middle Rio Grande, NM				3.7175		
Ash Meadows, NV	0.62		2.50	2.955	3.91	
Carson Valley, NV		1.70	1.70	3.5		5.00
Oasis Valley, NV	0.62	1.38	2.40	3.14		
Ruby Valley, NV		1.16			4.19	5.30
Smith Creek, NV	0.63	1.05				
Soda Lake, NV	0.74	1.70				
Spain		1.29			4.17	
Escalante Valley, UT	0.44	1.06				
AVERAGE	0.53	1.39	2.45	3.55	3.89	4.66

**Table 3.** Average of published ET rates for respective vegetation and landform types. Note that final averaged ET rates are slightly different from the Applicant's final averaged ET rates due to rounding or other unknown reasons.

to be 73 percent,<sup>43</sup> while the ET rate of 1.5 feet per year was measured at the Carson Valley USGS ET-7 site over a 5 to 7 foot tall stand of bitterbrush, sagebrush, and mixed grasses where the water table was about 60 feet below land surface.<sup>44</sup> ET at Carson Valley USGS ET-7 is likely entirely precipitation because the water table is 60 feet deep and the site is located on an alluvial fan of the Carson Range where more precipitation likely occurs than on the valley floor. That is, ground-water ET at Carson Valley site ET-7 is nil, all ET comes from precipitation. From observation of Figures 4, 5, and 6 (Appendix 1), it is obvious that there are significant differences between the density and vigor of scrub-shrub phreatophytes at Carson Valley ET sites 1 and 7 and the scrub-shrub phreatophytes in Red Rock Valley, and hence the ET rates for scrub-shrub phreatophytes in Red Rock Valley should be commensurately less than the rates measured in Carson Valley.

The State Engineer finds that the Applicant did not present sufficient or convincing evidence supporting the statistical analysis of averaging rates from around the world without

<sup>43</sup> Exhibit No. 51, Volume 5a, Attachment 5, p. 5a-11-18.

<sup>44</sup> Exhibit No. 51, Volume 5a, Attachment 5, p. 5a-11-18.

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consideration of precipitation amount, evaporative demand, and vegetation conditions in which the published ET rates were measured. In addition, the State Engineer finds that the Applicant's vegetation classification is subjective and is not consistent with the vegetation classifications used in the publications from which the respective ET rates are statistically analyzed and applied to Red Rock Valley.

## **XII.**

A significant amount of evidence was submitted totaling 23 peer reviewed publications pertaining to remote sensing techniques for estimating ET, mapping phreatophytes, scaling of ET rates based on remotely sensed plant density and vegetation indices, hydrologic modeling of ET, and the integration of remotely sensed ET with hydrologic models;<sup>45</sup> however, none of the methods outlined in the submitted evidence were applied in Red Rock Valley. The State Engineer finds that if phreatophyte ET rates are to be transferred from one basin to another, the climate, vegetation type and condition from which the ET measurements are taken must be considered, and the ET rates which are applied to the basins of interest must reflect those considerations.

The Applicant presented an ET rate of bare soil arguing that only a portion of precipitation should be deducted from the ET rates of delineated vegetation and landform units for estimating the ground-water discharge. The Applicant argued that since the average ET rate of bare soil was calculated to be 0.47 feet per year, a deduction of precipitation more than 0.47 feet would result in a negative ET rate, therefore only a portion of precipitation should be subtracted.<sup>46</sup> In estimating the bare soil evaporation rate for Red Rock Valley, the Applicant assumed that bare soil consisted of areas with less than 25% vegetation cover, and were mainly compiled from USGS-published ET rates. A total of 19 measured bare soil ET rates were compiled and averaged, which ranged in location from Smith Creek, NV, to Escalante Valley, UT, to Death Valley, CA. Because the Applicant did not consider the precipitation amount at the measurement sites respective to Red Rock Valley, and because there was no consideration of the soil moisture conditions at the measurement site, where it is obvious that there will be a higher ET rate for a consistently moist bare soil/playa area verses a lower ET rate for a consistently dry bare soil/playa area, the State Engineer finds that the Applicant's analysis and argument cannot be accepted.

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<sup>45</sup> Exhibit No. 51, Volume 6a, Attachment 6.

<sup>46</sup> Exhibit No. 51, Volume 1, p. 63.

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In addition to compiling and averaging published ET rates from around the world to estimate ET from phreatophyte vegetation in Red Rock Valley, the Applicant used the Penman-Monteith reference ET equation and the Food and Agricultural Organization crop coefficient methodology (FAO-56) to “independently validate” statistically derived ET for phreatophyte vegetation in Red Rock Valley, even though the FAO-56 crop coefficient methodology is meant to be used for agricultural settings that are under optimum soil water conditions.<sup>47</sup> The reference ET was calculated by applying the FAO-56 Penman-Monteith equation to weather data collected in Red Rock Valley by the Washoe County Department of Water Resources (WCDWR) and weather data collected at a Remote Automated Weather Station (RAWS) located in Doyle, CA. The Applicant estimated the actual ET from phreatophyte vegetation by applying crop coefficients to the calculated reference ET from both weather stations. The effects of various weather conditions on ET are incorporated into the reference ET, and the characteristics that distinguish the crop of interest from the reference crop are integrated into the crop coefficient. By multiplying the reference ET by the crop coefficient, actual ET is determined.<sup>48</sup> The Applicant applied FAO-56 crop coefficients to seasonal and perennial wetlands, and open water areas, which were specified in FAO-56 as cattails and bulrushes with no killing frost, reed swamp with standing water, and open water less than 2 meters depth, respectively. In addition, the Applicant assumed that FAO-56 crop coefficients for grazing pasture/extensive grazing, and grazing pasture/rotated grazing, which are designed for irrigated areas or areas under optimum soil water conditions, would be appropriate for the application to areas of non-irrigated scrub-shrub and grassland upland, respectively. Also, a crop coefficient was selected for bare ground, which is specified as no crop in the source reference.<sup>49</sup> The Applicant estimated ET from each vegetation and landform type using FAO-56 methods by multiplying respective crop coefficients for each season to respective time periods of calculated reference ET derived from the WCDWR and Doyle weather stations, however, the final analysis was limited to results derived from the WCDWR weather station located in Red Rock Valley.<sup>50</sup>

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<sup>47</sup> FAO Irrigation and Drainage Paper No. 56. Crop Evapotranspiration: Guidelines for Computing Crop Water Requirements, 1998, p. 89, official record in the Office of the State Engineer.

<sup>48</sup> FAO Irrigation and Drainage Paper No. 56. Crop Evapotranspiration: Guidelines for Computing Crop Water Requirements, 1998, official record in the Office of the State Engineer.

<sup>49</sup> Allen R.G., Clemmens A. J., Burt C. M., Solomon K., O'Halloran T., (2005). Prediction Accuracy for Projectwide Evapotranspiration Using Crop Coefficients and Reference Evapotranspiration. Journal of Irrigation and Drainage Engineering. p. 28.

<sup>50</sup> Exhibit No. 51, Attachment 2, Table 14c.

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The State Engineer finds that the Applicant's application of the FAO-56 method is inappropriate because crop coefficients designed for irrigated grazing lands were used for estimating ET from non-irrigated grassland and scrub-shrub upland areas. Methods proposed by FAO-56 clearly state in an entire chapter titled "Crop ET under soil water stress conditions," that when rainfall or irrigation is low, water stress is induced and the ET will drop below the standard crop ET, and a reduction in the crop coefficient under conditions of low soil water availability is determined using a stress coefficient, which is based on available soil moisture.

In the original and post-hearing filing of evidence, the Applicant analyzed published ET rates from two USGS studies conducted in Carson Valley (SIR 2005-5288 and SIR 2006-5305) and Ruby Valley (WRI 01-4234)<sup>51</sup> and compared USGS ET rates to those derived from her statistical and FAO-56 analysis.<sup>52,53</sup> In the comparison, the Applicant selected USGS ET rates measured over specific vegetation and landform types and assumed that those ET rates would transfer to their defined vegetation and landform types. The Applicant assumed that an ET of 3.0 feet per year measured over flood irrigated pasture (average of USGS ET 3 and 4 sites)<sup>54,55</sup> would transfer to non-irrigated grassland upland areas in Red Rock Valley. Also, it was assumed that an ET rate of 1.9 feet per year measured at the Carson Valley USGS ET-1 site over a stand of rabbitbrush, sagebrush, greasewood, and mixed grasses where the water table was 3 to 5 feet below and surface and plant density estimated to be 73 percent,<sup>56</sup> would be directly comparable to her scrub-shrub upland category. Measurements of ET made by the USGS in Ruby Valley over mixed phreatophyte shrubs (Phreatophyte-1)<sup>57</sup> and non-phreatophyte shrubs (Desert-shrub upland)<sup>58</sup> were averaged by the Applicant to produce an ET rate of 1.16 feet per year, which was assumed to transfer to scrub-shrub upland area in Red Rock Valley. In addition, the Applicant selected ET rates for playa, grassland, meadowland, marsh, and open-water areas in Ruby Valley report WRI 01-4234 and applied them to assumed bare soil, grassland, seasonal wetland, perennial wetland, and open water areas in Red Rock Valley.

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<sup>51</sup> Exhibit No. 51, Attachment 5, Volumes 5a-8, 5a-11, and 5a-9.

<sup>52</sup> Exhibit No. 51, Attachment 2, Table 14c.

<sup>53</sup> Exhibit No. 63, Appendix A.

<sup>54</sup> Exhibit No. 51, Volume 5a, Attachment 5, p. 5a-11-30.

<sup>55</sup> Exhibit No. 51, Volume 5a, Attachment 5, p. 5a-8-53.

<sup>56</sup> Exhibit No. 51, Volume 5a, Attachment 5, p. 5a-11-18.

<sup>57</sup> Exhibit No. 51, Attachment 5, Volumes 5a-8, p. 5a-9-17, Table 2.

<sup>58</sup> Exhibit No. 51, Attachment 5, Volumes 5a-8, p. 5a-9-17, Table 2.



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The State Engineer finds that the Applicant's comparison and application of USGS ET rates from Carson Valley and Ruby Valley are inconsistent and are not directly transferable to Red Rock Valley. For illustration purposes, Figures 4 and 5 (Appendix 1) respectively illustrate classified scrub-shrub upland areas in Red Rock Valley and the Carson Valley ET site where the associated ET rate of 1.9 feet per year is proposed to be equivalent to ET from Red Rock Valley scrub-shrub areas, while Appendix 1, Figures 7, 8 and 9 respectively illustrate the Red Rock Valley grassland area delineated by the Applicant, and the Carson Valley ET sites in which the associated average ET rate of 3.0 feet per year from irrigated pasture is proposed to be equivalent to ET from assumed Red Rock Valley grassland areas. The State Engineer finds that there are significant differences in vegetation density, vigor, and available water in the assumed grassland and scrub-shrub upland areas in Red Rock Valley when compared to Carson Valley ET sites chosen for analysis; therefore, ET rates measured at the Carson Valley ET sites illustrated cannot be directly transferred to Red Rock Valley due to the presence of irrigation at these sites, differences in soil water availability, and vegetation condition.

In Ruby Valley report WRI 01-4234, the USGS did not measure ET, but estimated ET for grassland and meadowland areas by applying ET estimates based from a remotely sensed plant cover – ground-water ET relationship outlined in USGS PP1628,<sup>59</sup> also referred to as the Nichols report. Also in WRI 01-4234, the ET rate for playa and bare soil was not measured but was estimated from USGS PP1628. The State Engineer finds that the Ruby Valley grassland and meadow ET rates that the Applicant presented in support of its statistically derived ET rates are flawed because grassland areas classified by the USGS have significantly different vegetation and moisture availability than the grassland area assumed by the Applicant in Red Rock Valley. In addition, grassland and meadowland ET rates in USGS WRI 01-4234 were not derived from ET measurements but were estimated using the Nichols remotely sensed plant cover – ground-water ET method. The State Engineer has been hesitant to adopt the Nichols remote sensing method for estimating ground-water discharge because the source data for Nichols' empirical relationship between plant cover and ground-water ET was almost entirely derived from Ash Meadows, NV, and Owens Valley, CA, which are areas that have less precipitation, longer growing season,

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<sup>59</sup> Exhibit No. 51, Volume 6a, Attachment 6, p. 6a-2-1.

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greater evaporative demand, and hence greater ground-water ET rates for the given plant cover than in northern or central Nevada.

In estimating the recharge for the east side of Red Rock Valley, the Applicant estimated the ground-water discharge by applying ET rates to respective vegetation and landform types, and by subtracting only a portion of the mean annual precipitation from the ET rates. The Applicant opined that only a portion of precipitation should be deducted from the ET rates, claiming that through an unsaturated zone modeling exercise using the HYDRUS software with daily time steps, it was estimated that 49% to 55% of the annual precipitation of 11.8 inches reaches the water table when the water table depth is 2.5 feet below land surface.<sup>60</sup> The Applicant further analyzed that 33% to 46% of the annual precipitation would reach the water table when the depth to water is 5 feet, and stated that the percent of precipitation that reaches the water table would be reduced as the water table is lowered.<sup>61,62</sup> This approach of deducting only a portion of precipitation from the total ET to determine the ground-water portion of ET was discussed at length at the hearing.<sup>63</sup> The Applicant opined that if water from precipitation reaches the water table, that amount of precipitation should not then be subtracted from the total ET rate to arrive at a ground-water discharge estimate. However, numerous USGS publications submitted into evidence by the Applicant clearly state that all precipitation needs to be subtracted from the total ET estimate to arrive at a ground-water discharge estimate. For example, "Estimates of mean annual ET include precipitation falling on the area that evaporates or recharges the shallow ground-water flow system and later is evaporated or transpired from within the area. Because the precipitation component of ET is not derived from ground water, it must be removed prior to estimating ground-water discharge."<sup>64</sup> Also, "As estimated, annual ET includes any precipitation falling on the local area that is evaporated, or that recharges the shallow ground-water flow system and later is evaporated or transpired. The estimate also may include some component of upward leakage (diffuse upflow) from the regional carbonate-rock aquifer. Annual ET is adjusted to remove any water contributed by local precipitation prior to computing ground-water recharge."<sup>65</sup>

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<sup>60</sup> Exhibit No. 51, p. 49.

<sup>61</sup> Exhibit No. 51, p. 49.

<sup>62</sup> Transcript, p. 144.

<sup>63</sup> Transcript, pp. 132 - 155.

<sup>64</sup> Exhibit No. 51, Attachment 5, Volume 5a-2-30-34.

<sup>65</sup> Exhibit No. 51, Attachment 5, Volume 5a-1-46.

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In estimating ground-water ET rates for each vegetation and landform type, the Applicant subtracted the amount of precipitation that did not reach the water table in the HYDRUS model, from the total ET rates. Table 4 shows a summary of the estimated mean annual ET rate, precipitation amount consumed by ET, ground-water ET rate, recharge rate in the discharge area, and the percent of precipitation assumed to recharge in the discharge area.

Applicant's Vegetation/Landform	Applicant's Statistical Analysis ET rate (ft/yr)	Applicant's Precipitation Amount Assumed to be Used by ET (ft/yr)	Applicant's Ground-Water ET rate (ft/yr)	Applicants Precipitation Amount Assumed to Recharge in the Discharge Area (ft/yr)	Percentage of Precipitation Assumed to Recharge in the Discharge Area
Bare Ground	0.47	0.47	0	0.51	52
Scrub-Shrub Upland	1.39	0.57	0.82	0.41	42
Grassland Upland	2.33	0.59	1.74	0.39	40
Seasonal Wetland	3.51	0.48	3.03	0.50	51
Perennial Wetland	4.03	0.00	4.03	0.98	100
Open Water	4.66	0.00	4.66	0.98	100

**Table 4.** Applicant's ET rate, precipitation amount consumed by ET, ground-water ET rate, precipitation amount to recharge in the discharge area, and the percent of precipitation assumed to recharge in the discharge area.

The State Engineer finds that the Applicant's analysis considering the amount of precipitation, which should be deducted from total ET to estimate ground-water discharge is flawed and deviates from accepted methodologies of experts in the field, including peer-reviewed publications submitted into evidence by the Applicant. The State Engineer finds 100% of the precipitation that falls on the discharge areas should be deducted from the total ET for computing a ground-water budget; failure to do so has resulted in inflated estimates of ground-water ET by the Applicant.

A summary of the total ground-water discharge for Red Rock Valley as presented by the Applicant is shown in Table 5. The total ground-water discharge estimate for Red Rock Valley is 4,362 acre-feet per year, with 2,972 afa of that amount occurring in the east part of the valley.<sup>66,67</sup> Table 6, which uses the total ET from Table 4 and subtracts all precipitation, estimated at 0.98 feet, results in ground-water ET of 2,025 afa for the east side of the valley. The State Engineer finds that the Applicant's ground-water ET estimate should have been

<sup>66</sup> Exhibit No. 51, Attachment 2, Tables 14a-c.

<sup>67</sup> Exhibit No. 63, Appendix A.

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computed as shown in Table 6, by subtracting all precipitation falling within the discharge area from the total ET to arrive at a ground-water ET estimate. The State Engineer also finds the Applicant's methodology for delineating vegetation/landform areas and applying assumed ET rates are subjective because both the vegetation/landform classifications assumed for Red Rock Valley and the applied rates are subjective and, in part, inconsistent with professional and peer-reviewed publications. The State Engineer finds these interpretations have resulted in an overestimation of ground-water ET for the Red Rock Valley. As an example, the Applicant's assumed grassland upland classification in Red Rock Valley would likely be considered a moderate to dense shrubland based upon USGS evidence submitted, and the rate would be 0.1 to 1.4 feet per year rather than the Applicant's rate of 1.74 feet per year.

Applicant's Vegetation/Landform	West Side Acreage	East Side Acreage	Applicant's Ground-Water ET rate (ft/yr)	West Side Ground-Water ET Volume (ac-ft/yr)	East Side Ground-Water ET Volume (ac-ft/yr)
Bare Ground	6	51	0	0	0
Scrub-Shrub Upland	267	1,298	0.82	220	1,070
Grassland Upland	188	776	1.74	326	1,347
Seasonal Wetland	196	109	3.03	593	331
Perennial Wetland	58	55	4.03	232	221
Open Water	4	1	4.66	19	3
<b>TOTAL</b>	<b>718</b>	<b>2,289</b>		<b>1,390</b>	<b>2,973</b>

**Table 5.** Summary of Applicant's ground-water discharge estimates.

Applicant's Vegetation/Landform	East Side Acreage	Applicant's Statistical Analysis ET rate (ft/yr)	Precipitation Amount (ft/yr)	Re-estimated GWET rate (ET rate -precip. ft/yr)	Recomputed Ground-Water ET Volume (ac-ft/yr)
Bare Ground	51	0.47	0.98	0.00	0
Scrub-Shrub Upland	1,298	1.39	0.98	0.41	532
Grassland Upland	776	2.33	0.98	1.35	1047
Seasonal Wetland	109	3.51	0.98	2.53	277
Perennial Wetland	55	4.03	0.98	3.05	167
Open Water	1	4.66	0.98	3.68	2
<b>TOTAL</b>	<b>2,289</b>				<b>2,025</b>

**Table 6.** Recomputed estimate of ground-water ET using Applicants total ET rate and deducting all precipitation.

### XIII.

In addition to the Applicant's analysis of ground-water discharge as the basis for determining the ground-water recharge, the Applicant's expert hydrogeologist, Dr. Pohll, provided a ground-water recharge analysis using three separate methods to evaluate the range of ground-water recharge from precipitation estimates in Red Rock Valley.<sup>68</sup> Using the Maxey-Eakin recharge coefficients and a digital version of the 1965 Hardman precipitation map, the ground-water recharge for Red Rock Valley was estimated at 1,400 acre-feet per year. Using the Nichols method, a method presented in USGS Professional Paper 1628,<sup>69</sup> the ground-water recharge for Red Rock Valley was estimated at 5,500 acre-feet per year. The Nichols method uses a combination of the 1997 version of the 1961 to 1990 PRISM precipitation map<sup>70</sup> with recharge coefficients calibrated to his estimates of ground-water discharge. The basins Nichols used for his calibration are located in eastern Nevada and most of those basins are within what is generally thought of as the carbonate-rock aquifer. The third estimate of recharge was made by applying a stochastic approach developed by University of Nevada, Hydrologic Sciences masters student, Brian Epstein,<sup>71</sup> in which independent recharge volumes were statistically evaluated against the 1998 version of PRISM 1961-1990 precipitation volumes, and simply put, a range of recharge coefficients were developed. Using Epstein's stochastic approach the Applicant estimated the ground-water recharge from precipitation for Red Rock Valley to range between a lower 95% confidence of 1,100 acre-feet per year, to an upper 95% confidence of 2,800 acre-feet per year, with a mean of 1,900 acre-feet per year. Note that ground-water recharge estimates from precipitation are for the entire Red Rock Valley hydrographic area, not just the east side of Red Rock Valley, which is the area of interest for predicting impacts associated with the pending applications. An analysis by the State Engineer's office found that if Epstein's stochastic approach was applied to just the east side of Red Rock Valley the estimated recharge would range between a lower 95% confidence of 700 acre-feet per year, to an upper 95% confidence of 1,800 acre-feet per year, with a mean of 1,200 acre-feet per year.

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<sup>68</sup> Exhibit No. 52, p. 7.

<sup>69</sup> Exhibit No. 51, Volume 6a, Attachment 6, p. 6a-2-1.

<sup>70</sup> Daly, C., et al., (1994). A statistical-topographic model for mapping climatological precipitation over mountainous terrain: Journal of Applied Meteorology. V.33, pp. 140-158.

<sup>71</sup> Epstein, B.J., (2004). Development and Uncertainty Analysis of Empirical Recharge Prediction Models for Nevada's Desert Basins. University of Nevada, Reno, unpublished Master's thesis.

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In the post hearing filing of evidence, a fourth estimate of ground-water recharge was made for Red Rock Valley<sup>72</sup> using empirical equations of water yield and runoff for mountain block sub-watersheds found in USGS WRI 99-4272.<sup>73</sup> Equations of water yield and runoff reported in USGS WRI 99-4272 were originally developed in USGS WRI 97-4191 in which non-linear regression equations were made between the area weighted depth of mean annual precipitation within mountain block sub-watersheds in the Eagle Valley Hydrographic Area, and the respective gauged mean annual surface runoff at the mountain front, and the respective mean annual subsurface flow at the mountain front estimated via chloride mass balance and Darcian flux estimates.<sup>74</sup> Dr. Pohll applied water yield and runoff equations to the area weighted mean annual PRISM precipitation estimates (800 meter resolution, 2007 version 1) for delineated mountain block sub-watersheds in the east side of Red Rock Valley. In addition to applying the water yield and runoff equations to the mountain block sub-watersheds, the equations were applied to the area weighted mean annual PRISM precipitation estimate for the valley floor. By applying the water yield and runoff equations to both the mountain block and valley floor/ground-water discharge area, the estimated ground-water recharge (i.e. water yield minus runoff) was 2,495 acre-feet per year. However, the water yield and runoff equations are not meant to be applied to valley floor areas.

In summary, the Applicant has estimated the ground-water recharge to the Red Rock Valley Hydrographic Area using several methods where the ground-water recharge is estimated independently of discharge, and where the ground-water discharge is estimated and is assumed to equal the ground-water recharge. Estimates of ground-water recharge for the entire Red Rock Valley Hydrographic Area range from 900 to 5,500 acre-feet per year,<sup>75</sup> with recharge to the eastern part of the valley being approximately one half of those amounts, or 450 to 2,700 acre-feet per year. There is also an undetermined amount of underflow from Bedell Flat Hydrographic Area, with a preliminary reconnaissance estimate by Rush and Glancy of 200 afa. Using the Applicant's ground-water discharge estimate,

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<sup>72</sup> Exhibit No. 63, p. 2.

<sup>73</sup> Berger, D.L., (2000). Water budgets for Pine Valley, Carico Lake Valley, and Upper Reese River Valley hydrographic areas, Middle Humboldt River Basin, North-central Nevada – Methods and Results. Water Resources Investigations report 99-4272. United States Geological Survey prepared in cooperation with the Nevada Division of Water Resources, Carson City, Nevada.

<sup>74</sup> Maurer, D.K., and Berger, D.L., (1997). Subsurface Flow and Water Yield From Watersheds Tributary to Eagle Valley Hydrographic Area, West-Central Nevada. Prepared in cooperation with the Carson City Utilities Department and the Washoe Tribe of Nevada and California.

<sup>75</sup> Exhibit No. 52, p. 7.

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and depending on assumptions of present-day steady-state conditions and the amount of recharge in the discharge zones, ground-water recharge ranges from 2,000 to 4,500 afa.,

During the time of the hearing and preparation of exhibits by the Applicant, a USGS study of the Basin and Range Carbonate-rock Aquifer System (BARCAS) in eastern Nevada was in draft form and available to the public, in which ground-water ET from phreatophyte shrubs were measured at six locations and spatially distributed to compute ground-water discharge volumes. Because the BARCAS study was in draft form at the time of the hearing, ground-water ET measurements presented in the BARCAS study were excluded by witness Carpenter.<sup>76</sup> However, prior to the hearing two USGS BARCAS companion reports describing the detailed methods and results of ground-water ET measurements<sup>77</sup> and delineation of ET units<sup>78</sup> were published and available to the public. Ground-water ET estimates presented in the BARCAS draft study, which were derived from the published companion reports, have important value due to the similar climate of the BARCAS study area and Red Rock Valley, and detailed analyses regarding the variability of ground-water ET related to phreatophyte type and density.

To provide alternative estimates of ground-water discharge from phreatophyte areas in Red Rock Valley that account for the spatial variability in phreatophyte density within defined units, as well as the variability of respective ground-water ET rates, State Engineer staff used identical methods as those used in the BARCAS draft report and published companion reports to delineate ET unit areas and estimate respective ground-water ET volumes. Remote sensing methods described in SIR 2007-5087<sup>79</sup> were followed to delineate ET units using the Modified Soil Adjusted Vegetation Index (MSAVI) and Southwest Regional Gap Analysis Program (SWReGAP) data, which result in the delineation of ET units including xerophytes, sparse desert shrubland, moderately dense desert shrubland, dense desert shrubland, grassland, meadowland, and marshland, and open water. Landsat Thematic Mapper imagery used for the analysis was acquired on July 16, 1999, in which the antecedent precipitation was slightly above normal as recorded at the Stead NWS weather station. The boundary used to limit the analysis to the ground-water

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<sup>76</sup> Exhibit No. 51, p. 30.

<sup>77</sup> Moreo, M.T., et al, 2007. Evapotranspiration Rate Measurements of Vegetation typical of Ground-Water Discharge Areas in the Basin and Range Carbonate-Rock Aquifer System, Nevada and Utah, September 2005-2006. USGS SIR 2007-5078.

<sup>78</sup> Smith, J. L., et al, 2007. Mapping Evapotranspiration units in the basin and Range Carbonate-Rock Aquifer System, White Pine County, Nevada, and Adjacent Areas in Nevada and Utah, USGS SIR 2007-5087.

<sup>79</sup> Ibid.

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discharge area in Red Rock Valley was obtained from the Applicant's submitted Geographic Information System (GIS) file of the phreatophyte area.<sup>80</sup> Ranges of ET rates for each ET unit were adopted directly from the BARCAS draft report.<sup>81</sup> As described in the BARCAS draft report, final ET rates were computed by scaling within the range of ET for each ET unit. The scaling procedure assigns the highest MSAVI value within an ET unit to the high value of the ET range and the lowest MSAVI to the lowest value of the ET range. Scaling within the ET range is done by using the average MSAVI found within each ET unit. Because the ET ranges used in BARCAS were derived from ET measurements which included precipitation, following methodology of the BARCAS report, local precipitation was subtracted from the scaled ET rates. The area weighted mean annual PRISM precipitation (800 meter resolution, 2007 version 1) estimate of 1.0 foot per year, which is essentially the same as the Applicants estimate of 0.98 foot per year, was subtracted from the scaled ET rates to compute the ground-water discharge rates for each ET unit. Volumes of ground-water discharge were computed by multiplying the computed ground-water discharge rates by respective ET unit areas, which yielded a total ground-water ET volume from the east side of Red Rock Valley of approximately 500 acre-feet per year (Table 7). However, the minimum ET rates for ET units of sparse desert shrubland and moderate desert shrubland published in the BARCAS report are below the precipitation amount in Red Rock Valley, therefore the minimum ET rates were adjusted upward to the precipitation amount of 1.0 foot per year. Scaling the range of ET rates starting from a minimum of precipitation resulted in a ground-water ET volume of approximately 710 acre-feet per year from the east side of Red Rock Valley (Table 8).

To provide an additional interpretation of ground-water ET in Red Rock Valley, State Engineer staff compiled recent USGS publications in which the ET and precipitation were measured during the same period, so that the ground-water ET rate could be determined by subtracting precipitation from the total ET. Compilation of ET and precipitation measurements were restricted to areas of similar latitude and climate, which resulted in measurements conducted in Spring Valley, White River Valley, Snake Valley, Carson Valley, and Ruby Valley. Published ground-water ET rates were grouped into representative ET units for developing ground-water ET ranges similar to the BARCAS

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<sup>80</sup> Exhibit No. 51, Attachment 1, Figure 25.

<sup>81</sup> Welch A. H., and Bright D. J., 2007. Water Resources of the Basin and Range Carbonate-Rock Aquifer System, White Pine County, Nevada, and Adjacent Areas in Nevada and Utah-Draft Report, USGS OFR 2007-1156, p. 58.



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study, where grouping of ground-water ET rates were determined from reported vegetation descriptions and photos of the measurement sites, as well as verbal communication with USGS staff specifically involved in data collection, interpretation, and analysis.<sup>82,83,84</sup> Following the BARCAS methodology described above, linearly scaled ground-water ET rates for each ET unit were calculated based on the minimum, maximum, and average MSAVI values within each ET unit, and the respective minimum and maximum ground-water ET rates. Multiplying scaled ground-water ET rates by respective ET unit areas yielded a ground-water ET volume for the east side of Red Rock Valley of 940 acre-feet per year (Table 9).

ET Area (Acres)	ET Unit	Minimum ET Rate (ft/yr)	Maximum ET Rate (ft/yr)	Scaled ET Rate (ft/yr)	Local Precipitation (ft/yr)	Scaled Ground- Water ET Volume (ac-ft/yr)
-	Dry Playa	-	-	-	-	-
24	Sparse Desert Shrubland	0.50	1.10	1.1	1.0	2
1,581	Moderately Dense Desert Shrubland	0.70	1.50	1.1	1.0	190
552	Dense Desert Shrubland	1.00	1.80	1.2	1.0	132
-	Moist Bare Soil	-	-	-	-	-
67	Grassland	1.60	2.70	2.1	1.0	76
43	Meadowland	2.20	3.30	2.5	1.0	66
11	Marshland	3.60	4.60	3.7	1.0	30
-	Openwater	-	-	-	-	-
Total Ground-Water ET Volume						496

**Table 7.** GWET total for east Red Rock valley using ET rates directly from OFR 2007-1156.

<sup>82</sup> Laczniak, R.J., November, 2007. Verbal communication.

<sup>83</sup> Moreo, M.T., October, 2007. Verbal communication.

<sup>84</sup> Smith, J.L., October, 2007. Verbal communication.

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ET Area (Acres)	ET Unit	Minimum ET Rate (ft/yr)	Maximum ET Rate (ft/yr)	Scaled ET Rate (ft/yr)	Local Precipitation (ft/yr)	Scaled Ground- Water ET Volume (ac-ft/yr)
-	Dry Playa	-	-	-	-	-
24	Sparse Desert Shrubland	1.00	1.10	1.09	1.0	2
1,581	Moderately Dense Desert Shrubland	1.00	1.50	1.25	1.0	395
552	Dense Desert Shrubland	1.00	1.80	1.25	1.0	138
-	Moist Bare Soil	-	-	-	-	-
67	Grassland	1.60	2.70	2.13	1.0	76
43	Meadowland	2.20	3.30	2.53	1.0	66
11	Marshland	3.60	4.60	3.71	1.0	30
-	Openwater	-	-	-	-	-
Total Ground-Water ET Volume						707

**Table 8.** GWET for east Red Rock Valley using ET rates modified from OFR 2007-1156 as discussed in ruling text.

ET Area (Acres)	ET Unit	Minimum Ground- Water ET Rate (ft/yr)	Maximum Ground- Water ET Rate (ft/yr)	Minimum Ground-Water ET Rate Source	Maximum Ground-Water ET Rate Source	Scaled Ground-Water ET Rate (ft/yr)	Scaled Ground- Water ET Volume (ac-ft/yr)
-	Dry Playa	-	-	-	-	-	-
24	Sparse Desert Shrubland	0.00	0.14	Assumed no GWET	SPV-1 <sup>1</sup>	0.13	3
1,581	Moderately Dense Desert Shrubland	0.09	0.33	WRV-2 <sup>1</sup>	SNV-1 <sup>1</sup>	0.22	346
552	Dense Desert Shrubland	0.35	1.39	WRV-1 <sup>1</sup>	ET-1 <sup>2</sup>	0.66	363
-	Moist Bare Soil	-	-	-	-	-	-
67	Grassland	1.22	1.60	ET-6 <sup>2</sup>	SPV-3 <sup>1</sup>	1.40	94
43	Meadowland	1.60	3.56	SPV-3 <sup>1</sup>	Bulrush marsh <sup>3</sup>	2.20	95
11	Marshland	3.56	3.94	Bulrush marsh <sup>3</sup>	ET-8 <sup>2</sup>	3.60	39
-	Openwater	-	-	-	-	-	-
Total Ground-Water ET Volume							940

<sup>1</sup> BARCAS Companion SIR 2007-5087, Table 7

<sup>2</sup> Carson Valley SIR 2005-5288, Table 2. Precipitation for study period taken from the Minden NWS weather station.

<sup>3</sup> Ruby Valley WRI 01-4234, Table 2. Precipitation for study period taken from the Ruby Lake wildlife refuge headquarters.

**Table 9.** GWET for east Red Rock Valley using published GWET rates from various areas in northern Nevada.

On the basis of the weight of the evidence discussed above, the State Engineer finds that a reasonable range for current ground-water ET in the eastern part of Red Rock Valley is between 800 and 2,000 acre-feet per year. The State Engineer finds that the amount of ground-water discharge under assumed current steady-state conditions in the eastern side of Red Rock Valley ranges between 1,200 and 2,400 acre-feet per year. These estimates are equal to the sum of the ground water ET plus the consumptively used ground-water pumping. Consumptive use of ground-water is based on 103 acres of irrigation<sup>85</sup> at the consumptive use rate of 2.5 feet per year (258 afa), and 136 existing domestic wells<sup>86</sup> at a

<sup>85</sup> Exhibit No. 52, p. 22.

<sup>86</sup> Exhibit No. 52, p. 18.

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rate of 1.0 acre-foot per well (136 afa) for a rounded total of 400 afa. The lower ET estimate is based on reconnaissance estimates of ET as well as studies by the State Engineer's staff, while the higher estimate is based on the Applicant's total ET minus total precipitation as shown in Table 6. Subsurface inflow from Bedell Flat and outflow to western Red Rock Valley, are highly uncertain and are tentatively considered to be approximately equal. In consideration of existing water rights in both the inflow and outflow basins, these flows will not be considered in determining the perennial yield of the eastern Red Rock Valley. The State Engineer finds the sustainable yield of the eastern half of the Red Rock Valley Hydrographic Area is between 1,200 and 2,400 acre-feet per year.

#### XIV.

The Applicant's expert hydrogeologist, Dr. Pohll, provided testimony and a report on a ground-water flow model constructed of the subject area.<sup>87</sup> The purpose of the model was to document their conceptual view of the hydrogeology and ground-water flow, establish hydraulic conductivity for the alluvial aquifer in the eastern half of the Red Rock basin, and predict the effects of proposed pumping on ground-water levels and water rights. Two layers were represented in the model, an unconfined surficial aquifer in the valley fill material and a deeper confined layer made up primarily of variably-weathered granitic bedrock. Ground-water recharge was simulated to occur around the perimeter of the valley floor. Ground-water discharge occurs through ET on the valley floor, as subsurface outflow to the northwest, and from existing wells. The water budget assumed present steady-state conditions. The model was calibrated to match steady-state water levels in 47 domestic and monitor wells. Water levels were derived from driller's reports as well as approximately 10 individual measurements. Model calibration was achieved by varying hydraulic conductivity in the upper model layer using the "pilot point" method in MODFLOW. Ground-water discharge due to ET was provided by the ET study.<sup>88</sup> Existing pumping was based on observed irrigated acreage from the May 31, 2000, Landsat image, and a count of domestic wells. Subsurface outflow to the northwest was simulated in the model with a specified head boundary, with the amount of outflow determined by the model. Ground-water recharge was simulated around the perimeter of the valley fill with specified flows, and because steady-state conditions were assumed, recharge was set to equal the total of the initial discharge estimate of 3,650

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<sup>87</sup> Exhibit No. 52.

<sup>88</sup> Various reports of Huffman and Carpenter.

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acre-feet per year. After steady-state calibration, the model was run in transient mode, where the applied-for water was pumped for a period of 50 years. The model simulations predicted future water levels as well as reductions in ET and subsurface discharge. As predicted by the model, water levels in the vicinity of the proposed well would decline moderately, with most of the decline occurring during the first 10 years. Water level decline at a distance of 2,500 feet was estimated to be about 15 feet after 10 years and about 20 feet after 50 years. After 50 years, most of the northern end of the basin would experience water level declines of less than 15 feet. Near steady-state conditions were predicted after about 30 years of pumping.

After the hearing, the State Engineer required the Applicant's expert to rerun the model and provide predictive results using revised estimates of ground-water recharge and specific yield. There were several reasons why the State Engineer wanted a revised model simulation.

- The Applicant's expert was asked to recalibrate and rerun the model with a reduced amount of natural ground-water recharge and discharge. Because the actual amount of recharge and discharge is unknown, a revised simulation with future pumping closer to the modeled recharge and natural discharge amounts is thought by the State Engineer to provide more useful information on potential future impacts.
- The original model distributed ground-water recharge more or less equally around the periphery of the alluvial basin; however such distribution is not supported by a conventional understanding of hydrologic processes. The distribution of ground-water recharge in a basin-fill aquifer is expected to be dependent on the source watershed, so that larger and wetter watersheds will provide more recharge to the basin. The original version of the model failed to fully consider this.
- The original model used a total recharge from local precipitation amount of 3,450 acre-feet per year for the eastern half of the basin,<sup>89</sup> which is far in

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<sup>89</sup> Exhibit No. 52, p. 22.

excess of reconnaissance recharge estimate for the entire basin of about 500 acre-feet annually.<sup>90</sup>

- Analyses of the Applicant's ET estimate found irregularities in estimating the ground-water component of the total ET. As shown in Table 6 above, a reduction in ground-water ET in the model was deemed to be consistent with the standard methodologies using the Applicant's data.
- The hydraulic conductivity distribution for model layer 1 was higher than expected based on the Applicant's own pumping tests and specific capacity data. Because hydraulic conductivity is a calibration parameter in the model, excessively high calibrated hydraulic conductivity distributions can result from overestimating model recharge and discharge.
- Predictive simulations were to use two values for the specific yield of the basin fill aquifer. The first transient model used a value of 0.2 for specific yield and a value of  $7.4 \times 10^{-7}$  for specific storage, and referenced Appendix D of that report for further information. However, no mention of storage coefficients was found at that location. In the absence of measured data, employing multiple input values allows for a range of predictions to be evaluated.

As mentioned above, the Applicant submitted two steady state ground-water flow models into evidence. The first model used a total annual recharge of 3,646 acre-feet annually, while the revised model used 2,534 acre-feet annually as the annual recharge. The modeling report compares the recharge used in the first model to other published estimates, and goes on to state that the model estimate is within the range determined from previous studies.<sup>91</sup> However, the model area only considers the eastern part of the basin, which is somewhat more than half the area of the total basin but receives less precipitation. In comparing model recharge to published studies, it would seem more appropriate to compare the model recharge to one half of the published amount for Red Rock Basin, or about 650 acre-feet annually. That is, one half of Rush and Glancy's 900 acre-feet annually plus 200 acre-feet annually of inflow from Bedell Flat. The Nichols

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<sup>90</sup> Rush and Glancy, 1967.

<sup>91</sup> Exhibit No. 52, p.iii.

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method for estimating recharge, the highest estimate shown in the model report,<sup>92</sup> has not been widely acknowledged as providing reasonable recharge estimates, and the State Engineer has been hesitant to use this method in estimating basin recharge.

The models were each calibrated to a set of water-level measurements using the assigned recharge, so that hydraulic conductivity was varied until water levels matched observed conditions. Each of the models used the "pilot point" method for calibrating the hydraulic conductivity; however, six of the 21 pilot points were not allowed to vary, their value being assigned directly on the basis of the pumping tests that have been completed by the consultant at those sites. The hydraulic conductivity of pilot points computed during the calibration process is significantly higher than the measured values. In the first version of the model, where recharge is distributed more uniformly around the perimeter of the valley floor, the hydraulic conductivity at the fixed pilot points averaged 1.3 meters/day (4.265 feet/day) while the computed hydraulic conductivity was 5.6 meters/day (18.37 feet/day), or approximately four times the computed value for adjacent pilot points. In the revised model, recharge was distributed on the perimeter of the valley floor with consideration given to the relative size of the up-gradient watershed using water yield and runoff derived recharge estimates. In this version of the model, the computed hydraulic conductivity was about five times the fixed value. Figure 11 of the modeling report displays approximately 30 hydraulic conductivity estimates for wells based on their measured specific capacity. Unfortunately, there was no table provided with which to compare those estimates to the modeled values. The concern here is simply that the measured hydraulic conductivity appears to be significantly lower than the values computed in the calibration process. This situation could be the result of having too much water flowing through the model domain, i.e. too much recharge and too much discharge, or a poor conceptual model, or other factors.

Another consequence of higher hydraulic conductivity in the model is its effect on computed water-level drawdown due to pumping. A higher hydraulic conductivity distribution will result in a shallower cone of depression in the immediate vicinity of the pumping well, but somewhat more drawdown at intermediate distances. As mentioned above, a hydraulic conductivity distribution higher than actually exists could be due to modeling more than the actual recharge.

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<sup>92</sup> Exhibit No. 52, p.7.

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As mentioned previously, the model's surficial aquifer was simulated as unconfined, even though there is abundant evidence for confined conditions throughout much of the alluvial aquifer, including the Red Rock Ranch well area. Water level decline of a pumped aquifer is strongly influenced by the storage coefficient of the aquifer, with lower storage coefficients resulting in more drawdown. Because the aquifer was modeled as unconfined, the storage coefficient is equal to the specific yield, which was set at 0.1 and 0.2. In a confined aquifer the storage coefficient is significantly lower, and was estimated by the Applicant in their pumping test to be approximately 0.0002, as calculated by the specific storage of  $7.4 \times 10^{-7}$  times the average aquifer thickness of 300 feet. Early drawdown from proposed pumping under confined conditions was not simulated, but predicted water levels would decline faster in the early stages of pumping if confined conditions were simulated. Long term water-level decline might not differ significantly from the unconfined simulations, assuming steady state conditions are reached.

The models were completed for the purpose of simulating future proposed pumping at the Red Rock Valley Ranch and predicting future water levels. The Executive Summary of the Model Report<sup>93</sup> states that the model predicted total ground-water ET of 2,869 acre-feet annually. However, this statement is misleading because ET was initially prescribed by the work of Huffman and Carpenter and would only be slightly modified by the model. The Summary also implies that recharge was estimated and verified by the model. However, recharge was a fixed water budget item. Because steady-state conditions are assumed, recharge must equal the sum of the ET plus pumping plus subsurface outflow. That is, recharge equals discharge. Discharge was almost entirely predetermined, therefore recharge was also predetermined.

There was animated discussion during the hearing concerning testimony and evidence presented to show that ground-water recharge occurs on the valley floor, specifically, in the discharge areas.<sup>94</sup> Much of this argument revolves around the approach one takes regarding differentiating total ET versus ground-water ET. The Applicant's argument, proffered by expert witness Ms. Carpenter, is not in agreement with conventional thought on this issue. Ms. Carpenter conducted an infiltration analysis using the program HYDRUS 1D to estimate the amount of rainfall that becomes

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<sup>93</sup> Exhibit No. 52.

<sup>94</sup> Testimony of Ms. Carpenter and Exhibit No. 51.

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recharge.<sup>95</sup> The analysis shows that infiltration of precipitation to the water table would occur under present conditions with the shallow water table. However, the predictive simulations of the ground-water flow model show 10 to 30 feet of drawdown across the valley floor. Under such conditions, infiltration of precipitation to the water table would decrease, which would then result in less recharge, which would result in more water level decline and correspondingly less infiltration. The situation is such that by capturing the recharge there will be less recharge in the future available for capture. It is a circular argument, with the only realistic solution being to neglect any potential recharge in the discharge areas. The scenario of decreasing recharge with water-level decline was not considered in the model predictions because recharge is held constant in a steady-state model. In fact, the model (correctly) did not simulate any recharge on the valley floor.

The State Engineer finds the ground-water flow model does not predict or verify either recharge or ET discharge, but that these water budget components were pre-estimated and input into the model. The State Engineer further finds that the recharge estimate used in the model is significantly higher than previously published and accepted values. The State Engineer finds that the calibrated hydraulic conductivity values are not satisfactorily within the range of observed values, and rather than adding confidence to the conceptual model, raise questions about the conceptual model and/or the recharge amount used.

The above irregularities notwithstanding, the State Engineer recognizes the usefulness and need for ground-water flow models in predicting future impacts. The model adequately demonstrates that the location of the application is well-suited to capture the existing natural discharge of the eastern half of the Red Rock Valley Hydrographic Area. The modeling study also shows that the proposed project will not unduly conflict with existing water rights so long as the proposed pumping, combined with existing rights and domestic wells, does not exceed the sustainable yield of the valley. These scenarios were evaluated by two separate models. The revised model showed water level decline in the nearby domestic wells will be less than 30 feet over the next ten years, and increase to only 30 to 40 feet after 50 years. Because current water levels are very near the land surface, and wells are required to be sealed in the upper 50 feet, this is not an unreasonable amount of drawdown. However, if the natural supply is

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<sup>95</sup> Transcript, p. 136.



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less than proposed pumping, water levels will continue to decline, and the pumping would conflict with existing water rights and domestic wells. The State Engineer finds that the modeling study does not prove either recharge or discharge in the eastern part of Red Rock Valley, but does show that development of the area within the local sustainable yield can occur without conflicting with existing rights or unreasonably effecting domestic wells.

#### XV.

As discussed above, the sustainable yield for the eastern part of Red Rock Valley is in the range of 1,200 to 2,400 acre-feet. The amount of water available for appropriation will be the sustainable yield minus the consumed portion of current water rights and domestic wells, with reserved water for future demand of one domestic well at each of the undeveloped parcels. There are currently 904 acre-feet of ground-water rights with a consumptive use estimate of 565 acre-feet per year. There are currently 136 developed parcels, and using the rate of 1.0 afa per parcel consumptive, annual use is 136 acre-feet. There are 128 undeveloped parcels, and 128 acre-feet per year will be reserved for future growth and development in the basin. The total of the consumed water and future needs is 829 acre-feet annually. The State Engineer finds the amount of unappropriated water is between 371 and 1,571 acre-feet.

#### XVI.

As discussed above, there is considerable uncertainty and disagreement in estimates of the sustainable yield and the amount of water available for appropriation. As previously stated, the State Engineer finds the sustainable yield is between 1,200 and 2,400 acre-feet, and the amount of unappropriated water is between 371 and 1,571 acre-feet. The Applicants have 484 acre-feet of existing rights that are available for export from the basin. The State Engineer finds that water rights in the amount of 371 acre-feet can be granted and available for export, so that the total available for export is 855 acre-feet. Since the Applicants have asked for a total combined duty of 1,273.39 acre-feet, there remains 418 acre-feet, which is requested for appropriation, but that amount would put the total quantity of water requested into a range of the available supply that is highly uncertain. Therefore, the State Engineer finds that a staged development of the resource is prudent and will be required before the remaining 418 acre-feet is available for export under the following two options:

### **OPTION 1**

- An initial staged development during a minimum 10-year period during which a maximum of 855 acre-feet can be pumped in any given year. Over a ten-year consecutive period, the pumping must average at least 750 acre-feet annually.
- With the exception of incidental uses related to the project, all ground water pumped during the staged development shall be exported from the Red Rock Valley.
- A detailed monitoring and mitigation plan shall be submitted and approved by the State Engineer.
- During the development period, the Applicant shall file an annual report with the State Engineer by March 15<sup>th</sup> of each year detailing the findings of the monitoring and mitigation plan.
- At the end of the staged development period the Applicant shall submit an updated ground-water flow model together with the data collected during the staged development period.
- The State Engineer will then make a determination as to whether the remaining amount may be pumped or if additional study is necessary.

### **OPTION 2**

The Applicant may wait for results from a new ET study for a determination on the availability of the remaining application amount and an updated estimate of the sustainable yield. The study shall be funded by the Applicant but overseen by the State Engineer's office, and will tentatively be designed as follows:

- An ET study utilizing micrometeorological stations located within the ground-water discharge area in the eastern part of Red Rock Valley.
- The study is to be conducted for a minimum of two consecutive years, during which ET data are collected on at least three sites that have representative and widespread vegetative units.
- Following the results of the study, the State Engineer will then make a determination as to whether the remaining amount may be pumped or if additional study is necessary.

## **CONCLUSIONS**

### **I.**

The State Engineer has jurisdiction over the parties and the subject matter of this action and determination.<sup>96</sup>

### **II.**

The State Engineer is prohibited by law from granting an application to appropriate the public waters where:<sup>97</sup>

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

### **III.**

The State Engineer concludes that the Applicant's request to defer action on Application 73963 (change of vested claim V-03111) cannot be approved.

### **IV.**

The State Engineer concludes that the additional statutory criteria required for an interbasin transfer of water under NRS § 533.370(6) can only be met with a staged and closely monitored development of the water resource in addition to reserving water for existing and future domestic well demand.

### **V.**

The perennial yield of the Red Rock Valley Hydrographic Area was previously estimated by the USGS, via reconnaissance level study, at 1,000 afa. Considering only the eastern half of Red Rock Valley results in a reconnaissance estimate of approximately 700 afa. Evaluation of all available evidence, including that provided at the hearing, indicates that the sustainable yield of the eastern part of Red Rock Valley is between 1,200 and 2,400 acre-feet per year; however, any sustainable yield above 1,200 acre-feet is highly uncertain; therefore, a cautious approach is warranted. By deducting the quantity of water necessary to satisfy existing rights and to satisfy existing and future domestic well demand in the eastern part of Red Rock Valley, the State Engineer concludes that there is 371 to 1,571 acre-feet of water available for appropriation.

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<sup>96</sup> NRS chapters 533 and 534.

<sup>97</sup> NRS § 533.370(5).

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However, the State Engineer further concludes that to appropriate any water above the 371 afa available, additional analyses must be completed as outlined in Finding XVII of this ruling.

#### VI.

The State Engineer concludes that Applications 73960, 73961, 73962, 73963, 73965, 73966, and 74368 may be considered for approval as follows:

- Change Applications 73960, 73961, 73962, 73963, and 73965 for a total combined duty of 484 afa.
- Application 73966 for a duty of 500 afa.
- Application 74368 for a duty of 289 afa.
- The total combined duty of Applications 73960, 73961, 73962, 73963, 73965, 73966, and 74368 is 1,273 afa.
- Applications 73966 and 74368 seek 789 afa in new appropriations; however, the Division has determined that only 371 afa of water is available with certainty. Therefore, the State Engineer concludes only 855 afa may be exported initially and the remaining 418 afa of water cannot be pumped until the aforementioned conditions are satisfied (Option 1 or Option 2).

#### VII.

The State Engineer has found that there is sufficient water available within the Red Rock Valley Hydrographic Area to support the export of 855 afa, at this time. A decision on the export of an additional 418 acre-feet will be deferred until the completion of additional studies. In addition, the Applicant must prepare a monitoring and mitigation plan to be approved by the State Engineer. In this context, the State Engineer concludes that the protest claims may be overruled.

#### VIII.

The State Engineer concludes that with the limitations and conditions imposed on Applications 73960, 73961, 73962, 73963, 73965, 73966 and 74368, the applications will not conflict with existing rights, will not conflict with protectible interests in domestic wells, and will not threaten to prove detrimental to the public interest.

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IX.


The State Engineer concludes that the protests to the applications were not supported by any substantial evidence or testimony and the Protestants either chose not to attend the administrative hearing or chose to attend only for the purpose of giving public comment; therefore, the protest claims are dismissed.

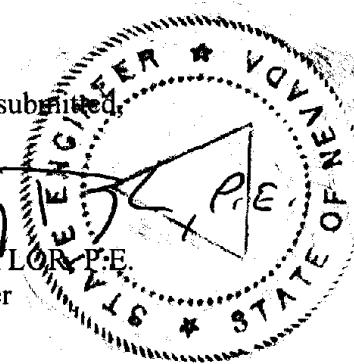
**RULING**

The protests to Applications 73960, 73961, 73962, 73963, 73965, 73966, and 74368 are hereby overruled and the applications are approved subject to:

1. Approved monitoring and mitigation plan;
2. Staged development or new ET study;
3. Existing rights; and
4. Payment of the statutory permit fees.

Respectfully submitted,

  
TRACY TAYLOR P.E.  
State Engineer



TT/TW/jm

Dated this 15th day of  
January, 2008.

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Figure 1. Red Rock Valley grassland upland vegetation unit as classified by the Applicant. Photo taken by State Engineer staff on September 27, 2006, after a near record 2006 water year precipitation amount of 20.4 inches recorded at the Stead NWS weather station. Vegetation illustrated here is assumed by the Applicant to have an ET rate similar to the measured ET rate of 3.07 feet per year from Fairbanks Meadow, Amargosa, Nevada, as shown in Figure 2, and the measured ET rate of 1.7 feet per year from the Carson Valley non-irrigated pasture grass ET-6 site as shown in Figure 3.

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Figure 2. USGS Fairbanks Meadow site in Amargosa, NV. The ET rate from this site of 3.07 feet per year is assumed to transfer to the grassland vegetation classification assumed by the Applicant and as shown in Figure 1. Photo was taken at this site on September 10, 2000. The USGS classifies this site as DGV, moderately dense to dense grassland vegetation.



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Figure 3. USGS Carson Valley non-irrigated pasture grass ET-6 site with a depth to ground-water from 6 to 7 feet. Photo taken on June 4, 2003. The ET rate of 1.7 feet per year from this site is assumed to transfer to the grassland vegetation classification assumed by the Applicant and as shown in Figure 1.



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Figure 4. Red Rock Valley scrub-shrub upland vegetation unit as classified by the Applicant. Photo taken by State Engineer staff on September 27, 2006, after a near record 2006 water year precipitation amount of 20.4 inches recorded at the Stead NWS weather station. Vegetation illustrated here is assumed by the Applicant to have an ET rate similar to the measured ET rate of 1.9 feet per year from the USGS Carson Valley ET-1 site as shown in Figure 5, and the measured ET rate of 1.5 feet per year from the USGS Carson Valley ET-7 site as shown in Figure 6.

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Figure 5. USGS Carson Valley rabbitbrush and greasewood ET-1 site with a depth to ground-water from 3 to 5 feet, and vegetation density of 73 percent. Photo taken on June 4, 2003. The ET rate of 1.9 feet per year is proposed to apply to the Applicant's scrub-shrub classification in Red Rock Valley as shown in Figure 4.



Figure 6. USGS Carson Valley sagebrush and bitterbrush ET-7 site with a depth to ground-water of about 60 feet. Photo taken on June 4, 2003. The ET rate of 1.5 feet per year is proposed to apply to the Applicant's scrub-shrub classification in Red Rock Valley as shown in Figure 4. Because the depth to water is about 60 feet and this site likely experiences a larger amount of precipitation than on the valley floor due to its proximity to the mountain front of the Carson Range, ET at this site is likely solely derived from precipitation.



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Figure 7. Red Rock Valley grassland upland vegetation unit as classified by the Applicant. Photo taken by State Engineer staff on September 27, 2006, after a near record 2006 water year precipitation amount of 20.4 inches recorded at the Stead NWS weather station. Vegetation illustrated here is assumed by the Applicant to have an ET rate similar to the average of the measured ET rate of 2.8 feet per year from the USGS Carson Valley flood irrigated pasture ET-4 site as shown in Figure 5, and the Carson Valley measured ET rate of 3.2 feet per year from the USGS Carson Valley flood irrigated pasture ET-5 site as shown in Figure 6. Ms. Carpenter use an average ET rate from Carson Valley flood irrigated pasture sites ET-4 and ET-3 to yield and average ET rate of 3.0 feet per year which was applied to Red Rock Valley in support of her statistically derived ET rate for grassland of 2.33 feet per year.



Figure 8. USGS Carson Valley flood irrigated pasture ET-4 site with a depth to ground-water from 3 to 4 feet. Photo taken on June 4, 2003. The measured ET rate of 2.8 feet per year was assumed to apply to the Applicant's grassland classification in Red Rock Valley as shown in Figure 7. The Applicant used an average ET rate from Carson Valley flood irrigated pasture sites ET-4 and ET-3 to yield an average ET rate of 3.0 feet per year.

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Figure 9. USGS Carson Valley flood irrigated pasture ET-3 site with a depth to ground-water from 2 to 5 feet. Photo taken on June 4, 2003. The measured ET rate of 3.2 feet per year was assumed to apply to the Applicant's grassland classification in Red Rock Valley as shown in Figure 7. The Applicant used an average ET rate from Carson Valley flood irrigated pasture sites ET-4 and ET-3 to yield an average ET rate of 3.0 feet per year.